Maximising Organisational Information Sharing and Effective Intelligence Analysis in Critical Data Sets

A case study on the information science needs of the Norwegian criminal intelligence and law enforcement community

Sonja Wilhelmsen

Dissertation for the degree philosophiae doctor (PhD)

Department of Information Science and Media Studies,

University of Bergen, Norway, 2009

Copyright © Sonja Wilhelmsen, 2009

Financial support was given by:
Department of Information Science and Media Studies, University of Bergen
Department of Information Systems, Agder University College (now University of Agder).

ISBN: 978-82-308-0849-8
University of Bergen, Norway.
Printed by AIT AS e-dit, Oslo

ABSTRACT

Organisational information sharing has become more and more important as the amount of information grows. In order to accomplish the most effective and efficient sharing of information, analysis of the information needs and the organisation needs are vital. This dissertation focuses on the information needs sourced through the critical data sets of law enforcement organisations; specifically the Norwegian criminal intelligence and law enforcement community represented by the National Criminal Investigation Service (Kriminalpolitisentralen (Kripos)). Information sharing is particularly important in these communities due to consequences for alleged perpetrators, victims and witnesses.

The theoretical framework starts with a brief investigation into the classical, mechanistic, and the systems worldviews before investigating different aspects of organisations; public administration; criminal justice organisations; an organisation's internal structure and environment; and organisational culture. Today most information systems consist of both humans and computers, hence; an investigation into the concepts of data, information, knowledge, and information systems has been performed; review of different definitions; review of what a computerised information system is as opposed to knowledge systems or expert systems; examination of information systems in an organisational context; and investigation of information systems development particularly requirements gathering and analysis. The last subject in the theoretical investigation relates to investigation and analysis of criminal actions; define and distinguish the terms investigation and intelligence; examine how the concepts of data, information, and knowledge are used in criminal investigation; define and distinguish the different forms of law enforcement analysis; and last investigate eyewitness testimonies which, despite the many advances in forensic science, of many still considered the most important information source in criminal investigation.

The empirical investigation at Kripos was performed using several different research methods aimed at qualitative aspects of the data followed by qualitative analysis. The theoretical views adopted in the research and the different data gathering methods allowed the researcher to explore information sharing throughout the organisation from both written and oral sources, and by doing so being able to; (1) identify possible communication break down points and specify an ideal communication pattern between different tribes (consisting of experts in the different fields needed in a criminal investigation); (2) develop an extended intelligence

process which was mirrored in (3) the specification of the borders for the computerised information system, and (4) the developed conceptual data model for a computerised information system; (5) specify a log function for the computerised information system.

ACKNOWLEDGEMENTS

Doctoral research and thesis writing is mostly a lonely task, but now and then we have some brief encounters with the social world around us, and at the end of my thesis work, which actually arrived, no matter how far away it seemed sometimes, I want to express my gratitude to some of those who helped me keep in touch with reality.

First and foremost I want to thank my supervisors, Professor Konrad Morgan and Professor Maung K. Sein at University of Agder. Professor Konrad Morgan has been my main supervisor, and for some time now he has been Dean at School of Applied Media and Information Technology, in Alberta, Canada. But even though he has been far away his support has not diminished, and I could not have wished for better support from my main supervisor. His professional advice and compassion has more than once helped me through confusion and difficult times by asking questions and making me investigate subjects from different angles.

Quite a few people have helped me on my journey to gain understanding of the work performed by criminal investigators and analysts and the environment they work in. Most of them are, or have been, working at Kripos, and I want to thank them all for the patience they showed, and the knowledge they shared with me. I also appreciate the opportunity I was given to participate in the Nordic Course in Criminal Intelligence Analysis in 2000, and the opportunity to present some results of the research for the group investigating new architecture for the police' systems in 2004. A civilian participator in the Course in Criminal Intelligence Analysis was not common; in fact I was the first one. After the initial curiosity towards me and my purpose for participating, and a statement that I did not, and would not, regard the human experts as obsolete, the help and information given was invaluable. In the meetings with the group investigating new architecture the members showed a genuine interest in details, purpose, and goals of the research.

In 2003 a stay at the University of Edinburgh gave me the opportunity to obtain information about different research projects within law enforcement, and to present my own research. I want to thank Mr Burkhard Schafer at School of Law/The Joseph Bell Centre for Forensic Statistics and Legal Reasoning for this opportunity and thank him and the employees at The

Joseph Bell Centre for Forensic Statistics and Legal Reasoning, where I had my office space, for help and advice during the month I stayed there.

I also like to express my thanks to family, friends and colleagues, both in Kristiansand and Bergen, for supporting me and believing in me through my research and thesis work. My family and friends near and far has been patient and understanding when the phrase "Sorry, I have to work" more often than not, was the reply to invitations. I admit that I am looking forward to the next time they ask how the work is progressing, and I will be able to say "I have finished writing my thesis". The phrase 'None mentioned and none forgotten' are often used when thanking a large number of people. However, some friends have been more involved than others and needs to be mentioned; Enid for motivating me and pushing me forward in the final stage of my thesis writing in her kitchen; Vibeke, Reidar and Karianne for taking care of formatting and errors and thereby saving me several hours in the stage where I had become blind to my own errors.

Bergen, February 2009
Sonja Wilhelmsen

TABLE OF CONTENTS

CHAPTER 1 INTRODUCTION 2
1.1 Personal motivation and comments 2
1.2 Introduction to the research 3
1.3 Research purpose, focus, goal and question 4
1.4 Research methodology and methods 6
1.5 Research results and contribution to knowledge 6
1.6 Overview of the chapters and appendices 7

CHAPTER 2 THEORETICAL FRAMEWORK 12
2.1 Introduction 12
2.2 The Aristotelian worldview 19
2.3 The mechanistic worldview 21
2.3.1 Francis Bacon 21
2.3.2 Mechanism in the 20th century 22
2.4 The systems worldview 24
2.5 Comments 29

CHAPTER 3 ORGANISATIONS 30
3.1 Introduction 30
3.2 Public administration 33
3.2.1 Comments 36
3.3 Criminal Justice Organisations 36
3.3.1 Comments 40
3.4 An organisation's internal structure and its environment 41
3.4.1 Comments 49
3.5 Organisational culture 50
3.5.1 Comments 54

CHAPTER 4 INFORMATION SYSTEMS 56
4.1 Introduction 56
4.2 Information and information systems 59
4.2.1 Comments 67
4.3 Information systems in an organisational context 68
4.3.1 Comments 74
4.4 Information systems development – requirements gathering and analysis 76
4.4.1 Comments 86

CHAPTER 5 INVESTIGATION AND ANALYSIS OF CRIMINAL ACTIONS 88
5.1 Introduction 88
5.2 Criminal intelligence and criminal investigation 92
5.3 Law enforcement analysis 97
5.3.1 Comments 101
5.4 The concept of information in criminal investigation 102
5.5 Eyewitness testimonies 104
5.5.1 Comments 107

CHAPTER 6 THE EMPIRICAL INVESTIGATION 110
6.1 Research purpose, goal, focus, and question 111
6.2 Research methodology and method 112
6.3 Overview of the research 114
6.4 Data gathering for the mock-up case for a stolen laptop at Department of Information Science, University of Bergen (21.06. – 01.08.2001) 117
6.5 Nordic course in criminal intelligence analysis. (19.06. – 30.06.2000) 118
6.5.1 Description of the intelligence process 120
6.6 Data gathering 23.01. – 01.02.02 124
6.6.1 Summary of field notes 126
6.7 Data gathering 26.11.2002 134
6.8 Data gathering 21.02.2003 136
6.9 Presentation of EER-models/data gathering 02.06.2003 139
6.10 Data gathering 01.09. – 03.09.2003 141
6.10.1 Summary of field notes 142
6.11 Data gathering 10.11.2003 147
6.12 Data gathering 20.04.2005 148
6.12.1 Summary of interview with NN2 149
6.12.2 Summary of interview with NN4 152
6.12.3 Summary of interview with NN5 155

CHAPTER 7 RESULTS 158
7.1 Mock-up case for a stolen laptop at Department of Information Science, University of Bergen 159
7.1.1 Outline of the case 159
7.1.2 First review of the data 159
7.1.3 Second review of the data 163
7.1.4 Results from the analysis 174
7.2 Initial analysis and results 177
7.2.1 Data sets and their area of use 178
7.2.2 Functions and characteristics of the data sets 180
7.2.3 Classification of data 182
7.2.4 Initial sketches for the computerised information system 184
7.2.5 EER-models and further sketches 196
7.2.6 Models to be used in data gathering 26.11.2002 201
7.3 Jack the Ripper 210
7.4 Final analysis and results 219
7.4.1 Data flow models 219
7.4.2 Conceptual data model 226
7.4.3 Log function 252

CHAPTER 8 DISCUSSION 254
8.1 Summary of research 254
8.1.1 Theoretical framework 254
8.1.2 Organisations 255
8.1.3 Information systems 259
8.1.4 Investigation and analysis of criminal actions 266
8.1.5 The empirical investigation 268
8.1.6 Research results 277

8.2 Discussion of the research results 281
8.3 Further research..... 285
8.4 Personal comments..... 288

REFERENCES 290

APPENDIX 304

LIST OF FIGURES

Figure 2.1 Current communication pattern between planners/strategists, detectives, and uniformed division within the police force..... 13

Figure 2.2 Model for ideal communication pattern between planners/strategists, detectives and uniformed division within the police force..... 14

Figure 2.3 Different views of the world..... 16

Figure 2.4 Aristotle..... 19

Figure 2.5 Sir Francis Bacon..... 21

Figure 2.6 Karl Ludwig von Bertalanffy..... 24

Figure 2.7 Morphogenesis of Systems Philosophy. Source: M'Pherson (M'Pherson, 1974, p. 134). 26

Figure 3.1 Organisation chart for the Norwegian prosecution authority. Source: Riksadvokaten. 31

Figure 3.2 Woodrow Wilson..... 33

Figure 3.3 Max Weber..... 41

Figure 3.4 An organisation's central features. Source: Scott (Scott, 2003, p.18)..... 43

Figure 3.5 Chester Barnard..... 50

Figure 3.6 Six basic parts of the organisation. Source: Mintzberg (Mintzberg, 1989, p. 99)..... 51

Figure 3.7 Levels of culture. Source: Schein (Schein, 1992, p. 17)..... 54

Figure 4.1 The intelligence process Source: Nordisk kurs i kriminalanalyse (Kripos, 2000, p. 2)..... 58

Figure 4.2 DIKW-hierarchy with Zeleney's descriptions. Adapted from: Zeleny (Zeleny, 1987)..... 62

Figure 4.3 Relationship between data, information, and knowledge. Source: Alter (Alter, 2006, p. 44)..... 67

Figure 4.4 Evolution of the DSS field. Source: Arnott and Pervan (Arnott & Pervan, 2005, p. 69)..... 70

Figure 4.5 The Work System Framework. Source: Steven Alter (Alter, 2002, p. 93)..... 73

Figure 4.6 The extended intelligence process. 75

Figure 4.7 Layers in the conceptual data model..... 76

Figure 4.8 Børje Langefors..... 77

Figure 4.9 Information systems development. Source: Hirschheim, Klein, and Lyytninen (Hirschheim, Lyytinen, & Klein, 1995, p. 16)..... 79

Figure 4.10 Current Information systems development paradigms.
Source: Hirschheim and Klein (Hirschheim & Klein, 1989, p. 1202) 80

Figure 4.11 Illustration of the five ontological domains.
Source: Iivari, Hirschheim and Klein
(Iivari, Hirschheim, & Klein, 2004, p. 319) 83

Figure 4.12 Framework for discussing the underlying philosophy of data analysis.
Source: Lewis (Lewis, 1994, p. 139)..... 84

Figure 5.1 Interacting tasks in a criminal investigation (Kripos).
Adopted from meeting 25.01.02 with Police Superintendent Arne R. Simonsen. 91

Figure 5.2 Components of a hypothesis (Kripos).
Adopted from meeting 25.01.02 with Police Superintendent Arne R. Simonsen. 92

Figure 5.3 Hans Gross..... 95

Figure 5.4 Crime analysis – the transition from data to knowledge.
Source: Bruce (Bruce, 2004, p. 12) 102

Figure 5.5 Elizabeth F. Loftus..... 106

Figure 7.1 Floor plan with entities and items, first review 163

Figure 7.2 Floor plan with entities and items, second review..... 171

Figure 7.3 Examples of different types of relationships between data. 184

Figure 7.4 Use of verified and unverified information between the different layers in
the conceptual data model 226

Figure 7.5 Use of different kinds of relationships within and between layers in
the conceptual data model. 228

LIST OF TABLES

Table 2.1 View of nature, epistemology, reasoning, methodology, and method in the Aristotelian, mechanistic and systems worldview 18

Table 2.2 An informal intuitive hierarchy of real-world complexity (after Boulding, 1956). Source: Checkland (Checkland, 1981, p. 104) 28

Table 3.1 Five Characteristics of Criminal Justice Organisation. Adapted from: Stojkovic et al. (Stojkovic, Klofas, & Kalinich, 2004) 39

Table 3.2 Dominant Theoretical Models and Representative Theorists: A layered model. Source: Scott (Scott, 2003, p. 108) 45

Table 3.3 A Comparison of Webers' theory of bureaucracy, open systems theory, and institutional theory. Adapted from: Evan (Evan, 1993)..... 47

Table 3.4 Four basic organisational environments. Source: Mintzberg (Mintzberg, 1979, p. 286) 49

Table 3.5 The External and Internal Tasks Facing All Groups Source: Schein (Schein, 1991, p. 249)..... 53

Table 4.1 Characteristics of Information Processing Systems. Source: Laudon and Laudon (Laudon & Laudon, 2006, p. 42)..... 69

Table 4.2 A Dichotomy of Information Work. Source: Sprague and McNurlin (McNurlin & Sprague, 2003, p. 19)..... 71

Table 4.3 Roles an Information System can play in Work Systems. Source: Steven Alter (Alter, 1999, p. 31). 73

Table 4.4 Examples of Different Roles Information Systems can play in Work Systems. Source: Steven Alter (Alter, 1999, p. 32). 74

Table 4.5 Summary of the four paradigms of information systems development. Source: Hirschheim and Klein (Hirschheim & Klein, 1989; Hirschheim, Lyytinen, & Klein, 1995, p. 91)..... 81

Table 5.1 Different types of criminal/crime analysis (Kripos). Source: Nordisk kurs i Kriminalanalyse (Kripos, 2000, p. 13). 89

Table 5.2 Description of different types of criminal/crime analysis (Kripos). Adapted from: Field notes and Nordisk kurs i kriminalanalyse (Kripos, 2000).... 90

Table 5.3 Different terms used for analysis of criminal actions. Adapted from: (Bruce, 2004; Gottlieb, Singh, & Arenberg, 1994; Osborne & Wernicke, 2003; Peterson, 1998)..... 98

Table 5.4 Descriptions of macro-terms for analysis of criminal actions.
Adapted from: (Bruce, 2004; Osborne & Wernicke, 2003; Peterson, 1998)..... 99

Table 5.5 Descriptions of types and subtypes for analysis of criminal actions. 100

Table 5.6 Examples of the transition from data to knowledge in a typical police agency.
Source: Bruce (Bruce, 2004, p. 13) 103

Table 5.7 The six stages of criminal intelligence analysis.
Adapted from: Morgan et al. (Morgan, Holland, Hardy et al., 1993)..... 104

Table 6.1 Overview of contacts at Kripos..... 115

Table 6.2 Chronological overview of data gathering..... 115

Table 6.3 Chronological overview of events (outside Kripos) with impact on the research 116

Table 6.4 Overview of properties determining the information's usefulness.
Adapted from: Nordisk kurs i kriminalanalyse (Kripos, 2000). 121

Table 6.5 Overview of techniques/diagrams used in case analysis.
Adapted from: Nordisk kurs i kriminalanalyse (Kripos, 2000). 122

Table 6.6 Parts of a hypothesis related to interesting aspects of information.
Adapted from: Nordisk kurs i kriminalanalyse (Kripos, 2000). 123

Table 6.7 Overview of unstructured interviews/talks at Kripos 23.01. – 01.02.2002..... 125

Table 6.8 Fixed data elements in Kripos reports.
Source: Kripos. 141

Table 6.9 Overview of unstructured interviews/talks at Kripos 01.09.03 – 0309.03..... 142

Table 6.10 Elements in reports from criminal investigative analysis.
Source: Kripos. 143

Table 6.11 Elements in reports from forensic investigation and analysis..... 145

Table 7.1 Entities in the interview with Hege Renee Hansen Åsand, first review 160

Table 7.2 Items in the interview with Hege Renee Hansen Åsand, first review..... 161

Table 7.3 Relationships in the interview with Hege Renee Hansen Åsand, first review..... 162

Table 7.4 Entities in the interview with Hege Renee Hansen Åsand, second review..... 166

Table 7.5 Entities in the interview with Bernt Olav Økland, second review..... 168

Table 7.6 Items in the interview with Hege Renee Hansen Åsand, second review 170

Table 7.7 Statements in interviews, second review 172

Table 7.8 Log containing actions for witness Hege Renee Hansen Åsand, second review. 173

Table 7.9 Log containing actions for witness Bernt Olav Økland, second review 173

Table 7.10 Types of data sets in a crime investigation with the analyst's interest in the data 179

Table 7.11 Problems in data sets related to functions and characteristics 181

Table 7.12 Time and date frame with accuracy percentage 182

Table 7.13 Classification of data used during criminal investigation 183

Table 7.14 Overview of models to be used in data gathering 26.11.2002. 201

Table 7.15 Description of entities in EER-models to be used in data gathering 26.11.2002. 204

Table 7.16 Overview of EER-models. 229

Table 7.17 Layer: Evaluation and preparation. Overview and description of main categories (generic entities/entities). Overview of subset categories (subset entities). 231

Table 7.18 Layer: Analysis - integration. Overview and description of main categories (generic entities/entities). Overview of subset categories (subset entities). 232

Table 7.19 Layer: Analysis - interpretation. Overview and description of main categories (generic entities/entities). Overview of subset categories (subset entities). 233

Table 7.20 Layer: Analysis - reports. Overview and description of main categories (generic entities/entities). Overview of subset categories (subset entities). 233

Table 7.21 Layer: Concluding remarks. Overview and description of main categories (generic entities/entities). Overview of subset categories (subset entities). 234

Table 7.22 Relationships between layer 'Evaluation and preparation' and 'Analysis integration'. 236

Table 7.23 Relationships between layer 'Analysis - Integration' and layers 'Evaluation and preparation' and 'Analysis - Interpretation' 238

Table 7.24 Relationships between layer 'Analysis–Report' and 'Analysis-Interpretation'... 239

Table 7.25 Relationships between layer 'Concluding remarks' and 'Evaluation and preparation'. 239

CHAPTER 1
INTRODUCTION

"I have always been struck by the analogy between the artist learning to see his or her subject before it can be rendered and the social scientist learning to see the psychodynamics and sociodynamics of individuals, relationships, groups, and larger organizational units. My own insights have only come after I have spent hours and hours immersed in a given phenomenon, after I have identified and dealt with all my own prior expectations and stereotypes, and have gradually come to see what is really out there."
Edgar H. Schein (1996, p. 239)

The focus of this thesis has been to gain a greater understanding of the human and cybernetic systems involved in the investigation of criminal actions. This first chapter will provide personal motivation and comments (section 1.1), an introduction to the research (section 1.2), the research purpose, focus, goal, and question (section 1.3), the research methodology and methods (section 1.4), the research results and contribution to knowledge (section 1.5), and an overview of the chapters and appendices (section 1.6).

1.1 Personal motivation and comments

During my work in an IT-department dealing with both IT-professionals and users, I often saw how difficult it was for the users and the IT-professionals to communicate. For example engineers were preoccupied with how the computer could perform a task, but the user was not interested in the technical aspects of the information systems. The users were interested in software that could perform the organisational tasks they were responsible for. This ongoing discussion was the starting point for my academic interest in information systems and organisations. Even though most people, at least in the western world, equals information systems with computers this research did not focus on technology, but on the different theoretical perspectives related to organisations and information systems, particularly systems analysis and modelling.

My research position was divided between the University of Bergen and Agder University College (now University of Agder, (UIA)). When I started my doctoral research Department of Information Science (now Department of Information Science and Media Studies), University of Bergen (UIB), the Norwegian Ministry of Justice (*Justisdepartementet,* now Ministry of Justice and the Police (*Justis- og politidepartementet*)), and the Norwegian National Criminal Intelligence Service (*Kriminalpolitisentralen, Kripos*) had signed an agreement aimed at developing methods for criminal intelligence analysis and computerised information systems for use in crime investigation. This agreement made me able to start my research into information systems and organisations with the additional interesting field of investigation and analysis of criminal actions.

During the research period, presentations were given at Kripos and the departments at University of Bergen and Agder University College several times. I also had the opportunity to present, and get feedback, on the work at The Joseph Bell Centre for Forensic Statistics and Legal Reasoning, University of Edinburgh. Another opportunity to present the research was for the working group drawing up a new architecture for the police systems. I participated in two meetings with the group, and the research was credited in their report (Politets data- og materielltjeneste, 2004). At a research seminar in qualitative research methods, I had the opportunity to discuss the planned empirical research with professor Jaber F. Gubrium, University of Florida, and professor emeritus David Silverman, University of London. In addition to the discussion, they advised me to keep in mind that I was a female researcher entering a male dominant organisation.

1.2 Introduction to the research

Criminal investigation has not been the subject of much published research in the public domain. A key reason for this is that much of the information is confidential. However, in chapter 5 there will be an overview and a discussion of some of the public literature that deals with investigation, intelligence, and analysis from various perspectives. Two examples of research are Courtroom 21 (The centre for legal + court technology, 2007) and the work carried out by Smith and King (Smith & King, 2002). Courtroom 21 aims at presenting information in court through different visual techniques, and the work carried out by Smith and King is focussing on presentation and analysis of criminal intelligence information in the form of link diagrams.

The information load associated with criminal investigation has grown during recent years and being able to manage the information using computers becomes increasingly important. Related criminal actions also tend to span a larger geographical area because it is easier to move between places now than it was just a few decades ago. Another change is that organised crime has increased in recent years, hence investigating crimes across different boundaries, both geographical and organizational (e.g. different police stations), becomes important. Kripos and the police use several data directories (Politiregisterutvalget, 2003; Riksrevisjonen, 2004) in their work, but the information sharing is not as effective and efficient as it could be. Criminal intelligence analysts at Kripos had few computerised systems except for the directories, and the computerised information systems they had were not able to exchange information without manual operations.

Kripos performs both technical and tactical investigation in serious crimes. Technical investigation relates to physical evidence (e.g. crime scene investigation and autopsy). Tactical investigation includes investigation management, general tactical investigation (includes interviews/interrogation and project management), and tactical (or operational) criminal intelligence analysis (Kriminalpolitisentralen, 2005). The main task for the analyst is to be able to provide an answer to who, what, where, when, why, and how. The work carried out in this process can in many ways be related to the social scientist's work dealing with qualitative characteristics in their analyses of e.g. interview data.

To be able to investigate the information needs of the Norwegian criminal intelligence and law enforcement community several theoretical aspects were included in the research; different worldviews (see chapter 2); theoretical aspects of organisations (see chapter 3); the concept of information and information systems (see chapter 4); theoretical aspects of investigation and analysis of criminal actions (see chapter 5). An overview of the different theoretical aspects is included in section 1.6 (Overview of the chapters and appendices).

1.3 Research purpose, focus, goal and question

The investigation into maximising organisational information sharing and effective intelligence analysis in critical data sets has been guided by a research purpose, focus, goal, and question.

Research purpose

The research purpose was to enable investigators of criminal cases to reconstruct the course of events involved in a crime as completely and accurately as possible with particular emphasis on increasing the human investigator's understanding of the events, actions and timelines involved in a crime.

Research focus

The research focus was criminal intelligence analysis, particularly case analysis and comparative case analysis.

Research goal

The initial research goal was to develop a model for a computerised information system to be used in the reconstruction process, and to decide the borders for the information system.

During the research two sub goals were added

- Understand and critically document the process involved in criminal intelligence analysis
- Understand and describe the possible boundaries and barriers that may prevent effective and efficient criminal intelligence analysis

Research question

The initial research question was as follows:

- Is it possible to represent diverse knowledge in dynamic data structures and thereby improve an applied field of criminal intelligence analysis?

During the research the initial research question was refined into the sub questions:

- Does the understanding of the applied process of criminal intelligence analysis influence the electronic representation in the communication system?
- Do the boundaries and barriers of the criminal intelligence analysis process fall in line with the boundaries of the proposed model for the computerised system?

1.4 Research methodology and methods

The research purpose, focus, goal and question were investigated using several different research methods. The research methods was aimed at the qualitative aspects of the data (Grønmo, 1996), and qualitative analyses (Miles and Huberman, 1994) was performed. The methods used were participant observations, document analysis, unstructured interviews/talks, and structured interviews with open-ended questions. The researcher also constructed a mock-up case. The mock-up case is based on a real event involving a stolen laptop from a student at the Department of Information Science, University of Bergen. To be able to understand the criminal intelligence analysis process the researcher also included other information sources than criminal intelligence analysts, i.e. technical and tactical investigators and criminal investigative analysts (criminal profiling).

The empirical investigation consisted of nine data gatherings:

1. Mock-up case for a stolen laptop (based on a real event)
2. Nordic course in Tactical Criminal Intelligence Analysis
3. Data gathering at Kripos (2 weeks)
4. Review of EER-models
5. Review of EER-models
6. Presentation and discussion of models at Kripos (two meetings)
7. Data gathering at Kripos (3 days)
8. Presentation and discussion of models at Kripos
9. Data gathering at Kripos

Each data gathering was followed by an extensive analysis of the collected data.

1.5 Research results and contribution to knowledge

According to Sprague and Watson (Sprague & Watson, 1996, p. 1) “Frameworks or “conceptual models” are often crucial to the understanding of a new or complex subject”. The resulting framework or conceptual model from this research consists of these parts:

1. Descriptions of
    - Kripos and its place in the judicial system
      (see section 3.1 and appendix 1 – 5)
    - The analytic work at Kripos (including the criminal intelligence process)
      (see section 4.1 and 5.1, and subsection 6.5.1, 6.6.1, and 6.10.1)

2. Identification of possible communication break down points and specifying an ideal communication pattern between and within law enforcement organisations
   (see section 2.1 and figures 2.1 and 2.2)
3. The extended intelligence process
   (see subsection 4.3.1 and figure 4.6)
4. Conceptual EER-model for a computerised information system
   (see subsection 4.3.1 and subsection 7.4.2)
5. Data flow model showing the borders and main processes for criminal intelligence analysis
   (see subsection 7.4.1)
6. Log function for the computerised information system
   (see subsection 7.4.3)

The contribution to knowledge from this research can be argued to consist of three related areas:

1. Increased understanding of information needs in criminal intelligence analysis
2. Increased understanding of the process of communication in law enforcement organisations
3. Increased understanding of data gathering methods

1.6 Overview of the chapters and appendices

Chapter 2, theoretical framework, (section 2.1) starts with a characterisation of information used by, and communicated between different tribes in law enforcement organisations, and an introduction to the different worldviews reviewed in this research. The worldviews include the Aristotelian (section 2.2), mechanistic (section 2.3) and the systems (section 2.4) view of the world. It will not be a lengthy discussion, merely an overview of the most defining

characteristics. In the section describing the mechanistic worldview a description of some of Francis Bacon's work is included (subsection 2.3.1). Francis Bacon is chosen because he is, by many, considered the father of modern science, and because his four forms of idols (Bacon, 1952) can be related to the different tribes. In table 2.1 (in section 2.1) the reader can find a summary of the different world views regarding; view of nature, core element, epistemology, knowledge, reasoning, methodology, and method. Comments from the researcher can be found in section 2.5.

Chapter 3 gives an overview of organisations. Organisations are viewed in light of the mechanistic and the systems worldview, and each subject that is treated starts with a very brief historical overview. The Aristotelian worldview was included because it has some bearing on the systems world view and will not be followed up further in the descriptions. First in this chapter the reader can find a description of Kripos and its place in the judicial system (section 3.1, see also appendix group A which consists of organisation charts for Kripos). Since Kripos is a public organisation the chapter will also include a discussion of public management in general and some specifics for Norway (section 3.2). Also included, is a review of literature discussing differences between public and private organisations. Section 3.3 contains a review of criminal justice organisations, and it is established that the formal task of the criminal justice system (Feeley, 1973) is to process, arrest, determine guilt or innocence, and in the case of guilt to specify an appropriate sanction. However, Kripos' scope is narrower and is explained in section 3.1. In section 3.4 an organisation's internal structure and environment are discussed. Both are elements of the formal organisation, and according to Scott (Scott, 2003), the internal structure consists of social structure, goals, participants, and technology. Organisational culture (section 3.5), on the other hand, refers to the informal organisation which is important in this work as part of that which defines the different tribes discussed in this thesis. A characteristic (Martin, 2002, p. 56) of most of the definitions for culture is "use of the word "shared" and a reference to culture as that which is distinctive or unique to a particular context". Comments to the different aspects of organisations can be found in subsections 3.2.1, 3.3.1, 3.4.1, and 3.5.1.

Chapter 4, information systems, begins with a presentation of the process of criminal investigation and analysis as it is carried out by Kripos (section 4.1). Kripos performs several types of analysis, and in order for the information system to support these types of analysis, the model of the intelligence process is extended. In section 4.2 a discussion of the concept of

information is put forward. The usual way of defining information within the information systems field is by a hierarchy consisting of the terms data, information, knowledge, and wisdom, and the roots of this hierarchy are identified. The chapter includes an overview of Braman's (Braman, 1989) four levelled information hierarchy. The hierarchy was developed within the field of information policy studies, but according to Kirk (Kirk, 1999) the hierarchy is applicable to organisations. Information from the user's point of view is discussed with basis in Buckland's (Buckland, 1991) three principle uses of information. An overview of Langefors' infological equation from 1966 is also given. Alter (Alter, 2006) illustrates how knowledge is used to convert data into information and how knowledge is used in decisions or actions. In section 4.3 information systems (IS) are seen in an organisational context. First in this section information systems are presented in connection with the different levels of organisations (the strategic level, management level, and operational level), including transaction process systems, decision support systems, and management information systems. A classification using type of information work (McNurlin & Sprague, 2003) is also included. The last classification in this section is the "Work system framework" developed by Alter (Alter, 2002). This framework can be used both by business/IT-professionals and academic researcher. Section 4.4 deals with information systems development (ISD) in a paradigmatic context. The paradigms are defined by Hirschheim and Klein (Hirschheim & Klein, 1989). The four paradigms are; functionalism, social relativism, radical structuralism and neohumanism. Since the research focused on requirements gathering and analysis the two paradigms (objectivist and subjectivist) for data analysis (Klein & Hirsccheim, 1987) is discussed. Section 4.4 also contains an overview of the five knowledge areas in information systems development (Iivari, Hirsccheim & Klein, 2004). Comments to the different subjects treated in this chapter can be found in subsections 4.2.1, 4.3.1, and 4.4.1.

Chapter 5, investigation and analysis of criminal actions, starts with an introduction of the analytic work at Kripos which can be divided into tactical (or operational) and strategic analyses (section 5.1). These two categories are further divided into different analyses based on focus for the analysis which can be criminal events, persons, and methods for crime control. The chapter also describes analysis in relation to investigation, intelligence, and other work. Section 5.2 contains a discussion of the distinction between criminal intelligence and criminal investigation by looking at different definitions of the two terms. In section 5.1 a description is given of how Kripos defines the different kinds of analysis, but in section 5.3 a wider view is presented by using four texts about law enforcement analysis. The concepts of

data, information, knowledge, and wisdom are discussed in section 4.2, and two examples of these terms in connection with criminal investigation will be given in section 5.4. In the last section, section 5.5, eyewitness testimonies are discussed. Eyewitness testimonies are still, even though analysis of forensic evidence is improving, important in criminal cases. However, eyewitness testimonies are connected with several problems which can be divided into system variables and estimator variables (Wells, Memon and Penrod, 2006). The criminal justice system has control of the system variables (e.g. how an eyewitness are instructed before a line-up), but no control over the estimator variables (e.g. cross-race identifications). Comments to the different aspects treated in this chapter can be found in subsections 5.3.1 and 5.5.1.

Chapter 6 presents the empirical investigation. The first part of this chapter is used to explain some of the terms used in the research. In section 6.1 the research purpose, goal, focus and question are presented. In section 6.2 the reader can find descriptions of the research methodology and method, including reliability and validity. Section 6.3 includes an overview of the research with a chronological overview of data gatherings (table 6.2) and a chronological overview of events (outside Kripos) with impact on the research (table 6.3). The nine different research steps are presented in section 6.4 – 6.12 and appendix groups A (appendix 1 – 5), C (appendix 10 – 15), and D (appendix 16 – 20).

Research results are presented throughout the thesis (see section 1.5), but the main body of results is presented in chapter 7 and appendix group B (appendix 6 – 9). Appendix group B contains results of the analysis periods between data gatherings, and includes models developed for intermediary analyses. Section 7.2 includes initial analysis and results, section 7.3 includes EER-model showing data from the case of Jack the Ripper, and section 7.4 includes final analysis and result. Chapter 7 (section 7.1) also includes results from the work with the mock-up case for a stolen laptop at Department of Information Science, University of Bergen.

Chapter 8, discussion, provides a summary of the research. In section 8.1; theoretical framework (subsection 8.1.1), organisations (subsection 8.1.2), information systems (subsection 8.1.3), and investigation and analysis of criminal actions (subsection 8.1.4). In subsection 8.1.5 a summary of the empirical investigation is presented including an overview of the theoretical concepts informing the research, and in subsection 8.1.6 a summary of the

research results is presented. The research is discussed in section 8.2. Further research is presented in section 8.3. Some personal comments from the researcher are provided in section 8.4.

CHAPTER 2
THEORETICAL FRAMEWORK

The good systems scientist or philosopher is both reductionist and holist.
P. K. M'Pherson (1974, p. 137)

The subject of this chapter is the overall focus for the research that has been carried out and the different ways it is possible to view the world. The introduction starts with a brief description of the information and the information exchange in law enforcement organisations and an overview of the different worldviews that will be included in this chapter; the Aristotelian, mechanistic and systems worldview. The following sections will contain a brief description of the three worldviews. The final section will contain some concluding comments regarding the theoretical framework as a lens for the research that has been carried out.

2.1 Introduction

Most of the information used in law enforcement organisations is sensitive, complex, and the result of time consuming tasks. Since knowledge and experience often are obtained with great personal and work related costs, the individual or the organisation can develop emotional ownership to the information and not be willing to share all they know. On the other hand sharing knowledge in these organisations is vital because misinformation[1] and/or disinformation[2] can have very unfortunate consequences. These characteristics make it even more important to be aware of the danger of not taking into account the question of boundaries.

[1] 1. The action of misinforming someone; the condition of being misinformed. 2. Wrong or misleading information. 3. An instance of misinformation (sense 1); an item of misinformation (sense 2) (Oxford English Dictionary).
[2] a. The dissemination of deliberately false information, esp. when supplied by a government or its agent to a foreign power or to the media, with the intention of influencing the policies or opinions of those who receive it; false information so supplied [....] b. [....] disinform [....], to supply with false information. (Oxford English dictionary) .

A goal for the research has been to design a conceptual framework that will enable communication to flow easier across different kinds of boundaries, e.g. boundaries between the different organisations involved in criminal investigation, and the information system boundaries that exists both within and across the different tribes[3]. In figure 2.1 the tribes are exemplified with the uniformed division, the detectives, and the planners/strategists within the police. The figure also shows the current information flow (or lack thereof) between these tribes. The information flow very often stops at the border between the tribes except for information exchange based on personal relationships. The broken line (without images of persons) represents both electronic and verbal information exchange. In addition to the exemplification of communication patterns shown below, there will be an organisational border which divides e.g. the police and the court, or two geographically separated police stations. However, the same communication pattern will recur on this organisational level.

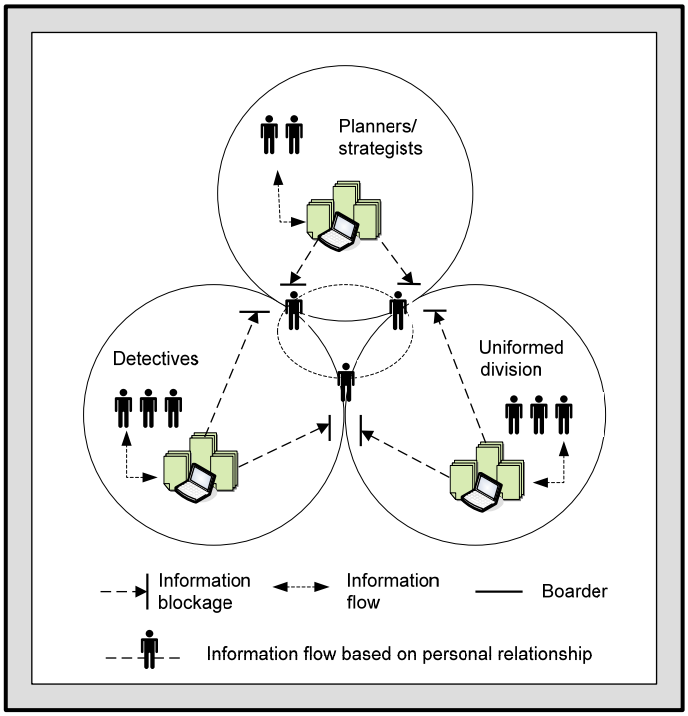


Figure 2.1 Current communication pattern between planners/strategists, detectives, and uniformed division within the police force.

[3] In this thesis the term tribe is defined as a social group with its own norms and practices. The social group also exhibits emotional ownership of their knowledge.

Figure 2.2 shows the ideal form of communication. The borders are still in place between the tribes, but information is exchanged across these borders. All information is "on the table". Both the electronic and the verbal information cross the borders. With this situation there is no longer need for relying on personal relationships to obtain the information necessary to achieve the goals for each tribe. Reaching this ideal is not possible by only creating a computerised information system that communicates across the borders; it is also necessary to have an organisation culture that makes it possible and encourage information exchange between the tribes. Much of the information gathered at Kripos is related to these issues. The conceptual model for the information system developed in this thesis can also be seen as a model for preferred social behaviour. A particular important aspect in this thesis considers the information system to include both humans and technology, and it is therefore important that the organisation culture allows the tribes to interact as shown in figure 2.2.

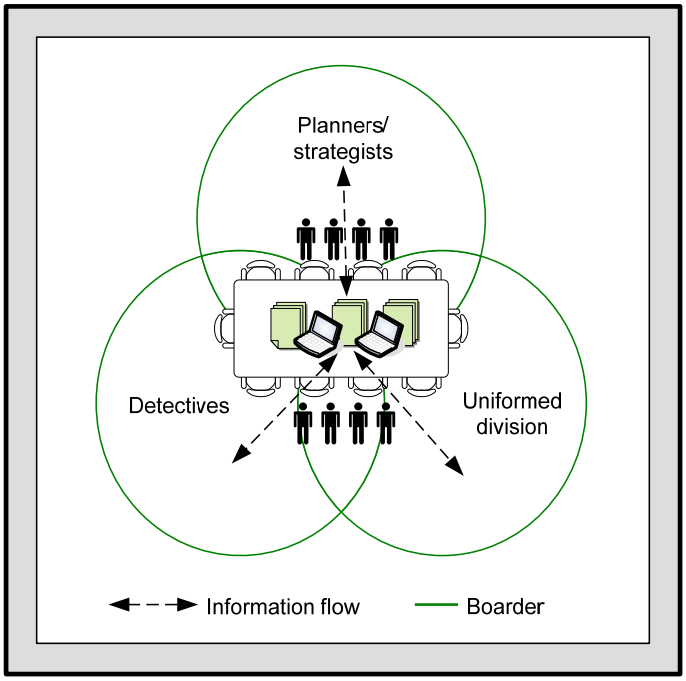


Figure 2.2 Model for ideal communication pattern between planners/strategists, detectives and uniformed division within the police force.

Before we examine the issues of conceptual and organisational boundaries, we must review the literature associated with the development of these ideas and approaches. We shall see that the theoretical and conceptual underpinnings of methods can be responsible for the construction of information boundaries, just as much as social. The worldview embedded in the process of developing information systems will impact the way the system is developed and the outcome of the process. Since this is not a thesis in philosophy, it will not be a lengthy discussion, only the main events and differences will be described. The paradigm shifts (Kuhn, 1962) that will be discussed are the shifts between the Aristotelian, mechanistic and the systems worldview. The narrative paradigm, proposed by Walter R. Fisher (Fisher, 1984, 1987), with emphasis on communication as storytelling will not be a part of the description. Before we proceed with the descriptions, we need a definition of the term worldview. Richard De Witt (DeWitt, 2004) states that the term "worldview" has been used for over a hundred years without a standard definition, but he defines worldview in the following way (p. 3):

> "I will use "worldview" to refer to a system of beliefs that are interconnected in something like the way the pieces of a jigsaw puzzle are interconnected. That is, a worldview is not merely a collection of separate, independent, unrelated beliefs, but is instead an intertwined, interrelated, interconnected *system* of beliefs."
> (Authors italics).

The journey through the different worldviews starts with the Greek philosopher Aristotle, who was born in Stagirus, Macedonia in 384 BC and died in 322 BC. Aristotle had a great impact on western philosophy. His worldview was dominant in the western world between 300 BC and 1600 AD (Stigen, 1983) (DeWitt, 2004), and it was largely unchallenged. The English philosopher Francis Bacon (1561 – 1626) was one of the first to question the Aristotelian philosophy (Klein, Fall 2004 Edition), and he sparked a revolution in thought with such great thinkers as the Italian philosopher and scientist Galileo Galilei (1564 – 1642), the English physicist and mathematician Isaac Newton (1642 – 1727), and the French philosopher, mathematician and scientist Renee Descartes (1596 – 1650), who is referred to as the father of modern philosophy. This revolution on thought resulted in a new worldview which later was labelled the mechanistic worldview, and it became dominant in the 17th century (Stigen, 1983). The scientific revolution resulting in the mechanistic worldview is also regarded as the start of modern science (Russell, 1945), and Bacon is named as the father of modern science. The mechanistic worldview is characterised by empirical testing of all knowledge by the use of reductionism (Stigen, 1983).

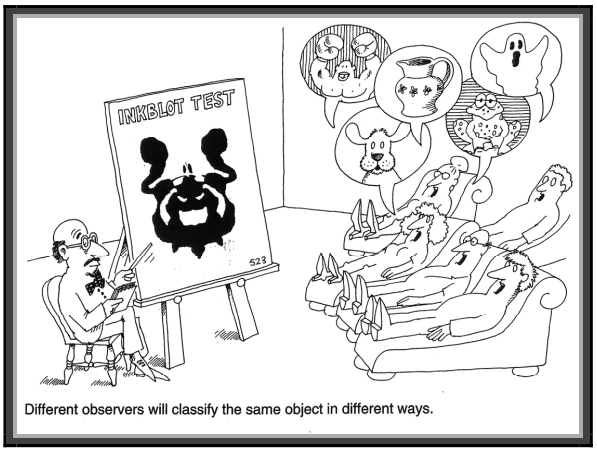


Figure 2.3 Different views of the world[4]

The second paradigm shift is between the mechanistic and the systems view of the world. The systems view of the world was a reaction to extreme use of reductionism within the mechanistic approach with its complexity of techniques and theoretical structures for every field (Bertalanffy, 1956). In contrast the systems view encourages recognition of the whole and the interrelationships between every thing. The founding fathers (Heylighen, 2004) of General Systems Theory (GST) were the Austrian biologist Ludwig von Bertalanffy (1901 – 1972) and the English (American citizenship in 1948) philosopher and economist Kenneth E. Boulding (1910 – 1993). Bertalanffy published his first statements in 1925-26 (Bertalanffy, 1968). The first writings in the philosophy of the systems view (M'Pherson, 1974) were carried out by the Hungarian philosopher Ervin Laszlo (1932 –). The theory of livings systems was proposed by the American psychologist James Grier Miller (1916-2002). In 1965 he published (Miller, 1965a) an article where he defined the basic concepts of general systems behavior theory which (p. 193) "is concerned with a special subset of all systems, the living ones." The basic concepts were matter, energy, and information. The same year he published two more articles dealing with structure, process, and cross level hypotheses (Miller, 1965b, 1965c).

The Hungarian mathematician John von Neumann (1903 – 1957) and the Australian systems scientist Fred Emery (1925 – 1997) was also part of the science of the new systems worldview. John von Neumann started working on his theory of (complex) automata in the

[4] Source: (Booch, 1994)

late 1940's (McMullin, 2000), but it was not published until A. W. Burks published his manuscript in 1966 (Neumann & Burks, 1966). Through the Tavistock Institute of Human Relations, London, Emery had a close cooperation with the English psychologist Eric Trist (1911 – 1993), and the Norwegian psychologist Einar Thorsrud (1923 – 1985) (both leading figures in organisational development). Emery and Trist developed the socio-ecological perspective, (Emery, 1965; Emery & Trist, 1973; Trist, 1977), and Emery and Thorsrud the socio-technical perspective (Emery & Thorsrud, 1976; Emery, Trist, & Thorsrud, 1969). The view of human systems as purposeful systems (Ackoff & Emery, 1972) was explored in cooperation with the American philosopher Russell Ackoff (1919 -). Merrelyn Emery outlines a current version of Emery's Open Systems Theory (Emery, 2000) and describes the core concepts in the following way (p. 623):

> ""Socioecology" captures the notion of people-in-environments. Included within this is the concept of open, jointly optimized, sociotechnical (and sociopsychological) systems, optimizing human purposefulness and creativity, and the best options afforded by changing technologies."

The different paradigms exhibit specific ways of looking at knowledge, and therefore the worldviews also implies that they can serve as a unity of science. This means (Bertalanffy, 1950, 1968; Carnap, 1934) that within the mechanistic world view all objects (animate and inanimate) can be described by the metaphor of a machine and reduce the biological, behavioural, and social levels to the science of physics, all events are reduced to physical events (matter). The scientific approach is analytical, executed through experiments and empirical investigation. Within the systems view the researcher are supposed to conform to the worldview and philosophy based on systems as wholes and their relationships to subsystems and context, and the approach are synthetic. Emphasis is placed on the synergies between the smaller elements to make more than the sum of its parts. However, each researcher is supposed to use the methods and techniques which are appropriate for their field. The unification in this view is through diversity. The unification of all science within a paradigm shift leads to problems, but these problems will not be dealt with here. For a discussion see e.g. "The unification of science" (Faye & Agazzi, 2001).

To permit a clearer overview of the different aspects related to worldviews, table 2.1 has been compiled from the previous descriptions[5]. The debate of what constitutes logic will not be included in this thesis (se the additional references for a discussion).

Worldview Aspect	**Aristotelian**	**Mechanistic**	**Systems**
View of nature	Organicism. Things are real and can be divided into ten categories with substance as the primary category. Human beings are both mental and physical beings.	**Early view:** Originally based on Newton's God-centred view and Laplace "the clock-work universe". Human experience of designing and constructing machines. Dualistic philosophy (mind-matter) from Descartes. **Later development:** All natural can be explained by matter, motion and their laws. Time moves in one direction.	Nature consists of systems that are organic, have emergent properties and exists in context. Realism, the world exists.
Core element	Substance	Substance	Process rather than substance
Epistemology	Holistic. Based on senses and rationality (differs from mechanistic in that the rationality is used to achieve a goal for fulfilling happiness). Nature is described according to the four causes (efficient, final, material formal). Matter and form is the logical explanation of the physical substance.	Reductionistic. Based on rationality and sensory experience (Descartes, Leibniz, Spinoza) and also Empiricism (Locke, Berkeley, Hume). Realism and objectivity. One-to-one cause and effect relationships. Universal laws. Falsification (Popper) through the hypothetic-deductive method.	Holistic. Based on realism, we can have some knowledge of the world (imperfect). Nature is being described according to relationships within and between wholes and context Observation and empirical testing.
Knowledge	Apriori	Apriori	Aposteriori
Reasoning	Deductive logic	Inductive logic. (Bacon)	Inductive logic.
Methodology[6]	Axioms.	Axioms. Analytic. Hypotheses testing. The scientific method. Quantitative measurements.	Synthetic, and analytic. Qualitative and quantitative measurements. Not multidisciplinary.
Method	Introspection.	Experiments based on quantitative measurements and classification.	Each branch of science is using methods from their discipline.

Table 2.1 View of nature, epistemology, reasoning, methodology, and method in the Aristotelian, mechanistic and systems worldview

[5] Additional references (Wolfram, 1989), (Chalmers, 1982), (Audi, 2001), (Bohman, 1991), (Stark, 1998), (Gharajedaghi, 2004).

[6] Methodology is here defined as " [….] a *principle of method* which in any particular situation have to be reduced to a method uniquely suitable to that particular situation."((Checkland, 1981), p. 159 and 160, authors italics).

2.2 The Aristotelian worldview

The description of the Aristotelian worldview is included for the sake of completeness.

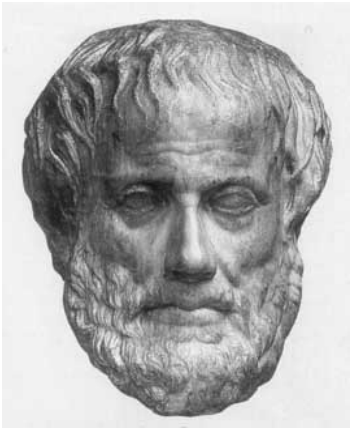


Figure 2.4 Aristotle[7]

In "Meteorology" Aristotle writes about the Earth, the moon, the stars and the sun, and holds that Earth is the centre of the Universe. The mid-air beneath the moon and above the earth holds such tings as clouds, rain, thunder and dew. The reality on Earth (Aristotle & Barnes, 1984) consists of four elements; earth, air, fire, and water. Each element has its own natural place and natural movement and they can act upon and change into another. In his view the most interesting things on earth to study are living things and their parts.

The Aristotelian (Aristotle & Barnes, 1984; Stigen, 1983) ontology holds that things are real and that things can be divided into ten categories. The primary category is called substance and for a thing to belong to this category it must be independent. Substances can be natural (a rock, a plant, a living being) or artificial (a house, an axe). All other categories (e.g. quality, quantity, and relation) depend on substances; they can not exist in themselves. An example is that colour always is found in bodies. A substance is further explained to consist of matter and form with a dynamic relation. Neither matter nor form are physical parts, a substance can not be divided into different parts based on matter and form (the wooden handle and the iron head of an axe as matter and the shape of the axe as the form). Both matter and form are to be viewed as logical parts of the physical substance and the explanation of what the substance is (e.g. an axe or a plant).

A characteristic of the Aristotelian substances are that they change, and he connected form with reality and matter with possibility. When a physical thing changes it is the form of the thing that is being realised. It is the matter that gives possibility for change and the form is real only when the thing is completely developed. Change in this respect is therefore a conversion of matter. A specific matter, for example clay, can take different forms and from

[7] Source: The Free library by Farlex (http://aristotle.thefreelibrary.com/ (Accessed 19.03.2008))

this follows that the defining part of a substance is the logical form. The form defines substances made of clay to be e.g. a statue or a pot.

The Aristotelian explanation of change is based on four causes. The four courses explain every material effect. The four causes are the efficient, the final, the material, and the formal cause. Sister Miriam Josephs (Joseph, 2002) describes the four causes this way:

> "1. The *efficient cause* is the agent and the instruments, for example: the sculptor, and the hammer and chisel.
> 2. The *final cause* is the end or purpose that moved the agent, for example: desire to honor a national hero, the particular design the artist conceived, love of art, fame, money, etc. The final cause is first in intention, last in execution.
> 3. The *material cause* is that out of which it is made, for example: marble, bronze, wood.
> 4. The *formal cause* is the kind of thing into which it is made, for example: Lincoln, Napoleon, Bucephalus, Joan of Arc."

Aristotelian science is based on axioms and deduction, and the two conditions for knowledge which are; the concept of causality, and that the axioms must be both prior to and the cause of the conclusion. The human knowledge is gained through sensation, and mainly perception. The sensations are the passive capacity for the soul to be changed and the soul changes as a result of contact with external objects. This contact with external objects results in information. Aristotle regards thought as an active process but without contact with external objects. The knowledge is based on the abstraction of form, not matter because it is the form that makes us able to recognise things. Although all knowledge must begin with information acquired through the senses, its results are achieved by rational means. Aristotle states that desire is the origin of movement toward some goal, and that animate beings are capable of responding to internal states and external environment to alleviate felt absence or lack of pleasure or felt presence of some pain. Even though Aristotle uses rational means, this differs from the mechanistic view in that the rationality is means of achieving the animate beings goal which is happiness. The Aristotelian explanation is a teleological one, the goal or final cause is always observed in nature, not imposed on nature by theoretical considerations.

2.3 The mechanistic worldview

This section will start by introducing one of the first modern thinkers. We shall see that the ideas were quite different from Aristotle's philosophy and science. Francis Bacon has been chosen as a representative for the mechanistic view because he is regarded as the father of modern science.

2.3.1 Francis Bacon

Figure 2.5 Sir Francis Bacon[8]

In "Advancement of Learning" (Bacon, 1952) Bacon describes his empiricist natural philosophy. The book was published in 1605 and was in opposition to the Aristotelian theoretical natural philosophy. Bacon rejects both the Aristotelian logic and the Aristotelian conception of science as knowledge of necessary causes. His empiricist natural philosophy has roots back to the pre-Socratic atomists and especially Democritus, the leading figure in atomism.

The natural philosophy is based on the theory that we have to free our mind from the idols before we can gain knowledge. In Novum Organum (Bacon, 1952) Bacon identifies four forms of idols and states that the use of induction to form notions and axioms is an appropriate way to banish idols. The four categories of idols are

1. Idols of the tribe. These idols are false conceptions due to human nature. The human understanding is an uneven mirror that merges its own nature with the nature of things, which results in distortions.
2. Idols of the cave. These idols are conceptions or doctrines hold by the individual without having any evidence of their truth. These idols can result from education, upbringing or admiration of others.
3. Idols of the marketplace. These idols are illusions that seem to rise from agreements and from human communication. They enter man's mind through words, and an unskilful choice of words obstructs the understanding.

[8] Source: The Free Library by Farlex (http://bacon.thefreelibrary.com/ (Accessed 19.03.2008))

4. Idols of the theatre. These illusions stems from different philosophies. The philosophies create fictional worlds. The same is true for axioms of sciences that have grown strong from tradition, belief and inertia.

In his system of sciences Bacon replaces the scholastic deduction with induction, and observation with experiments. In Novum Organum (Bacon, 1952) he uses the ant and the spider to illustrate the scientists before him that had either been empiricists or dogmatists. The bee is used to describe a new alliance of the experimental and rational: (p. 126):

> ”Those who have treated of the sciences have been either empirics or dogmatical. The former like ants only heap up and use their store, the latter like spiders spin out their own webs. The bee, a mean between both, extracts matter from the flowers of the garden and the field, but works and fashions it by its own efforts. The true labor of philosophy resembles hers, for it neither relies entirely or principally on the powers of the mind, nor yet lays up in the memory the matter afforded by the experiments of natural history and mechanics in its raw state, but changes and works it in the understanding. We have good reason, therefore, to derive hope from a closer and purer alliance of these faculties (the experimental and rational) than has yet been attempted.”

2.3.2 Mechanism in the 20th century

In 1942 (Hayes, Hayes, & Reese, 1988) Pepper identified four world hypotheses: mechanism, formism, organicism, and contextualism. Within each hypothesis other world views can be interpreted, but not directly compete. Later on Kuhn should express similar views as paradigms. In “World Hypotheses” Pepper (Pepper, 1942) describes mechanism to have two poles; the lever and electromagnetic field as a material model. In both cases the root metaphor is a machine. He states that mechanism has three primary (effective) categories and three secondary (ineffective) categories that correspond to the description of a machine. The primary (effective) categories a machine has is 1) a specified location, 2) all parts of the machine are expressed in quantitative terms, 3) the effective relationship or law among the parts in the machine, which can be described in the form of a functional equation. This equation describes an efficient law of action inherent in the structure of the machine. The secondary categories are qualities observed in parts of the machine, but not directly relevant to its action (e.g. colours, texture and smell). The location defines existence of mechanism and determines reality.

> “Things are real only if they have a time and place. *Only particulars exist*. This principle must never be abandoned, for the penalty is the dissolution of mechanism. If this implication is realized, one sees at once that in a mechanistic nature there can be no alternatives and that for mechanism statistical laws are not laws of nature in any ultimate sense, but only human constructions *symbolizing* to some *approximation* the

> actual relations of nature. The mechanists' instinctive belief in the complete determinateness and determination of nature is hereby justified."
> (Pepper, 1942, p. 211, authors italics)

Koestler (Koestler, 1967) states that before Behaviourism (which started with the American psychologist Watson's article "Psychology as the behaviourist views it" (Watson, 1913)) it was the psychologists and logicians view that mental events have special characteristics and that these characteristics distinguished them from material events. However, the physiologists materialist view was that "all mental events can be reduced to the operation of the 'automatic telephone exchange' in the brain." (Koestler, 1967, p.202). Professor Gilbert Ryle, an Oxford Philosopher, called the mental events 'ghost in the machine' (Ryle, 1949). However, if we overlook this ghost, which is responsible for the actions of the body, we take the risk of turning the ghost into a malevolent one (Koestler, 1967). Among Koestler's four pillars of unvisdom we find that all organisms are essentially automata controlled by the environment and that the only scientific method worth that name is quantitative measurement.

Fritjof Capra (Capra, 1983) also discuss different paradigms, and has the following comments to the reductionist approach:

> "Although Descartes' simple mechanistic biology could not be carried very far and had to be modified considerably during the subsequent three hundred years, the belief that all aspects of living organisms can be understood by reducing them into their smallest constituents, and by studying the mechanisms through which these interact, lies at the very basis of most contemporary biological thinking. [....] Although the reductionist approach has been extremely successful in biology, culminating in the understanding of the chemical nature of genes, the basic units of heredity, and in the unravelling of the genetic code, it nevertheless has its severe limitations." (p. 94).

The Newtonian Physics (Capra, 1983) had to make way for the new physics in the beginning of the 20th century when Albert Einstein initiated two revolutionary trends in scientific thought – theory of relativity and the beginnings to quantum theory. The new physics are related to general systems theory which, according to Capra, is based on wholes with structures arising from interactions and interdependence of their parts. Capra further (Capra, 1996) explains that Bertalanffy insisted on using biology, not physics as the basis of General Systems Theory and emphasised the crucial difference between physical and biological systems. The next section will deal with the systems worldview in more detail.

2.4 The systems worldview

The first written thoughts about the new systems view belong to Bertalanffy (Bertalanffy, 1956, 1968). His new ideas was a reaction to science becoming more and more specialised and that scientists became encapsulated in their private universe. Or in the words of Koestler (Koestler, 1967, p. 179-180) "There is a popular superstition, according to which scientists arrive at their discoveries by reasoning in strictly rational, precise verbal terms. The evidence indicates that they do nothing of the sort". Bertalanffy's idea was to develop a theory of universal principles applying to systems in general as opposed to systems in physics that are of different levels of generality.

Figure 2.6 Karl Ludwig von Bertalanffy[9]

Previous to a further overview of the systems world view, we need a definition of a system, as seen within the systems paradigm, along with the definition of objects, attributes, and boundaries. Together with the concept of relations, the concept of boundaries will be a major issue in the discussions in this thesis. When emphasis are placed on the systems boundaries, the system will always have an environment, or stated in another way functions that has impact on the system, and as such can be viewed as the supplier and the recipient of the system.

There are numerous definitions of systems and related concepts. The definitions used in this thesis are from an article written by Hall and Fagen.

A system is defined as (Hall & Fagen, 1956, p.63):

> "A system is a set of objects together with relationships between the objects and between their attributes."

Hall and Fagen (Hall & Fagen, 1956) describe objects as "the parts or components of the system" (p. 63). Attributes are "properties of objects" (p. 64), and relationships "tie the system together" (p.64).

[9] Source: Psykologibasen.dk (http://psykologibasen.dk/Bertalanffy.jpg (Accessed 19.11.2007))

Environment is defined as (Hall & Fagen, 1956, p. 66):

> "For a given system, the environment is the set of all objects a change in whose attributes affect the system and also those objects whose attributes are changed by the behaviour of the system."

To the question of what belongs to the system and what belongs to the environment, the lines are not definite (Hall & Fagen, 1956, p. 67).

> "In a sense, a system together with its environment makes up the universe of all things of interest in a given context."

Since the borders between the environment and the systems are not definite, it is important that the boundaries between the system and the environment are defined by an agent. In defining the borders the agent's understanding of the system under investigation will be shaped, and this may in turn influence future actions of the agent (Midgley, 2000).
A systems scientist is mainly interested in systems that are behavioural and purposive. The systems are of the types biological, social and man-made (M'Pherson, 1974).

M'Pherson (M'Pherson, 1974) divides the systems field into three main components; general systems theory, systems science, and systems philosophy. The term "general systems theory" (GST) has been described in various ways, but Bertalanffy (Klir, 1972), who introduced the term, used GST as a collective noun for systems problems in the same way that "theory of evolution" implies all aspects of the study of natural evolution, not just Darwin's theory.

Lazlo, the founder of systems philosophy, points out that GST is a realist ontology (Laszlo, 1972, p. 57) "The world exists [....] and [….] is, at least in some respects, intelligibly ordered [....]". "Realists also assume that, not only is there order in the world itself, but we can have some (albeit imperfect) knowledge of it." (Midgley, 2002, p. xxv).

According to M'Pherson (M'Pherson, 1974), the philosophy of systems has had several influences, and figure 2.7 gives an overview in the form of a flowchart (according to himself a very selective flowchart):

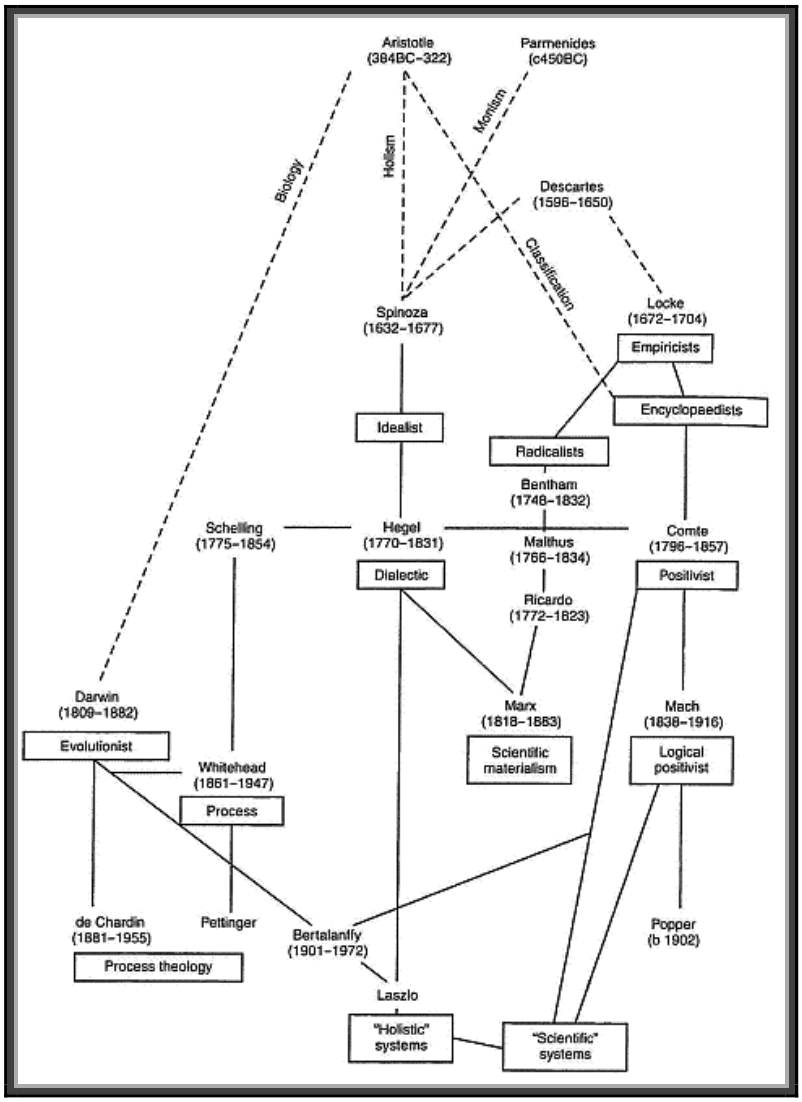


Figure 2.7 Morphogenesis of Systems Philosophy.
Source: M'Pherson (M'Pherson, 1974, p. 134).

For a full explanation of figure 2.7, the reader is referred to M'Pherson's article. The only comments from the article included here is that systems philosophy has inherited the unification of science and the scientific method in the social sciences from the Cartesian and Empiricist School, and that the holistic thought stems from Aristotle through Spinoza and Hegel.

The unity of science in the mechanistic worldview is apparent in the reduction into physical events. In General Systems theory the contrasting view is termed perspectivism (Bertalanffy, 1968, p. 49)

> "We cannot reduce the biological, behavioural, and social levels to the lowest level, that of the constructs and laws of physics. We can, however, find constructs and possibly laws within the individual levels. The world is, as Aldous Huxley once put it, like a Neapolitan ice cream cake where the levels – the physical, the biological, the social and the moral universe – represent the chocolate, strawberry, and vanilla layers. We cannot reduce strawberry to chocolate – the most we can say is that possibility in the last rest, all is vanilla, all mind or spirit. The unifying principle is that we find organization at all levels."

General Systems Theory (Bertalanffy, 1956, 1968) is based on the existence of systems properties that are general, and structural similarities or isomorphies in different fields. These two characteristics are the means to deal with organised complexity. Bertalanffy points out that Aristotle's statement "The whole is more than the sum of its parts", is still valid (Klir, 1972). In addition Bertalanffy builds on the teleological viewpoint from Aristotle that human actions always are directed towards a goal. Important aspects (Bertalanffy, 1968) of General Systems Theory are those of closed and open systems, information and entropy, and causality. The theory is grounded on open systems, teleology and information as meaning, not, as often is thought to be the case, the "Mathematical Theory of Communication" of Shannon and Weaver (Shannon & Weaver, 1949). This theory is often referred to as Theory of Information (François, 1999), but it is built on the concepts of source, code, message, transmitter, signal, channel and receptor.

Boulding (Boulding, 1956, p. 197) has the following comments to GST:

> " ….a name which has come into use to describe a level of theoretical model-building which lies somewhere between the highly generalized constructions of pure mathematics and the specific theories of the specialized disciplines",

and further (Boulding, 1956, p. 197 - 198)

> "…It does not seek, of course, to establish a single, self-contained "general theory of practically everything" which will replace all the special theories of particular disciplines. Such a theory would be almost without content, for we always pay for generality by sacrificing content, and all we can say about practically everything is almost nothing. Somewhere however between the specific that has no meaning and the general that has no content there must be, for each purpose and at each level of abstraction, an optimum degree of generality. It is the contention of the General Systems Theorists that this optimum degree of generality in theory is not always reached by the particular sciences."

For a hierarchical arrangement of systems we turn to Boulding (Boulding, 1956). His hierarchy has frameworks (the static structure) as the 1st level and the transcendental as the 9th level (the ultimates and absolutes and the 'inescapable unknowables'). Over the years many scientists have used Boulding's article and composed his hierarchy into a table. Table 2.2 are composed by Checkland (Checkland, 1981).

Level	Characteristics	Examples (concrete or abstract)	Relevant disciplines
1. Structures, frameworks	Static	Crystal structures, bridges	Description, verbal or pictorial, in any discipline
2. Clock-works	Predetermined motion (may exhibit equilibrium)	Clocks, machines, the solar system	Physics, classical natural science
3. Control mechanisms	Closed-loop control	Thermostats, homeostasis mechanisms in organisms	Control theory, cybernetics
4. Open systems	Structurally self-maintaining	Flames, biological cells	Theory of metabolism (information theory)
5. Lower organisms	Organized whole with functional parts, 'blueprinted' growth, reproduction	Plants	Botany
6. Animals	A brain to guide total behaviour, ability to learn	Birds and beasts	Zoology
7. Man	Self-consciousness, knowledge of knowledge, symbolic language	Human beings	Biology, psychology
8. Socio-cultural systems	Roles, communication, transmission of values	Families, the Boy Scouts, drinking clubs, nations	History, sociology, anthropology, behavioural science
9. Transcendental systems	'Inescapable unknowables'	The idea of God	?

Notes. (1) Emergent properties are assumed to arise at each defined level.

(2) From level 1 to level 9: Complexity increases; it is more difficult for an outside observer to predict behaviour; there is increasing dependence on unprogrammed decisions.

(3) Lower level systems are found in higher level systems – e.g. man exhibits all the distinguishing properties of levels 1 – 6, and emergent properties at the new level.

Table 2.2 An informal intuitive hierarchy of real-world complexity (after Boulding, 1956). Source: Checkland (Checkland, 1981, p. 104)

2.5 Comments

The reason for introducing Francis Bacon as the representative for the mechanistic worldview was that he is regarded as the father of modern science. Another reason for choosing Bacon is that his identification of the four forms of idols can be linked to the tribes and also to eyewitness descriptions which are discussed in chapter 5. The difficulties in communication between the tribes and the difficulties connected with eyewitness testimonies can be explained by the four forms of idols identified by Francis Bacon.

Figure 2.1 and
Figure 2.2 described in section 2.1 can be seen as expressions of viewing both organisations and information systems respectively through the lens of the mechanistic and the systems worldview. Therefore, in the next two chapters organisation theory, information theory, and information systems theory will be related to the mechanistic and the systems worldview. The Aristotelian worldview was only included because it had some bearings on the systems worldview, and will not be followed up further.

CHAPTER 3
ORGANISATIONS

Theories shape our world; they encourage us to see it a certain way,
and then we exclude other visions that could direct our actions.
Charles Perrow (1986, p. 235)

First in this chapter (section 3.1) the reader will find an introduction containing a presentation of the purpose of this chapter, a definition of formal organisations, and of the organisation in question: The National Criminal Investigation Service (NCIS) (*Kriminalpolitisentralen (Kripos)*), which was established in 1959. After the introduction this chapter will consist of a section discussing public administration (section 3.2), then a section discussing criminal justice organisations (section 3.3). After discussing an organisation's internal structure and its environment in section 3.4 we will turn towards the last piece of the puzzle in this chapter; namely the organizational culture (section 3.5). After each section (apart from the introduction) a subsection with comments about the subject will be included.

3.1 Introduction

In Norway the prosecuting authority is arranged with four levels (see figure 3.1 (yellow and red colour)). At the highest level, the Government (*Regjeringen*); at the second level, the Office of the Director of The Public Prosecutions (*Riksadvokatembetet*); at the third level the National Authority for Prosecution of Organised and Other serious crime (*Det nasjonale statsadvokatembete for særskilte saker*), ten regional prosecution offices (*10 regionale statsadvokatembeter*), and the Norwegian National Authority for Investigation and Prosecution of Economic and Environmental Crime (*Økokrim*); and at the lowest level, Kripos, 27 local police districts, and the Norwegian Police Security Service (PST, Politiets sikkerhetstjeneste).

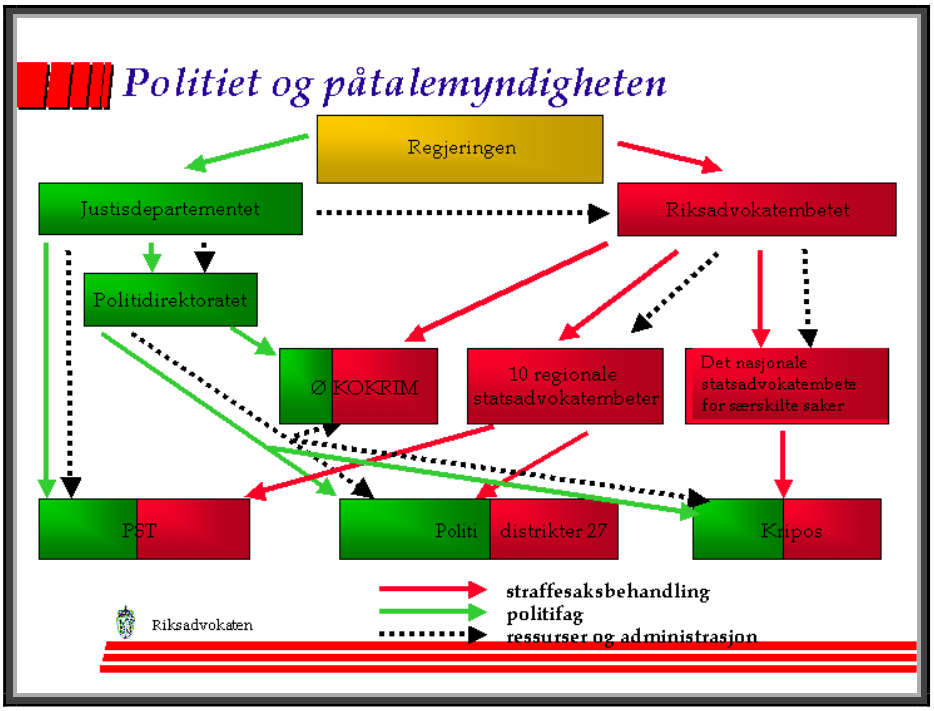


Figure 3.1 Organisation chart for the Norwegian prosecution authority.
Source: Riksadvokaten.[10]

Most of the time the research was carried out Kripos was a formal support unit for the police departments around the country (Kriminalpolitisentralen, 2004;Kriminalpolitisentralen, 2005; Justis- og Politidepartementet, 2005;Politiet, 2006). Kripos did not have the right to present cases for the court themselves; instead they assisted the local police following a formal request from the local police. However, this changed 1.1.2005 when Kripos changed its name and role. The new name was *Den nasjonale enhet for bekjempelse av organisert og annen alvorlig kriminalitet* (*Nye Kripos*). In addition to their established role Kripos is now permitted to start investigating cases on their own initiative and present those cases for the court of justice. The Data Crime Centre of the Police (*Politiets datakrimsenter*) was also transferred from the Norwegian National Authority for Investigation and Prosecution of Economic and Environmental Crime (*Økokrim*) to Kripos. In January 2006 Nye Kripos became Kripos again, but this time only the name changed. The organisational changes are

[10] (http://www.riksadvokaten.no/bin/main.cgi?kilde=Info/pol_paat.xml, (accessed 08.09.06)).

presented in organisations charts that show the organisation before and after 1.1.2005 (appendix 1 and 2). During the research period Kripos has also had other changes in their organisation, the latest in 2007 (Politiet, 2007) (appendix 3). In this last reorganisation they focused mainly on process driven organisation with larger units.

The Norwegian Police has also changed during the research period; the National Police Directorate (*Politidirektoratet*) was established 10.01.2001 and on 01.01.2002 the number of police districts was reduced from 54 to 27 (Politidirektoratet, 2004). Police management was transferred from Ministry of Justice and the Police to National Police Directorate. Charts showing the organisation before and after the changes can be found in appendix 4 and 5. As the organization charts show, Kripos is part of a hierarchical organised criminal justice system, and Kripos itself is also a hierarchical organisation as the charts in appendix 1 - 5 show.

Now we will leave the organisation in question, and turn towards application of the mechanistic and systems worldview in the context of organisations. The purpose of this chapter is to investigate and understand the nature of organisations. Several definitions have been put forward during the years, the one used here is March and Simon's (March, Guetzkow, & Simon, 1993, p. 2) view of formal organisations.

> "Organizations are systems of coordinated action among individuals and groups whose preferences, information, interests, or knowledge differ. Organization theories describe the delicate conversion of conflict into cooperation, the mobilization of resources, and the coordination of effort that facilitate the joint survival of an organization and its members."

In addition organisations are usually not established as ends in themselves (Morgan, 1997). The origin for the word organisation is the Greek word organon which means tool or instrument, and the word organisation reflects that organisations are instruments created to achieve other ends. The fundamental concepts in organisations are tasks, goals, aims, and objectives and instruments are usually developed to aid some kind of goal oriented activity.

The goal-oriented activity associated with Kripos in this research is to understand and document in a truthful manner the course of events in a committed crime or criminal activity. The task of the local police, the operational force, is to find and stop the presumed guilty person. It is the courts who decide meaning and guilt, and the information about the crime

should reach the court unbiased. Kripos' tasks are investigation and analyses of different kinds of evidence (e.g. physical evidence or interviews), and the instrument of interest in this thesis is the information system. Of particular interest is the information flow between the different tribes in law enforcement organisations and the information flow between different law enforcement organisations. In this context the organisation's internal structure, the organisation's environment, and the organisation's culture will be outlined.

Before we start to review these topics it must be mentioned that criminal investigation is done by organisations in the public sector. Kripos is no exception. Not only is Kripos a public organisation, it is also an organisation that has some resemblance to the military. It is of course under the management of the government, but it is not the subject of democratic leadership as e.g. the Justice Department which has both a political and an administrative management. Therefore the two first sections will deal with organisations in public sector and characteristics of criminal justice organisations. The comments on public sector will be narrowed down to the modern construction of public sector; they will not take into account classical work on administration by e.g. the Greek philosophers and statesmen.

3.2 Public administration

When we consider the public sector one man emerges as being the pioneer in terms of understanding the public sector. This person is Woodrow Wilson.

"The field of administration is a field of business. It is removed from the hurry and strife of politics; it at most points stands apart even from the debatable ground of constitutional study. It is a part of political life only as the methods of the counting house are a part of the life of society; only as machinery is part of the manufactured product. But it is, at the same time, raised very far above the dull level of mere technical detail by the fact that through its greater principles it is directly connected with the lasting maxims of political wisdom, the permanent truths of political progress." (Wilson, 1887, p. 209 -210)

Figure 3.2 Woodrow Wilson[11]

[11] Source: The official cite of the U.S. Constitution (http://www.usconstitution.com/inagaddrwoodrowwilson.htm (Accessed 19.11.2007))

At the time he wrote this, Woodrow Wilson was a professor in political science at Princeton University. In 1912 Woodrow Wilson was elected, and in 1913 became, the 28th president in the United States. The essay is regarded as the founding of the field of public administration. It is not possible to derive a universal theory of Public Administration that is true anywhere at any time (Kickert, 1997), nor is it possible for the subfield of Public Management. This opens up for comparative investigations of public administrations like the one using the systems in Norway and the United States and the independent variables of structure and culture (Christensen & Peters, 1999). Another comparison has been carried out by Johnson (Johnson, 2000) between state and society in Britain and Germany. Germany has been strongly influenced by views of the holistic and teleological state. In Britain the term 'state' has never really been adopted as a guiding concept in political thinking nor as an expression for the way the society is politically organised. When creating a science of public administration Robert A. Dahl (Dahl, 1947, p. 11) identified three problems:

> "No science of public administration is possible unless: (1) the place of normative values is made clear; (2) the nature of man in the area of public administration is better understood and his conduct is more predictable; and (3) there is a body of comparative studies from which it may be possible to discover in principles and generalities that transcend national boundaries and peculiar historical experiences."

Rainey et al. (Rainey, Backoff, & Levine, 1976) suggest approaches to classify and define comparisons between private and public organisations and summarise the literature on differences between public and private organisations. They divide the main points of consensus from the literature into environmental factors, organisation-environment transactions, internal structures, and processes. But the public sector is often seen to be on equal footing with the budget (Lane, 2000). In this view the legislative perspective is forgotten. Lane introduces different definitions of public sector with the most general definition being (p. 15):

> "(DF1) 'Public sector'= def. 'Government activity and its consequences' "

Studies (Rainey, 2003) of government agencies have shown that variables such as size, task, and technology may have more influence than the fact that they are governmental. These findings and the commonsense observation that organisations become bureaucratic because of its large size agree with each other. However, researchers do not agree (Banner & Gagné, 1995) that size causes structural characteristics. Organisations in the public sector have, until few years ago, relied heavily on the hierarchical structure (Lane, 2000), but in the early 1980's the New Public Management (NPM) started with Premier Thatcher. The

characteristics of NPM are that bureaucracy[12] is not the most efficient way to organise public sector and that contractualism[13] should be used instead. The language of NPM (Lane, 2005) is different than the traditional one and the keywords are: service to customer, leadership or entrepreneurship, contracting, governance, and re-engineering government.

Graham Allison (Allison, 1983) asks if public and private management are fundamentally alike in all unimportant respects, and starts the debate. There are two directions (Lægreid, Roness, Røvik et al., 2004), one that distinguishes between these two types of organisations, and one that does not. The latter corresponds to the New Public Management reforms in public sector. The first argument of the direction that distinguishes between private and public organisations is that public interests is different from private interests in that public organisations must allow for a wider set of goals and values. Democratic considerations, constitutional values and considerations for the community are more important in public than in private organisations. The other argument is that managers in public organisations have a responsibility towards the citizens and constituents that outweighs the responsibility towards special groups. Thirdly there is a higher demand for openness, insight, fair treatment and predictability from public organisations.

In Norway the public sector (Fimreite & Grindheim, 2001) can be divided into two tasks; administration and production. The defence and judicial system are part of the production. Administrative principles include principle of legality, principle of public access, and

---

[12] Modern officialdom functions in the following specific manner: (Weber, Gerth, & Mills, 1948, pp. 196-198).
"I. There is the principle of fixed and official jurisdictional areas, which are generally ordered by rules, that is, by laws or administrative regulations. [….] In public and lawful government [….] constitute 'bureaucratic authority'. In private economic domination, they constitute bureaucratic 'management' [….]
II. The principles of office hierarchy and of levels of graded authority mean a firmly ordered system of super- and subordination in which there is a supervision of the lower offices by the higher ones. Such a system offers the governed the possibility of appealing the decision of a lower office to its higher authority, in a definitely regulated manner. [….]
III. The management of the modern office is based upon written documents ('the files') which are preserved in their original or draught form [….]
IV. Office management, at least all specialized office management – and such management is distinctly modern – usually presupposes thorough and expert training. [….]
V. When the office is fully developed, official activity demands the full working capacity of the official, irrespective of the fact that his obligatory time in the bureau may be firmly delimited. [….]
VI. The management of the office follows general rules, which are more or less stable, more or less exhaustive, and which can be learned. Knowledge of these rules represents a special technical learning which the officials possess. [….]"

[13] "Contractualism [….] understands principles of right conduct as the object of a rational agreement. [….] contractualism sees the relevant agreement as governed by a moral ideal of equal respect [….] (Darwall, 2002, p. 4)

principles of hearing both sides of a case. Characteristics of these organisations (Lægreid, Roness, Røvik et al., 2004) include that management is elected by popular vote, they are multifunctional and they do not operate in a free economic marked.

3.2.1 Comments

These brief comments about public organisations just serve the purpose of making the user aware that differences between private and public organisations exist. However, in this research, these differences are not the most interesting aspects of the organisation. The boundary concept is vital, but the boundaries discussed in this thesis are the boundaries towards other organisations with the same interests, or between different tribes within one organisation, not towards a private consumer or a citizen in need of legal assistance. Even though Fimreite and Grindheim (Fimreite & Grindheim, 2001) see the judicial system as a part of production, it can also be argued, according to the principles of precedence, that the judicial system is a part of the administration.

3.3 Criminal Justice Organisations

Leaving the discussion between the public and the private sector we turn towards some of the special features of criminal justice organisations. The formal task of the criminal justice system (Feeley, 1973) is to process, arrest, determine guilt or innocence, and in the case of guilt to specify an appropriate sanction. The key elements are institutionalised[14] interaction of a large number of actors. The actors' roles are highly defined, they are required to follow highly defined rules, and they share a responsibility for a common goal – that of processing arrests.

There are few theoretical discussions of the administration process of criminal justice (Feeley, 1973), but the studies of administration of justice in the United States can be divided in two models; the 'rational goal model' and the 'functional-systems model'. Both models are based

[14] "Institutionalization is a process. It is something that happens to an organization over time, reflecting the organization's own distinctive history, the people who have been in it, the groups it embodies and the vested interests they have created, and the way it has adapted to its environment. [….] "In what is perhaps its most significant meaning, "to institutionalize" is to *infuse with value* beyond the technical requirements of the task at hand. The prizing of social machinery beyond its technical role is largely a reflection of the unique way in which it fulfils personal or group needs." (Selznick, 1957, pp. 16-17, Authors italics).
"There is a close relation between "infusion with value" and "self-maintenance". As an organization acquires a self, a distinctive identity, it becomes an institution. This involves the taking on of values, ways of acting and believing that are deemed important for their own sake. From then on self-maintenance becomes more than bare organizational survival; it becomes a struggle to preserve the uniqueness of the group in the face of new problems and altered circumstances." (Selznick, 1957, p. 21).

on Etzioni's (Etzioni, 1960) discussion of the 'goal model'[15] and the 'system model'[16]. The 'rational goal model', where focus on formal rules is a common theme, builds on the 'goal model' which focuses on goal activities, but also on Weber's 'rational-legal model' of organisation (Weber & Parsons, 1964) which focuses on means activities[17]. According to Weber the bureaucratic structure (Weber, Shils, & Rheinstein, 1966, p. 351)"[….] provides the administration of justice with a foundation for the realization of a conceptually systematized rational body of law on the basis of "laws" [….]"

Feeley argues that the 'rational goal model' and Weber's 'rational-legal model' can be joined in the administration of criminal justice, because

> "means and goals merge. While on a highly abstract level, the goal – as opposed to the means – of the criminal justice system might be stated in terms of achieving justice, this goal has no clear empirical referent or context by itself. In the dominant tradition of the West at least, the goal, justice, usually acquires meaning in a normative, legal, and empirical context, only when operationalized in terms of procedure, i.e., means." (Feeley, 1973, p. 409).

In the 'functional-systems model' (based on the model Etzioni refers to as the 'system model') the organization of the administrative system of criminal justice is viewed (Feeley, 1973, p. 413, author's italics.)

> "[....] as a system of action based primarily upon *cooperation*, *exchange*, and *adaptation*, and emphasize these considerations over adherence to formal rules and defined "roles" in searching for and developing explanations of behavior and discussing organizational effectiveness."

Herbert Packer (Packer, 1968) states that an organisation can have many goals when the 'functional systems model' are used as a lens for criminal justice organisations. These goals

---

[15] "Organizational goal serve many functions. [….] They serve as sources of legitimation which justify the organization's activities and its very existence, at least in the eyes of some participants and in those of the general public or subpublics [….]" (Etzioni, 1960, p. 257).
"Goals, as norms, as sets of meanings depicting target states, are cultural entities. Organizations, as systems of coordinated activities of more than one actor, are social systems." (Etzioni, 1960, p. 258).

[16] "The starting point for this approach [the system model] is not the goal itself but a *working model of a social unit which is capable of achieving a goal*. Unlike a goal, or a set of goal activities, it is a model of a multifunctional unit." (Etzioni, 1960, p. 261, author's italics).
"One function each social unit must fulfill is adjusting to its environment." (Etzioni, 1960, p. 262).
"Organizations have to adapt to the environment in which they function." (Etzioni, 1960, p. 264)

[17] "….'rational-legal authority'. The order in question then consists in a body of generalized rules, in the type case logically consistent and claiming to cover all possible 'cases' of conduct within the jurisdiction of the *Verband* as well as to define the limits of that jurisdiction. (Weber & Parsons, 1964, p. 57, authors italics)
"The fundamental source of authority in this type is the authority of the impersonal order itself…….Where rational legal authority involves an organized administrative staff……it takes the form of a 'bureaucratic' structure." (Weber & Parsons, 1964, p. 58.)

operate simultaneously and they can be in conflict. Packer offers two models that are an abstraction of two separate value systems competing for priority in the operation of the criminal process. The first model is called 'due process model', and the second 'crime control model'. The emphasis of the 'due process model' is on the rights of the individual and adherence to rules, and for the 'crime control model' emphasis is on regulation of criminal conduct as the most important function of the judicial system and adherence to formality are not so much in focus.

Also Stojkovic (Stojkovic, Klofas, & Kalinich, 2004) discuss goals in criminal justice organisations, but at the same time focus is placed on other aspects of criminal justice organisations. He uses five characteristics to describe the organisation and links these characteristics to the administrators of the organisation. In table 3.1 the five characteristics are presented with comments and a description of the administrators for each characteristic.

Another theoretical viewpoint is Wright's (Wright, 1981) discussion of the recent, as he calls it, "growing obsession with the idea of creating a monolithic system for the administration of justice" (p. 209). The common theme for these writings is; if the criminal justice system is to fulfil its functions of crime control, a transformation towards a rational, well-integrated system with a common set of goals pursued through a compatible set of strategies and techniques is necessary. Wright reaches another conclusion; there are no monolithic and unifying sets of values in our society, nor should there be. Goal conflict and fragmentation within criminal justice organizations are both endemic and liberating at the same time. It represents a check on the powers of criminal justice administrators and an opportunity for a diversity of ideas to be expressed within the criminal justice system, and promotes a smoothly operating offender-processing system.

	Characteristic	Comments	Administrators
1	Criminal justice organisations serve people	Some of these people are offenders, and others can be concerned citizens or crime victims.	The primary considerations for the administrators are how people are served by their organisations.
2	Criminal justice organisations have a concern for efficiency and productivity	The most visible is in the correction operations, e.g. prisons. Private companies are entering this scene. Use of private security forces in the police field and private competition in connection with computation and modernisation of the court systems. Yet another concern is the private handling of disputes that earlier was addressed by the criminal justice system.	Administrators face challenges from private competition that was unheard of a decade ago.
3	Criminal justice organisations are expected to accomplish conflicting and multiple goals	In prisons rehabilitation is expected, but prisons are primarily structured to be secure facilities. The police are expected to control crime at the same time as they are sensitive to the rights of suspects. Courts must guarantee due process rights to defendants at the same time as they are cognizant of efficiency and case processing issues.	These conflicting and multiple goals lead to innovative ideas and approaches from the criminal justice administrators.
4	Criminal justice goals are defined by external constituencies	Examples are citizen groups demanding that something should be done with a sexual predator; politicians legislating that parole boards not release certain types of offenders; business interest wants more police protection during specific times. Some groups have more influence than others.	For the administrator these requests are not unreasonable, but they must be understood within the context of finite resources chasing infinite demands. The administrators can't respond to all requests and respond either to the most "rational" from their perspective, or try to pass resources around to as many constituencies as possible, but they also tend to respond according to the group's influence.
5	Criminal justice organisations are composed of competing and conflicting internal constituencies	It is a multidimensional conflict. Police organisations can be split by these dimensions: age, race, gender, educational level, years of service, and rank. These are just a few conflict dimensions.	In the twenty-first century the police "troops" will be more diverse, and this will make police administration more problematical and difficult. Similar concerns exist for correctional administrators and court personnel. Managing diverse organisations will become one of the most challenging tasks.

Table 3.1 Five Characteristics of Criminal Justice Organisation. Adapted from: Stojkovic et al. (Stojkovic, Klofas, & Kalinich, 2004)

3.3.1 Comments

Before we leave the subject of criminal justice organisations some comments about the research will be put forward. The tasks for the administrators of law enforcement organisations were identified in table 3.1. However, focus for the research is not the administrators, but the employees executing the analysis of information related to a committed crime, and therefore characteristics of employees in relation to the organisation becomes interesting. Employees in most police organisations have different levels of competence or skill (Evan, 1993), and police organisations are multidimensional hierarchical (King, 2005). The hierarchies are based on attributes (such as skills) and on differential allocation of resources (such as rewards and formal power), and can be divided into five hierarchies. The five hierarchies identified are the skills hierarchy, the reward hierarchy, the seniority hierarchy, the status hierarchy, and the authority hierarchy. The authority hierarchy includes the rank structure, span of control, supervisor intensity, centralisation of decision-making, and to which degree the procedural due process limits the decision-making autonomy of managers. The multi-hierarchical nature of police organisations is at present a hypothesis that needs to be assessed along with the interrelationships of the hierarchies. According to King (King, 2005) the interrelationships should be examined by both qualitative and quantitative research.

In subsection 2.3.1 the four categories of idols identified by Francis Bacon could explain the communication difficulties between the tribes in law enforcement organisations (identified and explained in section 2.1) on an individual level. An explanation on the organisational level might be the hierarchical structure of criminal justice organisations. The different hierarchies can be related to the tribes identified in this research. As observed at Kripos the tribes have different routines and rules to guide their work, and also different goals. Developing the model for the information systems will therefore be seen in the light of the ‘due process model’. The ‘due process model’ is relevant because this research focuses on crimes already committed and the focus should therefore be on the individuals involved in the investigation and adherence to the rules is important to secure the best result. On the other hand adherence to the rules does not rule out application of the personal experience and knowledge of investigators and analysts. Errors in the investigation may have severe consequences for the involved individuals, and the decision base for the courts has to be as good as possible in order to secure the right conviction for the right people and to avoid any miscarriage of justice.

3.4 An organisation's internal structure and its environment

The emergence (Scott, 2003) of organisations as a field of study started with the translation of the German sociologist Max Weber's (1864 – 1920) and the German-born Italian political sociologist Robert Michels' (1876 – 1936) analyses into English; Michels' analyses of oligarchical tendencies of modern democracy (Michels, 1915) and Weber's 'Essays in sociology' which included comments on power and hierarchy (Weber, Gerth, & Mills, 1948).

Figure 3.3 Max Weber[18]

Shortly after these translations were made, the American sociologist Robert K. Merton (1910 – 2003) and his students began to outline the boundaries of this new field by compiling theoretical and empirical material dealing with various aspects of organisations (Merton, 1949). At the same time the American social scientist Herbert Simon (1916 – 2001) assembled an eclectic group of political scientists, economists, engineers, and psychologists. Their focus was on building a behaviourally oriented science of administration (Simon, 1947) with emphasis on decision making and choice within organisations.

Mintzberg (Mintzberg, 1979) views organisational structure as (p. 2):

> "Every organized human activity – from the making of pots to the placing of a man on the moon – gives rise to two fundamental and opposing requirements: the *division of labor* into various tasks to be performed and the *coordination* of these tasks to accomplish the activity. **The structure of an organization can be defined simply as the sum total of the ways in which it divides its labor into distinct tasks and then achieves coordination among them**." (Author's italics and boldfaced type.)

Mintzberg (Mintzberg, 1979) further identifies five coordinating mechanisms as the basic elements of structure and explaining factors. These are mutual adjustment, direct supervision, standardisation of work processes, standardisation of work outputs, and standardisation of worker skills. Different views on organisations offer different solutions for how these basic elements should be organized.

[18] Source: Biografias y Vidas (http://www.biografiasyvidas.com/biografia/w/weber_max.htm (Accessed 19.11.2007)).

Several attempts have been made to classify organisations. To understand organisational life Morgan (Morgan, 1997) uses metaphors, but he emphasises the restrictions all metaphors hold in that they are partial. Even though metaphors are vehicles for gaining insight by allowing us to see similarities, they ignore the differences. As an example he uses the phrase; 'a man is a lion'. The man is brave, strong, and ferocious. However, the man is not covered in fur, he does not have four legs, sharp teeth and a tail. So metaphors are "also incomplete, biased, and potentially misleading." (Morgan, 1997, p. 5). Morgan uses nine different metaphors for organisations; machines, organisms, brains, cultures, political systems, psychic prisons, flux and transformation, and instruments of domination which he calls 'the ugly face'.

Another way of viewing organisations and their development can be found in Hatch (Hatch, 1997). She classifies organisations into Classical (1900s -), Modern (1950s -), Symbolic-Interpretive (1980s -), and Post-modern (1990s -), and connects these views to organisational man. The view of man for the classical organisations is the economic man with focus on wealth and power. For the early modern view it is the scientific man with focus on rationality and management control. For the modern view organisational man is the ecological man who focuses on environment and external control. In the two last perspectives on organisations, symbolic-interpretive and post-modern, the view of man is respectively the symbolic man with focus on interpretation and meaning, and the aesthetic man with focus on creativity, freedom, and responsibility.

Leavitt identifies four internal elements of an organisation; structure, technology, people (actors), and task (Leavitt, 1965) in his model of organization. To give a complete model of an organisations' central features Scott (Scott, 2003) builds on Leavitt's Diamond: A Model of organization. The model still consists of 4 internal elements, but Scoot adds a fifth; the environment (see figure 3.4).

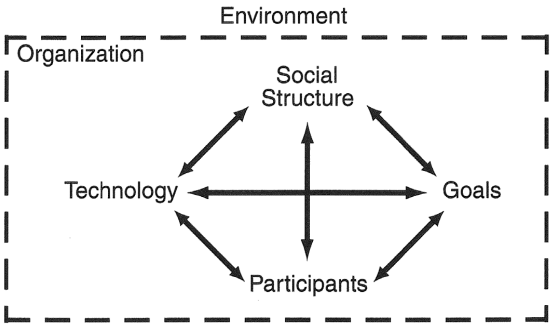


Figure 3.4 An organisation's central features.
Source: Scott (Scott, 2003, p.18)

The social structure (Scott, 2003) refers to the regularised aspects of the relationships existing among participants in an organisation and can be analytically separated into three components; normative structure which includes values, norms, and role expectations. The second component is the cultural-cognitive structure which gives the framework for helping the participants interpret and collectively make sense of their world. This includes shared beliefs and understanding of situation and interest. The third component is the behavioural structure where the focus is on actual behaviour rather than on normative prescriptions or cognitive patterns guiding behaviour, and on recurrent behaviour of a given individual or similarities in the behaviour of a class of individuals. The participants are those individuals who, in return for a variety of inducements make contributions to the organisation. Participants can be a term that covers more than the employees; stakeholders (community members, stockholders, regulators, and exchange partners) can also be a part of this term. The goal concept is one of the most important, and is tentatively defined as conceptions of desired ends, achieved through the participants' performance of task activities. All organisations possess technology, but there are variations on how the technology is understood, how the routines are established, or how capable the technology is to produce the desirable effect. When the focus is on technology an organisation is viewed as a place where work and energy are used on materials to transform inputs to outputs. Scott further includes environment as a part of every organisation. No organisations are self-sufficient; to survive they have to rely on relations with the larger system in which they are a part to survive, they have to adapt to physical, technological, cultural, and social environments. Organisations must therefore (Banner & Gagné, 1995) be involved in boundary-spanning activities. These activities assist

the organisations in adapting to the changes of the environment, and regulate the flow of inputs and outputs.

Scott (Scott, 2003) categorises the different views on organisations into a layered model of dominant theoretical models and representative theorists. The organisations are labelled closed, open, rational and natural systems. As table 3.2 shows, there has been a historical development from organisations as closed systems into open system. Organisations were viewed as closed systems between 1900 and 1960. From 1960 onwards organisations have been viewed as open systems. Within both of these models organisations can be seen as rational or natural models.

Scott (Scott, 2003) also provides definitions of the rational, natural and open system perspective:

The rational system perspective (p. 27):

> "Organizations are collectivities oriented to the pursuit of relatively specific goals and exhibiting relatively highly formalized social structures."

The natural system perspective (p. 28):

> "Organizations are collectivities whose participants are pursuing multiple interests, both disparate and common, but who recognize the value of perpetuating the organization as an important resource. The informal structure of relations that develops among participants is more influential in guiding the behavior of participants than is the formal structure."

The open system perspective (p. 29):

> "Organizations are congeries of interdependent flows and activities linking shifting coalitions of participants embedded in wider material-resource and institutional environments."

Scott states that all organisations are open systems and offer no definition for closed systems.

Levels of analysis	Closed System Models		Open System Models	
	1900 – 1930 Rational Models	**1930 – 1960 Natural Models**	**1960 – 1970 Rational Models**	**1970 – Natural Models**
Social Psycho-logical	Scientific Management Taylor (1911) Decision Making Simon (1945)	Human Relations Whyte (1959)	Bounded Rationality March and Simon (1958)	Organizing Weick (1969)
Structural	Bureaucratic Theory Weber (1968 trans.) Administrative Theory Fayol (1919)	Cooperative Systems Barnard (1938) Human Relations Mayo (1945) Conflict Models Gouldner (1954)	Contingency Theory Lawrence and Lorsch (1967) Comparative Structure Woodward (1965) Pugh et al. (1969) Blau (1970)	Sociotechnical Systems Miller and Rice (1967)
Ecological			Transaction Cost Williamson (1975) Knowledge-based Nonaka and Takeuchi (1995)	Organizational Ecology Hannan and Freeman (1977) Resource Dependence Pfeffer and Salancik (1978) Institutional Theory Selznick (1949) Meyer and Rowan (1977) DiMaggio and Powell (1983)

Table 3.2 Dominant Theoretical Models and Representative Theorists: A layered model. Source: Scott (Scott, 2003, p. 108)

To further elaborate on this classification we turn to Evan (Evan, 1993) who uses six theories of organisation for comparison. These are Weber's theory of bureaucracy, open systems theory, resource dependence theory, institutional theory[19,20], transaction-cost economics, and organizational ecology. Evan compares the six models by using key concepts, major assumptions, unit of analysis, key propositions, and problem areas. In table 3.3 three of these theories are described; Weber's theory of Bureaucracy as an example of what Scott labels rational models, Open Systems Theory which corresponds to Scott's Open Systems Models and Institutional Theory which is an example on what Scott labels Natural Models.

[19] "To summarize: organizations are technical instruments, designed as means to definite goals. They are judged on engineering premises; they are expandable. Institutions, whether conceived as groups or practices, may be partly engineered, but they have also a "natural" dimension. They are products of interaction and adaptation; they become the receptacles of group idealism; they are less readily expendable. (Selznick, 1957, pp. 21-22).

[20] "[….] omnibus conception of institutions:
- Institutions are social structures that have attained a high degree of resilience.
- Institutions are composed of cultured-cognitive, normative, and regulative elements that, together with associated activities and resources, provide stability and meaning to social life.
-Institutions are transmitted by various types of carriers, including symbolic systems, relational systems, routines, and artifacts.
- Institutions operate at multiple levels of jurisdiction, from the world system to localized interpersonal relationships.
-Institutions by definition connote stability but are subject to change processes, both incremental and discontinuous." (Scott, 2001, p. 48.)

Overview of	Weber's Theory of Bureaucracy	Open Systems Theory	Institutional Theory
Key Concepts	Rational-legal authority A system of graded positions Expertise (as a criterion for recruitment and promotion) Rules Written documents Bureaucratization	Open system Organizational inputs Organizational throughputs Organizational outputs Organizational feedback	Institution Institutionalization Institutional environment Institutional isomorphism Legitimacy
Major Assumptions	A rational-legal system of authority is (1) universally applicable; and (2) the most efficient mode of organization	Organizations are open systems. Organizations have ongoing interactions with other organizational systems in their environment.	All organizations are embedded in institutional environments. Institutional environments affect organizational structures, practises, and performance.
Unit of analysis	Subunit of an organization and total organization	Organizational subsystems and total organizational system.	Total organization. Organization-environment relationship.
Key Propositions	A rational-legal bureaucracy is more efficient than one based on the authority of tradition or charisma	Maintaining negative feedback in an organizational system requires the inflow of necessary inputs, the design of appropriate throughputs, and the outflow of appropriate outputs. Ashby's law of requisite variety states that the rates of change of organizational systems must correspond to the rates of change of environmental systems	Organizations are more likely to survive if they obtain legitimacy and social support from their institutional environment. Organizational structures evolve through a process of adaptation and incorporate elements from institutional environment.
Problem Areas	What are the relationships among the characteristics of Weber's ideal type of bureaucracy? What are the correlates of bureaucratic structures?	What are the relationships between external organisational systems and the focal organizational system? Are the organizational throughputs (i.e., social structure and technology) appropriately designed to process organizational inputs? Are the organizational outputs effectively channelled to markets or relevant environments? What are the effects of negative and positive feedback over time?	Why are organizations so similar? Why do organizations differ in legitimacy and institutionalization? How does one measure the effect of institutional environment? How do institutional environments affect organizational structure and performance?

Table 3.3 A Comparison of Webers' theory of bureaucracy, open systems theory, and institutional theory.
Adapted from: Evan (Evan, 1993).

When organisations are viewed as open systems and the environment has to be taken into account, there is also the question of where the boundary between the organisation and the environment should be defined. When analysing organizations, the trickiest part (Hatch, 1997) is to define the organisation. The definition includes determining the organisation's boundary, and boundary definition is easier said than done. Boundary definition is determined by the reasons for conducting an analysis and this entails that there is not one right view.

The literature on organisations (Mintzberg, 1979) seldom defines the term environment[21], but it is often discussed according to the characteristics of the organizational environment. Mintzberg presents five hypotheses about the environment based on the four characteristics of the environment. The four characteristics are: (1) Stability, with the range from stable to dynamic; (2) Complexity, with the range from simple to complex; (3) Market diversity, with the range from integrated to diversified; (4) Hostility, with the range from munificent to hostile. The last two characteristics are exemplified as: The market diversity characteristic is exemplified with the iron mine that sells its one commodity to a single steel mill (integrated), and trade commissions that seek to promote all of a nation's industrial products all over the world (diversified). Diversity can result from a broad range of clients, products or services. The hostility characteristic is exemplified with a prestige surgeon who can choose and pick his patients (munificent) and a construction firm that which must bid on all its contracts, to that of an army fighting a war (hostility). Hostile environments generally demand fast reactions by the organization.

From the characteristics stability and complexity Mintzberg, identifies four basic forms of environments (see table 3.4). An environment is complex if it requires the "organization to have a great deal of sophisticated knowledge about products, customers, or whatever. It becomes simple, however, when that knowledge can be rationalised, that is broken down into easily comprehended components" (Mintzberg, 1979, p 268).

[21] "**2.** *concr.* **a.** That which environs; the objects or the region surrounding anything.
b. *esp.* The conditions under which any person or thing lives or is developed; the sum-total of influences which modify and determine the development of life or character." (Oxford English Dictionary)

	Stable	Dynamic
Complex	Decentralized Bureaucratic (standardisation of skills)	Decentralized Organic (mutual adjustment)
Simple	Centralized Bureaucratic (standardisation of work processes)	Centralized Organic (direct supervision)

Table 3.4 Four basic organisational environments.
Source: Mintzberg (Mintzberg, 1979, p. 286)

Simple stable environments (Mintzberg, 1979) give rise to classical organisation types with centralised, bureaucratic structures that rely on standardisation of work processes. Organisations in complex stable environments will have bureaucratic but decentralised structures and coordinate by standardisation of skills. When an organisation's environment is dynamic and simple, flexibility of organic structures are required. The power can remain centralised, and direct supervision is the prime coordinating mechanism. In dynamic and complex environments the organisation must decentralise to managers and specialists who can comprehend the issues and allow them to interact with flexibility in an organic structure. The flexibility enables the organisation to respond to unpredictable changes. The prime coordination mechanism is mutual adjustment.

3.4.1 Comments

Mintzberg (Mintzberg, 1979) uses the detective squad as an example of a dynamic environment because the detective squad never knows what to expect next. However, the environment surrounding Kripos investigated in this research is other organisations in the law enforcement system and in this respect Kripos' environment should be classified as stable and complex. Kripos is bureaucratic in nature and staff is engaged according to skills in e.g. police work and different kinds of analysis. Kripos is decentralised because different departments deal with different parts of the investigation (e.g. fingerprints, laboratory and tactical analysis are different departments with their own departmental managers).

In this thesis organisations are viewed as open systems. Kripos falls into the bureaucratic model of organisations, but this does not contradict the open system view. Several theorists have commented on the fact that Weber's bureaucratic model has been misinterpreted as a closed system by early theorists in organisational theory (Hatch, 1997; Scott, 2003) (Ashmos & Huber, 1987; Evan, 1993). The determination of the boundaries has been given much attention during the research. The focus of the research has been the start of a criminal case by the police; follow it through the detective's analyses (both tactical and technical) until it can be used as a basis for prosecution and/or strategic decisions. The research has also included management in the investigation by including some features in the delegation of tasks. This contradicts the present view that tends to view each unit (police, detective and strategic) as separate units.

The last piece in the organisation puzzle treated here is culture. This subject falls within the social structure in Scott's model of organisations (Scott, 2003) and the human-cultural subsystem defined by Kast and Rosenzwweig (Kast & Rosenzweig, 1973).

3.5 Organisational culture

Chester Barnard (1886 – 1961) was president of the New Jersey Bell Telephone Company (Hatch & Cunliffe, 2006). In 1938 he suggested that managing the informal organisation by organising into cooperative social systems through the integration of work efforts with focus on worker motivation was a key function if executives should succeed (Barnard, 1938). Hatch (Hatch & Cunliffe, 2006) links the idea of the informal organisation to the contemporary theories on organisational culture.

Figure 3.5 Chester Barnard[22]

In 1979 Mintzberg (Mintzberg, 1979) stated that organisations have five parts, but he has later added a sixth part (Mintzberg, 1989); ideology. The six parts are illustrated in figure 3.6. The only part that will be treated in this section is the ideology. According to Mintzberg another term (Mintzberg, 1989) for ideology is "culture". The culture "encompasses the traditions and beliefs of an organization that distinguish it from other organizations and infuse a certain life into the skeleton of its structure" (p. 98).

[22] Source: Zitate-online.de (www.zitate-online.de/thema/gewinn/ (Accessed 19.11.2007)).

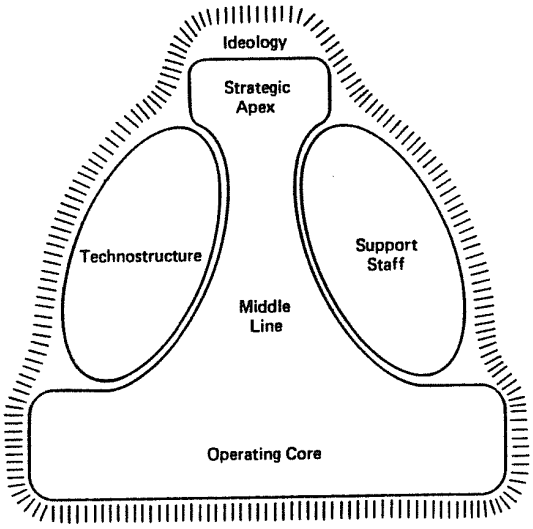


Figure 3.6 Six basic parts of the organisation.
Source: Mintzberg (Mintzberg, 1989, p. 99)

As with most scientific terms there are many definitions for culture, but most definitions include "use of the word "shared" and a reference to culture as that which is distinctive or unique to a particular context" (Martin, 2002, p. 56). Definitions have varied in their content and e.g. Frost (Frost, 1985) includes importance of symbolism, rituals, myths, stories and legends, interpretation of events, ideas and experiences. Alvesson (Alvesson, 2002, p. 2, author's italics) refers to culture in the following way:

> "My major point is *not* however, to preach culture as the principle means to corporate effectiveness, growth and success. It is, [….] difficult to establish clear and causal links between culture and something else. Trying to do so easily implicates a rather simplistic view on culture that seriously underestimates its theoretical potential and value. [….] For me, organizational culture is significant as a way of understanding organizational life in all its richness and variations. The centrality of the culture concept follows from the profound importance of shared meanings for any coordinated action."

Culture (Martin, 1992; Meyerson & Martin, 1987) can be seen from three different points of view; the integration view (harmony and homogeneity), the differentiation view (separation and conflict), and the fragmentation view (multiplicity and flux). In studies conducted from the integration perspective there is no place for doubt, uncertainty, or collective dissent in the culture and leaders are often portrayed as culture creators and culture transformers. Defining

characteristics of this view are organisation-wide consensus, consistency, and clarity. The differentiation perspective acknowledges conflicts of interest between groups and attends differences of opinion. In this perspective the organisation consists of a series of overlapping, nested subcultures that coexist. The coexistence can be in harmony, conflict or indifference. Defining characteristics of the differentiation view are inconsistency, sub-cultural consensus, and the relegation of ambiguity to the periphery of subcultures. In the fragmentation perspective ambiguity and exploration of the complexity of relationships between one cultural manifestation and another is at the forefront. A study in this view presents a multiplicity of interpretations that seldom coalesce into a stable consensus. Defining characteristics are; focus on ambiguity, complexity of relationships, and a multiplicity of interpretations.

The formal definition of culture used in this research was published for the first time in 1985 by Schein.

> "The culture of a group can now be defined as a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems." (Schein, 2004, p. 17.)

Schein (Schein, 1991) further elaborates on the definition by stating that culture is a property of a human group, and that the group must be defined before we can define the culture of the group, and that it is only what is shared in a group that is cultural. New groups or new organisations have to deal with two fundamental sets of issues, external adaptation and internal integration at the behavioural, cognitive, and emotional level (see table 3.5). The external adaptation and integral integration specify the learning focus, and no two groups will share the same culture because they have had different histories regarding problem solving learning.

External Adaptation Tasks		Internal Integration Tasks	
Developing consensus on		**Developing consensus on**	
1.	The core mission, functions, and primary tasks of the organization vis-à-vis its environment.	1.	The common language and conceptual system to be used, including basic concepts of time and space.
2.	The specific goals to be pursued by the organization.	2.	The group boundaries and criteria for inclusion.
3.	The basic means to be used in accomplishing the goals.	3.	The criteria for the allocation of status, power, and authority.
4.	The criteria to be used for measuring results.	4.	The criteria for intimacy, friendship, and love in different work and family settings.
5.	The remedial or repair strategies if goals are not achieved	5.	The criteria for the allocation of rewards and punishments.
		6.	Concepts for managing the unmanageable – ideology and religion.

Table 3.5 The External and Internal Tasks Facing All Groups.
Source: Schein (Schein, 1991, p. 249)

The learning process (Schein, 1991) proceeds according to the following dynamic model; the founder of the new group starts with some beliefs, values, and assumptions, teaches these to the new group members, and in this way the founder's basic reality becomes a set of interim values and beliefs about which the new group members have limited choice to question. If the group fails in their behaviour, the group is dissolved, and no new culture is formed. The process always starts with belief predictions (how things are) and value statements.

An organisation's culture also has different levels, and Schein (Schein, 1992) has defined the levels to be; artefacts, values, and underlying assumptions. The different levels are presented in figure 3.7. To be able to understand the culture of a group or an organisation, one always has to understand the deeper levels, i.e. one can not study artefacts without understanding values.

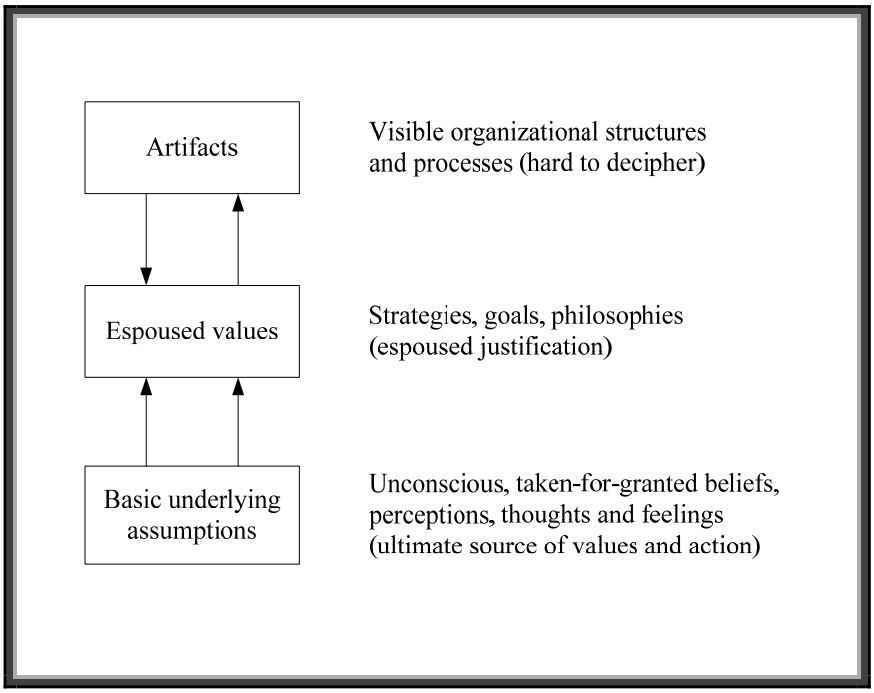


Figure 3.7 Levels of culture.
Source: Schein (Schein, 1992, p. 17)

3.5.1 Comments

When investigating a crime, the focus for all involved will be to find evidence in order to reconstruct the course of events as accurately and truthfully as possible. However, the different tribes will have their own basic means to obtain the goals, and their own criteria for measuring the results; they will have their own culture. It may not be possible for the different tribes to be able to reach a consensus on means and criteria. When it comes to remedial or repair strategies these will also differ, although for facing the external world, there will be a common strategy. As for the internal integration tasks the different tribes will also most likely have different views on how consensus is to be reached, particularly regarding status, power, authority and allocation of rewards and punishments. These differences are grounded in the different hierarchies in the criminal investigation organisations and how much emphasis is placed on each hierarchy within each group. In some groups emphasis is placed on skills and the skill hierarchy will define power, authority and allocation of rewards and punishments, in other groups the emphasis may be placed on the seniority hierarchy.

The research at Kripos has been performed with the fragmentation perspective in mind. Although the tribes have a common goal, their methods are quite different. It is possible to imagine a scenario where the tribes have evidence pointing in different directions. It is then vital that there are channels of communication between the tribes so that they can solve the task together, and then the investigators will be able to avoid competing cultures where the result from one or more of the tribes receive more focus than the others. This effective information sharing can not be achieved with a computerised information system alone. It will also be necessary with changes in culture to obtain effective communication.

CHAPTER 4
INFORMATION SYSTEMS

Information is easily confused with knowledge, certainty, wisdom, and data.
The meaning of a picture, a scene, a sensation, is information.
Information glows in a sea of randomness.
An organization is not physical; it's people bound by information.
An organization, any organized activity, is impossible without information.
Edward M. Housman
(Verse 7 of the poem "The Nature of Information" (Housman, 2000))

The first section in this chapter (section 4.1) contains an introduction to the investigation process carried out by Kripos. Then we turn to a review of the concepts of information and information systems in section 4.2. In section 4.3 information systems are seen in an organisational context, and in section 4.4 information system development is reviewed. After each section (apart from the introduction) a subsection with comments about the subject is included. One clarification is necessary first; the term criminal intelligence analysis is used to describe analysis of information of committed crimes (see the discussion of different terms in section 5.3).

4.1 Introduction

When introducing a computerised information system, the flow of information in the organisation can be changed and hopefully improved, but the computerised part of the information system is not going to be better than the humans operating it. Hence, communication break downs are important and one result of this research (as described in section 2.1 and 2.5) is the identification of possible points of communication break down within and between law enforcement organisations. The possible communication break down points was taken into consideration when developing the conceptual model of the information system for Kripos. Another aspect that may change when introducing an information system

is the power[23, 24]/authority[25] structure of the organisation[26, 27] (see the different descriptions of the information hierarchy in section 4.2). The power/authority structure at Kripos has not been a focus for this research, but the researcher has been aware of this aspect during the research.

The process of criminal investigation and analysis carried out by Kripos has been a focus for the research and therefore a description of the process will be presented. The description is based on material obtained during the researcher's data gathering (field notes and course material (Kripos, 2000)). All information was given in Norwegian and is here translated into English by the researcher.

The analytic work consists of the following elements:

- analysis of vast amounts of information from different sources
- extracting meaning of the information
- prepare graphical presentations as a supplement to, and an illustration of, the information
- model, evaluate, and present conclusions based on the information

The process of investigating a crime (see figure 4.1) is divided into steps but emphasis is placed on viewing the process as one system consisting of several activities/sub-processes. The sub-processes result in the most exact and useful inferences, which can be obtain by the information at hand. In the first three sub-processes data is gathered, evaluated and prepared (organised and stored). The actual analysis starts with the sub-process of integration. At this step data are retrieved and adapted in ways which make it possible to understand meaning and

[23] Dahl's model of power is rooted in rational action and defines power as: "*A* has power over *B* to the extent that he can get *B* to do something that *B* would not otherwise do." (Dahl, 1957, p. 203. Authors italics.)
[24] Salancik and Pfeffer's view of power is an elaboration of strategic-contingency theory, and has the following comments: "Power adheres to those who can cope with the critical problems of the organization. [….] And power, while it eludes definition, is easy enough to recognize by its consequences – the ability of those who possess power to bring about the outcomes they desire."(Salancik & Pfeffer, 1977, p.3.) "[….] power helps organizations become aligned with their realities." (Salancik & Pfeffer, 1977, p.4.)
[25] Weber has defined three types of authority: Traditional, charismatic, and rational/legal. Rational/legal authority is associated with the bureaucratic organisation. Both traditional and charismatic are associated with individuals (Weber, Gerth, & Mills, 1948).
[26] "Computer information systems in organisations bring changes in either increased centralisation or decentralisation of power and changes in types of control." (Winfield, 1991, p. 76.)
[27] Readers interested in this field can find discussion about the theme in e.g. (Alvesson, 1996; Horton, 2000; Kipnis, 1990; Knights & Roberts, 1982; Levine & Rossmoore, 1994/1995; Pettigrew, 1972; Pfeffer, 1992; Tuomi, 1996; Zuboff, 1988).

coherence i.e. identify shortcomings in the information already gathered. Identifying shortcomings help focusing on collecting the "right" information later on in the investigation.

The most important step in the analysis is the interpretation. The information is adapted in different ways, e.g. diagrams, forms, maps etc. These techniques are used to 1) focus the analysis, 2) as an aid in presentations and 3) a starting point for inference, but they are not the end product of the analysis. The end products of the analysis are hypotheses supported by facts and the investigators interpretation.

Hypotheses are tested by iteration of the sub processes, gathering, evaluation, preparation, integration and use of inductive logic. Each time iteration is performed the focus increases towards the specific information needed to strengthen or weaken a hypothesis. The optimal goal for this process is to present a conclusion, a prediction or calculation that gives the most support for an action. The process and its different steps are explained in more detail in section 5.1, and subsections 6.5.1 and 6.6.1.

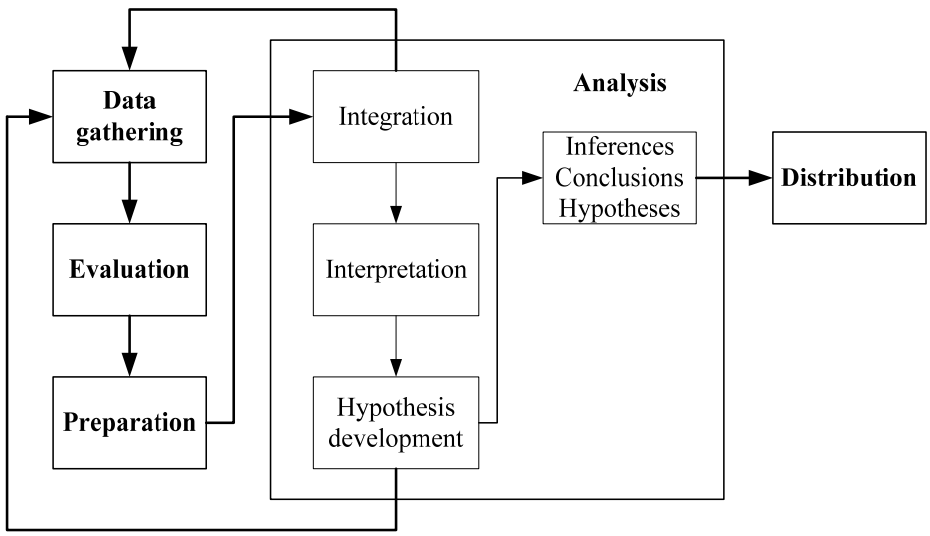


Figure 4.1 The intelligence process[28]
Source: Nordisk kurs i kriminalanalyse (Kripos, 2000, p. 2)

[28] Kripos defines intelligence to be "the result from gathering, evaluation, preparation, integration and interpretation of information. Intelligence can be seen as information supplied with "something". This "something" being supplied is the result of the analysis, in other words an explanation of what the information means." (Kripos, 2000)

4.2 Information and information systems

Definitions of information differs both within and between disciplines (Liebenau & Backhouse, 1990), they also seem to be a function of the time when they were defined (Summers, Oppenheim, Meadows et al., 1999), and Yuexiao (Yuexiao, 1988) estimates that several hundred definitions exists. Machlup and Mansfield have identified more than 40 academic fields that deal with information and states that (Machlup & Mansfield, 1983):

> "Evidently, there should be *something* that all the things called information have in common [but] it surely is not easy to find out whether it is much more than the name."

Later in this section the definition of information used in the field of information systems will be put forward, but first we shall go through the hierarchy of information definitions developed by Sandra Braman (Braman, 1989), and principle uses of the word information (Buckland, 1991).

According to Sandra Braman (Braman, 1989) the abundance and diversity of definitions of information bewilder. She has developed a hierarchy of definitions of information in the area of information policy studies. According to Kirk this hierarchy is applicable to organisations because (Kirk, 1999, p. 4)

> "…firstly, it recognises the qualitative difference among definitions of information; secondly, its macro view is more appropriate to organisations than definitions based only on the individual as an information user; thirdly, it provides a range of definitions which are useful in different situations; and fourthly, it foreshadows the need for information policy in organisations."

The hierarchy is based on definitions from many different fields and it has four levels: (Braman, 1989,)

1. Information as a resource. "[….] information, and its creators, processors and users are viewed as discrete and isolated entities. Information comes in pieces unrelated to bodies of knowledge or information flows into which it might be organized. The social structures as viewed this way is simple (there are two classes – haves and have-nots), and the scope of phenomena covered is limited. Information is not seen to have any power in and of itself, though its role in sustenance of specific entities is acknowledged. Definitions that treat information as a resource have implicit within them the notion that, also like physical resources, information can be processed." (p. 236)
2. Information as a commodity. "The notion of information as a commodity requires as a complement a concept of an information production chain. The steps of such a chain, [….], include information creation (creation, generation and collection), processing (cognitive and algorithmic), storage, transportation, distribution, destruction and seeking. Commoditized information gains in economic value as it passes through each stage of the chain….the scope of the notion of information as

a commodity is wider than that of information as a resource, for it incorporates the exchange of information among people and related activities as well as its use. The social structure, too, is more articulated and therefore complex, comprising buyers, sellers and the organization required in order to sustain a market, rather than simply entities struggling individually for survival. With this type of definition, information is granted at least economic power." (p. 237 – 238)[29]

3. Information as perception of pattern. This definition broadens the concept of information because it is adding context. The information has a past, present and future, and it can be affected by motive and other environmental and causal factors. It also has effects itself. The simplest definition in this category focus on the capacity of information to reduce uncertainty and more complex definitions centre on context (semiotics is an example) . "The primary disadvantage of this approach is that it is highly relativistic. Perception of pattern and context shift from observer to observer, so that any use of such a definition must make explicit the point of view from which it is being applied. [….] definitions are capable of application to a highly articulated social structure [….] information is clearly granted power of its own, although its effects from this perspective are isolated in themselves – uncertainty, for example, is reduced as it regards a specific single question, without concern for trends or structural effects….If knowledge is power, contextualized knowledge is greater power." (p. 239)
4. Information as a constitutive force in society. In this category information are granted an active role in shaping context. "[….] information is not just affected by its environment, but is itself an actor affecting other elements in the environment. Information is that which is not just embedded within social structure, but creates that structure itself". (p. 239) "Definitions that treat information as a constitutive force in society are at the top of this definitional hierarchy, they apply to the entire range of phenomena and processes in which information is involved, can be applied to a social structure of any degree of articulation and complexity, and grant information, its flows and use an enormous power in constructing our social (and ultimately physical) reality."(p. 241)

Buckland view information from the user's point of view and identifies three principle uses of the word information; (Buckland, 1991, p. 3-4, authors italics.)

1. *"Information-as-process*. What someone knows is changed when he or she is informed. In this sense information is "the action of informing [….]; communication of the knowledge or 'news' of some fact or occurrence; the action of telling or fact of being told something" (Oxford English Dictionary [OED] 1989, 7:944.
2. *Information-as-knowledge*. *Information* is also used to denote that which is imparted in Information-as-process: the "knowledge communicated concerning some particular fact, subject, or event; that which one is apprised or told; intelligence, news" (OED 1989, 7:944). The notion of information as that which reduces uncertainty could be viewed as a special case of information-as-knowledge. Sometimes information increases uncertainty.
3. *Information-as-thing*. The term *information* is also used attributively for objects, such as data and documents, that are referred to as information

[29] For further elaboration on the information production chain, see (Braman, 2004) (Braman, 2006) (Machlup, 1980) (Boulding, 1966).

> because they are regarded as being informative, as "having the quality of imparting knowledge or communicating information; instructive" (OED 1989, 7:946)."

Further, Buckland identifies the key characteristic of knowledge (and by that Information-as-knowledge) to be intangibility; it is not possible to touch or measure knowledge in any direct way, and comments (Buckland, 1991, p. 4)

> "Knowledge, belief, and opinion are personal, subjective, and conceptual. Therefore, to communicate them, they have to be expressed, described, or represented in some physical way, as a mark, signal, text, or communication. Any such expression, description, or representation would be information-as-thing. [….] The distinction between knowledge in the pure sense – denoting what some individual actually knows – and the extended or metaphorical use of knowledge – as in recorded knowledge, knowledge engineering, and knowledge base, to denote a physical representation of what some individual may have known – is of central importance in information studies. Recorded knowledge is knowledge in much the same way that a written biography is a life. The distinction between something, often something intangible, and representations is an essential feature of the study of information and information systems. Unfortunately, careless failure to remember the differences between a word and what it is used to represent is common in the literature and accounts for major problems in the study of information systems."

Buckland is aware that some authors object to consider Information-as-thing, because information has no matter or energy, but Buckland will not dismiss information-as-thing because it is a commonly used meaning of the term information. (Buckland, 1991, p. 4)

> "Indeed, languages evolve, and with the expansion of information technology, the practice of referring to communications, databases, books, and the like as information appears to becoming commoner and, perhaps, a significant source of confusion since symbols and symbol-bearing objects are easily confused with whatever the symbols represent. Further, information as thing, by whatever name, is of special interest in relation to information systems because ultimately information systems, including expert systems and information retrieval systems, can deal directly with information *only* in this sense."

Buckland distinguishes three kinds of information-receiving situation, viewed from the perspective of the person being informed (Buckland, 1991, p. 30, authors italics.):

"1. *Communication*, in which information is conveyed, intentionally and more or less directly, to the receiver, as in a conversation, a letter, or a lecture, constitutes one class of information-receiving situations.
2. *Retrieval-based information services*, wherein collected and stored information-as-thing is sought and retrieved by the user, represent another sort of information-receiving situation. A retrieval situation is more complex than a communication situation.

3. *Observation*. Information can also be received by other means such as observing an event, conducting an experiment, or contemplating any evidence that has not been communicated or retrieved. We refer to this third class as observation."

Retrieval-based (Buckland, 1991) information systems are artefacts which involve selecting, collecting, retrieving, and searching. They have two foundations; a role and a mission. The role is to facilitate access to information and the mission is to support whoever funds them.

Retrieval-based information systems should also be open (van Rijsbergen, 1996). Open systems in this sense means that the process of retrieval can, in any stage, be influenced of the knowledge and expertise of the user.

Although Tuomi (Tuomi, 2000) has developed a reversed knowledge hierarchy to explain the relationship among data, information, knowledge and wisdom, the main view within the field of information systems is that information is a part of the data, information, knowledge, and wisdom hierarchy (DIKW) (see figure 4.2).

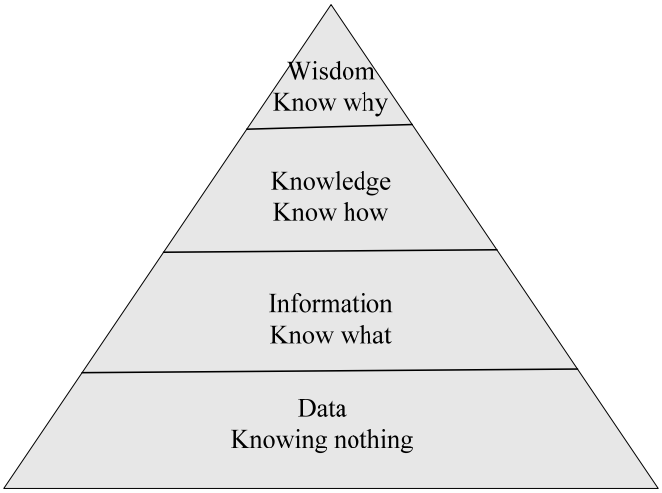


Figure 4.2 DIKW-hierarchy with Zeleney's descriptions.
Adapted from: Zeleny (Zeleny, 1987).

The hierarchy has many names (Sharma, 2005) and it has different origins. In the field of Knowledge Management the hierarchy often goes by the name of "Knowledge Hierarchy" or "Knowledge Pyramid", while in the domain of Information Science it goes by the name of

"Information Hierarchy" or "Information Pyramid". The field of Design also refers to the DIKW hierarchy and their references go back to Mike Cooley (Cooley, 1987). The fields of Information Science and Knowledge Management use two different origins of the hierarchy; Knowledge Management often cites Russell Ackoff (Ackoff, 1989) as the initiator to the hierarchy. However, Sharma points out that Milan Zeleny (Zeleny, 1987) also builds the knowledge hierarchy and this article was produced two years earlier. Information Science often refers to Harlan Cleveland who published his article in 1982 (Cleveland, 1982). Cleveland names it the "T. S. Eliot hierarchy" because the poet T. S. Eliot was the first to mention the hierarchy in the poem "The Rock" (Eliot, 1934):

> "Where is the life we have lost in living?
> Where is the wisdom we have lost in knowledge?
> Where is the knowledge we have lost in information?"

The DIKW has, as we have seen, several points of origin within the different fields, and the explanation can vary slightly or stages can be added. Choo (Choo, 2006) creates a hierarchy of signals, data, information and knowledge, and Gottschalk (Gottschalk, 2004) creates a chain of data, information, knowledge, and wisdom and action on the same level. Ackoff (Ackoff, 1989) adds understanding (between knowledge and wisdom) to the DIKW-hierarchy, but Bellinger et al. (Bellinger, Castro, & Mills, 2004) states that understanding supports the transition from each stage to the next in the hierarchy consisting of data, information, knowledge, and wisdom.

In Ackoff's word the hierarchy is described as follows: (Ackoff, 1989, p. 3.)

> "Wisdom is located at the top of a hierarchy of types, types of content of the human mind. Descending from wisdom there are understanding, knowledge, information, and at the bottom, data. Each of these includes the categories that fall below it – for example there can be no wisdom without understanding, and no understanding without knowledge."

Data (Ackoff, 1989) are products of observation and to observe is to sense. Data are symbols representing properties of objects, events and their environments. Information is extracted from data by analysis and contained in descriptions. Information is answers to questions like who, what, where, when and how many. Knowledge is know-how and enables the transformation of information into instructions and instructions make control of a system possible. Control of a system is to make it work efficiently. Knowledge can be obtained in

two ways; transmission from another who has it (by instruction) or by extracting from experience. In both cases learning and adaptation is the processes by which we acquire knowledge. Learning takes place when one's efficiency increases over time by trial and error in stable environments. In changing environments new learning is needed to maintain or increase efficiency and this process is called adaptation. Intelligence is the ability to acquire knowledge on one's own. Systematic learning and adaptation is detection and correction of error. This requires understanding (know why) of why the error was made and how to correct it. Diagnosis is the identification of the cause of the error and prescription is the instruction directed towards correction. Information, knowledge and understanding have a focus on efficiency and intelligence is the ability to increase efficiency. Wisdom however, is the ability to increase effectiveness. The difference between efficiency and effectiveness is reflected in the difference between growth and development. Growth can take place with or without development and development can take place with or without growth. Growth does not necessarily imply an increase in value, but development does. Development "is a process in which an individual increases his ability and desire to satisfy his own needs and legitimate desires, and those of others. [….] Because development consists of increases in desire and ability, it cannot be given to or imposed on another. One party cannot develop another, but can encourage and facilitate the development of another." (Ackoff, 1989, p. 5 - 6, author's italics). Wisdom adds value and requires the mental function called judgement. Ethical and aesthetical values are personal and unique, and can not be programmed or automated. Evaluations of efficiency (which is the focus of information, knowledge and understanding) are all based on logic. These principals are general and impersonal, independent of the actor. Hence the logic can, in principle, be specified and therefore programmed and automated.

Information systems (Ackoff, 1989) generate, store, retrieve, and process data. The processing is often statistical or arithmetical. Computers are adept to extract information from data. When computers are programmed they are instructed and thereby 'taught' how to understand something. Computerised expert systems are knowledge systems in which the expert's knowledge has been programmed. Knowledge systems are seldom learning systems (they are not capable to learn on their own). Computers have been programmed to learn from experience but such learning is generally very elementary. 'Artificial intelligence' systems often do not have the ability to learn on their own (an ability Ackoff calls intelligence), and

are therefore mislabelled. A system that generates understanding of purposeful[30] systems and thus facilitates and accelerates learning and adaptation exists, but they are generally man-machine systems. Machines have been used to explain errors in the operations of machines, but they cannot be used for purposeful biological and social systems.

Another view of information is Langefors' infologigal equation (IE), which was developed in 1966. (Langefors, 1995, p. 144).

> "The infological equation (Langefors 1966) [….] "I = i(D, S, t)" where I is the information (or knowledge) produced from the data D and the pre-knowledge S, by the interpretation process I, during the time t. In the general case, S in the equation is the result of the total life experience of the individual. It is obvious, from this, that not every individual will receive the intended information from even simple data. The infological analysis demonstrates that the problem of designing information systems takes on very complex, humanistic dimensions, indeed"

Langefors states that the term information (Langefors, 1995) is used with different meanings. Information systems theory sees information as that which we obtain when we get informed. In this sense information is something we get to know (knowledge of some sort). In the "mathematical" theory of information, the word is used to denote reduction of uncertainty. New information or knowledge obtained by the decision maker can be used to reduce the number of alternatives, i.e. reduce uncertainty. Dedicated information means that information is intended for a specific application. Traditional data processing was seen to handle data, not information. However, Langefors regards this not as data processing, but directed information processing. The acquisition of knowledge can take place in two ways; by observation through our senses (direct acquisition) or through communication with other people about observation (or decisions) that they have made (indirect acquisition). In both cases it is factual knowledge (know that or know what) that is being obtained. In addition to factual knowledge, we need methodological knowledge (know-how) to act in the world. We get methodological knowledge through the same processes as factual knowledge; observation or communication. Methodological knowledge can also be called "methodological information". In connection with information systems the term information is mostly associated with factual information, but during the 1980's the terms "knowledge-based

[30] "[….] purpose can only exist where there is *choice*, and choice is of either means or ends, that is, desired outcomes. An entity is purposeful if it can select both means and ends in two or more environments. [….] The outcome of purposeful behaviour is never completely determined externally. It is at least partially determined by the choice made and therefore by the one making the choice." (Ackoff, 1999, p. 21 – 22, (authors italics).)

systems" and "knowledge systems" was used as a description of systems providing methodological information.

> "It is important to note that in both of the two definitions of information outlined above – as reduction of certainty vs. as some kind of knowledge – information is knowledge and not physical signs. We inform by communicating knowledge. It appears that not all knowledge is information. Perhaps one might say that information is structured knowledge, structured in such a way that it can be communicated. Furthermore, knowledge that can be communicated can be stored, so information is storable knowledge." (Langefors, 1995, p. 107.)

Langefors further describes a distinction between information and data. Data are signs used to represent information. As an example he uses the sign "information" which is composed of eleven letters, and it is data used to represent some concept or component of information to somebody who knows the concept. The equation indicates many consequences (Langefors, 2005, p. 3.):

- "Perceived, non-linguistic patterns are also data D.
- IE refutes positivistic ambitions.
- Data do not *contain* information.
- Words do not have unique meaning.
- User involvement in data design is necessary.
- The time symbol in IE has important consequences.
- Language translation is impossible to computerize.
- Knowledge atoms do not exist."

Alter (Alter, 2006) illustrates the relationships between data, information and knowledge as shown in figure 4.3. Alter describes data to include facts, images, or sounds. Data can be useful for a particular task, or they may not be useful. Information is data that are appropriate for a particular use. Both the data's form and content can be appropriate for a particular use. Knowledge is a combination of instincts, ideas, rules and procedures which guide actions and decisions. Alter also distinguishes between tacit and explicit knowledge. Tacit knowledge is unrecorded, understood and applied unconsciously, while explicit knowledge is articulated and often codified in documents or databases.

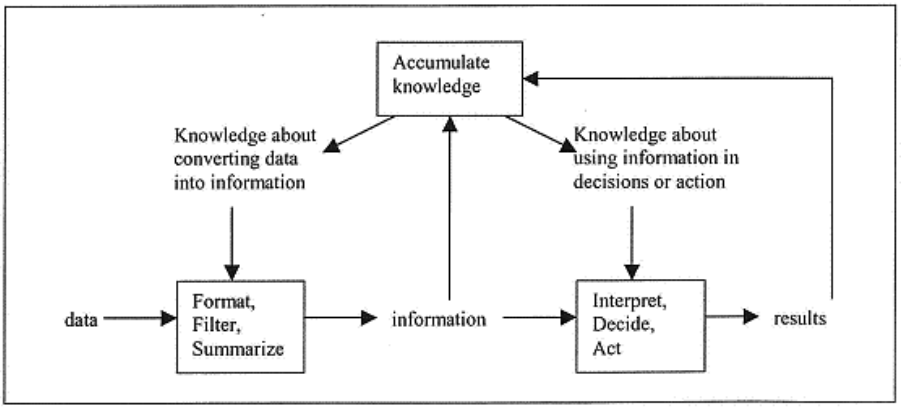


Figure 4.3 Relationship between data, information, and knowledge.
Source: Alter (Alter, 2006, p. 44)

4.2.1 Comments

This research has adopted a view of information that corresponds to 'Information as perception of pattern' (see Braman's hierarchy). Information in this view is granted contextualised power, and incorrect information can lead to a person being sentenced without being guilty, or the real perpetrator will not be found. Hence relevant and correct information is vital in criminal cases, as is the communication channels it is transferred through. Therefore this research viewed information both in an organisational context, and as a basis for a computerised information system. Information transfer from an organisational point of view is the basis for the communication model presented in figure 2.2. Communication as modelled here is preferred in order to avoid misinformation/disinformation, and increase the possibility for correct sentences. The communication between people in the organisation can be seen as (in Buckland's terms) 'Information-as-process' and 'Information-as-knowledge', and interaction between the computerised IS and the employees can be seen as both 'Information-as-knowledge' and 'Information-as thing' in the 'Retrieval-based information services'. A focus in this research was also the development of a conceptual model for a computerised information system, information as in 'information-as-thing' and therefore a walkthrough of the DIKW-hierarchy seemed to be necessary. In order to be able to distinguish between the many labels connected with computerised IS a basic understanding of the concepts involved is necessary. Using Ackoff's and Langefors' definitions a computerised information system based on the conceptual models developed in this research is categorised as an information system. Apart from being able to record thoughts about the specific data used in one specific analysis no attempts have been made to program the crime

analyst's expertise into the system; the human analyst will use his or her own expertise in each case. The focus has been on data and their transformation during the analysis process, this includes the possibility for different perspectives on the data for each criminal intelligence analyst.

In the next section some theoretical views on computerised information systems and how they can be viewed in an organisational context are discussed.

4.3 Information systems in an organisational context

Entire conferences have been arranged in order to consolidate views of information systems (Alter, 2004), but classification of information systems are still fragmented. In this section some brief notes on classification of information systems are given.

When presenting information systems in relation to organisations, a hierarchy of the organisational levels are often used (Andersen, 1994; Gottschalk, 2004; Laudon & Laudon, 2006). The organisation is divided into strategic level, management level, and operational level. The information systems are classified and linked to the different organisational levels; executive support systems (ESS) at the strategic level; management information systems (MIS) and decision support systems (DSS) at the management level; and transaction processing systems (TPS) at the operational level. This classification also corresponds to the decisions made in an organisation, which can be divided into strategic planning, management control, operational control and operational performance (Anthony, 1965).

The boundaries between executive support systems (or strategic information systems) and management information systems are not clear (Galliers, 2004; Larsen & Levine, 2005; Thierauf, 1991;Ward, 2002). However, Laudon and Laudon's (Laudon & Laudon, 2006) descriptions of the different types of information systems can be found in table 4.1.

Type of system	Information inputs	Processing	Information outputs	Users
ESS	Aggregate data; external, internal	Graphics; simulations; interactive	Projections; responses to queries	Senior managers
DSS	Low volume data or massive databases optimized for data analysis; analytic models and data analysis tools	Interactive, simulations; analysis	Special reports; decision analyses; responses to queries	Professionals; staff managers
MIS	Summary transaction data; high-volume data; simple models	Routine reports; simple models; low-level analysis	Summary and exception reports	Middle managers
TPS	Transactions; events	Sorting; listing; merging; updating	Detailed reports; lists; summaries	Operations personnel; supervisors

Table 4.1 Characteristics of Information Processing Systems.
Source: Laudon and Laudon (Laudon & Laudon, 2006, p. 42)

Since Gorry and Morton (Gorry & Morton, 1971) coined the term "Decision Support Systems", discussions about the difference between MIS and DSS (and if there is one) has been voiced (Moore & Chang, 1980; Power, 2002; Venkatraman, 1989). According to Alter (Alter, 2004), the term decision support system (DSS) covers a wide range of information systems and in the early days it attempted to move beyond MIS (summarising transactions and operational data for managers). Over the years different classifications for DSS has been put forward (Alter, 1980; Power, 2001; Sage, 1991; Sprague, 1980), but most acknowledge that they shall be able to support the decision making process[31] and Moore and Chang states that the origin of the term was straightforward enough (Moore & Chang, 1980, p. 8 - 9):

> "1. decision – emphasizes the primary focus on decision making in problem situations rather than simply information retrieval, processing, or reporting;
> 2. support – clarifies the computer's role in aiding rather than replacing the decision maker, thus including those decision situations with sufficient "structure" to permit computer support, but in which managerial judgment is still an essential element;

[31] Most models of decision making relates back to Herbert A. Simon's work and models of problem solving (foundations for artificial intelligence) back to Herbert A. Simon and Allen Newell (Newell & Simon, 1972). In 1947 Simon defined the decision making to consist of the following steps (Simon, 1947, p. 77):
"1. Identify all the possible alternatives;
2. determine all the possible consequences or these alternatives;
3. evaluate all the possible consequences.
In 1976 Simon (Simon, 1976) presented his four phases of decision making which is intelligence, design, choice, and review. These a closely linked to his work with March (March, Guetzkow, & Simon, 1993) (the works was fist published in 1958) on the three key factors of cognitive load in decision making; attention, information and stress, and on satisfactory alternatives in stead of optimal alternatives (bounded rationality).

3. system – highlights the integrated nature of the overall approach, suggesting the wider context of man, machine, and decision environment."

To get an overview of the complex field of decision support systems, figure 4.4 developed by Arnott and Pervan (Arnott & Pervan, 2005) can be helpful[32].

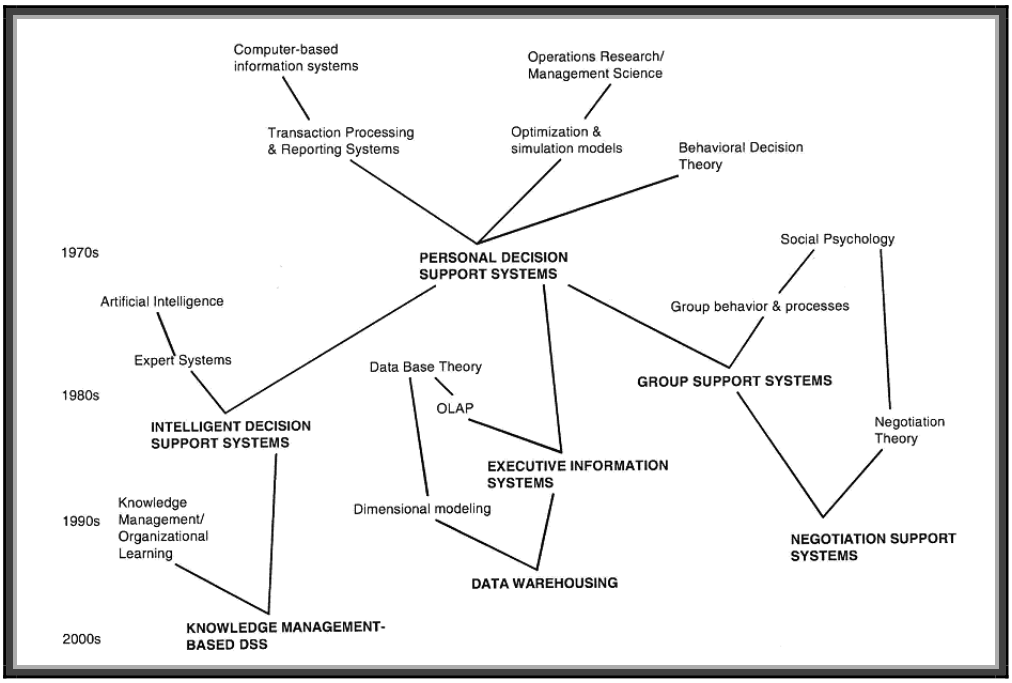


Figure 4.4 Evolution of the DSS field.
Source: Arnott and Pervan (Arnott & Pervan, 2005, p. 69)

In this classification DSS range from personal and group decision systems to intelligent decision support systems. Jackson (Jackson, 1998) points out that expert systems (Giarratano & Riley, 1998) of some are called knowledge systems, even though knowledge systems are a broader term. Intelligent decision support systems differ from traditional decision support systems in that they (Phillips-Wren, Mora, Forgionne et al., 2006, p. 9)

> "….extends traditional DSS by incorporating techniques to supply intelligent behaviors and utilizing the power of modern computers to support and enhance decision making."

[32] OLAP in the figure stands for on-line analytical processing.

Differences in public and private management and management information systems has also been found (Boyne, 2002; Bozeman & Bretschneider, 1986; Nutt, 1999; Rainey & Kingsley, 1998; Rainey, Pandey, & Bozeman, 1995), and some of the differences had been pointed out to be that (Bretschneider, 1990, p. 543):

> "[….] the environment of PMIS differs from that of its private sector counterpart. The difference is primarily in the form of greater interdependencies, leading, at least in part, to increased accountability, procedural delays, and red tape. [….] within these more constrained environments, traditional MIS prescriptions are not automatically adopted."[33, 34]

Another classification for information systems is using type of work as a point of departure. Work best supported by transactions- and decision support systems was first characterised as type-I and type II-work (Sprague, 1986), and later the dichotomy of information work was called procedure based and knowledge based activities (or goal based activities) (McNurlin & Sprague, 2003). The characteristics of each type of information work are presented in table 4.2. The model focuses on the important characteristics of the information workers (job procedures and knowledge) rather than data type, business function or job title.

Procedure Based	Knowledge Based
High volume of transactions	Low volume of transactions
Low cost (value) per transaction	High value (cost) per transaction
Well-structured procedures	Ill-structured procedures
Output measures defined	Output measures less defined
Focus on process	Focus on problems and goals
Focus on efficiency	Focus on effectiveness
Handling of "data"	Handling of concepts
Predominantly clerical workers	Managers and professionals
Examples	Examples
"Back office"	Loan department
Mortgage servicing	Asset/liability management
Payroll processing	Planning department
Check processing	Corporate banking

Table 4.2 A Dichotomy of Information Work.
Source: Sprague and McNurlin
(McNurlin & Sprague, 2003, p. 19)

[33] PMIS stands for public management information systems.
[34] Bozeman defines red tape as "rules, regulations, and procedures that remain in force and entail a compliance burden for the organization but have no efficacy for the rules' functional object". (Bozeman, 1993, p. 283)

Alter proposes a theory for IS that can be applied by both business/IT-professionals and academic researchers. The former can apply this theory in order to understand and analyse information systems, the latter can apply it to gain a deeper appreciation of past research and to develop future research projects. The theory are based on work systems and which roles the IS can play in the work systems (Alter, 1999, p. 8). A work system is defined as

> "[....] a system in which human participants and/or machines perform a business process using information, technology, and other resources to produce products and/or services for internal or external customers. Organizations typically contain multiple work systems and operate through them."

Elements of a work system are the business process, participants, information, technology, product, and customers, and the understanding of a work system includes an understanding of these elements.

An information system is defined as (Alter, 1999, p. 9)

> "[….] a work system whose internal functions are limited to processing information by performing six types of operations: capturing, transmitting, storing, retrieving, manipulating, and displaying information."

IS systems serves work systems and they (Alter, 1999, p. 9)

> "exist to produce information and/or to support or automate the work performed by the other work systems. Information systems may serve other work systems through a variety of roles. In relation to a single work system, an information system may provide information for decision making, may structure or control the work, or may automate some of the work. In relation to a group of related work systems, an information may support information sharing, may coordinate work, and may integrate the work."

The environment (Alter, 2002) includes the organisational, cultural, competitive, technical, and regulatory aspects within which the work system operates (see figure 4.5). The infrastructure includes human, informational, and technical resources, which the work system relies on. The work systems' strategy and the organization's strategy may help explain why the work system operates as it does. Products and services are the combination of physical things, information, and services produced by the work system, and the customers are people who receive direct benefit from the products and services produced by the work system.

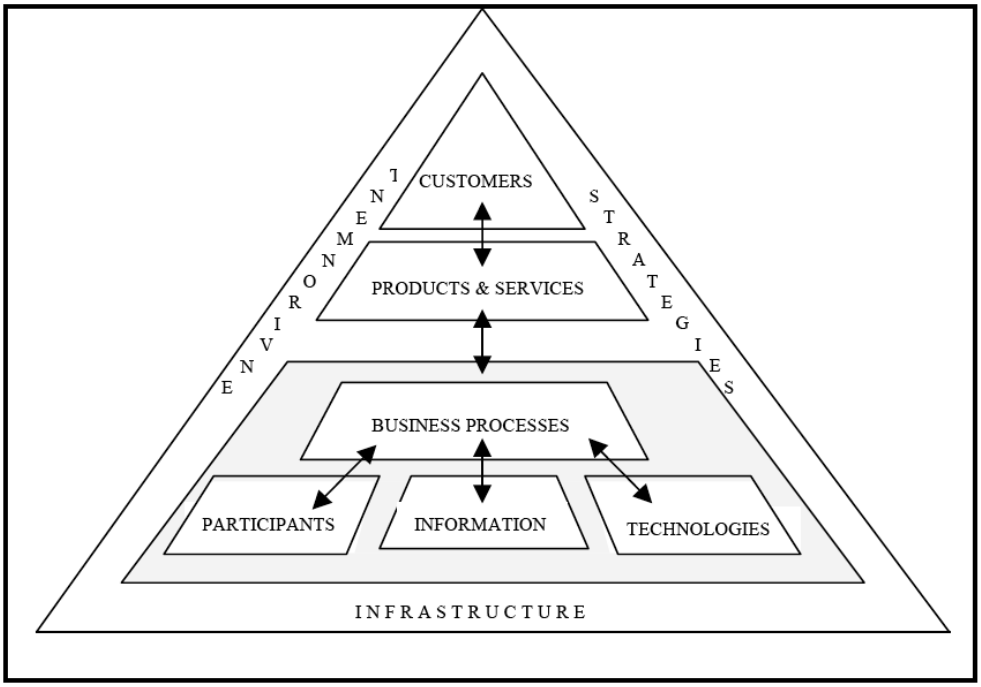


Figure 4.5 The Work System Framework.
Source: Steven Alter (Alter, 2002, p. 93)

In table 4.3 and 4.4 an information systems roles in supporting individual or multiple work systems with both mandatory and voluntary use of the system are presented. Table 4.3 shows the roles and table 4.4 presents some examples.

Supporting an individual work system	PROVIDE INFORMATION Provide information that supports work done in an individual work system	STRUCTURE WORK Structure work done in an individual work system	AUTOMATE WORK Automate some of the work done in an individual work system
Supporting multiple work systems	INFORMATION SHARING Support information sharing across multiple work systems	COORDINATE WORK Coordinate work done in multiple systems	INTEGRATE WORK Integrate work done in multiple systems
	Imposing minimal amount of structure – – – – – – – – Voluntary usage	<< = = = = = = = >>	Imposing large amount of structure – – – – – – – – Mandatory usage

Table 4.3 Roles an Information System can play in Work Systems.
Source: Steven Alter (Alter, 1999, p. 31).

Supporting an individual work system	PROVIDE INFORMATION Managers use an MIS to track progress and identify issues. Individual uses as DSS to analyze an issue.	STRUCTURE WORK Insurance sales people fill out forms in sales processes. Interactive IS identifies errors and suggests corrective action. Expert system structures work of a novice.	AUTOMATE WORK Information system controls equipment in a factory. Mathematical model performs calculation that determines a decision.
Supporting multiple work systems	INFORMATION SHARING Intranet provides access to company info. Groupware supports document access. Videoconferencing supports information sharing.	COORDINATE WORK Planning system balances workload. Information system updates factory schedule for new sales.	INTEGRATE WORK ERP system provides common database and consistent naming. CAD system detects inconsistencies across modules from different designers.
	Imposing minimal amount of structure – – – – – – – – Voluntary usage	<<= = = = = = = = >>	Imposing large amount of structure – – – – – – – – Mandatory usage

Table 4.4 Examples of Different Roles Information Systems
can play in Work Systems.
Source: Steven Alter (Alter, 1999, p. 32).

4.3.1 Comments

When trying to classify the information system developed in this research, the first two classification systems fell short. The first classification fells short because it only mentions transaction process systems on the operational level, and the other because it focuses on the information worker. Crime analysts are information workers, but the view of information system is too narrow. The work system framework however, has a different focus, and by using this way of viewing IS it is possible to see further than the development of an analysis tool for crime analysts. If one views the intelligence process presented in section 4.1 and figure 4.1, an IS developed for these processes will only be able to support criminal intelligence analysis (or in Kripos terms case analysis.) However, if an additional step of 'concluding comments' (i.a. outcome of the trial) is added (see figure 4.6), the information

system can play a role in multiple work systems at Kripos. If such a system should be implemented in the different police districts as well, it will be easier to cross the boundaries between the different organisations.

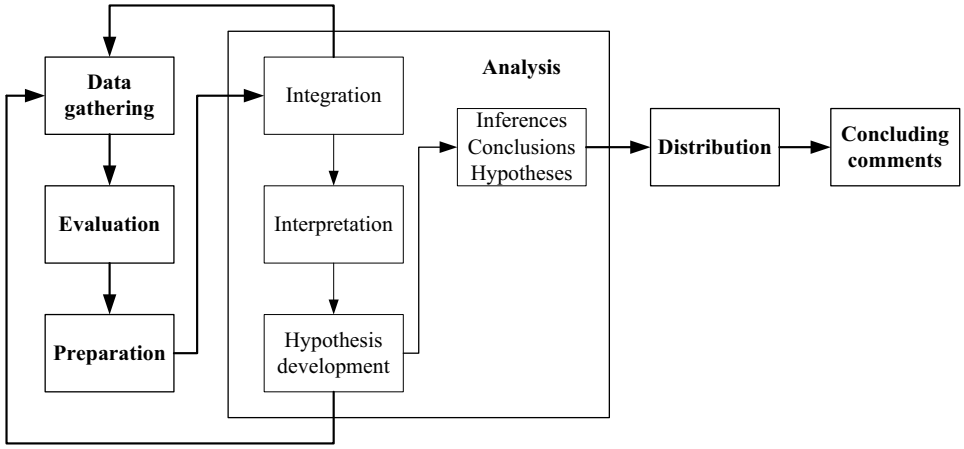


Figure 4.6 The extended intelligence process.

The conceptual data model has been built to correspond to the extended intelligence process. This is achieved by building a layered data model as figure 4.7 shows. A log is included in the model for recording any access to data elements and relationships. The entries in the log will be recorded automatically and can not be changed.

Two types of relationships are incorporated in the conceptual data model (see figure 7.5); a relationship type determined by the data itself and a relationship type based on the analyst's thoughts about the data. The conceptual data model of the information system also includes information categorised as type of crime, geographical area where the crime was committed, and the time each crime was committed. Hence the information system can now serve several types of analysis carried out at Kripos (see section 5.1 for a description):

- tactical analyses called 'case analysis', 'comparative case analysis', and 'analysis of criminal groups'
- strategic analyses called ' analysis of crime patterns', 'analysis of methods for crime prevention', and 'investigation analysis'

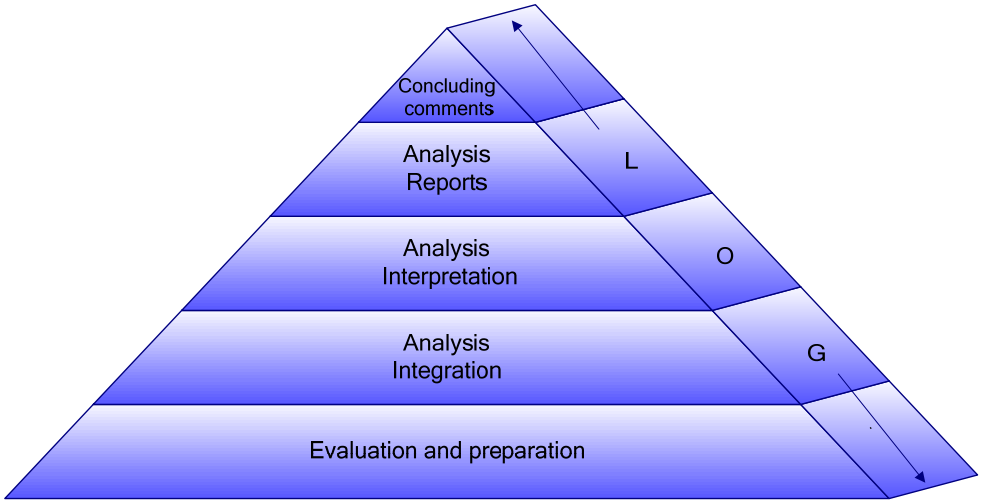


Figure 4.7 Layers in the conceptual data model

Focus for the research was to develop a conceptual data model for an information system from the perspective of case analysis.

For a more detailed description of the conceptual data model the reader is directed to chapter 7 and appendices B and C. The initial models can be found in section 7.2 and the final models can be found in section 7.4.

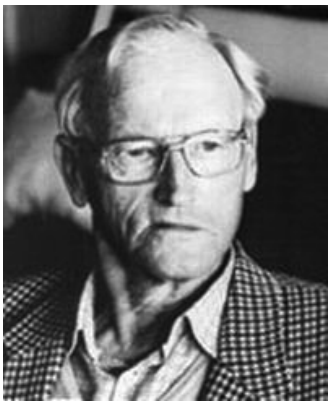
Comments related to the information system under development conclude the investigation into information systems and we will now turn to theory of information systems and their development.

4.4 Information systems development – requirements gathering and analysis

The academic field of information systems and the function in organizations (Davis, 2006) responsible for information and communication needs (including the supporting technology), have both developed over a period of 55 years (but mostly in the last 40 years). Computers were first introduced in organizations in the late 1950's, but the field of information systems was not established until the 1960's. The first professor in Information Processing, and one of the pioneers in the field of information systems was Børje Langefors. In 1965 he was appointed professor in Sweden (a joint chair provided by the Royal Institute of Technology

and Stockholm University) with special emphasis on Administrative Data Processing (Davis, 2004). The same year he was appointed chairman of the committee for the scientific program for the third International Conference on Information Processing and Computer Sciences and there he proposed that the name for one of the five major subject areas should be "Information systems", and this was accepted (Langefors & Sundgren, 1975).

Langefors first published his works in "Theoretical analysis of information systems" in 1966 (Langefors, 1966), and the work gained international attention. He saw the development of data bases to consist of two related tasks with different views (Langefors & Sundgren, 1975, p. 253):



"The infological approach to the data base should help the systemeers to concentrate their initial efforts on the design problems that are of interest to the ultimate users of the data base. Those are the design problems that concern *what* the data base should be capable of doing, more than *how* it should be done. Ultimately, however, a data base has to be a system of data, stored on physical media, and data transforming processes executed by computers or other processors. Thus the data base systemeer has to combine the infological view of the data base with the datalogical, computer-oriented considerations. …. the datalogical design of a data base should be regarded as a natural extension of the infological design."

Figure 4.8 Børje Langefors[35]

The field of information systems (Bellinger, Castro, & Mills, 2004) is international and there is geographical differences (Avgerou, Siemer, & Bjørn-Andersen, 1999) (Davis, 2000; Iivari & Hirschheim, 1996; Iivari, Hirschheim, & Klein, 1998) on how information systems and information systems development (ISD) should be defined and carried out, and the views have also changed over time (Avison & Fitzgerald, 2006; Chen & Hirschheim, 2004; Fitzgerald, 1996; Orlowski & Baroudi, 1991). Their ontological and epistemological assumptions are also different (Hirschheim & Klein, 1989; Hirschheim, Lyytinen, & Klein, 1995; Iivari, 1991; Iivari, Hirschheim, & Klein, 1998; Mingers, 2001; Nunamaker & Chen, 1990; Nurminen, 1988, 1997; Walsham, 1993). The focus for this research is the information requirements and analysis of a computerised information system; hence this section will include a definition of ISD, different paradigms of ISD and their impact on the developer,

[35] Source: Association for Information systems (www.aisnet.org/award/bios/langefors.html (Acessed 20.111.2007)).

processes and elements, and five knowledge areas in ISD. Last in this section a presentation is given of the entity relation ship modelling and data flow modelling, which are the techniques used in the analysis of the computerised information system.

The ISD definition used by Hirschheim et al. is based on the definition by Welke (Welke, 1983), and they define ISD as (Hirschheim, Lyytinen, & Klein, 1995, p. 15, author's italics.)

> "a *change process* taken with respect to *object systems* in a set of *environments* by a *development group* to achieve or maintain some *objectives.* "

The components (Hirschheim, Lyytinen, & Klein, 1995) of the definition of systems development form a complicated 'web' of social, technological, and cultural phenomena. The components are not independent of each other, nor are the completely dependent. ISD is based on developers' intentions to change object systems towards desirable ends. The change process is founded on recognition of phenomena by more than one participant and on mutual understandings and coordination of participants' actions. The change process is not deterministic. Developers are often uncertain whether the planned intervention can be carried out, and whether the resulting object systems will have the desired properties. Environments should be viewed as 'webs' of conditions and factors 'which surround development processes'. This includes labour, economy, technology, application, and external and normative environments. They exert influence on development activities and organisation outcomes. The system development is carried out by a formally organised group which has similarities with social institutions. Intentions in systems development are expressed by objectives. These are related to general value-orientations and represents what 'one ought to do' or 'what is good' Objectives have several features that must be kept in mind; they can be implicitly imposed; they can be clear or vague; they can be uni- or multi-functional; they can be conflictual or a-conflictual. Object systems consist of phenomena 'perceived' by the members of the development group. What is 'perceived' is either given as a reality independent of the observer, or socially constructed through sense-making and institutionalised conventions. Object systems identify a target of change, and often there is more than one object system that a development group can identify. Object systems are often related and changes in one object system can induce change in others. Change process is an event in which phenomena, i.e. objects, properties and their relationship in object systems, come into being as a result of a development group's deliberate action. The change process is

further characterized by intentionality, intersubjectivity and uncertainty. The components of the ISD definition is graphically illustrated in figure 4.9.

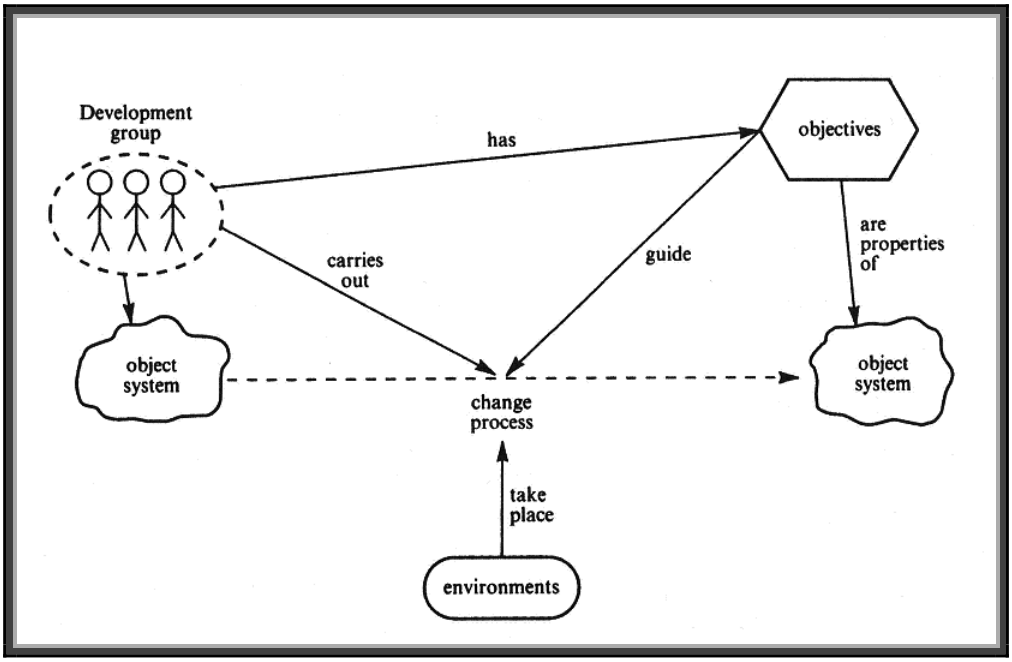


Figure 4.9 Information systems development.
Source: Hirschheim, Klein, and Lyytninen
(Hirschheim, Lyytinen, & Klein, 1995, p. 16)

Hirschheim and Klein defines four paradigms of information systems development; functionalism, social relativism, radical structuralism, and neohumanism. Figure 4.10 shows a graphical representation of the four paradigms. Hirschheim and Klein describe the four paradigms in the following way (Hirschheim & Klein, 1989, p. 1201):

> "The functionalist paradigm is concerned with providing explanations of the status quo, social order, social integration, consensus, need satisfaction, and rational choice. It seeks to explain how the individual elements of a social system interact to form an integrated whole. The social relativist paradigm seeks explanation within the realm of individual consciousness and subjectivity, and within the frame of reference of the social actor as opposed to the observer of the action. [….] The radical structuralist paradigm emphasizes the need to overthrow or transcend the limitations placed on existing social and organizational arrangements. It focuses primarily on the structure and analysis of economic power relationships. The neohumanist paradigm seeks radical change, emancipation, and potentiality, and stresses the role that different social and organizational forces play in understanding change. It focuses on all forms

of barriers to emancipation – in particular, ideology (distorted communication), power, and psychological compulsions and social constraints – and seeks ways to overcome them."

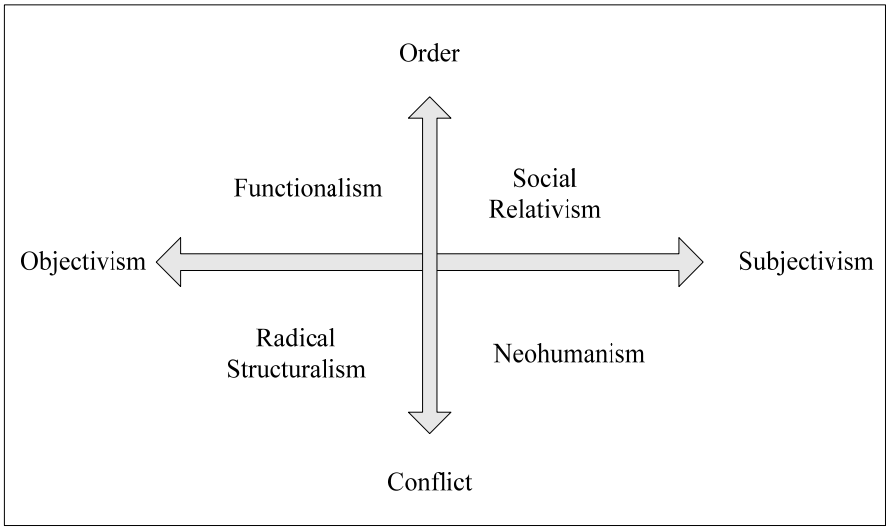


Figure 4.10 Current Information systems development paradigms.
Source: Hirschheim and Klein (Hirschheim & Klein, 1989, p. 1202)

The four paradigms have implications for the developer, the systems development, and the elements used. The differences between the paradigms are showed in table 4.5.

Paradigm	Developer archetype	Systems development proceeds	Elements used in defining IS
Functionalism	Expert or Platonian 'Philosopher King'	From without, by application of formal concepts through planned intervention with rationalistic tools and methods	People, hardware, software, rules (organizational procedures) as physical or formal, objective entities
Examples: Structured Analysis, information engineering			
Social Relativism	Catalyst or 'Facilitator'	From within, by improving subjective understanding and cultural sensitivity through adapting to internal forces	Subjectivity of meanings, symbolic structures affecting evolution of sense-making and sharing of meanings of evolutionary social change
Examples: Ethnographic approaches, FLORENCE project			
Radical Structuralism	Warrior for social progress or 'partisan'	From without, by raising ideological conscience and consciousness through organized political action and adaptation of tools and methods to different social class interests	People, hardware, software, rules (organizational procedures) as physical or formal, objective entities put in the service of economic class interests
Examples: Trade-union led approaches, UTOPIA and DEMOS projects			
Neohumanism	Emancipator or social 'therapist'	From within, by improving human understanding and the rationality of human action through emancipation of suppressed interests and liberation from unwarranted natural and social constraints	People, hardware, software, rules (organizational procedures) as physical or formal objective entities for technical control; subjectivity of meanings and intersubjectivity of language use in human understanding and emancipation
Examples: Critical social theory, SAMPO Project			

Table 4.5 Summary of the four paradigms of information systems development.
Source: Hirschheim and Klein (Hirschheim & Klein, 1989; Hirschheim, Lyytinen, & Klein, 1995, p. 91)[36]

Andersen et al. (Andersen, 1990) propose that the process of ISD should be divided into product-oriented views and process-oriented views. They are respectively named the 'system development performance' and 'systems development management'. Examples of the 'system development performance' are (Iivari, Hirschheim, & Klein, 2004) organizational alignment,

[36] Neohumanism - technical control: "It is a unique characteristic of the human being to seek knowledge to exercise better control over nature and people and thereby rationalize work. [….] Habermas refers to this as the technical knowledge interest (TKI), and it is aimed at overcoming natural and social obstacles to obtaining products and services for the continued maintenance and reproduction of the human species. The principal means by which the TKI is realized is through the applied physical sciences. They are characterized by the dominance of instrumental reasoning, or adopting positivism as the basis for checking the validity of knowledge claims. Information systems are an important resource for achieving the TKI." (Hirschheim & Klein, 1989, p. 1208)

requirements construction, user interface design, software design, and IS test. Examples of 'systems development management' are project organizing, people management, risk management, and quality assurance.

Iivari, Hirschheim and Klein (Iivari, Hirschheim, & Klein, 2004) identify five knowledge areas in information systems development founded on five ontological domains. The five ontological domains are reified social constructions existing independently of any individual perceptions of them, and they represent the underlying social constructions embodying ISD. The five ontological domains are (for a graphical illustration see figure 4.11) technology domain, application domains, domain of IS development processes, domain of IS applications, and domain of intra- and interorganisational context. The five knowledge areas are not assumed to be completely independent, but rather that each area logically, practically and historically can draw on more than one domain to create new meanings. The five knowledge areas are defined as (Iivari, Hirschheim, & Klein, 2004, p. 318-319, authors' italics)

> "*Technology knowledge* refers to knowledge associated with understanding the types of hardware and software available and how and where they might be applied. *Application domain knowledge* refers to knowledge about the application domain for which an information system is built. For example, in the case accounting information systems, the application domain knowledge relates to accounting concepts and principles. *Systems development process* knowledge refers to the tools, techniques, methods, approaches and principles used in systems development. [….] Organizational knowledge is knowledge 'about the social and economic processes in the organizational context in which the IS is to be developed and used' [….] *IS application knowledge* [....] is the knowledge about typical IT applications, their structure, functionality, behaviour and use, in a given application domain. It includes the knowledge of possibilities to support activities in the intra- and interorganisational context by IS applications in a specific application domain."

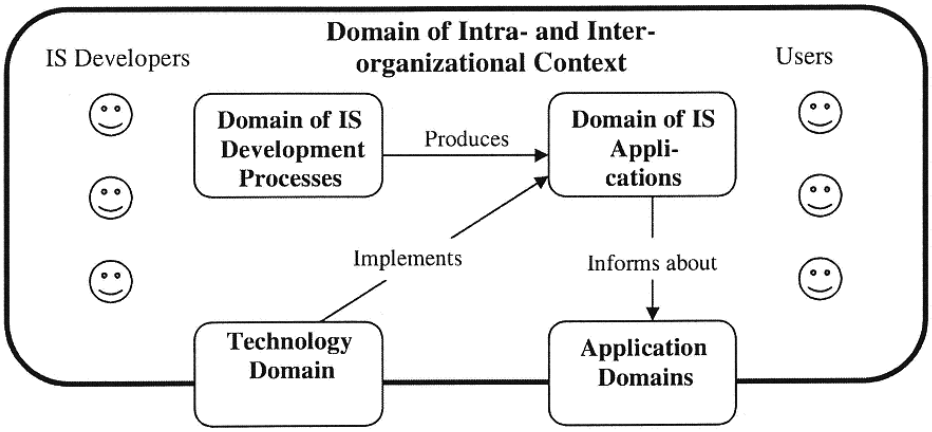


Figure 4.11 Illustration of the five ontological domains.
Source: Iivari, Hirschheim and Klein
(Iivari, Hirschheim, & Klein, 2004, p. 319)

According to Flynn (Flynn, 1992), requirements determination is the least well defined activity in the development process and it includes, among other activities, requirements acquisition and requirements analysis. It is the least technical, and most organisation dependent task, and requirements are not as clearly defined and fixed as is commonly supposed. The requirements analysis is also called 'data analysis' which Lewis (Lewis, 1994) describes as the process of investigating the nature and structure of the data used in a problem situation. The specification of the information content are termed conceptual (Kent, 2000) (or sometimes information or entity) layout, as opposed to the physical layout of the database or the multiple views held by different applications. As means (Klein & Hirschheim, 1987) to structure the data several techniques has been developed and one central concept that has emerged is the notion of a data model. Klein and Hirschheim states that (Klein & Hirschheim, 1987, p. 8)

> "No data modelling approach can avoid philosophical assumptions, because data modelling is a process of inquiry that has intrinsic similarities with classic scientific theory construction."

Klein and Hirschheim further outline the ontological and epistemological grounds for data modelling. The ontological assumptions concern the nature of the 'Universe of Discourse' (UoD) which the resulting schema of the data modelling will represent. The two basic ontological positions are realism and nominalism. The epistemological assumptions also include two principal positions; positivism and interpretivism. The epistemological

assumptions relates to the nature of knowledge of the UoD and how this knowledge is acquired. Lewis (Lewis, 1994) adopts the distinction outlined by Klein and Hirschheim and illustrates the paradigms as shown in figure 4.12.

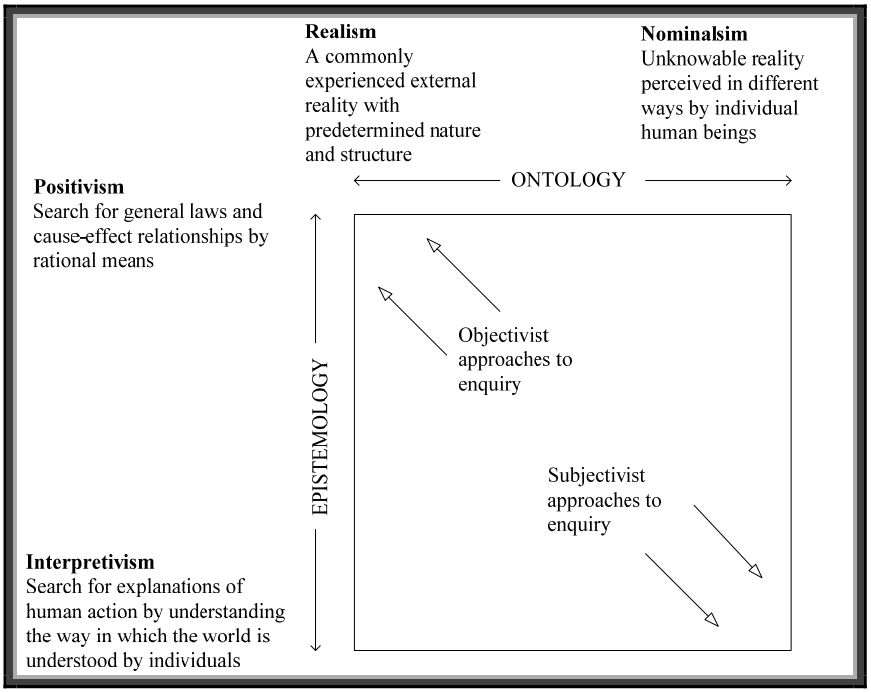


Figure 4.12 Framework for discussing the underlying philosophy of data analysis.
Source: Lewis (Lewis, 1994, p. 139)

From the (Klein & Hirschheim, 1987) epistemological and ontological dimensions four possible paradigms can be defined. Only two are of primary significance for data modelling. The two are the realist-positivist and nominalist-interpretivist positions. The former position defines an objectivist paradigm and the latter a subjectivist paradigm. In the objectivist paradigm UoD is objectively given; in the subjectivist paradigm UoD is a question of the social construction of reality. In the objectivist view different opinions about the UoD must be a reflection of human error, and inconsistencies between different views are unwarranted and a threat to data integrity. Different opinions can be eliminated. In the subjectivist view the UoD is a question of the social construction of the reality, there is no objective reality except through cultural sharing, and inconsistencies in different views are not necessarily a

sign of error. Errors (Gause & Weinberg, 1989) can stem from interpretation, observation and recall. The distinction (Klein & Hirschheim, 1987) between objectivist and subjectivist are also reflected in the data models. In the objectivist view a data model are seen to 'reflect' reality, the data corresponds to facts. In the subjectivist view the data model is seen as consisting of subjective meanings constructing reality, data cannot 'have' an objective meaning.

A common approach (Klein & Hirschheim, 1987) for data modelling used in the objectivist paradigm is the entity-based approaches while rule based approaches are influenced by the subjectivist paradigm. Even though entity-based approaches are often used, they are not without problems, and Klein and Hirschheim discuss three anomalies; Frege's puzzle of denotational meaning; Wittgenstein's puzzle of rules of correspondence; and Austin's puzzle of performative meanings.

However, the entity-based models are widely used, also when the subjectivist view guides the modelling process. The entities then do not refer to objective facts, but to perceived objects. One of the entity-based models is the entity-relationship model developed by Chen (Chen, 1976, 1977, 1983, 2002). The models use the constructs of entities, relationships and attributes. The relationship construct is an association between entities, and the attribute express the information about an entity or relationship. E.g. a gun can be seen as an entity and calibre as an attribute of the gun. The connection between a gun and the person owing it will be called a relationship, and date of purchase an attribute of the relationship. Through the constructs ER-models can express both historical and current data.

In addition to the basic constructs of entity, relationship and attribute, ER-models have been extended to include hierarchies (EER-models). The hierarchies can be both generalizations (Codd, 1972; Smith & Smith, 1977) and aggregations. Smith and Smith describe the abstractions in the following way (Smith & Smith, 1977, p. 106, author's italics):

> "*Aggregation* refers to an abstraction in which a relationship between objects is regarded as a higher level object. In making such an abstraction, many details of the relationship may be ignored. For example, a certain relationship between a person, a hotel, and a date can be abstracted as the object "reservation." It is possible to think about a "reservation" without bringing to mind all details of the underlying relationship - for example, the number of the room reserved, the name of the reserving agent, or the length of the reservation. *Generalization* refers to an abstraction in which a set of similar objects is regarded as a generic object. In making such an abstraction,

> many individual differences between objects may be ignored. For example, a set of employed persons can be abstracted as the generic object "employee." This abstraction disregards individual differences between employees-for example, the facts that employees have different names, ages, and job functions."

Another part of the analysis has been to capture the flow of data in the process of criminal intelligence analysis. This interaction between data-driven and function-driven approach to information systems development is described by e.g. Batini et al. (Batini, Ceri, & Navathe, 1992). In structured systems analysis data flow diagrams (DFD) is used to perform this task. DeMarco defines a data flow diagram in the following way (DeMarco, 1979, p. 47, author's italics):

> "A *Data Flow Diagram* is a network representation of a system. The system may be automated, manual or mixed. The Data Flow Diagram portrays the system in terms of its component pieces, with all interfaces among the components indicated."

The data flow diagram consists of four elements (DeMarco, 1979) (Gane & Sarson, 1979); data flows, processes, data stores (or files), and data sources and sinks. A data flow is seen as a pipeline for information packets. The information packets flow into a process. This process transforms the incoming data flow to the outgoing data flow. The data stores (or files) are repositories of data. The source or sink represent a person or organisation (or another system) outside the system being analysed.

4.4.1 Comments

The research carried out lies within the social relativist paradigm for information systems development and the subjectivist paradigm for data modelling. EER-modelling is used in the sense that constructs refers to perceived objects, not objectivist facts. Data flow models are used because they give the opportunity to specify the border for the system. A dataflow from a source or to a sink depicts when the information crosses the border to the system under investigation. The social relativist paradigm for ISD and the subjective paradigm for data analysis can also be explained by Bacon's four categories of idols (described in subsection 2.3.1.).

The knowledge areas necessary in information systems development have already been or will be addressed in this work. Both the IS application knowledge and the systems development process have been discussed in this chapter. The organisational knowledge was discussed in the previous chapter and in the beginning of chapter 2. Since this work focus on requirements gathering and analysis, the technology knowledge has not been explicitly

discussed. The conceptual model should be developed without specific reference to technology. The application domain knowledge has been briefly outlined in the beginning of this chapter and will be further discussed in the next chapter. This includes an overview of the different forms of analysis carried out at Kripos, a theoretical discussion of criminal intelligence analysis, and problems with eyewitness testimonies which are the basis for criminal intelligence analysis.

CHAPTER 5
INVESTIGATION AND ANALYSIS OF CRIMINAL ACTIONS

The ultimate goal of any criminal investigation is to determine,
to the extent possible, the truth about how a crime occurred.
Michael F. Brown (2001, p. 3)

In the introduction a description of the different analysis methods will be given. Section 5.2 distinguishes the concepts of intelligence and investigation. Section 5.3 gives an example of the concept of information in criminal investigation, and section 5.4 provides an overview of law enforcement analysis. The last section, section 5.5, deals with the most important data type in the analysis; eye witness descriptions.

5.1 Introduction

The description of the analytic work at Kripos is based on field notes from the researchers' data gathering and course material (Kripos, 2000). See chapter 6 for a more detailed description. All notes and material was written in Norwegian and is translated into English by the researcher.

The analytic work at Kripos can be divided into

- Tactical (or operational) analysis, which is directed towards short term investigations, with an eye to an immediate effect in the form of arrest, imprisonment, confiscation, etc.
- Strategic analysis, which is directed towards more long term investigations, such as the nature of crime or criminals, the extent or potential extent in different types of crimes, and assigning priorities in the fight against crime.

Tactical (or operational) and strategic analysis are both divided into groups in relation to the focus of the analysis. Analyses can be focused on criminal events, persons (perpetrator or victim), and methods for crime control. The classification results in eight different types of analysis (see table 5.1.).

	Strategic types	Tactical types
Criminal events	Analysis of crime patterns	Case analysis Comparative case analysis
Person(s)	General profile analysis	Analysis of criminal groups Criminal investigative analysis (criminal profiling)
Methods of control	Analysis of methods for crime prevention	Investigation analysis

Table 5.1 Different types of criminal/crime analysis (Kripos).
Source: Nordisk kurs i Kriminalanalyse (Kripos, 2000, p. 13).

Each form of analysis has its focus and use different techniques to extract meaning from the information. In table 5.2 the different types of analyses are presented with their focus and the different techniques/diagrams used in the analysis. For a description of relationship diagram, commodity flow diagram, event diagram and activity diagram see table 6.5.

Type of analysis	Focus	Techniques
Analysis of crime patterns	Investigation of type, extent and development of crimes or certain types of crimes in one geographical area within a certain time frame	Graphs Maps Statistics Structured reports
Case analysis	Attempt to reconstruct the course of events and patterns involved in one particular crime. The purpose is to display indications for further investigation and to reveal inconsistencies in information from different sources	Relationship diagram Commodity flow diagram Event diagram Activity diagram Structured reports
Comparative case analysis	Compare information about similar criminal acts to discover if some of them might be committed or organised by the same perpetrator(s)	Systematic search through data files Comparison programs Probability calculations Structured reports
General profile analysis	Attempt to discover special features in persons that commits the same type of crime	Statistics Maps Behaviour profiles Structured reports
Analysis of criminal groups	Organising available information about one familiar group of criminals in order to gain insight into the group's structure and the role of each person or company etc. in the group	Relationship diagram Commodity flow diagram Event diagram Activity diagram Calculation of hidden income Structured reports
Criminal investigative analysis (criminal profiling)	Attempt to make a profile of the perpetrator(s) of a crime based on features of the event and other background information	
Analysis of methods for crime prevention	Evaluation of one crime prevention method used in several cases in order to build a foundation for a sound practise in the future	
Investigation analysis	Evaluation of the activity which is or has been carried out during the investigation of one particular case. The evaluation is conducted in order to guide the investigator.	A systematic approach towards this type of analysis is still in its initial phase

Table 5.2 Description of different types of criminal/crime analysis (Kripos).
Adapted from: Field notes and Nordisk kurs i kriminalanalyse (Kripos, 2000).

The focus for this research has been the tactical case analysis and comparative case analysis, and the reminder of this chapter is written from that point of view.

Figure 5.1 shows how the different tasks in a criminal investigation interact, and how the documents flow. "Other work" refers to e.g. analysis of forensic evidence. Much of the work with forensic evidence is performed at Kripos, but by scientists that are specialists in their

field. All tasks utilise existing databases in addition to data gathered in the particular case under investigation. These interacting tasks create the information needed in a criminal investigation.

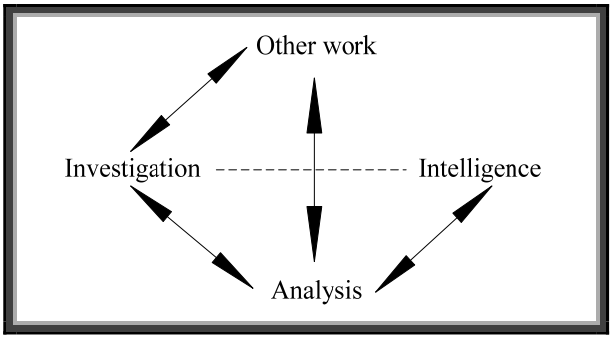


Figure 5.1 Interacting tasks in a criminal investigation (Kripos).
Adopted from meeting 25.01.02 with Police Superintendent Arne R. Simonsen

The resulting documents follow the case until conviction/acquittal. Some of (or parts of) the documents can be taken out of the case if the perpetrator is found. Parts of the information can also be taken out of the case if it does not have anything to do with the crime. The analysis report is not part of the case documents because it contains intelligence information. Intelligence information is a part of the task of developing hypotheses, but all information that is to be released must consist of verified information, i.e. verified facts (by witnesses, suspects or physical evidence in that particular case), not intelligence information which often consists of unverified information. This division makes it important to know the source of the data. During, and at the end of, analysis hypotheses are developed and tested. Figure 5.2 shows the components of a hypothesis.

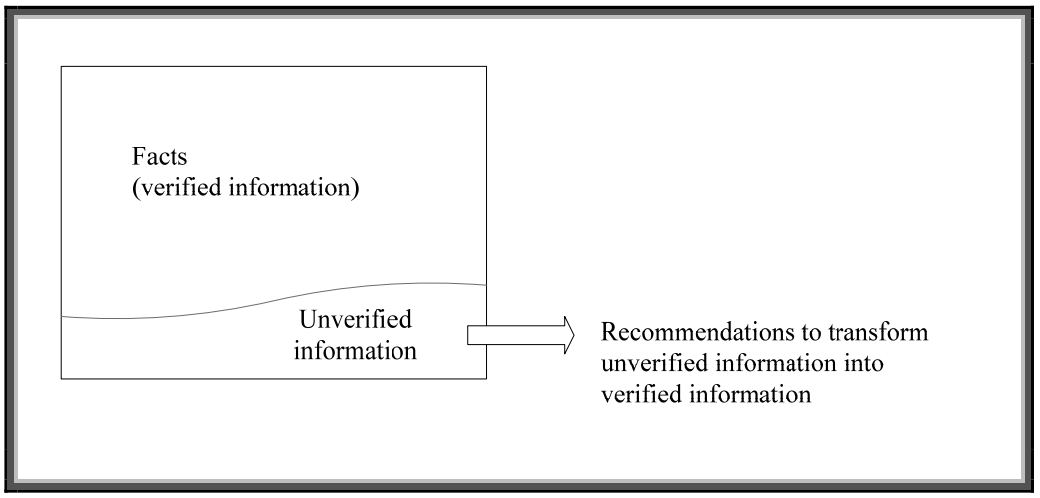


Figure 5.2 Components of a hypothesis (Kripos).
Adopted from meeting 25.01.02 with Police Superintendent Arne R. Simonsen

Unverified information can be withheld from the defence counsel, and Kripos can give the solicitors professional secrecy.

Now that we have an overview of the analytic work at Kripos, we turn to a theoretical viewpoint of analysis and investigation in criminal cases. The next section will provide a discussion of the differences between criminal intelligence and investigation, section 5.3 will provide a view of the concept of information in crime analysis, in section 5.4 a discussion of the concepts of crime analysis and criminal intelligence analysis, and section 5.5 will provide an overview of the most important data in the analysis, eye witness descriptions.

5.2 Criminal intelligence and criminal investigation

To gain a clearer overview of the distinction between unverified and verified data in a criminal investigation, some definitions of both criminal intelligence and criminal investigation will be put forward in this section.

Intelligence is defined in Oxford English Dictionary as:

> "7 a. Knowledge as to events, communicated by or obtained from another; information, news, tidings; *spec.* information of military value.
> b. A piece of information of news.
> c. The obtaining of information; the agency for obtaining secret information; the staff of persons so employed, secret service.
> d. A department of state organization or of a military or naval service whose object is to obtain information (esp. by means of secret service officers or a system of spies)."

Military intelligence is outside the scope of this research. However, Michael Warner at the US Central Intelligence Agency (CIA) discusses the definition of intelligence in his article "Wanted: A definition of "Intelligence". Understanding our craft." (Warner, 2002). Many of these definitions are directed towards military intelligence and describe intelligence both as a process and a product. The Federal Bureau of Investigation, Directorate of Intelligence, USA, states that the intelligence cycle (FBI (b)) consists of six steps (requirements, planning and direction, collection, processing and exploitation, analysis and production, and dissemination). The process is circular in nature, but the movement between the steps is fluid. Sometimes it is necessary to go back to an earlier step before moving forward. FBI defines the word intelligence (FBI (a), authors boldface type) in the following ways:

1. "Intelligence is a **product** that consists of information that has been refined to meet the needs of policymakers.
2. Intelligence is also a **process** through which that information is identified, collected, and analyzed.
3. And intelligence refers to both the individual **organizations** that shape raw data into a finished intelligence product for the benefit of decision makers and the larger **community** of these organizations."

The Cabinet Office in UK has published a report about the "National Intelligence Machinery" (Great Britain Joint Intelligence Committee, 2006). The report deals with, among other factors, the Agencies;MI5 or Security Service, MI6 or Secret Intelligence service, and the Government Communications Headquarter. In the report intelligence is outlined as follows (page 37):

> "Secret intelligence is information acquired against the wishes and (generally) without the knowledge of the originators or possessors. Sources are kept secret from readers, as are the many different techniques used. Intelligence provides privileged insights not usually available openly.
>
> Intelligence, when collected, may by its nature be fragmentary or incomplete. It needs to be evaluated in respect of the reliability of the source and the credibility of the information in order to allow a judgement to be made about the weight to be given to it. It then needs to be analysed in order to identify significant facts before circulation

> either as single source reports or collated and integrated with other material as assessments. Assessment should put intelligence into a sensible real-world context and identify elements that can inform policy making [….]"

Further (page 38):

> "The most important limitation [of intelligence] is incompleteness. [....] Even after analysis it may still be, at best, inferential."

And (page 38-39):

> "A picture that is drawn solely from secret intelligence will almost certainly be a more uncertain picture than one which incorporates other sources of information. Those undertaking assessments, whether formally in a written piece or within their own minds when reading individual reports, need to put the intelligence in the context of wider knowledge available."

Robert M. Clark (Clark, 2004) writes that the nature of intelligence is to reduce uncertainty in conflict by obtaining information that the opponent in a conflict wishes to deny you. Conflict, and the issue of whether another party is an opponent or an ally, is defined by context. A typical goal of intelligence is to establish facts and then to develop precise, reliable, and valid inferences (hypotheses, estimations, conclusions, or predictions) for use in strategic decision-making or operational planning. When accurate information is not available through traditional means, then a wide range of specialised techniques and methods can be used, e.g. intercept telephone communications. Intelligence deals with concealment, denial, and deception. Intelligence is always concerned with a target – the focus of the problem, and it support operations such as military planning and combat, diplomatic negotiations, trade negotiations and commerce policy, and law enforcement.

A definition of intelligence that is directed towards criminal actions is the definition by Auglend, Røsandhaug and Mæland (Auglend, Røsandhaug, & Mæland, 1998, p. 513):

> "[….] en målrettet innhenting, systematisering og analyse av opplysninger rettet mot saksområder, organisasjoner eller personer med sikte på å skaffe kunnskap om straffbare handlinger."
>
> *"[....] a goal oriented gathering, systematisation and analysis of information directed towards fields of responsibility, organisations or persons with a view to gain knowledge about criminal acts." (Researcher's translation.)*

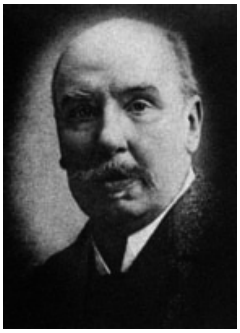
Strategic intelligence (IALEIA, 2004) and tactical intelligence has different focus. Strategic intelligence is often "related to the structure and movement of organized criminal elements, patterns of criminal activity, criminal trend projections, or projective planning" (IALEIA,

2004, p. 35), and tactical intelligence concerns a specific criminal event. The information gathered can be used immediately by operational units in the investigation, to plan tactical operations and provide for officer safety.

After this discussion of intelligence, we turn to investigation of criminal actions. Many different actions are regarded as crimes (e.g. murder, stealing, and parking tickets). A crime is usually (Ellingsen, 2001) seen to have two parties, the perpetrator and the victim, but the picture is not that simple. Crimes can be directed towards common goods or society, and criminal acts can also be performed of criminal groups, companies or organizations. However, a general definition of a crime is found in Oxford Dictionary of Law (2003):

> "An act (or sometimes a failure to act) that is deemed by statute or by the common law to be a public wrong and is therefore punishable by the state in criminal proceedings."

The Austrian Jurist Dr. Hans Gross (1847-1915) has been central to the modern debate concerning criminal investigation. His major works are "Criminal Investigation; a Practical Textbook for Magistrates, Police Officers and Lawyers" (Gross, 1949) first published in 1893 and "Criminal psychology; a Manual for Judges, Practitioners, and Students" (Gross, 1911) first published in 1898. Gross is regarded as the founder of "criminalistics" (Grassberger, 1956), and according to Valeta (Valeta, 2006, p. 361)



"[Hans Gross] maintained that criminal anthropology's key problem was that, from the outset, it had falsely understood itself as "the science of the physical and mental distinctiveness of the criminal…." [Hans Gross] sought to sidestep this problem by shifting the emphasis away from the criminal and onto the investigative and judicial processes. He insisted that the study of crime could simply not be divorced from these and called for a dedicated science dealing with all the issues pertaining to this perception. [….] covering both the handling of physical evidence and the psychological side of detection where one dealt with defendants, witnesses, jurors, and the like."

Figure 5.3 Hans Gross[37]

The term 'criminalistics' has changed over the years; Gross would describe a criminalist as "one who studies crime, criminals, and the scientific methods of their identification, apprehension, and prosecution" (Forensic Solutions LLC, 2005); the modern use of the word

[37] Source: Forensic Solutions LLC (2005) (www.forensic-science.com/ (accessed 19.03.2008))

is narrowed to mean a forensic scientist[38] dealing with forensic biology, drug analysis, fibre debris analysis, and trace evidence [39].

Gross (1911) also emphasises the importance of induction as the empirical method in the study of cases, because the empirical rule[40] is capable of explaining e.g. "that the criminal who has soiled his hands with blood in some violent crime was accustomed to wipe them on the underside of a table" (Gross, 1911, p. 136). Purely empiric laws are vital to establish and Gross refers to Öttingen (Öttingen, 1882) when defining induction as (Gross, 1911, p. 137)

> "the generalization or universalization of our experiences; and inference that a phenomenon occurring x times will invariably occur when the essential circumstances remain identical. The earliest investigators started with the simplest inductions, --that fire burns, that water flows downward, -- so that new, simple truths were continually discovered. This is the type of scientific induction and it requires further, the addition of certainty and accuracy."

Two definitions nearer our time are the definitions of Michael F. Brown and Rieber-Mohn. The definition by Michael F. Brown place emphasis on legal support (Brown, 2001, p. 3):

> "Criminal investigation is the process of legally gathering evidence of a crime that has been or is being committed."

The definition by Rieber-Mohn focus on criminal investigation as a purposeful activity (Rieber-Mohn, 1996, p. 30)

> "[Etterforskning] er ikke en mer eller mindre tilfeldig innsamling av fakta, men en formålsstyrt virksomhet. Målet for denne faktainnsamlingen er en vurdering av om en strafferettsbestemmelse er overtrådt, og om gjerningsmannen oppfyller de tre øvrige vilkår for straffbarhet [….]"
>
> *"[Investigation] is not a more or less random gathering of facts, but a purposeful activity. The goal for this gathering of facts is to assess whether a law has been*

[38] "A *forensic scientist* examines physical evidence and then testifies about the results of their examination in court. They are in fact defined by the expectation that they may give expert testimony about their examinations and further provide interpretations or opinions regarding the results.[…] A related profession is that of evidence technician. An *evidence technician* (aka *crime scene technician*) is charged with the recognition, documentation, collection, and preservation physical evidence." (Forensic Solutions LLC, 2005 (www.forensic-science.com/ (accessed 19.03.2008)) (authors italics)).

[39] Forensic science:
"Sometimes called simply forensics, forensic science encompasses many different fields of science, including anthropology, biology, chemistry, engineering, genetics, medicine, pathology, phonetics, psychiatry, and toxicology. " (The free dictionary by Farlex (*http://legal-dictionary.thefreedictionary.com/* (accessed 19.03.2008))).

[40] "We will call those laws purely empirical which, in the study of nature, yield regularities that are demonstrated by observation and experiment, but upon which little or no reliance is placed with regard to cases which differ considerably from the observed. The latter is done because no reason is seen for the existence of such laws." (Gross, 1911, p. 136)

broken and whether the perpetrator fulfils the three other conditions for criminal offence [....]" (Researcher's translation.)

We now leave the discussion of intelligence and investigation and turn towards the concept of law enforcement analysis.

5.3 Law enforcement analysis

The title of this section is one of the many terms used for describing analysis in law enforcement organisations. The different terms will be put forward in this section, and we begin with the shift of focus in criminology[41]. Vellani and Nahoun (Vellani & Nahoun, 2001) states that resent criminological theory has changed focus from an offender-based to a target-oriented foundation. This shift represents a focus from the offender and his apprehension (traditional criminology) to blocking criminal opportunities at the property level (e.g. explain why some places are more prone to crime than others). However, the offender-based and target-oriented criminology is considered alternatives, not that the target-based should replace the offender-based criminology. Analysis methods covering both viewpoints exist, and several terms are used in describing the different forms of analysis. Several of the terms are also used interchangeably. Table 5.3 shows different terms used in four texts about law enforcement analysis.

[41] "Scientific study of the nonlegal aspects of crime and delinquency, including its causes, correction, and prevention, from the viewpoints of such diverse disciplines as anthropology, biology, psychology and psychiatry, economics, sociology and statistics." (http://www.britannica.com/eb/article-9109546/criminology (accessed 19.03.2008)).

Author	Macro-term	Types	Subtypes of crime analysis
Gottlieb, Singh and Arenberg		Crime analysis Operations Analysis Intelligence Analysis Investigative analysis	Tactical analysis Strategic analysis Administrative analysis
Peterson	Criminal analysis[42] Includes: Crime analysis Intelligence analysis Strategic analysis		
Bruce	Law enforcement analysis (also called public safety analysis or police analysis)	Crime analysis Criminal intelligence analysis Criminal investigative analysis	Tactical crime analysis Strategic crime analysis Administrative crime analysis Police operations analysis[43]
Osborne and Wernicke	Crime analysis		Tactical crime analysis Strategic crime analysis Administrative crime analysis Investigative crime analysis Intelligence analysis Operations analysis

Table 5.3. Different terms used for analysis of criminal actions. Adapted from: (Bruce, 2004; Gottlieb, Singh, & Arenberg, 1994; Osborne & Wernicke, 2003; Peterson, 1998).

Table 5.4 includes descriptions of the macro-terms criminal analysis, law enforcement analysis, and crime analysis from the texts operating with macro-terms (Bruce, 2004; Osborne & Wernicke, 2003; Peterson, 1998).

[42] Both analysis and synthesis is equally important. Analysis is defined as ”separation of a substantial whole into its constituent pars” to allow an examination and interpretation of the thing.” Synthesis is defined as ”the reassembly of those constituent parts into a restructured whole which gives us new information.” (Peterson, 1998, p. 2)

[43] “[Gottlieb et al., 1994] include “operations analysis” as a category of law enforcement analysis, but other crime analysts seem to recognize operations analysis as a function specific to crime analysis, it is presented that way here.” (Bruce, 2004, p. 15)

Author	Macro-Term	Description
Peterson[44]	Criminal analysis	Application of particular analytical methods to data collected for the purpose of criminal investigation or criminal research. Practised in law enforcement, the criminal defence field, the military, and private security organizations.
Bruce	Law enforcement analysis	Processes, techniques, and products providing information support to the mission of law enforcement agencies.[45]
Osborne and Wernicke	Crime analysis	The breaking up of acts committed in violation of laws into their parts to find out their nature and reporting statements of these findings. The objective of most crime analysis is to find meaningful information in vast amounts of data and disseminate their information to officers and investigators in the field to assist in their efforts to apprehend criminals and suppress criminal activity.

Table 5.4. Descriptions of macro-terms for analysis of criminal actions.
Adapted from: (Bruce, 2004; Osborne & Wernicke, 2003;
Peterson, 1998).

Descriptions of the types and subtypes of crime analysis are rather similar in the texts by Gottlieb et al. and Bruce. Osborne and Wernicke's descriptions of subtypes of crime analysis are similar to the descriptions of types and subtypes by Gottlieb et al. and Bruce. Table 5.5 therefore contains the description of types and subtypes as provided by Bruce.

[44] The term "criminal analysis" has not been broadly used to cover this endeavour in the past. The most common type of reference to the application of analytical methods and products within the criminal justice field are intelligence analysis. The term had its origin at the time raw data collected in the field by investigators were considered "intelligence", and the collection/analysis/conclusion data cycle was termed "the intelligence cycle". Most of what is taught as "intelligence analysis", however, is analysis to be used in aid of an investigation… " (Peterson, 1998, p. 2)

[45] ""Law enforcement agency" is a common term that comprises municipal police, state police, and investigative or special-purpose agencies with local, state, national, or international jurisdiction." (Bruce, 2004, p. 15)

Type (T)/ Subtype of crime analysis (S)	Description
Crime analysis (T)	Crime analysis is focused on the study of criminal incidents; the identification of patterns, trends, and problems; and the dissemination of information that helps a police agency develop tactics and strategies to solve patterns.
Tactical crime analysis (S)	Describes the daily identification and analysis of emerging or existing crime patterns, including series and hotspots. The goal of tactical analysis is to - Identify emerging crime patterns as soon as possible - Complete comprehensive analyses of any patterns - Notify the agency of the patterns' existence - Work with the agency to develop the best strategies to address patterns
Strategic crime analysis (S)	Strategic crime analysis focuses on trends, problems, and their causes. Trends are long-term increases and decreases in crime, or changes in the characteristics of a particular crime over a long period of time (rarely discussed in terms shorter than a month or longer than a decade).
Administrative crime analysis (S)	A broad category including an eclectic selection of administrative and statistical reports, research, and other projects not focused on the immediate or long-term reduction of elimination of a pattern or a trend.
Police operations analysis (S)	Describes the study of a police department's own operations and policies – including its allocation of personnel, money, equipment, and other resources, geographically, organizationally, and temporally – and whether these operations and policies have the most effective influence on crime and disorder in the agency's jurisdiction.
Criminal intelligence analysis (T)	Criminal intelligence analysis concentrates on the collection and dissemination of information about criminals, particularly organizations and conspiracies. Intelligence analysts hunt for leads on the structure and hierarchy of criminal organizations, the flow of money and goods, relationships, current activities and plans, and personal information about the participants – usually with the goal of arrest, prosecution, and conviction of the offenders involved.
Criminal investigative analysis (T)	The procedures and skills used to create a physical, behavioural, or psychological profile of an offender based on the characteristics of the crimes that he or she has committed. "Profiling" is a synonym. Generally only applied to cases of murder, rape, and arson. Crime analysts might use some investigative analysis techniques to help the agency solve an individual crime, as when an analyst compares a suspect's actions in a particular incident to a database of offenders known to commit crimes the same way. Investigative analysis applied to a crime series also shares some territory with tactical crime analysis, as when an analyst uses his knowledge of criminal behaviour to "profile" a serial burglar. Nevertheless, these are informal applications of criminal investigative analysis, and investigative analysis is usually regarded as a unique profession, distinct from crime analysis.

Table 5.5. Descriptions of types and subtypes for analysis of criminal actions.
Adopted from: (Bruce, 2004)

According to Interpol[46] there are many definitions of criminal intelligence analysis in use, but a group of twelve European Interpol member countries agreed on the following definition in June 1992 (Interpol, 2008, Criminal Intelligence Analysis):

> "The identification of and provision of insight into the relationship between crime data and other potentially relevant data with a view to police and judicial practice."

This definition has been adopted by several countries since 1992. Interpol (Interpol, 2008 Criminal Intelligence Analysis) divides criminal intelligence analysis into operational (or tactical) and strategic analysis. The difference between operational (or tactical) and strategic analysis lies in the level of detail and the type of client the products are aimed at. Operational (or tactical) analysis is aimed towards achieving a specific law enforcement outcome, e.g. arrests, seizure or forfeiture of assets or money gained from criminal activities, or the disruption of a criminal group. Strategic analysis is intended to inform higher level decision making and is usually aimed at managers and policy-makers rather than individual investigators. The intention in strategic analysis is to provide early warning of threats and to support senior decision-makers, e.g. allocating resources to different areas of crime, increased training in a crime fighting technique, or taking steps to close a loophole in a process.

The Trevi[47] definition of crime analysis (Read & Oldfield, 1995) distinguishes between 'strategic' and 'operational' crime analysis. The 'strategic' analyses are designed to aid the formation of policy, and those analyses designed to support the investigation of particular cases are termed 'operational'. The three forms of strategic analysis are; crime pattern analysis; general profile analysis; and crime control methods analysis. The five forms of operational analyses are; case analysis, comparative case analysis; offender group analysis; specific profile analysis; and investigative analysis.

5.3.1 Comments

The definitions and classifications used at Kripos are consistent with the Trevi definition. In the framework of Bruce (Bruce, 2004), Osborne and Wernicke (Osborne & Wernicke, 2003), and Gottlieb et al. (Gottlieb, Singh, & Arenberg, 1994) the work carried out in this research will fall in the category of criminal intelligence analysis. In terms of the Trevi definition (and

[46] "INTERPOL is the world's largest international police organization, with 186 member countries. Created in 1923, it facilitates cross-border police co-operation, and supports and assists all organizations, authorities and services whose mission is to prevent or combat international crime." (Interpol, 2008, About Interpol).
[47] Trevi - An inter-governmental group created to facilitate police co-operation was founded in 1975. (http://ec.europa.eu/justice_home/fsj/police/printer/fsj_police_intro_en.htm (accessed 19.03.2008)).

Kripos) the work is related to case analysis and comparative case analysis. In the next section we will turn to the concept of information in criminal investigations.

5.4 The concept of information in criminal investigation

Chapter 4 had an extensive discussion of data, information, knowledge and wisdom. In this section a view of the concepts data, information and knowledge in criminal intelligence analysis will be put forward.

Bruce (Bruce, 2004) explains the conversions of data to knowledge through the steps of analysis and communication (see figure 5.4). It is the analyst's efforts that create information; the raw material is data, which can come from numerous sources. The information is delivered to the police agency, and when the information has been internalised it becomes knowledge that informs police action. To transform data to knowledge there are two processes at work (Bruce, 2004, p. 12)

> "1. *Data* becomes *information* when it is effectively *analyzed*.
> 2. *Information* becomes *knowled*ge when it is effectively *communicated*."

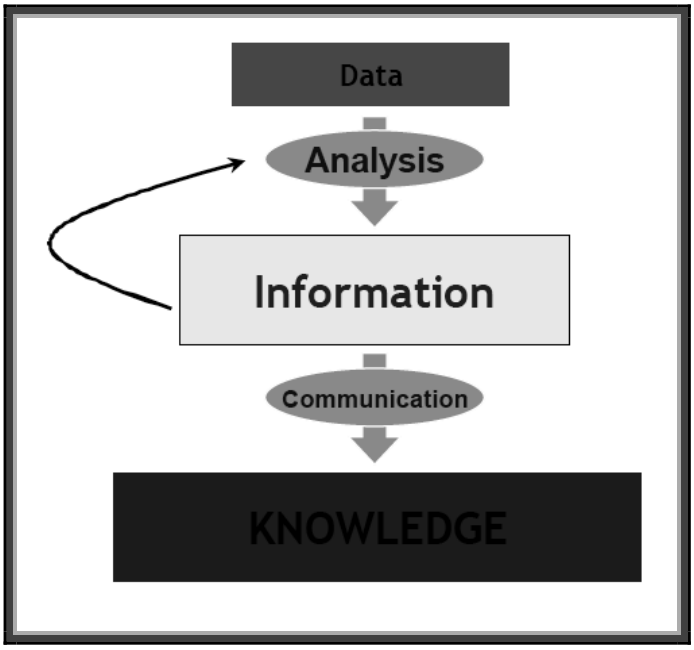


Figure 5.4 Crime analysis – the transition from data to knowledge.
Source: Bruce (Bruce, 2004, p. 12)

The loop between information and analysis is self-feeding; new data is juxtaposed against existing information to create further levels of analysis. The focus for the crime analyst is on the analysis process, but both analysis and communication fall within the crime analyst's area of responsibilities.

Table 5.6 provides some examples of the transition from data to knowledge in a typical police agency.

Data		Information		Knowledge		Result
Individual incident Reports in a records management system	Analysis	Six of the reports are related in a series of robberies	Communication	Robbery series is prime topic of discussion in next detective's meeting	Strategy & Action	Robbery offender is apprehended
Statistics showing number of officers per capita throughout the state		Your police department has 20% fewer officers per capita than average		Chief has this information in mind when preparing his budget proposal		Agency is granted additional officers by city
Crime volume of current year compared to past years; individual records in RMS; jurisdictional information		Auto theft is up 20 %, with most of the increase in Police Beat 5 on the midnight shift, probably influenced by new sports arena		Officers internalize this information and consider it when patrolling Beat 5		Auto theft is reduced

Table 5.6 Examples of the transition from data to knowledge
in a typical police agency.
Source: Bruce (Bruce, 2004, p. 13) [48]

Morgan et al. (Morgan, Holland, Hardy et al., 1993) divide criminal intelligence analysis into six stages, and through these six stages data is transformed to information, knowledge, decisions and real-world actions. The system can be computer or human based. Table 5.7 gives an overview and a description of the six stages.

[48] RMS – Records Management System. "A computerized application and database in which data about crimes and other incidents, arrests, persons, property, evidence, vehicles, and other data of value to police are stored." (Bruce, 2004, p. 413)

Stage	Description
Data gathering	Data originates from a vide variety of sources. Data have varying degrees of reliability.
Data accumulation	Data is centrally accumulated. Ensures that all data are available to the investigating team.
The transformation of data to information	Data of unknown reliability is transformed to useful reliable information
The transformation of information to knowledge	Information is transformed to knowledge based models of events and activities. Useful and usable information is defined as knowledge. Information about a crime is not necessarily incorporated into a knowledgebase because it is currently useless.
The transformation of knowledge to decisions	The knowledge based models are used to suggest possible activities or scenarios. This transformation may increase the degree of certainty and reduce any gaps or weaknesses.
The transformation from decisions to real-world actions	Real-world actions are based on the decisions from the knowledge base.

Table 5.7 The six stages of criminal intelligence analysis.
Adapted from: Morgan et al. (Morgan, Holland, Hardy et al., 1993)

Comments about the concept of information were outlined in subchapter 4.2.1 and will not be commented further. Instead we turn to an investigation of eyewitnesses. Eyewitnesses are of many regarded as the most important data source.

5.5 Eyewitness testimonies

O'Hara and O'Hara (O'Hara & O'Hara, 2003) refer to the tools of the crime investigator as the three "I's"; Information, Interrogation[49], and Instrumentation. Information is used to describe the knowledge that the investigator gather from other persons, and information is the most important of the three "I's". Interrogation includes the skilful questioning of witnesses as well

[49] "Authorities on police interrogation differ somewhat in how interrogation is defined. …. From these authorities [(Aubry & Caputo, 1980; O'Hara & O'Hara, 1988; Royal & Schutt, 1976; Yeschke, 1987)], we learn that the goal of interviews is to gather facts, [….] It is equally clear that these authorities differentiate interviews from interrogations, which have as their purpose securing a confession. It is equally clear that interrogations are conducted once it is reasonably certain that the person being questioned is guilty." (Shuy, 1998, p. 8).
Inbau et al. (Inbau, Reid, Buckley et al., 2001) provides characteristics of interviews and interrogations.

as suspects, and the success of information depends on the intelligent selection of informative sources. Instrumentation means more than criminalistics (the application of physics, chemistry, biology and pathology to crime detection), and includes all technical methods e.g. computerised fingerprints, criminal records systems, DNA analysis, modus operandi files, communication systems, and surveillance equipment. O'Hara and O'Hara further state that, in some crimes (e.g. robbery or assault), eye witness testimonies may provide all elements, but more complicated crimes (e.g. forgery, burglary, and fraud) ordinarily require more evidence than that of eyewitnesses.

Even today with progress in the forensic science or the third "I" (Instrumentation), eyewitnesses are important in trying to establish the events in a crime. Recent reports and projects from Norway, Great Britain, and USA support the view that eyewitnesses are necessary and important. The U.S. Department of Justice has published a guide and a trainer's manual for law enforcement regarding eyewitness evidence where they state that eyewitnesses play a vital role in the criminal justice system (Technical Working Group on Eyewitness Evidence, 1999, 2003). Great Britain has an ongoing project called "No Witness, No Justice" (The Crown Prosecution Service, 2004). The project's aim is that a higher degree of attention is directed towards needs of witnesses and victims. In Norway the Ministry of Justice and the Police has received a report from a working group who has evaluated practical, non-judicial measures to strengthen the follow-up of witnesses in criminal cases (Justis- og Politidepartmentet, 2006).

According to Wells et al. (Wells, Memon, & Penrod, 2006) it was professor Elizabeth F. Loftus that gave rise to the modern era of eyewitness research through her articles in the 1970's. Loftus is an American psychologist and a renowned expert in memory and eyewitness testimony. The "Eyewitness Testimony" first published in 1979 and revised in 1996 (Loftus, 1996) remains one of the best known psychological books on eyewitness research. She also co-authored a book with James M. Doyle who are an experienced trial lawyer . The book is called "Eyewitness Testimony. Civil and Criminal." (first published in 1987), and in which they state that (Loftus & Doyle, 1992, p. 1):

"It is a fortunate lawyer who has the ability to prove that what an eyewitness claims he saw is a virtual impossibility. Without this ability, the eyewitness, however wrong, is likely to be believed. In most eyewitness cases, whether civil or criminal, the people who must judge the eyewitness' testimony have no alternative sources of information. Even if they did have alternative information, it is not clear they would use it."

Figure 5.5 Elizabeth F. Loftus[50]

Wells et al. have the following comment to witness errors (Wells, Memon, & Penrod, 2006, p. 45):

> "The psychological processes leading to eyewitness error represent a confluence of memory and social-influence variables that interact in complex ways."

The variables affecting eyewitness accuracy (Wells, Memon, & Penrod, 2006) can be divided into two sets; system variables and estimator variables. The system variables are variables the criminal justice system has control over and includes how eyewitnesses are instructed before a line-up and methods for interviewing eyewitnesses. The estimator variables are outside the criminal justice system's control and include e.g. cross-race versus within-race identifications.

Wells (Wells, Memon, & Penrod, 2006) and Doyle (Doyle, 2005) points to the fact that scientists have shown how eyewitness mistakes may occur. These can be classified as factors determining perception, retention and retrieval of events, and recognizing people (Loftus & Doyle, 1992) (Ainsworth, 1998). The factors determining perception are divided into event factors and witness factors. The event factors can be related to lightning conditions, duration of event, type of fact, speed and distance, and colours. Witness factors can include level of stress and fear, weapons focus (a witness focus is on the weapon) a witness age, alcohol or other substance influence. Factors vital to retention can be cases of forgetting, post event information, factors affecting memory distortion, or real and unreal memories. When it comes to retrieving events from memory, methods of questioning and confidence can influence the result. Recognizing people is dependent on facial features, instructions to witnesses, and some special issues are cross-racial identification, if a person is a victim or witness, and voice identification or "earwitness" testimony.

[50] Source: http://faculty.washington.edu/eloftus/ (accessed 19.03.2008).

Bromby and Hall (Bromby & Hall, 2002) have developed a web-enabled knowledge-based decision support application called ADVOKATE. The system provides an indicative assessment of the credibility of eyewitness testimony. The acronym, ADVOKATE, refers to the eight witness reliability factors whcih must be examined in order to comply with the Turnbull directive (Bromby & Hall, 2002, p. 147, author's italics):

> "A – the **Amount** of length of time the witness observed the perpetrator
> D – the **Distance** from the witness to the perpetrator
> V – the **Visibility** conditions at the material time
> O – whether the line of **Observation** was impeded either partially or temporarily
> K – whether the perpetrator was **Known** to the witness in any way
> A – if there were **Any reasons** for remembering the event or the perpetrator
> T – the **Time** elapsed since the event
> E – whether there were any **Errors** in the description of the perpetrator compared to the appearance of the accused."

In addition to these psychological causes of error, a witness may use deception. Deception can be defined as (Memon, Bull & Vrij, 2003, p. 7)

> "a successful or unsuccessful deliberate attempt, without forewarning, to create in another a belief which the communicator considers to be untrue."

Memon et al. (Memon, Bull, & Vrij, 2003) use the words deception and lying interchangeably and describe the act as being intentional, i.e. it is only deception if the communicator consider the statement to be untrue, not if the communicator misremember for some reason or another.

5.5.1 Comments

Eyewitness testimonies are, as shown above, complicated, and accuracy depends on many factors that can be related to the witness or the environment, and also the four idols identified by Francis Bacon (described in subsection 2.3.1). In addition to these factors an eyewitness can wilfully deceit the investigator, hence the information must be investigated thoroughly in order to reconstruct the past. In addition to the above mention difficulties, many criminal groups also have their own "language", or at least a way of talking that is not consistent with common norms. All these factors points to the importance of building a structure for the information system before any attempts are made to automate any of the processes necessary in the investigation and analysis of crimes.

These comments conclude the theoretical investigation; in chapter 6 and 7 the empirical investigation will be in focus. Chapter 6 contains a description of the research purpose, goal, focus and question. An overview of research methodology and method is given as well as an

overview of the research and a description of the research steps. Chapter 7 contains a description of the results of the research.

CHAPTER 6
THE EMPIRICAL INVESTIGATION

About intelligence information:
"Today several people are working with the same case without knowing it,
or somebody holds onto information that more should know about."
Office of the Auditor General of Norway (2004, p. 40)
(Researcher's translation)

Om etterretningsinformasjon:
"I dag arbeider flere med samme sak uten å vite om det,
eller noen sitter på informasjon som flere burde ha tilgang til."
Riksrevisjonen (2004, s. 40)

After the literature review in the previous chapters, we now turn to the empirical investigation. This chapter gives an overview over research purpose, goal, focus, and question (section 6.1) followed by an overview of research methodology and method (section 6.2). Section 6.3 gives an overview of the research, and the reminder of this chapter (section 6.4 – 6.12) gives a description of each research step and includes the methods used for each step. The results are presented in chapter 7 or as an appendix, and references will be provided in each section.

Before we begin viewing the different results, some definitions and explanations will be given. The terms 'criminal investigative analysis', 'criminal profiling', and 'offender profiling' are used interchangeably, and so are the terms 'operational' and 'tactical'. Some of the titles in the Norwegian police and the Norwegian prosecution authority can not be directly translated into English, and there is a discussion on how the terms are to be translated into English. In addition some of the titles have dual meanings. After a discussion with employees at Kripos and the prosecution authority, the following terms will be used in this thesis. The term "Senior Investigation Officer" (*etterforskningsleder*) denotes the person in charge of the investigation, i.e. a police officer, not a lawyer. This implies that the Senior Investigation Officer has no authority to prosecute, only investigate. There is also another

role which here is described by the term “Head Investigator” (*utrykningsleder*). The function for this role is to coordinate the activities at the scene of the crime. The roles as the head investigator and the senior investigation officer are often carried out by the same person.

After this initial clarification of terms, we turn to the description of the empirical investigation.

6.1 Research purpose, goal, focus, and question

Research purpose

The research purpose was to enable investigators of criminal cases to reconstruct the course of events involved in a crime as completely and accurately as possible with particular emphasis on increasing the human investigator’s understanding of the events, actions and timelines involved in a crime.

Research focus

The research focus was criminal intelligence analysis, particularly case analysis and comparative case analysis.

Research goal

The initial research goal was to develop a model for a computerised information system to be used in the reconstruction process, and to decide the borders for the information system.

During the research two sub goals were added

- Understand and critically document the process involved in criminal intelligence analysis
- Understand and describe the possible boundaries and barriers that may prevent effective and efficient criminal intelligence analysis

Research question

The initial research question was as follows:

- Is it possible to represent diverse knowledge in dynamic data structures and thereby improve an applied field of criminal intelligence analysis?

During the research the initial research question was refined into the sub questions:

- Does the understanding of the applied process of criminal intelligence analysis influence the electronic representation in the communication system?

- Do the boundaries and barriers of the criminal intelligence analysis process fall in line with the boundaries of the proposed model for the computerised system?

6.2 Research methodology and method

In chapter 2 (table 2.1) different methodologies were put forward; hypothesis testing using the method of experiments with quantitative measurements and classification in the mechanistic worldview; synthetic and analytic methodology with qualitative and quantitative measurements in the systems world view. In the latter researchers are using methods from their own discipline.

Research in social science with focus on Information systems development has a wide variety of choice of methodology and method, e.g. case study research (Creswell & Plano Clark, 2006) action research (Stowell, West, & Stansfield, 1997), design research (Hevner, March, Park et al., 2006), and mixed method approaches (Creswell & Plano Clark, 2006). Both case study research and action research can be positivist, interpretive, and critical (Klein & Myers, 1999).

Since there has been little, at least publicly available, research in the field of criminal intelligence analysis, a qualitative[51] approach to the research was preferred. A discussion of the different qualitative approaches in the IS field can be found in the "Information Systems and qualitative research: Proceedins of the IFIP TC8 WG 8.2 International Conference on Information Systems and Qualitative Research" (Lee, Liebenau, DeGross et al., 1997). An

[51] "….Nonetheless, an initial, generic definition can be offered: Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. These practises transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings, and memos to the self. [….] "(Denzin, Lincoln, 2005, p. 3).

experimental method was ruled out because that would bring the persons out of their natural environment. Almost any book dealing with IS development is focusing on the formal aspects of the organisation (structure, goal, functions, and formal descriptions of work processes) in which the information system is to be implemented. The research described here includes the informal aspects of the organisation (expressed as culture, identity, and informal descriptions of work processes). Results of the formal descriptions gathered during the research gave a different view than the data gathering focusing on how the work was performed on an everyday basis. However, lately researchers in information systems have also opened up for anthropological methods such as participant observation (Avison & Myers, 1995) (Creswell & Plano Clark, 2006) (Myers 1997, 2008).

The methods[52] (Silverman, 2001) have been aimed at the qualitative aspects of the data (Grønmo, 1996), and qualitative analysis (Miles & Huberman, 1994) has been performed. The methods used were; participant observations; construction of a mock-up case based on an actual event involving a stolen laptop from a student at the Department of Information Science, University of Bergen; document analysis; unstructured interviews/talks; and structured interviews open ended questions; The data gatherings were performed with representatives from the different tribes at Kripos. The methods are described more in detail in connection with the different data gathering events.

The overall framework for the research falls within the systems worldview (described in section 2.1 and 2.4) in that systems are viewed as open social systems containing subsystems and existing in context. The research has also had emphasis on internal and external relationships. The overall view also incorporates a socio-technical theoretical view where the systems are viewed as consisting of two interacting parts, the technical and the social. The focus has been on the social system, and both formal and informal descriptions are included.

The concepts validity, reliability, and triangulation, and their relation to qualitative research are subject of much debate (Ritchie and Lewis, 2003). Several authors also substitute e.g. reliability with other concepts as 'confirmability' of findings, 'thrustwordiness' (Glaser and Strauss, 1967), 'consistency' (Hammersly, 1992;Robson, 2002), or 'dependability' (Lincoln

[52] "A methodology refers to the choices we make about the cases to study, methods of data gathering, forms of analysis etc in planning and executing a research study. [….] methods are specific research techniques." (Silverman, 2001, p. 4).

and Guba, 1985). To secure the reliability of qualitative research two levels are suggested (Ritchie and Lewis, 2003, p. 272):

> "Fist there is the need to ensure that the research is as robust as it can be by carrying out internal checks on the quality of the data and its interpretation. Second, there is the need to assure the reader/enquirer of the research by providing information about the research process."

Validity is also substituted with other concepts (Ritchie and Lewis, 2003) such as 'credibility' and 'transferability' (Lincoln and Guba, 1985), and 'credibility' and 'plausibility' of research claims (Glaser and Strauss, 1967). Triangulation can be seen as an alternative to validation (Flick, 2002; Denzin and Lincoln, 2005), and Denzin and Lincoln states (Denzin and Lincoln, 2005, p. 5):

> "[….] The use of multiple methods, or triangulation, reflects an attempt to secure an in-depth understanding of the phenomenon in question. Objective reality can never be captured. We know a thing only through its representations. [….] The combination of multiple methodological practices, empirical materials, perspectives, and observers in a single study is best understood, then, as a strategy that adds rigor, breadth, complexity, richness, and depth to any inquiry."

Denzin (1989) distinguishes four types of triangulation; data triangulation, investigator triangulation, theory triangulation, and methodological triangulation. In data triangulation different data sources are used and the phenomenon should be studied at different times, spaces and with different persons. Investigator triangulation is based on different researchers studying the phenomena to detect or minimize bias. In theory triangulation the data are viewed from multiple perspectives and hypotheses. The methodological triangulation is divided into within-method and between-method.

6.3 Overview of the research

The data gathering was performed between June 2000 and February 2005 (see table 6.2). Between each data gathering it was necessary to have some time to analyse the data, but also other circumstances has influenced the time frame. Often analysts and investigators have to travel to a crime scene on short notice, with the result that some of the scheduled meetings were postponed. Longer periods of sick leave for the researcher also influenced the time frame. Another factor is that the departments at Kripos where the contacts work have undergone several reorganisations. Table 6.1 gives an overview of the names of the contacts and the period they acted as a contact.

Period	Name
June 2000 – September 2001	Adviser Knut Erik Friis
September 2001 – August 2003	Police Inspector Siri Stedje
August 2003 – December 2004	Police Superintendent Philip Tolloczko
December 2004 -	Head of department for information and communication technology Helmer Haukaas

Table 6.1 Overview of contacts at Kripos

Before we turn to each step of the data gathering two tables will be presented. The fist table (table 6.2) gives an overview of the different steps (in chronological order) taken to gather information at Kripos. The table only includes formal meetings at Kripos or other locations, in between these meetings telephone conversations and e-mail have been used to gather additional information or to clarify elements in the research (e.g. to be able to translate the Norwegian titles into English several telephone conversations with different institutions was necessary). In addition to the events related to data gathering there have been several meetings with representatives from Kripos where the research has been presented and the project has been discussed.

When	Where	What
19.06. – 30.06.2000	Starum	Nordic course in tactical criminal intelligence analysis (organised by Kripos)
21.06. – 01.08.2001		Mock-up case for a stolen laptop
23.01. – 01.02.2002	Oslo, Kripos	Data gathering
26.11.2002	Oslo, Kripos	Data gathering
21.02.2003	Bergen, Department of information Science, UIB	Data gathering
02.06.2003	Oslo, Kripos	Presentation of EER-model/data gathering
01.09. – 03.09.2003	Oslo, Kripos	Data gathering
10.11.2003	Oslo, Kripos	Meeting and presentation of models
01.04.2004 – 30.03.2005	Researcher sick leave (100% 01.01.04 – 31.10.04, 50% 1.11.04 – 30.03.05)	
20.02.2005	Oslo, Kripos	Data gathering
01.12.2006 – 31.08.2007 07.04.2008 –	Researcher sick leave (100%)	

Table 6.2 Chronological overview of data gatherings

The second table (table 6.3) gives an overview of presentations/discussions (outside Kripos) with an impact on the research.

When	Where	What
08.05.2001	University of Bergen	Discussion of aspects of the research with Professor Hubert Dreyfus, University of California, Berkeley
18.09 – 21.09.2001	Agder University College	Research seminar in qualitative research. Discussion of research design with professor David Silverman, Professor Emeritus, Goldsmiths College, University of London, and professor Jaber F. Gubrium, Chair of the Sociology Department at the University of Missouri
22.05.2003	Department of Information Science University of Bergen	Defending essay in scientific theory
02.08. – 28.08.2003	School of Law/The Joseph Bell Centre for Forensic Statistics and Legal Reasoning University of Edinburgh	Data gathering/Presentation
07.01.2004	National Police Computing and Material Service (*Politiets data- og materielltjeneste, PDMT*)	Presentation/discussion of the research with the group responsible for the report "*Ny arkitektur for politiets systemer*" ("New architecture for the police' systems") (Researcher's translation) (Politiet, 2004) [53]
18.02.2004	National Police Computing and Material Service (*Politiets data- og materielltjeneste, PDMT*)	Presentation/discussion of the research with the group responsible for the report "*Ny arkitektur for politiets systemer*" ("New architecture for the police' systems") (Researcher's translation) (Politiet, 2004)

Table 6.3 Chronological overview of events (outside Kripos) with impact on the research

The following sections contain descriptions of each data gathering step carried out in the research.

[53] This research has been credited in the report.

6.4 Data gathering for the mock-up case for a stolen laptop at Department of Information Science, University of Bergen (21.06. – 01.08.2001)

Although the work with the mock-up case is not the first chronological step, this event will be described first. The reason is that this work will give a brief overview of the other parts of the empirical investigation. Data from this case can also be presented in this thesis, which is not possible with the real cases that were examined at Kripos and used in the analysis course.

The course in criminal intelligence analysis gave training in how to use the different techniques when the information already was gathered, and the participants only received parts of the information in a case. Working with a mock-up case would give some experience in interviewing witnesses and information about how such a process could proceed. The case was real, but there were no skilled criminal intelligence investigators involved. The course in operative criminal intelligence analysis had shown which pieces of information that was interesting and the techniques used to piece the information together, but we were not allowed to bring the cases with us. A case was needed in order to start categorisation of the interesting information, and the mock-up case was made for this purpose. All of the interviews and the work with them were carried out using Norwegian, but are here translated into English.

The data was gathered through interviews and questionnaires with open-ended questions distributed through e-mail. The first interview was with the owner of the computer, Hege Renee Hansen Åsand on June 28th 2001. In this interview she mentioned who she had seen on the premises at the time of the theft. Since these people could have been witnesses, the next step was to gather information from them. Interviews were performed with Bernt Olav Økland on June 29th, Kristin Eide on July 19th. Interview with Magnhild Viste on two occasions were cancelled due to faulty equipment. Short conversations were held with Geir Andre Bakke and Kjell Arne Sviggum. E-mails were sent to Maren Simonsen, Magnhild Viste, Olav Gjesdal, and Lene Lund.

The witnesses were asked a set of questions both in interviews, conversations, and e-mails. In the interviews there were also asked questions following-up answers given.

Because people often refer to themselves when they are describing others, the first three questions asked to the witnesses were:

1. What is your height?
2. How old are you?
3. Which clothes were you wearing?

The three next questions were asked to try and determine if people could remember where they were at the time of the theft:

4. Where were you before the laptop was stolen?
5. Where were you when the laptop was stolen?
6. Where were you after the laptop was stolen?

The eight last questions were related to what the witnesses saw on the premises:

7. Did you see anyone else?
8. Can you give a description of the stranger?
9. How old was he?
10. How tall was he?
11. What was he wearing?
12. Which colours were his clothes?
13. Where did he move?
14. Do you have anything to add?

The interviews were transcribed and an Excel spreadsheet was used to get an overview of the interesting information. Analysis of the data was carried out through two reviews, and a description is provided in section 7.1.

6.5 Nordic course in criminal intelligence analysis. (19.06. – 30.06.2000)

The first chronological step was participation in a course in criminal intelligence analysis. The course is held every year, and it is directed towards criminal intelligence analysts, intelligence personnel and investigators from Scandinavia. The course objective was to present an analysis system and develop the skills to use it. The analytic work included analysis of information from different sources; extract meaning from the information; prepare graphical presentations

as a supplement to, and an illustration of, the information; and model, evaluate, and present conclusions based on the information.

This particular course had participants from Norway (7 men and 1 woman), Denmark (1 man), and Sweden (5 men and 1 woman), and the administration of the course was carried out by Kripos. At the time of request for the researcher's participation no other civilians had participated in the course, but after some debate, the researcher was allowed to take part in the course.

The course lasted for three weeks, but for practical reasons the researcher was only able to participate in the last two weeks. At the first day of participation it was agreed that the researcher could participate in the same manner as the other participants. Full participation was also the researcher's goal to gain necessary first hand experience with the analysis approach. The researcher also participated in the social events in the evenings, and through discussions with the other participants gained some insight into differences and similarities of the work and point of view (cultures and identities) of the different tribes (police and analysts), and different nationalities.

In addition to receiving instructions from experts in the different fields, the participants "solved" several cases (parts of real world crimes). The work was carried out in teams of 4 – 5 members, and for each case the team members changed challenging the members to readjust according to the new composition of the group. There were no computers available, so all of the work was carried out manually. For each case the first task carried out by the team was to review the information. Then the team decided which techniques the team members should apply in the analysis and distributed the different tasks. Often one or two members carried out the different analyses. When the analyses were finished the team discussed the results from each technique and developed a conclusion. After the teams had "solved" the case through practical work, using the team's chosen techniques; the result was discussed in plenary session. Since the analysis was divided between the team members using different techniques, communication between members was vital.

All participants in the course received written material about the intelligence process containing descriptions of e.g. how to evaluate information, develop conclusions, and use the different techniques. The reminder of this section contains some of this information related to

the intelligence process (see also section 4.1 which contain a graphical representation of the intelligence process and section 5.1 which contain descriptions of different kinds of analysis carried out by Kripos). All information was given in Norwegian, but is here translated into English by the researcher (some Norwegian words are kept and written in italics).

6.5.1 Description of the intelligence process

The intelligence process consists of five steps; data gathering, evaluation, preparation, analysis, and distribution.

Data gathering

Data gathering is a controlled and focused gathering of information from all sources, e.g. individuals, police, judicial system, and open sources.

Examples:

- Police databases
- Informants
- Surveillance
- Interviews/Interrogations
- Official statistics
- Literature studies
- External databases (open sources)

In tactical analysis the goal of the team of investigators is to explore the most useful sources, and to gather the information that most likely will give positive results. The head of the team must make sure that all possibilities are explored and that possible clues are prioritised. Data gathering methods shall be evaluated during the investigation to determine if they are efficient or not. Planning secures that all members in the team (management, investigators, and analysts) are moving in the same direction and understands what they are searching for.

In strategic analysis the task is to view the present situation in relation to one specific type of crime or try to locate future trends and what this mean for the tasks of the police. Typical aspects are social, political, and economic factors, geography, technology, laws and police methods, and relevant indicators.

The analyst is a vital part of the data gathering phase. Main work tasks are co-operation with the management in planning, organising and examination of the information, and propose hypotheses that need testing through further data gathering.

Evaluation

This step includes determination of the information's usefulness (*anvendbarhet*) and evaluation of the information.

The information's usefulness (*anvendbarhet*) is determined by the properties described in table 6.4.

Property	**Description**
Relevance (*relevans*)	Does the information concern the crime? If yes, is the information connected to the current violation of the law?
Comprehension (*forståelse*)	Is there room for misinterpretation in the further examination of the information? The information ought to be presented and documented in a clear and concise way.
Sufficiency *(tilstrekkelighet*)	Does the information include details about space, time, person, etc? Without such information it is not possible to draw a conclusion.
Essentialness (*vesentlighet*)	To which degree is the information relevant for the case? Some of the information is more relevant.
Timeliness (*aktualitet*)	The police often receive information after a crime is committed. Information about future events are often very useful and often the best information.
Reliability (*troverdighet*)	There exist several different systems for evaluating reliability. In the system used by Kripos the following is considered: - what are the facts? - reliability evaluation of the source for the information - the information's validity (*holdbarhet*) - source evaluation and information evaluation are done separately

Table 6.4 Overview of properties determining the information's usefulness.
Adapted from: Nordisk kurs i kriminalanalyse (Kripos, 2000).

Preparation

Preparation is completed when information are stored and cross-referenced in ways that provide easy access to the data. In order to avoid waste of time and effort the plan for how the information should be compared should be decided in the planning process.

Analysis

The analysis phase consists of 4 steps/processes

1. Integration
2. Interpretation
3. Develop and test hypotheses
4. Develop conclusions and recommendations

1. Integration

The goal for the analyst is to integrate the information in such a way that the meaning becomes clearer, and it becomes easier to point out the need for additional information. The analyst often gives the information a visual form (diagrams). Different techniques are used for different types of information. The nature of information and the goal of the analysis determine which techniques that is suited in each case. The different techniques/diagrams are described in table 6.5.

Technique/diagram	**Description**
Relationship diagram	Shows relationship(s) between entities (e.g. persons and organisations). Examples: A person's participation in an organisation (e.g. owner, employee, membership). One person's relationship with another (e.g. family member, friend, been in contact). Relationships can be of two types; verified or unverified.
Commodity flow diagram	Defines and illustrates the flow of money or commodities (e.g. drugs or stolen goods) through the entities in a criminal network. Flows can be of two types; verified and unverified.
Event diagram	Shows relationships of time between criminal events.
Activity diagram	Defines patterns or sequences of criminal acts, including modus operandi.

Table 6.5 Overview of techniques/diagrams used in case analysis.
Adapted from: Nordisk kurs i kriminalanalyse (Kripos, 2000).

2. Interpretation

The most important part of the intelligence process. The analyst ought to use inductive logic and be as objective as possible towards the information. The analyst also has to go beyond facts to generate hypotheses, predictions and evaluations. If the analyst does not take any

risks and goes beyond the facts, the analyst is not able to provide the team with a worthwhile goal.

Interesting aspects of the information is:

Who is involved?

What are they doing?

How are they doing it?

Where does it happen?

When did or will it happen?

Why are they doing it?

3. Develop and test hypotheses

The hypothesis presents a theory that focuses on further information gathering. Every hypothesis must be tested, and exists only for this purpose. The testing is carried out by gathering new information, and by evaluating, preparing and integrating the new information. These activities lead either to rejection of the hypothesis or changing it to a conclusion.

The interesting aspects of the information relate to the parts of the hypothesis as table 6.6 shows.

Aspect of information	**Part of hypothesis**
Who is involved?	Key person(s)
What are they doing?	Criminal activities
How are they doing it?	Modus operandi
Where does it happen?	Geographical perspective
Why are they doing it?	Motive
When did or will it happen?	Time frame

Table 6.6 Parts of a hypothesis related to interesting aspects of information.
Adapted from: Nordisk kurs i kriminalanalyse (Kripos, 2000).

A plan for the information gathering should be made to:

- Secure that necessary information is gathered and that irrelevant information is not.
- Improve efficiency.
- Strengthen co-ordination and understanding.
- Secure a complete case – support at time of prosecution.

4. Develop conclusions and recommendations.

The end products of the analytic process are conclusions and recommendations that should be reported, verbally or written, as soon as possible. Conclusions and recommendations should be useful, i.e. they ought to have logical support and be tailor made for one particular area of use, e.g. prosecution, strategy, further investigation, or developing guidelines.

Distribution

The end product of the intelligence must be delivered to the decision-makers, the head of the investigators or the civil servants working with the case. Diagrams must not be used in isolation, but with an explanation of the meaning. Presentation can be delivered verbally or in writing, but a written report should always be available as support for the oral presentation.

6.6 Data gathering 23.01. – 01.02.02

Until now the data gathering had resulted in formal descriptions of how an investigation ought to be conducted and information related to the techniques used in an investigation, and most of the analysis work had been focusing of the data and their characteristics. The purpose of this visit to Kripos was twofold; 1) to meet persons working with different aspects of an investigation to gain insight into how the work was carried out, not only formal descriptions; 2) to read cases that had led to conviction in order to check if the analysis of the mock-up case had focused on the correct information.

The visit to Kripos was, for different reasons, postponed twice. When the data gathering took place, there was no schedule for the visit, interviews was scheduled on a day to day basis, depending upon who was present. The purpose for the visit was communicated before we arrived at Kripos, and the contact at Kripos at that time, police inspector Siri Stedje, took care that meetings were set up with analysts, employees working with intelligence information, investigators, senior investigation officer, psychologist, evidence (a.k.a crime scene) technician, and it-personnel. The interviews were unstructured, the questions asked in each interview depending to a great extent of what was learned in the previous interviews during the data gathering. All interviews except one (two interviewees) were carried out with one interviewee. Some of the interviewees, without being asked, provided additional verbal or written information during the researchers stay.

The different unstructured interviews/talks are presented in table 6.7 with an overview of the different persons participating, and their area of expertise. Police inspector Siri Stedje participated in some of the interviews (that was not scheduled for her) for a shorter or longer period of time. The researcher was also in contact with police inspector Siri Stedje every day of the visit as she also provided the solved cases for analysis.

Interview no	**Date**	**Participants**	**Area of expertise**
1	23.01.02	Police Inspector Siri Stedje	Criminal intelligence analysis
2	24.01.02	Police Inspector Siri Stedje	Criminal intelligence analysis
3	24.01.02	Police Superintendent Morgan Grindheim	Information technology
4	24.01.02	Police Superintendent Tor Grenersen	Intelligence information
5	25.01.02	Police Inspector Siri Stedje	Criminal intelligence analysis
6	25.01.02	Police Superintendent Arne Røed Simonsen	Criminal intelligence analysis
7	28.01.02	Adviser and psychologist Brit Røisli	Criminal investigative analysis (criminal profiling)
8	28.01.02	Police Chief Inspector Kim Stiansen	Telephone log analysis
9	28.01.02	Police Superintendent Svein Åge Rønning	Investigation (Senior Investigation Officer)
10	29.01.02	Police Inspector Siri Stedje	Criminal intelligence analysis
11	29.01.02	Police Superintendent Per Magne Iversen Police Superintendent Jon Ståle Stamnes	Forensic evidence Investigation (sexual abuse) Both are working with criminal investigative analysis (criminal profiling) and investigation

Table 6.7 Overview of unstructured interviews/talks at Kripos 23.01. – 01.02.2002

Most of the interviews took place during the first week of the visit, and when these had come to and end, examinations of previous cases were carried out. The examination was based on document analysis (the content of the documents), but also analysis of additional information

the analysts had entered into the documents. Criminal intelligence analysis relays today heavily on manual methods; the investigators very often read hard copies of documents and mark the interesting text with a marker (some also use colour classification, i.e. green for interesting cars, blue for interesting persons). The document analysis was mostly performed on hard copy documents, but also analysis of electronic documents and tools was performed. At the course in criminal intelligence analysis, only manual methods had been used therefore the electronic documents were of interest this time.

Also in this data gathering the researcher participated in the social gatherings during the day together with the employees.

The field notes from this data gathering are summarised and translated into English in subsection 6.6.1 (some Norwegian words are kept and written in italics).

6.6.1 Summary of field notes

The field notes are based on both interviews and analysis of documents and software.

General comments

Different cases demand different persons and techniques. Organised crime has a different goal (what happens now?) and includes undercover agents in addition to analysts and investigators. The focus for this research is committed crimes where the cases aim at reconstructing the past, and the following reltes to these kinds of cases. The cases can be project based and include several single cases, but the same method of analysis is used; i.e. crime scene inspection and analysis of the physical evidence including autopsy, criminal intelligence analysis, and criminal investigative analysis. In criminal intelligence analysis the analyst uses data from witness interviews, suspect interrogations, telephone logs, tips etc, in criminal investigative analysis analysts use data from autopsy and crime scene inspection.

Some analysts distinguish between tactical (or operational) and strategic analysis, but one of the analysts said that she uses the same tool to both tactical and strategic analysis, the procedure is rather similar. One part of the strategic analysis is evaluation of what the witness has stated, but her opinion is that this is evaluated also in tactical analysis. Strategic analysis does not evaluate every witness interview, but looks for trends and patterns. Strategic

analysis involves more prediction, and not so much reconstruction which is the case in tactical analysis. Strategic analysis is supposed to answer the question: What should be done to fight the problem?

Information gathering is the most important aspect of the job. More and more restrictions are placed on investigations, both by law and the European Human Rights Organisation; hence investigators must act in accordance with several laws. The result of the criminal intelligence analysis can not be presented in court as evidence, only the sources of the information (e.g. eye witnesses). One of the investigators was of the opinion that the focus on the intelligence analysis is overstated. It is important to keep a clear head all the way from data gathering to presentation.

A good system must contain quality assurance in such a way that it can be shown that the information was collected in the right way; information must be gathered legally. This is especially important when you do not catch people red handed. For security reasons there ought to be a barrier between software containing intelligence information and software containing investigation information. It should not be to easy to import unverified information and use it as verified information.

A wish was for an investigation tool that could give an overview of actions taken with regard to the information. All documents from interviews/interrogations should be available in text, the whole interview. Interviews/interrogations are delivered on paper today, and the content is a subjective choice by the investigator, and other things can be relevant on a later moment in time. Links that are not confirmed are important. What is checked out? What is not checked out? The information system should give an opportunity to reproduce this at a later moment in time. E.g.: Fingerprints are often removed gradually (a case can start with six different fingerprints and only two will be left at the end of the analysis). A log function would be useful in tracing; by whom, how, when. Such a log function would also be very useful in cases that are reopened (which often happen with cases of sex abuse). It will then be possible to trace the investigators reasons for why the acted as they did.

The investigation process

Usually the Head Investigator, and two or three investigators and one analyst travels to the place where assistance is required. Crime scene investigators belong to a different department

within Kripos, but it is the Head Investigator (*utrykningsleder*) that leads them when they are in the field. The investigators and the analyst now often arrive at the scene of the crime at the same time as opposed to earlier when the investigators often arrived before the criminal intelligence analyst. When investigators from Kripos are not present, the local police are using their system which includes a numbering system for documents. When investigators from Kripos are present, they use their system which has another system for numbering documents. The criminal intelligence analyst only uses these numbers as document references in their work, but these references are extremely important.

The information is very different from case to case, but the analysis is equal in each case; mapping movements on the scene of the crime. When the mapping is 100% then the case is solved. Sometimes specialists are brought into to the investigation, e.g. by arson, and aircraft accidents.

The first task at the crime scene is to organise personnel to take care of incoming tips. Tips can be good or poor. They are often written on post-it notes and chaos is often connected to tips because post-it notes are not searchable, and the handwriting can often be hard to read. It is problematic to make people understand that the tips should be stored electronically. The Senior Investigation Officer (*etterforskningsleder*) commented that "Old habits die hard" ("*Gammel vane er vond å vende*"), and that electronic storage is preferable even if this will take more time. If a tip is interesting, the person is brought in for questioning.

Investigators speak with every household member within a certain radius (can be 20 – 25 police officers dedicated to this work). This investigation always results in a lot of important information. It focuses on who has been seen at foot, in a car, on a bike, who has visited them, and where they have been themselves. The police officers bring a form they have to fill in, and this is done manually (with a pen). Particularly in the early phase of an investigation the working conditions are very stressful much due to the enormous time pressure, and therefore it would be a benefit to have this information stored in software (at the time of the data gathering).

The interviews start immediately. First those who accompanied the victim, which often are family and friends. Then the search is broadened, and expanded with interrogation of possible suspects. Interviews (and interrogations) are often recorded. During interviews and

interrogations a summary is written electronically. The witness signs this document. The accused does not need to give evidence in court, but witnesses have to. The investigator chooses which information to register in the software, and everything is filed chronologically.

Sometimes the investigators are out looking for the perpetrator, e.g. when the perpetrator is familiar to the police. In some cases the investigator searches through all information from the media in order to rule out the possibility that the perpetrator could have read any information.

Different electronic tracks are also gathered, e.g. telephone calls, cash registers, video surveillance, and credit cards.

The Senior Investigating Officer wished for automatic retrieval of certain type of information, e.g. cars. The retrieval should be simple and user friendly. Often a lot of documents can have been processed when a certain feature becomes important. It should be easy to go back to the already processed documents and search for this feature. Another wish was that all interviews with one person could be stored in one place.

The public prosecutor meets with the management of the investigation. It is the lawyer at the local police station which has the authority to arrest and he or she also sends suggestions for initiative to the public prosecutor, which formally prosecutes. The public prosecutor uses information from the police investigation, and the case is sent back and forth.

Physical evidence

Representatives from Kripos are present at autopsies which are performed by the Institute of Forensic Medicine. Kripos documents the event by taking pictures and notes.

A confiscation report is written containing a list of all physical evidence in a case. The list also includes descriptions of every item. The confiscation list is not included in any system; it exists only as a report. When the report is delivered from the forensic department, it becomes a part of the documents in the case. The report is divided into 2 parts: a report from the crime scene (which ought to be delivered to the Senior Investigating Officer within 14 days), and an investigation report (lists which actions that has been performed on the items), and a conclusion that builds on both. The report is stored in the evidence technician's personal

computer as a word document. Sometimes the document is stored in the investigation software (performed by the Senior Investigating Officer). The system is not good enough today when it comes to where the confiscated items are located.

The analysis process when Kripos is involved

No one starts with analysis before Kripos arrives; only data gathering are performed. If an interview/interrogation is poorly executed (or lacking information needed by the analyst), the investigators are asked to do a new one.

One of the criminal intelligence analysts did not consider the different types of numbering documents (the police and Kripos each use their own system) a problem as the analyst was only interested in the interviews of the witnesses. Other analysts/investigators looked at the rest of the documents. Excel was used during analysis of the documents and one of the columns was for document reference. Several criminal intelligence analysts have the same job, but they all perform the work in different ways. The analyses are very individual.

In criminal cases, e.g. murder, the local police often begins with tips, not interviews. The analyst enters this information into the Excel spread sheet. It is easy to define columns and criteria. Who has been where? Who has seen who? Has anybody seen the perpetrator? When the witness interviews arrive, the analyst hands the tips over to the investigators who filter them. The analyst begins with the first document, no documents are skipped.

When a tip is received it is placed on a "to do list" (for interviewing) at the same time as the tips are being ranked. If the person is anonymous, the police sometimes try to trace the call. There are often lots of tips, 2 – 3 times the amount of interviews. One analyst's opinion was that tips are for the investigators to deal with. Tips are given totally without responsibility, and a tactical investigator should evaluate them. However, the tips should be available in order to look through them when things settle down. Tips are not listed in the software today as other information is; they should be registered in the "to deal with" list.

The data gathering must be planned (both intelligence and investigation). Analysis is the best method to change gathered material into something concrete. One of the analysts uses the evidence technicians actively, and a task for the analyst is to interpret the reports from evidence technicians.

A case example

Kripos went to the location where the crime had been committed and stayed there for six weeks. After these six weeks they went back to the local police once a week. After a while there is often little new in a case, and representatives from Kripos therefore only visit the local police, they do not stay there all the time. The local police force transferred the new material to Kripos. The printers are connected so Kripos can e.g. write maps at the local police offices. In this case the investigators performed 800 interviews the first six weeks.

Some times the analysts turn the pile and begin from the beginning. This was done in this case. The first time the information was put together a criminal intelligence analyst was looking at transcripts from witness interviews, the investigator analysed house-to-house information. They switched and began from the top again.

Interesting information during the analysis

One of the analysts described an analyst's work in the following way:

Questions that must be asked are

- Who has seen what?
- Is it correct?

The most important task is cross-referencing and identification of the information. Interesting information include

- Name
- Age (not personal identification code as in other documents)
- Place (some times geographical name, some times a geographical zone)
- What the witness was doing
- The witness description of him or herself at the time in question

At the beginning of the analysis document number of the interesting information about the scene of the crime and time is marked. Thereafter the criteria of the information are defined and columns for these criteria are set up, e.g. a column for cars. In addition a column for notes about interesting things is set up. Time indications are almost always corrected, some times several times, because witnesses are often wrong about the time.

Telephone analysis

Telephone analysis is a part of the analysis process, and is often performed by other people than those dealing with analysis of witness and suspect data. The analyst starts with print outs (or electronic documents) from telephone companies. In order to obtain information about text-messages from mobile phones, Kripos must have a warrant from the court. An analysis of 2000 conversations may include just 100 different telephone numbers. A major question is "Who is in contact with whom?" The length of the conversation is also relevant. In telephone analysis it is possible to identify which telephone number has been connected at which point in time, and the duration of the call. If it is a registered telephone number, it is possible to find the name of the owner. Kripos also gathers information from the persons' work places, not only telephones at home or mobile telephones. Even though they know the telephone numbers that have been connected and who the telephone are registered to, it is not proof of who the parties in the conversation has been. The information must be checked against other information in the investigation, e.g. confiscations, and interviews of witnesses. Telephone analysis can also be used as an alibi control.

For mobile phones it is also possible to pinpoint the geographical location through base stations. Information registered for each conversation are; Base station, IMEI-number (identifies GSM mobile phone), IMSI no (code used by the operator for invoicing foreign mobile phones), SIM-card (every SIM-card has a unique number), and telephone number. Information in the SIM-card can also be obtained, but this is regarded on the same level as control of post deliveries. Sources of errors can be that the conversation is not patched through the nearest base station and that the time by the different operators can vary. Before analysis it is important to decide the structure of the data. Information from telephone analysis in intelligence must be verified before it can be used in a criminal case.

Collection of data connected with telephone conversations are seen as confiscation, and a report is drawn up. The report follows the case and contains the persons name (the owner of the telephone number), role (accused, witness), telephone number, period, legal ground for the confiscation, date the print out was received, and file name.

Criminal investigative analysis (criminal profiling)

Criminal investigative analysis is disputed within psychology. The focus is on an unknown perpetrator, it is driven by actions, and the first analysis was developed in USA to use in cases

of serial killers. FBI does not re-examine the hypothesis. In England they are more concerned with re-examination and the system itself.

Criminal investigative analysts enter the arena when everything else has proven futile. It is the last attempt to solve a case before the case is dropped. They often lack information of the victim, and criminal investigative analysts look for clues that investigators normally do not look for, i.e. circumstances that can not be re-examined. Investigators often focus on information that can be re-examined. Criminal investigative analysis at Kripos is performed by one psychologist, one evidence technician, and one investigator.

To succeed in a criminal investigative analysis it is important that the motive is personal (sex, revenge) in order to be able to make the profile of a perpetrator. When money is the motive a profile is not made. They use forensic reports, information about social environment, and victim(s), and they look for anything that does not add up. Hypotheses are created, and a report is written, but the report is not a part of the case papers. The prosecutor has access to the report, the defence council has not.

Software

Kripos has many different tools for administration, investigation, intelligence, and analysis. A description of the different software will not be included, but comments common to most of the software used in the investigation and analysis process (administrative software will not be commented on).

The local police used one type of software during investigation and analysis while Kripos used another. When Kripos leaves the local police, they take the data entered into their software with them, and continue the investigation/analysis from their offices. There was no exchange of data between the programs; a Kripos employee did not have access to the software at the local police, and the local police had no access to the software Kripos used. This disconnectedness was also typical for other software, i.e. the result of analysis of telephone logs was stored on individual computers with no electronic exchange to other analysts. Much of the information needed by a criminal intelligence analyst had to be printed on paper and then entered into another system manually. The analyst marked the interesting information manually with a marker and entered this information into an Excel spread sheet.

Some of the graphical representations were automatically made from this spread sheet, some were not.

Some databases were on old technology, and were operated by trained employees. Investigators/criminal intelligence analysts have to rely on these people to obtain the information they want (the reference here is to databases with e.g. intelligence information, not forensic information). The criminal intelligence analyst does not operate the forensic directories. Many of the forensic analyses require different skills, e.g. analysis of DNA and fingerprints. The evidence technicians transfer the results of the analysis to the criminal intelligence analyst, and then the criminal intelligence analyst interprets these results in combination with other information in the case.

6.7 Data gathering 26.11.2002

This data gathering involved an unstructured interview with the contact at Kripos at the time. The basis for the unstructured interview was the models developed with this data gathering in mind (see subsection 7.2.6). Since it was the first time the models were presented for the interviewee the interviewer also took the time to explain the thoughts behind the model. The conversation was recorded and transcribed afterwards. The transcript can be found in appendix 12. The interviewee gave permission to the publication of the transcript in this thesis and signed a permission agreement form (see appendix 10). Models with handwritten corrections made during the conversation can be found in appendix 11. The conversation was held in Norwegian and the translation of the interviewee's response is performed by the researcher.

Besides discussing the different models, some terms was discussed, e.g. verified and unverified data, and the importance of having the opportunity to distinguish one from the other since unverified data is not used in the final report.

Comments to EER-model of step 2 evaluation, and step 3 preparation

Person evaluation and information evaluation was incorporated in the model because a 4 x 4 matrix is used to evaluate both information and persons providing the information in intelligence. However, this matrix is not used in cases consisting of information from

investigation only (not intelligence information). The interviewee stated this in the following way:

> "No, in cases consisting of only investigation information, the investigators do not use 4 x 4. [….] It is very rare that they write anything in the section reserved for comments from the author of the report."
>
> *"Nei, i rene etterforskningssaker så bruker ikke etterforskerne 4 x 4. [....] Det er svært sjelden at de skriver noe på rapportskrivers merknad."*

After a discussion about the necessity of keeping the information and person evaluation, it was concluded that since intelligence information is used in the analysis, the person and information evaluation should be kept. It should also be possible to store both use of the 4 x 4 matrix and a description.

The interviewee saw criminal investigative analysis

> "Both [as a part of the preparation and evaluation and analysis]. It depends on the analyst's knowledge. Some has knowledge from offender profiling, others do not."
>
> *"Begge deler [del av både preparation and evaluation and analysis]. Det kommer helt an på kunnskapen til analytikeren. Noen har kunnskaper fra offender profiling, andre har det ikke."*

Criminal investigative analysis should be seen as part of the basis for analysis, even though it is a part of the analysis. The criminal investigative analysis is performed by people trained for this kind of work (as the physical evidence are analysed by forensic scientists).

The interviewee pointed out that telephone log was not the only form of electronic traces. Information from banks and the internet was also important.

According to the interviewee reports from undercover police work is an example of reports from an investigation.

Comments to EER-model of step 4 analysis – integration

References to documents are a vital part of the integration. Every piece of information stored in this step has to have a reference to the document it is taken from.

It must be a possibility to record characteristics to both entities and items, e.g. beyond the colour of a car; if it had dents or go-faster stripes etc.

On the question if social security number is important the interviewee answered that she did not use it. What is important is that

> "[…] one finds all men less than 20 years, as an example. […] or age between 16 and 22."
>
> *"[…] en finn alle menn under 20 år, eksempelvis. […]"eller alder mellom 16 og 22."*

According to the interviewee people remember and describe dogs easier than people, therefore during one investigation the investigators took pictures of all the witnesses.

Comments to EER-model of step 4 analysis – interpretation and hypothesis building, and step 4 – analysis, conclusions and recommendations

The discussion about these models was mostly about the different terms used in the models. Some confusion was due to the translation from Norwegian to English, and some confusion was related to the fact that different terms are used by the criminal intelligence analysts.

In addition the following statements by the interviewee must be taken into account during further development of the models:

> "Premises are fixed, […] those are the document references, but it is only verified and unverified information. […] The hypothesis, our product, is not presented in criminal cases. […] [The analysis report] is not enclosed in a criminal case."
>
> *"Premissene, de er jo faste, […] det er jo dokumentreferanser, men det er jo bare verifisert og uverifisert informasjon. […] Hypotesen, vårt produkt skal ikke legges fram i straffesak. […] [Analyserapporten] skal ikke vedlegges straffesak."*

The discussion about which terms to be used concluded this data gathering, and the next section will describe data gathering performed at Kripos 21.02.2003.

6.8 Data gathering 21.02.2003

This data gathering involved an unstructured interview with the same contact at Kripos as the data gathering 26.11.2002. Also this time the basis for the conversation was models, and the models can be found in appendix 6. The interview was recorded and transcribed afterwards, and the transcript can be found in appendix 14. The interviewee gave permission to the publication of the transcript in this theses and the permission agreement form can be found in

appendix 10. In appendix 13 the reader will find models with handwritten corrections made during the data gathering. The conversation was held in Norwegian and the translation of the interviewee's response is performed by the researcher.

The following description of the data gathering will be divided into comments concerning the individual models; the first being data gathering.

Comments to the model of data gathering

The question here was about who is gathering information from the external databases as e.g. Krimsys. Is it the investigators or the analysts?

The response from the interviewee was that

> "[…] it is mainly the analyst. […] but more and more the analyst is giving tasks to those who use Krimsys on a daily basis. […] Some [investigators] are authorised [to collect information from Krimsys], but it is few."
>
> *"[…] det er stort sett analytikeren. […] men mer og mer nå så blir det at analytikeren gir arbeidsoppgaver til de som sitter på Krimsys daglig. Noen [etterforskere] er autorisert [til å hente ut informasjon fra Krimsys], men det er et fåtall. "*

Comments to the model of overview of the process in operational and strategic criminal intelligence work

The outcome of the discussion was that it should be possible to have a visual presentation of 'Analysis - conclusion and recommendation'. E.g. it must be possible to present a network diagram of persons involved in the case in the report.

Comments to EER-models and sketches of step 2 evaluation, step 3 preparation, and step 4 analysis integration

The discussion was mostly about which types of data that was interesting for the analysts. The fist issue that was discussed was criminal investigative analysis, and the interviewee stated that

> "[…] offender profiling is a part of criminal analysis, criminal intelligence analysis. Not, it is not tactical or forensic authorised evidence […]. Intelligence information to be investigated. When I speak of what is evidence or not I am thinking of that which is admissible in court and offender profiling is not used in the Norwegian court."
>
> *"[…] offender profiling går […] inn under kriminalanalyse, kriminaletterretnings-analyse. Ikke, det er da ikke taktiske eller tekniske godkjente bevis […]. En*

etterretningsinformasjon til etterforskning. Når jeg snakker om bevis og ikke bevis så tenker jeg på hva som er godkjent i retten og offender profiling så er ikke det i bruk i norsk rett."

The next issue was data from telephone conversations. According to the interviewee analysis of data from telephone conversations is to link time, place and person and this type of analysis is often used both in investigation and intelligence. To obtain the content of text messages a special permit must be used. This analysis process is different from the process including data from witnesses and suspects.

The third issue was related to physical evidence. The interviewee saw the need for the information system to include data about items that are confiscated during the investigation. The items can be computers, mobile phones, or diaries. In some cases the number of items confiscated can be very high, and according to the interviewee in one case

"50 addresses were searched and at each location an average of 20 – 30 items were found."

"50 adresser som vi ransaket på og på hvert sted så fant du jo i gjennomsnittlig 20 og 30 gjenstander."

Reports will be written for each confiscation and according to the interviewee it is important to include names of the officers present, and whether the search was performed with consent or with search warrant.

Comments to models for step 4 Analysis – interpretation and hypothesis building, and hypotheses and recommendations

According to the interviewee each case can include several hypotheses build on premises that may consist of both intelligence and investigation information. The interviewee also pointed to the need for strategic use of information. E.g. each year Kripos have to send overviews of the murder cases to the Office of the Director of The Public Prosecution (*Riksadvokaten*). The information provided in these reports concerns the relation between victim and offender, and the result. From a strategic point of view the interviewee also wanted a possibility to store the sentence in each case.

The discussion about hypotheses and recommendations concluded this data gathering, and the next section will describe data gathering performed at Kripos 21.02.2003.

6.9 Presentation of EER-models/data gathering 02.06.2003

This visit to Kripos consisted of a presentation and a meeting. All employees in the Department for Tactical Investigation (*Taktisk etterforskningsavdeling)* ere invited to participate in the morning presentation and between 20 and 25 employees participated. At the meeting in the afternoon the following persons was present. Some were present for parts of the meeting, others the whole time.

Chief Superintendent Ola Thune
Head of Department of tactical investigation (*Taktisk etterforskningsavdeling*)
Police Superintendent Vigleik Antun
Head of Subsection for analysis and method development (*Avsnitt for analyse og metodeutvikling*)
Professor Konrad Morgan
Department of information science, University of Bergen
Police Superintendent Arne Røed Simonsen
Police Chief Inspector Kim Stiansen
Adviser Brit Røisli
Adviser Knut Erik Friis
Executive officer Heidi Marie Engvold

The EER-models that was presented in both the presentation and the meeting can be found in appendix 8. For the presentation additional EER-models displaying data from the case of the serial killer called "Jack the Ripper" had been prepared. The reader can find more information about these models in section 7.3. The researcher also handed out a letter of introduction. This letter can be found in appendix 7. Unlike the previous data gatherings no recording was done, nor any corrections was written on the models. However, some notes were made both during the presentation and the meeting. Some information was also given in e-mails after the meeting.

At the presentation in the morning some comments were given to the EER-models;

In the model covering Evaluation/preparation and closure the entity "verdict" should be connected to "Event", not "Case". Each event can have its own verdict.

In the model covering evaluation and preparation of evidence and electronic traces bugging (of rooms, telephones) should be incorporated. It is necessary to store both sound files and transcripts. Also text and multimedia messages should be included. In the entity "confiscation" it is necessary to incorporate an item log.

A comment was given that it would be preferable to be able to record which info that has been given to the press in order to be able to separate which information that witnesses and/or suspects could have read in e.g. newspapers and which information that must have been obtained in other ways. In addition to the information the date the information was released must be recorded.

House-to-house investigations are often followed up with interviews and/or interrogations, but some interviews/interrogations can be held without previous contact with the witnesses.

In the afternoon meeting most of the time the researcher answered questions about the model. It was the first time the participants had seen the models, and some explanation of the thoughts behind the model was in order.

Comments to the model of evidence and electronic traces in evaluation and preparation were data needed for the entity "bank/credit cards" (e.g. time, type of transaction) and for the entity Telephone (e.g. map coordinates/sector).

In an e-mail after the meeting information of the format of reports (fixed data elements) from forensic evidence analysis was given. In addition other data elements will be included. Table 6.8 gives an overview of the fixed data elements.

Part of report	Data item	Explanation
Heading	Date	The date the report was written
	Author of report	Name of the author
	Police district	The police district where the author is employed (e.g. Kripos)
	Duty station	The department/subsection where the author is employed
	Case number	Number of the case
	Document number	Number for each document. Can be both a serial number and the number placed on the document when the case is edited
Introduction	The case background	
	Report writer's mandate in the case	
	Intention and purpose	
Method	Explanation of technical terms	
	Basis for information	
	Methods used in examinations	
Examinations	A list of examinations performed with results	
Summary/conclusions		

Table 6.8 Fixed data elements in Kripos reports.
Source: Kripos.

With these comments and additions to the models we turn to the next data gathering and the next section will describe the data gathering at Kripos 01.09.03 – 03.09.03.

6.10 Data gathering 01.09. – 03.09.2003

The work after the previous data gathering focused on both EER-models and data flow diagrams. Even though some information regarding criminal investigative analysis and forensic evidence was obtained earlier (see subsection 6.6.1 and section 6.9.) further information about criminal investigative analysis, forensic evidence and internet traces were necessary to draw up the boundaries for the computerised information system. Several attempts to arrange meetings with employees at Kripos in June/July/August failed, and the first opportunity suitable for all involved was 01.09.03 – 03.09.03. Three unstructured

interviews/talks were conducted during the period and table 6.9 gives an overview of the participants.

Interview no	Date	Participants	Area of expertise
1	23.01.02	Adviser and psychologist Brit Røisli	Criminal investigative analysis (criminal profiling)
2	24.01.02	Police Superintendent Per Magne Iversen (evidence technician)	Forensic investigation and evidence
3	24.01.02	Police Superintendant Lars Kvinnegard	Sexual abuse and racialist statements on the Internet

Table 6.9 Overview of unstructured interviews/talks at Kripos 01.09.03 – 0309.03.

The researcher took notes during the unstructured interviews/talks and the notes are summarised in subsection 6.10.1. The notes were written in Norwegian and are here translated into English.

6.10.1 Summary of field notes

The field notes summarised in this subsection is divided into paragraphs for each interviewee, and the first interview was with adviser and psychologist Brit Røisli.

The first unstructured interview/talk

The first unstructured interview/talk was with adviser and psychologist Brit Røisli regarding criminal investigative analysis (criminal profiling).

It is vital for the criminal investigative analysts to be part of the team the first days after the crime has been committed. If the investigation is going well, the criminal investigative analysts withdraw. If the investigation halts, however, the investigative analysts enter the scene again. In criminal investigative analysis a main focus is errors that may have occurred during inference, and as such they are controlling previous inferences in criminal intelligence analysis. A central element of criminal investigative analysis is the concept of signature. A signature is acts performed by the perpetrator beyond the criminal act, and which often has a special meaning for the perpetrator.

The tasks involved in creating a profile include meetings with the Senior Investigation Officer (*etterforskningsleder*). It is vital to have access to all documentation. The report is equally important as forensic reports, but the report is not a case document. The hypothesis created can be used by the investigator, but he need not to. Several reports can be written in one case.

The elements of the criminal investigative report are shown in table 6.10, and are mainly focusing on behaviour for both the victim and the perpetrator. See also table 6.8 which gives an overview over fixed elements in Kripos reports.

Part of report	**Explanation/comments**
Table of contents	
Summary of the case	
Purpose	E.g. In which group of men is the perpetrator most likely found
Method	Not exact science, caution is required
The victim	In murder cases. A description of the person, the crime scene, what kind of person the victim was when he was alive. E.g. the victim grew up with 2 sisters, and their conflicts. Who the victim was towards others, but on the victim's terms.
The crime scene	E.g. Location, time of day, weather conditions
Other circumstances	These can relate both to the person or the location. E.g. particular events before the crime were committed.
Risk analysis	How great a risk was taken by the perpetrator and the victim?
Assessment of the perpetrator	
Conclusion	
Recommendations	E.g. sending a picture/photograph to the press

Table 6.10 Elements in reports from criminal investigative analysis.
Source: Kripos.

This table concludes the summary of field notes from the first unstructured interview/talk and the following paragraphs will give a summary of the field notes from the unstructured interview/talk with Police Superintendent Per Magne Iversen, evidence technician.

Second unstructured interview/talk

The second unstructured interview/talk was with Police Superintendent Per Magne Iversen, evidence technician.

Evidence technicians have their own report which includes photographs of forensic traces from the crime scene. In addition an autopsy report is included when needed. The autopsy report deals with all the injuries on the body of the deceased. Institute of Forensic Medicine (*Rettsmedisinsk institutt*) is regarded as the expert when it comes to autopsies, and carries out the work at the request of Kripos. Conclusions from laboratory examinations are included in the forensic report. The forensic report has two parts, part one is for internal analyses, and part two for external analyses. In addition the report has an appendix consisting of photographs, sketches and maps. The appendix is explained in more detail after the table. An overview of the report is given in table 6.11. See also table 6.8 which gives an overview of fixed elements of Kripos reports.

Section	Subsection	Explanation
Part 1 Crime scene investigation, secured material		
Table of contents		
Information	Request/Turn-out	Summary of information received before turn-out, the turn-out, and arrival
	Case information	Orientation on arrival, and reference to sources
	Definitions	Descriptions of secured material with references
Description of the crime scene(s)	Location, surroundings, and access	Descriptions
	The crime scene	Descriptions
Examination of the crime scene(s)		E.g. when the work started, who was present, how the crime scene was secured
	Registration of traces outside	
	Registration of traces inside	
	The central crime scene	
	The corps(es)	
	Assistance from experts on the crime scene	
	Specific examinations performed on the crime scene	
Expert examination of the corpse	Autopsy	Who was present, which evidence that was found.
Other examinations (outside the crime scene)		E.g. who was present, how the object was secured
	Examination of the accused	Description of possible traces that can be connected with the case
	Reconstruction	
	Other subsections can be included as well	
Secured material		A list of the material secured on the crime scene
Part 2 Examinations, assessments and conclusions		
Conclusion		
Specific examinations		Examinations carried out after the crime scene examination
Examination of secured material		The material can be e.g. from the crime scene, the corpse, the accused
Summary and assessment		
Further treatment of secured material		

Table 6.11 Elements in reports from forensic investigation and analysis.
Source: Kripos.

The forensic report has an appendix consisting of photographs, sketches and maps:

1. Overview photographs of the area in question.
   E.g. photographs from outside into a house or from blood traces on a door to the central crime scene.
2. Outline of rooms.
3. Overview photographs inside a house with arrows pointing to central crime scene.
4. Sketch of central crime scene where central details are marked
5. Photographs of central crime scene with arrows pointing to important objects. Several photos from different angles.
6. Photographs with details of the corpse.
7. Photographs of e.g. clothes and shoes.

It is important that everything is documented, and each photograph or sketch is connected to describing text, arrows and/or other markings on the photograph itself.

We now leave the forensic evidence and turn to the third and last unstructured interview/talk in this data gathering which was with Police Superintendent Lars Kvinnegard regarding sexual abuse and racialist statements on the Internet.

Third unstructured interview/talk

The third unstructured interview/talk was with Police Superintendant Lars Kvinnegard. He mainly works with cases of sexual abuse and racialist statements on the Internet.

Criminal intelligence analysis is rarely involved in cases of sexual abuse and racialist statements. These cases are also often based on reports from other countries and international police organisations. Also in these cases a report is written and the layout is mainly the same as for forensic reports, it also includes the interpretation of the electronic traces. The interpretation must e.g. always take into consideration that it is not necessarily the owner of a computer that has committed a crime; it may as well be another with access to the owner's computer.

This unstructured interview/talk concluded the data gathering, and in the next section the data gathering at Kripos 10.11.2003 will be described.

6.11 Data gathering 10.11.2003

After being postponed once this data gathering took place at Kripos with the following participants from Kripos.

Police Superintendent Vigleik Antun
Head of Subsection for analysis and method development (*Avsnitt for analyse og metodeutvikling*)
Police Superintendent Svein Kjus
Police Superintendent Arne Røed Simonsen
Police Superintendent Philip Tolloczko
Police Chief Inspector Kim Stiansen
Police Chief Inspector Kristin Hauge Bardal
Police Inspector Ingrid Hansen
Adviser and psychologist Brit Røisli

Some of the participants were present parts of the meeting which lasted from 09.30 to 15.00. This was the last data gathering concerning feedback on conceptual data models and data flow diagrams. The models had been sent to Kripos before the meeting, and a copy can be found in appendix 9.

In this meeting every model was discussed in detail, one by one, and the researcher recorded the changes directly on the models (written in red ink). The models with corrections can be found in appendix 15. On these models the reader can also find questions and comments the researcher wanted to discuss in the meeting (written in blue ink), and some additional comments to be discussed with the supervisor afterwards (written in black ink).

The discussion was very much related to details in the models, but also the English phrases used for naming entities and attributes was widely discussed. As a result e.g. the entity 'Informants' was renamed to 'Information source', and the analysis layer 'Inferences, conclusions and recommendations' was renamed to 'Reports' The inclusion of a log including the analysts' actions in the information system received a very positive response.

This time specifications of an automated log were also included. Traceability of information used in a case, when it was used and by whom, was a function that had been discussed for some time, and probably would be emphasised more in the future.

After this data gathering the changes were incorporated into the models, and the final models with comments can be found in subsection 7.4.

Even though this was the last data gathering concerning the data- and data flow models, the last data gathering in the research project was structural interviews which are described in the next section.

6.12 Data gathering 20.04.2005

The method used in this data gathering was structured interviews. An interview guide was prepared and sent the interviewees by e-mail before the interviews (the interview guide can be found in both Norwegian and English in appendix 16). The interviews were recorded and transcribed (in Norwegian) and transcripts can be found in appendix 18 – 20. The transcripts were sent to the interviewees together with a permission agreement. The letter following the transcripts (in Norwegian) can be found in appendix 17 and so can the permission agreement (in English). Four interviews were held and transcribed, and permission agreement was signed by three of the interviewees.

The questions prepared for the data gathering were divided into two main categories

The planning- and decision making process

1. Can you describe a typical planning- and decision making process for introducing an information system
2. Are there characteristic features associated with the planning- and decision making process?

Information systems

3. Which information systems are used in operational analysis at KRIPOS today?
4. Are all systems available to the investigator or do the investigator have to rely on other persons to obtain the information they need?
5. How is information exchanged between KRIPOS and the police?
6. How is information exchanged between KRIPOS and the judicial system?
7. Can you highlight problems and successes in new systems?

During the interviews following-up questions were also asked, and the questions are transcribed along with the interviewees' responses.

The remainder of this section will contain summaries of the transcripts translated into English for the three interviewees that signed the permission agreement. At the start of each subsection a brief description of the interviewees' background will be provided.

6.12.1 Summary of interview with NN2

First in this subsection an overview of the interviewee's background will be given. Thereafter the summary of the transcript will be divided into three parts; the planning- and decision making process (which include answers to question 1 and 2), information systems (which include answers to question, 3 – 6), and problems and successes in new systems (which include answers to question 7).

Background of the interviewee

Interviewee NN2 has a civilian education as a graduate engineer (*sivilingeniør*). NN2's career has been in the public sector; System developer in Statskonsult; head of (*byråsjef*) the Police Department, Ministry of Justice and the Police (*Justis- og politidepartementet*); head of National Police Computing Service (*Politiets datatjeneste, PD*); since 2004 NN2 has been head of Department for Information and Communication Technology (*IKT-avdelingen*) at Kripos.

The planning- and decision making process

The National Police Computing and Material Service (PDMT, *Politiets data- og materiellt jeneste)* is responsible for the development and maintenance of computer systems. There is no uniform way in which information systems is planned, but there are two main sources for a planning- and decision making process. Some information systems have been the result of needs from those using the system, and some information systems have been the result of a political process.

Systems being the result of a political process have often had its origin in an event, and the task of developing the system has been entrusted to PDMT who have been forced to give the task priority and not been able to take time to consider how the system should be connected to other systems. The result is that an autonomous system is performing the particular task. When PDMT receives a request for developing a new system they initiate a project with a project team and a steering committee with participants from the involved parties. Introduction of the system depends on the complexity of the system. In complex systems the Norwegian Police University College (*Politihøgskolen*) can be involved in training the users, or PDMT can, in less complex system, be responsible for the training. An example of a system that was developed as a result of a political process is the software for processing finger prints. In the 1980's the technology existed, but it was very expensive and there was

little appreciation for investing in a system as specialised as this. The event leading to the political decision for investing in such a system was a bomb exploding in a train station. A person sitting in a photo booth was killed when the bomb went off. It took quite some time to capture the perpetrator, and the head of the department dealing with finger prints was on the front page of VG (a Norwegian newspaper). He stated that with an automated finger print system the case would have been solved fast. This statement resulted in, almost over night, a political decision stating that an automated finger print system should be procured.

Often PDMT is occupied with tasks they have received from the political authorities, and when e.g. Kripos or a police district needs a new system, PDMT does not have the time to develop these minor systems. The development is therefore done locally and the result is again autonomous systems. A consequence of autonomous systems is that data has to be printed out from one system and entered into another in order to produce new reports. However, as time has passed some of the larger systems have been integrated. Integrated systems give the opportunity to focus on processes in stead of systems.

> "The benefit of information systems within the police today depends mostly on the knowledge each person has of the systems, and that they know what it contains in order to be able to search for data in the first, second, third, fourth or fifth system. Instead of, in a case of searching for a missing person, one can act in accordance with the function. But today you must use one system for wanted notices to Interpol, a second system for wanted notices to Schengen, a third system if you are going to send finger prints to Eurodac, and a fourth system for wanted notices in Norway."
>
> "*Nytten man i dag har av datasystemer i politiet er i stor grad avhengig av at den enkelte kjenner systemene og vet hva som ligger i de slik at du kan slå opp i det ene, andre, tredje, fjerde eller femte systemet. I stedet for at, hvis du satt med etterlysninger, så forholdt man seg til en etterlysningsfunksjon som tilbød alt du trengte i forbindelse med etterlysningen. Men i dag må du inn i ett system hvis du skal etterlyse i Interpol, du må i et annet hvis du skal etterlyse i Schengen, du må inn i et tredje hvis du skal sende fingravtrykk til Eurodac, du må inn i et fjerde hvis du skal etterlyse lokalt i Norge."*

The police have many good individual systems, but the systems require much of the users in order to find relevant information. If these systems had not existed good police work had not been possible.

Information systems

Potential interesting information for criminal intelligence analysis can be found in several systems both at the police force and at Kripos. The system used for the central part of the

intelligence analysis is a system called Analyst Notebook, and this system has interfaces to several other systems. But the analyst also has to find information in other systems without interface with Analyst Notebook. Intelligence has their own system called Krimsys and this is managed by Kripos. Two systems are used to record a person's criminal history; each police district is using a system as an initial record system (called BL) and the information is transferred to a central system (Strasak). Logs from telephone companies are also used in the analysis process in order to create relevant connections between people.

The investigator and analyst depend on access to several systems. Some of the systems are fairly easy to use and the access is regulated according to a persons function. Other systems are based on technology so old that reports have to be individually programmed. In some cases persons can receive a higher clearance to obtain information they usually do not have access to (e.g. intelligence information). Some of the systems also require specialist knowledge to be able to operate them. Both the analysis system and the fingerprint system are examples of these kinds of systems. The fingerprint system will provide a list of possible hits for a fingerprint, but it is a forensic scientist that ultimately makes the decision of a match. Employees at Kripos often have the expertise necessary to operate these kinds of systems which requires a certain amount of cases. E.g. in murder cases most police districts in Norway have too few murders to be able to maintain expertise in this area. Kripos therefore assists these districts when a murder is committed. However, the technology is changing so fast that what is considered expertise today may be viewed as general knowledge tomorrow.

Exchange of information between Kripos and the judicial system has been limited to sending reports of the investigation and analysis through the police district requesting the investigation.

Problems and successes in new systems

One system that started out being problematic is the DNA-system. A decision was made allowing the police to record DNA-profiles belonging to persons sentenced for specific crimes. This allowed search for DNA-comparisons from crime scenes. However, the regulations about using the system were quite restrictive. A blood sample should be taken and analysed in order to produce the profile. However, occasionally health personnel guarded against taking blood samples in prison. This resulted in taking samples from the mouth and

this was a task that could be performed by others than health personnel. A suspect's DNA-profile could be matched to the material gathered in a case, but trying to find a match in unsolved cases was not allowed unless the suspect gave a written consent. A suspect normally does not agree to give a written consent, but in one case the suspect gave permission to match the profile, and a match was found in an unsolved rape case. The case was published in the press and now this restriction does not apply any longer. After this event more samples has been analysed and recorded in the database, and the number of hits has increased.

Another success story is the Eurodac system in which fingerprints are recorded. This system is a result of the Dublin convention. The Dublin convention states that asylum seekers travelling to different countries seeking asylum shall be sent back to the first country where they applied for asylum. The Norwegian fingerprint database is electronically linked to the Eurodac system and this has resulted in that several asylum seekers travelling from country to country has been detected and sent back to the first country. False identities have also been discovered.

Two information systems which have not been a success are Krimsys and Narksys. Narksys contains drug crimes and all other crime is recorded in Krimsys. A division based on type of criminality was not purposeful, because criminal actions often involve more than one type of crime (e.g. organised crime). A result of the difficulties to find information was the establishing of local databases, which only increased the problems. However, a decision has been made to develop a new integrated intelligence system.

6.12.2 Summary of interview with NN4

First in this subsection an overview of the interviewee's background will be given. Thereafter the summary of the transcript will be divided into three parts; the planning- and decision making process (which include answers to question 1 and 2), information systems (which include answers to question, 3 – 6), and problems and successes in new systems (which include answers to question 7).

Background of interviewee

Interviewee NN4 is educated at the National Police School (*Politiskolen*) in Norway and has since then occupied different positions within the Norwegian Police. During the years after finishing the education at the National Police School NN4 has also taken different courses in law at university level, analysis course (at New Scotland Yard) and management course at the Norwegian Police University College (*Politihøgskolen*). NN4 has mainly worked with international investigation and intelligence in cooperation with international partners e.g. at Interpol, Oslo. Since 1994 NN4 has been employed by Kripos. NN4 has also had some administrative responsibilities, e.g. development of requirement specifications for a new national criminal intelligence system.

The planning- and decision making process

With large systems, like a system for criminal intelligence, the planning phase begins with the need for a system. An appropriate system does not exist, or the systems are too old to be useful because new technology is available, or the criminality has changed demanding a better system. The planning starts with making a survey of what criminal intelligence is; type of information, what does criminal intelligence produce, what does criminal intelligence need. Solutions are discussed and so is the implementation. The decision process starts with a decision in favour of a new system from the National Police Directorate (*Politidirektoratet*) and then a work group is established. Members of this group are experts in ICT (employees at PDMT), the expert users at the police districts and the special agencies. The Police Directorate (*Politidirektoratet*) participates with one or two members in leading positions. New smaller information systems also have its origin in a need for new systems. However, the planning, decision process and implementation are performed by the management at Kripos (if several departments use the systems) or the management in each department.

Software development for the Police, as a government department, are a niche product in the society, particularly in the Norwegian society, and some matters must be attended to; one must have documentation regarding presentation of evidence, one must know the police terms, and one must have a relation to the cycle of processing criminal cases which are not seen in other companies, except maybe in some law firms and The Customs and Excise Authorities (*Tollvesenet*). Attention to the cycle of processing criminal cases is probably the most important.

Information systems

Criminal intelligence analysis can be performed in many different cases and depending of type of case varies in its nature. All police systems are used (both national and international), and in addition information is gathered from telephone companies, banks, post offices and other governmental directories. Systems that are most used are the intelligence systems (Krimsys and Usys), a case system called BL (*Basisløsninger*) where all information produced by the civil servants in a case is recorded, and PO (*Politi Operativt System*) which is the orderly book for the operative task within the police. Even though information recorded in PO is not utilised at the moment of recording it can be useful in later investigations. With proper training the investigator will be able to collect data from most of the police' systems, but collecting data from other systems requires permissions from the court. Information exchange between the police districts and Kripos are done both in writing, by telephone, e-mail etc. Both the police districts and Kripos have access to an intranet where information is posted. The system BL (*Basisløsninger*) is now in the process of being updated so that all police districts and Kripos can use the same system. Information exchange between Kripos and the judicial system is mainly performed through paper documents.

The technological platform for police systems is fixed, and each system being developed must use this technology.

Problems and successes in new systems

It has been a problem that not enough attention was paid to the big picture when information systems were planned and implemented. New systems were isolated solutions.

> "A typical example is the journal at Kripos which is not electronically coordinated with the other computer solutions […] a system exist where data must be recorded, but it is not nationally available. That was a problem, now I can say that this really turned out to be a success because now it is recognised that […] the purpose of implementing new systems is trying to integrate existing solutions."
>
> "*Typisk er journalsystemet i Kripos som ikke er elektronisk samkjørt med de andre dataløsningene […] man har et system man bare må putte data inn i og som ikke er nasjonalt tilgjengelig. Det var et problem, nå kan jeg si at det egentlig er snudd til en suksess for nå ser man nettopp dette at […] poengene med å innføre nye systemer er å prøve å slå sammen eksisterende løsninger.*"

A stolen car used to be recorded in three different systems, but now it is recorded only once because integration between these three systems is now in place. Also an international

advertisement of loss in international police records is integrated.

6.12.3 Summary of interview with NN5

First in this subsection an overview of the interviewee's background will be given. Thereafter the summary of the transcript will be divided into three parts; the planning- and decision making process (which include answers to question 1 and 2), information systems (which include answers to question, 3 – 6), and problems and successes in new systems (which include answers to question 7).

Background of interviewee

Interviewee NN5 is educated at the National Police School (*Politiskolen*) in Norway. NN5 has additional education in data bases, analysis, and management (Norwegian Police University College). After working at a local police district NN5 has been employed by Kripos (since 1993). The tasks at Kripos have been investigation, intelligence, analysis, and a better utilisation of information within the police. NN5 has been head of Subsection for Data Records Management (*Avsnitt for registerforvaltning*) in the Department of Information and Communication Technology (*IKT-avdelingen*), and head of Subsection for Analysis and Method Development (*Avsnitt for analyse og metodeutvikling*). NN5 has often been an instructor at Norwegian Police University College (*Politihøgskolen*), and the subject areas have been investigation, intelligence and analysis.

The planning- and decision making process

A new system is often planned and implemented after an idea or that someone has seen a system that could be useful for the police. The next step will be an unofficial testing to determine if the system is useful. Then the formalisation process begins. The organisation is very hierarchical and the process is gradually lifted to higher levels within the organisation and at some point a formal decision is made to look more closely on the information system. A demo is tested out and a survey is made to determine the usefulness of the system and how it can be utilised. A plan for the economic costs is then made. The plan includes costs for training and implementation. The training is probably the part where it fails the most, the technical part is always taken good care of by professionals in that area within the police. A short training is given in new systems, but often other tasks have to be performed and the

training is forgotten. Most employees would benefit from a follow-up training. The total utilisation of ICT (Information and communication technology) available at the police is low. PDMT (National Police Computing and material Service, *Politiets data- og materielltjeneste*) has failed to attend planning and decision making in some processes, probably due to lack of capacity.

Many of the systems within the police are not integrated. This is a huge problem. When presenting the police' systems in lectures and talks an average of 40 systems was included. It is not possible for any one person to be able to utilise all these systems.

> "Improvements have emerged during recent years, but the characteristics for police systems are that there has been a lack of overall thinking. A need surfaces, the need has to be met, and then a solution covering just that need is made. […]This leads to autonomous systems."
>
> *"Det har kommet seg nå de siste årene, men det som har preget politisystemene er lite helhetlig tekning. Det oppstår et behov, det behovet må dekkes og så lager man en løsning som dekker akkurat det behovet. […] Så dette fører da til at det blir selvstendige systemer."*

Information systems

In the analysis phase of a case analysts read paper documents, mark out interesting information, and record the information in Excel. In some cases hundreds of folders with documents have to be manually analysed. Criminal intelligence analysts mostly use Excel and Analyst Notebook, but the systems are not utilised fully. Analyst Notebook has an analysis function and good interfaces for visualisation and the software are often used for visualisation only. In criminal intelligence analysis large, complicated amounts of information are handled. It is important to be able to present the information in a less complicated manner. Judges will often be familiar with the information, but jury members are not. An explanation of the term 'base station' is easier to understand if a visualisation of the technical aspects is provided.

Exchange of information with the judicial system always takes the form of paper documents. Within Kripos and between Kripos and the police districts the picture is more varied. Electronic exchange exits between e.g. BL (the investigation system of the police) and Strasak (journal of criminal cases) and Edis (database including missing vehicles and persons).

Problems and successes in new systems

Analyst Notebook is definitely an example on systems with success. It handles large amount of dynamic information well, new information is often added to a case. Changing information from unverified to verified are also being handled well. Problems with information systems are the lack of integration between different systems. The result is double or triple recording of data items. A danger then is the risk of errors. Even though quality assurance routines are followed, the risk of making errors is always present, even more so when one data item has to be recorded several times. This repeated recording also uses more resources than necessary. In later years much more focus is placed on choosing software that interacts, and many of the products are acquired from Microsoft and I2.

With the description of the structured interviews the data gathering is concluded. Results of the research are presented in the next chapter (chapter 7), as appendices and throughout the theoretical part of the thesis (the sections labelled introduction and comments in chapter 2 – 5).

CHAPTER 7
RESULTS

It seems to me that a much more appropriate term than systems analyst would have been systems synthesist – except for the unfortunate difficulty of saying this mouthful out loud. Synthesis is the "combining of separate elements or substances to form a coherent whole," and that seems to say pretty well what we are looking for. Perhaps the term synthesist would do all by itself, as systems is pretty well implied.
Gerald M. Weinberg (1988, p. 10)

The previous chapter outlined the different steps in the data gathering together with a description of which methods that had been used. This chapter will include results from the research; section 7.1 gives a description of the work with the mock-up case involving the stolen laptop; section 7.2 gives a description of the initial analysis and results; section 7.3 gives a description of EER-models with data from Jack the Ripper; and section 7.4 gives a description of the final analysis and results. However, results from the research are also presented in chapter 2 – 5, and as appendices. In appendix 6, 8 and 9 the reader can find EER-models and data flow diagrams from analyses performed after data gathering described in section 6.7., 6.8., 6.9, and 6.10.

Many of the sections in chapter 2 – 5 are followed by a subsection with comments relating the theoretical topics that have been discussed to the work performed at Kripos and to Kripos as an organisation. The introduction and comment sections in chapter 2 – 5 also include results, and some will be highlighted here. Section 2.1 includes the identification of possible points for communication break down (figure 2.1) and a model for an ideal communication pattern (figure 2.2). Section 3.1 includes an overview of Kripos as an organisation. In section 4.1 a brief overview of the analytic work and the intelligence process is given. In subsection 4.3.1 the reader can find comments to and a model of the extended intelligence process (figure 4.6). In the same subsection a model of the layered conceptual data model can be found (figure 4.7). As an introduction to chapter 5 (section 5.1.) a description of the analytic work at Kripos is given.

7.1 Mock-up case for a stolen laptop at the Department of Information Science, University of Bergen

As mentioned in chapter 6, the mock-up case was not the first chronological step, but it gives an overview of the research, hence it will be the first step to be described. The next subsection will include an outline of the case, thereafter the results of the first (subsection 7.1.2) and second review (subsection 7.1.3) of the data will be given. The last subsection will give an overview of the results of the analysis (subsection 7.1.4).

7.1.1 Outline of the case

This outline is based on the interview with the owner of the computer. A laptop was stolen from Hege Renee Hansen Åsand 16.04.2001, between 17.00 – 17.45. The laptop was stolen from her desk in reading room number 1 at the Department of Information Science, University of Bergen. The room was not locked. Connected to the laptop was a keyboard, a mouse, and a headset. Her wallet and a removable disk were also lying on the desk, but these were not stolen, neither were the keyboard or the headset. The thief had also stolen a black shoulder bag that was located under her desk. A male stranger with a black shoulder bag was seen at the premises about the same time as the laptop was stolen. The door to the department was locked at the time of the theft so somebody must have opened the door for the stranger.

7.1.2 First review of the data

After the interviews were transcribed an Excel spreadsheet was used to get an overview of the interesting information. In this thesis the information are translated into English and presented in tables (table 7.1 – 7.9). At the same time a classification was established (see table 7.13). The tables containing the interview data are divided according to the classification in table 7.13. The entity/item/relationship numbers was assigned to interesting items in the interview regardless of classification. This first analysis of the interview with Hege Renee Hansen Åsand resulted in the three tables (table 7.1 – 7.3).

Interview with Hege Renee Hansen Åsand, June 28th, 0905 – 0920.			
Entities		**Description**	**Researcher's comments**
1	Hege Renee Hansen Åsand	The person who was robbed of a laptop. Height: 1,72 Age: 29 Was sitting in the kitchen.	Can not remember where?
3	Geir André Bakke	Was sitting at data reading room 1. Used headset.	
4	Olav Gjesdal	Was sitting at data reading room 1. Used headset.	
10	Lene Lund	Was probably sitting in the kitchen.	
11	Bernt Olav Økland	Saw an unknown person in the hallway towards the kitchen. Was sitting in computer lab, room 4150.	Room number was added after the interview.
12	Unknown person	Male. Moving towards the kitchen. Obviously did not know where he should go. Went into the hallway again. (Described by Bernt Olav Økland).	Second hand information. Attributes that give direction and speed
13	Kristin Eide	Let the unknown person in to the department after 4 pm. Saw the same person leave with a black shoulder bag. (Described by Kristin Eide).	Her description fits well with Bernt Olav Økland's description. Second hand information. What about the item this person is carrying?
14	Magnhild Viste	Present when Bernt Olav Økland saw the unknown person. Not present when Hege Renee Hansen Åsand discovered that the laptop was missing.	
15	Maren Simonsen	Informed that Kristin Eide was sitting at the computer lab (room no 4149).	Room number added after the interview.

Table 7.1 Entities in the interview with Hege Renee Hansen Åsand, first review

Interview with Hege Renee Hansen Åsand, June 28th, 0905 – 0920.			
Items		**Description**	**Researcher's comments**
2	Laptop	Located at data reading room 1, the desk near by the entryway. Connected: external keyboard, mouse, network interface card, and headset. The laptop was logged in. Keyboard, mouse and network cable were not stolen.	Are keyboard, mouse and similar items in their own right, or attributes of item laptop?
5	Door leading to data lab 1	Open.	
6	Department exit door	Locked after 4 pm.	
7	Wallet	Belonged to Hege Renee Hansen Åsand. Located beside the laptop. Was not stolen.	
8	Disk	Belonged to Hege Renee Hansen Åsand. Was not stolen.	
9	Bag	Black shoulder bag for carrying the laptop. Belonged to Hege Renee Hansen Åsand. Was stolen.	

Table 7.2 Items in the interview with Hege Renee Hansen Åsand, first review

Interview with Hege Renee Hansen Åsand, June 28th, 0905 – 0920.			
Relationships		**Description**	**Researcher's comments**
16	Hege Renee Hansen Åsand Lene Lund	Sat talking in the kitchen.	Shall all the relationship be included? How should they be represented? What about the relationships the interviewee has been told about (the person she heard it from?)
17	Hege Renee Hansen Åsand Bernt-Olav Økland	Spoke after the theft.	
18	Hege Renee Hansen Åsand Maren Simonsen	Maren Simonsen notified Hege Renee Hansen Åsand that Kristin Eide was in Data Lab 1 during the theft.	
19	Hege Renee Hansen Åsand Kristin Eide	Contact after the theft through e-mail.	
20	Hege Renee Hansen Åsand	Mailed all the students at the department.	

Table 7.3 Relationships in the interview with Hege Renee Hansen Åsand, first review

After the analysis a floor plan for the department was used to represent the different entities and items, and which direction the entities were moving (see figure 7.1). The floor plan also helped to identify the room numbers added into the tables. Data reading room 1 is the room marked DL1 and the kitchen is marked "pauserom". The kitchen is just an expansion of the hallway.

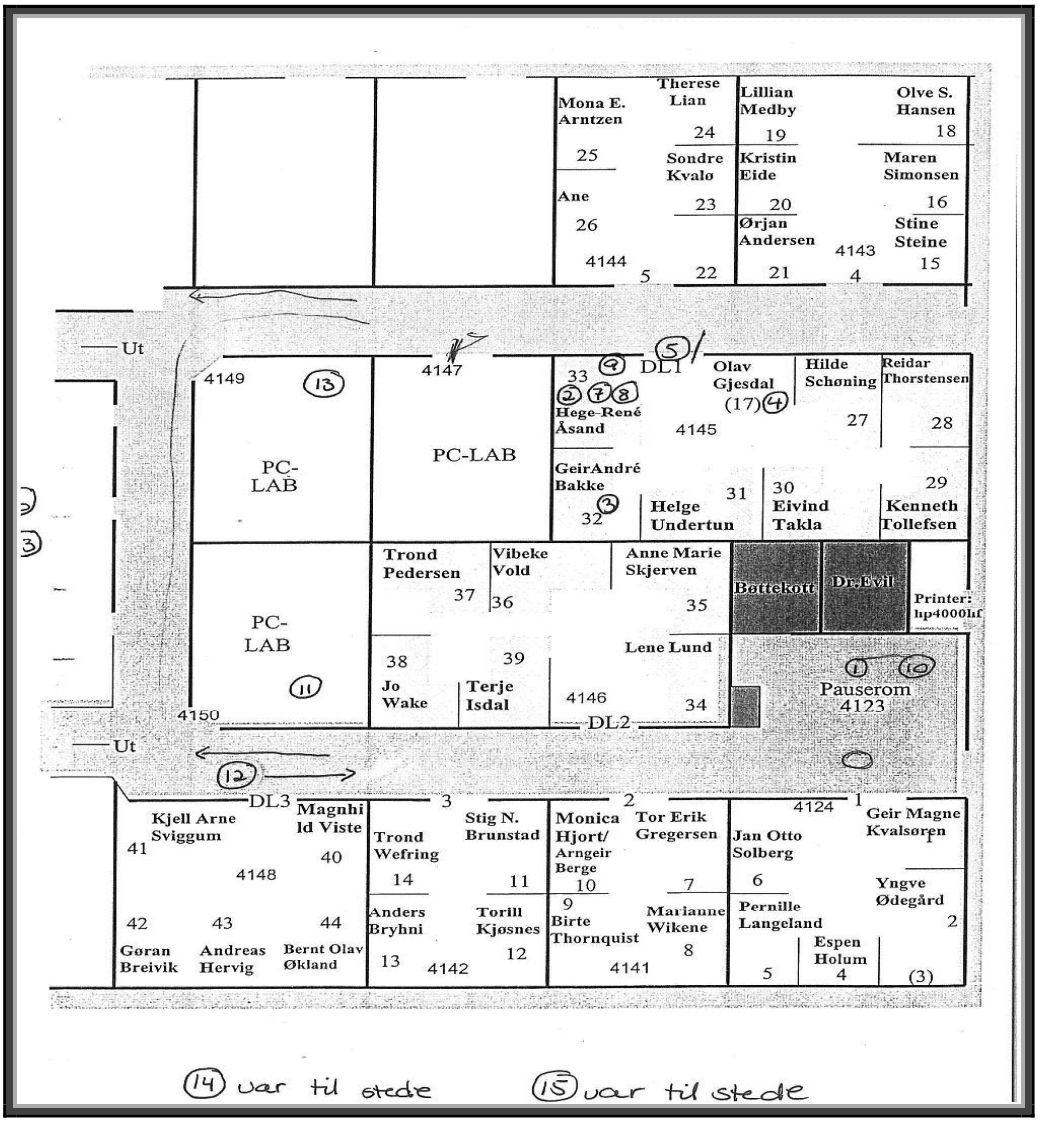


Figure 7.1 Floor plan with entities and items, first review

7.1.3 Second review of the data

After the first review of the data new spread sheets were made for the interviews with Hege Renee Hansen Åsand and for the interview with Bernt Olav Økland. The first three tables (table 7.4 – 7.6) will include entities and items. This time the numbers corresponds to the classification, entities were identified by numbers, items were identified by letters. A further categorisation of the information about entities and items was also introduced. For entities

height, age, and clothes the interviewee was wearing. For both entities and items location was divided into categories before, during, and after the laptop was stolen, and if the locations were exact or not. The last category for entities and items was for additional information. For items a category for state was also included.

Interview with Hege Renee Hansen Åsand, June 28th, 0905 – 0920.			
Entities		**Categorisation**	**Description**
1	Hege Renee Hansen Åsand	Height	1,72 m
		Age	29
		Clothes	Cannot remember
		Position before laptop was stolen	Kitchen
		Exact position	No
		Position when laptop was stolen	Kitchen
		Exact position	No
		Position after laptop was stolen	Department
		Exact position	No
		Additional information	The person who was robbed of a laptop
2	Geir Andre Bakke	Position before laptop was stolen	Data reading room 1
		Exact position	Yes
		Position when laptop was stolen	Data reading room 1
		Exact position	Yes
		Position after laptop was stolen	Department
		Exact position	No
		Additional information	Used headset. Tried to find out what had happened after the theft.
3	Olav Gjesdal	Position before laptop was stolen	Data reading room 1
		Exact position	Yes
		Position when laptop was stolen	Data reading room 1
		Exact position	Yes
		Position after laptop was stolen	Department
		Exact position	No
		Additional information	Used headset. Tried to find out what had happened after the theft.

Interview with Hege Renee Hansen Åsand, June 28th, 0905 – 0920.			
Entities		**Categorisation**	**Description**
4	Lene Lund	Position before laptop was stolen	Kitchen
		Exact position	No
		Position when laptop was stolen	Kitchen
		Exact position	No
		Position after laptop was stolen	No information
		Exact position	No information
		Additional information	The witness is not sure about Lene Lund being in the kitchen.
5	Bernt Olav Økland	Position before laptop was stolen	No information
		Exact position	No information
		Position when laptop was stolen	No information
		Exact position	No information
		Position after laptop was stolen	Computer Lab, room 4150
		Exact position	No
		Additional information	In the timeperiod in question he saw an unknown person probably not belonging to the department.
6	Unknown person (Information about entity 6 is second hand (from Bernt Olav Økland)).	Description	Male
		Direction of movement	Walking down the hall towards the kitchen, thereafter back down the hall again.
		Additional information	Quite obvious that he did not know where here was going, looking around.
7	Kristin Eide (Information about entity 7 is second hand (from Kristin Eide)).	Position before laptop was stolen	Department exit door
		Exact position	Yes
		Position when laptop was stolen	No information
		Exact position	No information
		Position after laptop was stolen	Not at the department
		Exact position	No information
		Additional information	Let the unknown person in to the department after 4 pm. Saw the same person leave with a black shoulder bag.

Interview with Hege Renee Hansen Åsand, June 28th, 0905 – 0920.			
Entities		**Categorisation**	**Description**
8	Person (Statement from interviewee based on information from Kristin Eide).	Description	Description that fits Bernt Olav Økland's description of unknown person.
9	Magnhild Viste	Position before laptop was stolen	No information
		Exact position	No information
		Position when laptop was stolen	Department
		Exact position	No
		Position after laptop was stolen	Not present
		Exact position	No information
		Additional information	No information
10	Maren Simonsen	Position before laptop was stolen	No information
		Exact position	No information
		Position when laptop was stolen	Computer Lab, room 4149
		Exact position	No
		Position after laptop was stolen	Department
		Exact position	No information
		Additional information	Told Hege Renee Hansen Åsand that Kristin Eide was sitting at the same Computer Lab.

Table 7.4 Entities in the interview with Hege Renee Hansen Åsand, second review

Interview with Bernt Olav Økland, June 29th, 1230 – 1240.			
Entities		**Categorisation**	**Description**
5	Bernt Olav Økland	Height	Appr. 1,80 m
		Age	26
		Clothes	Black jeans, black t-shirt
		Position before laptop was stolen	Kitchen. His position allowed him to look down the hallway.
		Exact position	Yes
		Position when laptop was stolen	Kitchen. His position allowed him to look down the hallway.
		Exact position	Yes
		Position after laptop was stolen	Data reading room/on his way there from the kitchen.
		Exact position	No
		Additional information	No information
6	Unknown person	Sex	Male
		Height	Appr. 1,80 m
		Hair	Short, probably dark blond.
		Clothes	Jacket: probably khaki, definitely fair. Trousers: Fair.
		Additional information	Looking normal.
		Direction of movement	Down the hall towards the kitchen, stopped outside data reading room 3, turned and went away.
		Additional information	Looked like he read the names at the door to data reading room 3. The interviewee thought he was about to read the labels on the door on the other side of the hallway, but he left. The interviewee did not know the person. Not observed after Hege Renee Hansen Åsand became aware of that the laptop was stolen.

Interview with Bernt Olav Økland, June 29th, 1230 – 1240.			
Entities		**Categorisation**	**Description**
10	Magnhild Viste	Position before laptop was stolen	Kitchen, she could see down the hallway
		Exact position	Yes
		Position when laptop was stolen	Kitchen, she could see down the hallway
		Exact position	Yes
		Position after laptop was stolen	No information
		Exact position	No information
		Additional information	No information
1	Hege Renee Hansen Åsand	Position before laptop was stolen	The kitchen
		Exact position	No
		Position when laptop was stolen	The kitchen
		Exact position	No
		Position after laptop was stolen	Department
		Exact position	No
		Additional information	Asked who it was that had taken her laptop

Table 7.5 Entities in the interview with Bernt Olav Økland, second review

Interview with Hege Renee Hansen Åsand, June 28th, 0905 – 0920.			
Items		**Categorisation**	**Description**
A	Laptop	Position before laptop was stolen	Data reading room 1, the desk near by the door.
		Exact position	Yes
		Position when laptop was stolen	Data reading room 1, the desk near by the door.
		Exact position	Yes
		Position after laptop was stolen	
		Exact position	
		Additional information	Logged on to the departments network.
B	Keyboard	Position before laptop was stolen	Data reading room 1, the desk near by the door.
		Exact position	Yes
		Position when laptop was stolen	No information
		Exact position	No information
		Position after laptop was stolen	Data reading room 1, the desk near by the door.
		Exact position	Yes
		Additional information	Connected to the stolen laptop.

Interview with Hege Renee Hansen Åsand, June 28th, 0905 – 0920.			
Items		**Categorisation**	**Description**
C	Mouse	Position before laptop was stolen	Data reading room 1, the desk near by the door.
		Exact position	Yes
		Position when laptop was stolen	No information
		Exact position	No information
		Position after laptop was stolen	Data reading room 1, the desk near by the door.
		Exact position	Yes
		Additional information	Connected to the stolen laptop.
D	Headset	Position before laptop was stolen	Data reading room 1, the desk near by the door.
		Exact position	Yes
		Position when laptop was stolen	No information
		Exact position	No information
		Position after laptop was stolen	Data reading room 1, the desk near by the door.
		Exact position	Yes
		Additional information	Connected to the stolen laptop.
E	Network Cable	Position before laptop was stolen	Data reading room 1, the desk near by the door.
		Exact position	Yes
		Position when laptop was stolen	No information
		Exact position	No information
		Position after laptop was stolen	Data reading room 1, the desk near by the door.
		Exact position	Yes
		Additional information	Connected to the stolen laptop.
F	Door to Data reading room 1	State	Open.
G	Department Exit door	State	Locked (automatically locks at 4 pm)
H	Wallet	Position before laptop was stolen	Data reading room 1, the desk near by the door.
		Exact position	Yes
		Position when laptop was stolen	No information
		Exact position	No information
		Position after laptop was stolen	Data reading room 1, the desk near by the door.
		Exact position	Yes
		Additional information	Belonged to Hege Renee Hansen Åsand

Interview with Hege Renee Hansen Åsand, June 28th, 0905 – 0920.			
Items		**Categorisation**	**Description**
I	Disk	Position before laptop was stolen	Data reading room 1, the desk near by the door.
		Exact position	Yes
		Position when laptop was stolen	No information
		Exact position	No information
		Position after laptop was stolen	Data reading room 1, the desk near by the door.
		Exact position	Yes
		Additional information	Belonged to Hege Renee Hansen Åsand
J	Bag	Position before laptop was stolen	Data reading room 1, under the desk near by the door.
		Exact position	Yes
		Position when laptop was stolen	Data reading room 1, under the desk near by the door.
		Exact position	Yes
		Position after laptop was stolen	Stolen.
		Exact position	
		Additional information	Belonged to Hege Renee Hansen Åsand. The thief had probably put the computer into the bag.

Table 7.6 Items in the interview with Hege Renee Hansen Åsand, second review

The entities and items were drawn into the floor plan (see figure 7.2). Numbers symbolise entities and letters symbolise items. To make a distinction to the sources of the information symbols were used. Information taken from the interview with Hege Renee Hansen Åsand is placed in a circle. Information from the interview with Bernt Olav Økland is placed in a triangle. Movement is depicted with an arrow. The solid-drawn lines represents first hand information, the broken lines represents second hand information. Exact location of the entities and items are shown with symbols in red, located in the room is shown in blue, present at the department, but without any location is shown in black (and drawn outside the department to avoid confusion).

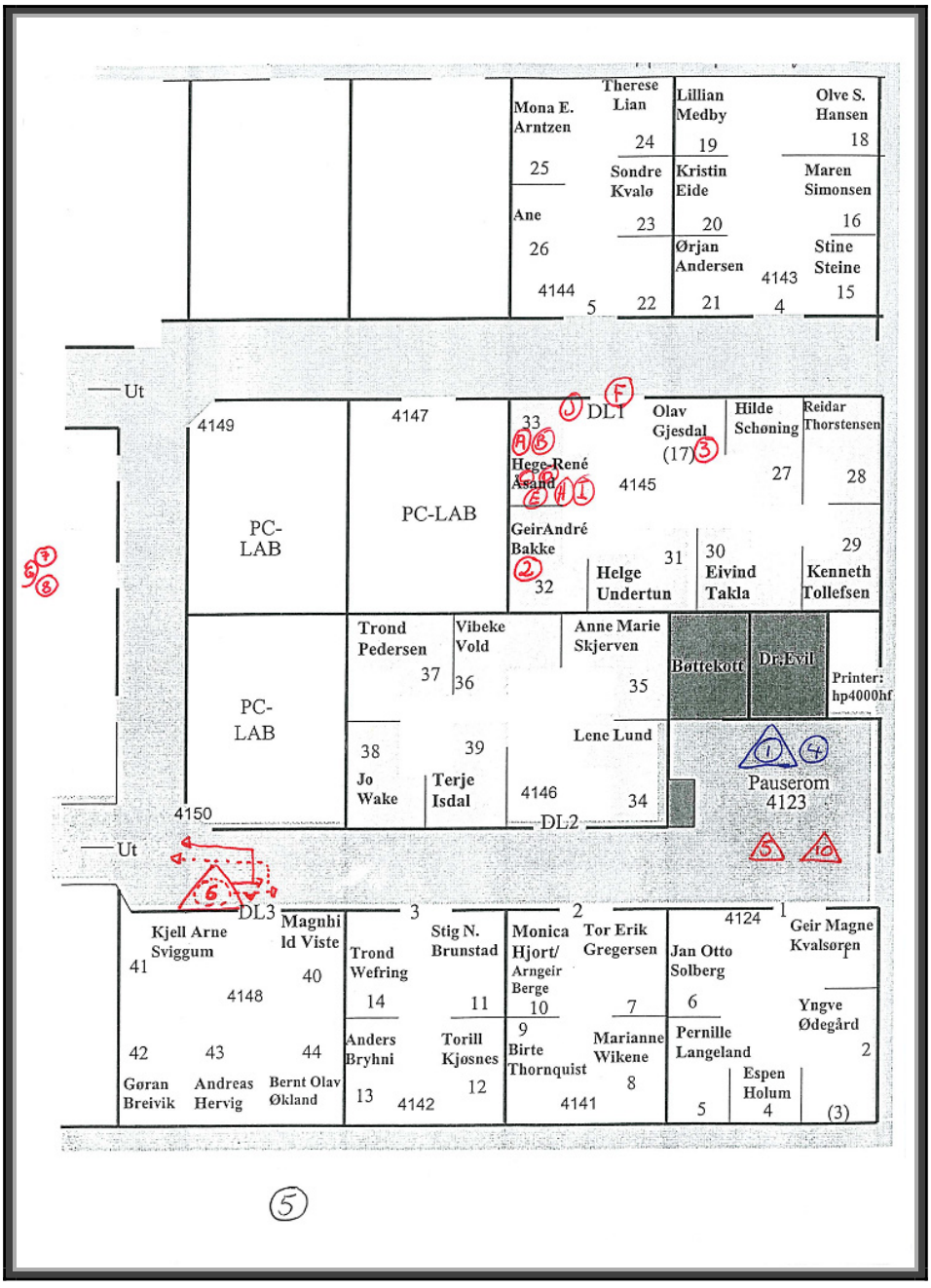


Figure 7.2 Floor plan with entities and items, second review

Relationships between the entities were given numbers from 101 and upwards. Table 7.7 gives an overview of the relationships in the interview with Hege Renee Hansen Åsand. No other change than the numbering was done in the second review.

At this point it also became clear that statements could be of great importance. Conflicting and/or correspondence between statements were important to represent. Some statements can be interesting without being in correspondence and/or conflict with other statements (single). The table below shows two statements that are in conflict. The reference consists of: the initials to the interviewee-number of entity/*number of statement.

Statements			
Interview with Hege Renee Hansen Åsand, June 28th, 0905 – 0920.	**Interview with Bernt Olav Økland, June 29th, 1230 – 1240.**	**Correspondence/ Conflict/ Single**	**References**
(Talking about who was sitting in the kitchen with her). I think it was Lene Lund, I think it was her I was sitting together with. Yes. There were probably some more people here, but they were not sitting in the kitchen at that time. (Talking about what she was doing after the theft was discovered, and where people had been during the theft.) ….Bernt Olav Økland was sitting in the data reading room…	(Talking about which persons were sitting in the kitchen.) It was me and Magnhild sitting there. There were more people sitting there, but I can not remember who.	Conflict	HRHÅ-04/*1> BOØ-05/*1

Table 7.7 Statements in interviews, second review

Conflicts between statements or information about entities, items, and relationships that are not clear can lead to new actions. The conflict of statements in table 7.7 resulted in a new e-mail to Hege Renee Hansen Åsand to clarify where Bernt Olav Økland had been. The need to keep track of actions taken became clear, and table 7.8 and 7.9 give an overview of the actions for witness Hege Renee Hansen Åsand and Bernt Olav Økland. The syntax for action number is: interviewee inititals-sequential number, and the syntax for reference is interviewee

initials-entity number/*number of statement> interviewee initials-Entity number/*number of statement.

Log, theft of laptop. Owner: Hege Renee Hansen Åsand.				
Witness: Hege Renee Hansen Åsand.				
Action number	**Date**	**Action**	**Investigator**	**Reference**
HRHÅ-01	26.06.2001	E-mail, inquiry about interview	SW	
HRHÅ-02	26.06.2001	E-mail, answer to inquiry	SW	
HRHÅ-03	26.06.2001	E-mail, agreement on interview	SW	
HRHÅ-04	28.06.2001	Interview	SW	
HRHÅ-05	01.07.2001	Transcription	SW	
HRHÅ-06	23.07.2001	E-mail, inquiry about additional information	SW	HRHÅ-04/*1> BOØ-05/*1
HRHÅ-07	25.07.2001	E-mail, additional information	SW	

Table 7.8 Log containing actions for witness
Hege Renee Hansen Åsand, second review

Log, theft of laptop. Owner: Hege Renee Hansen Åsand.				
Witness: Hege Renee Hansen Åsand.				
Action number	**Date**	**Action**	**Investigator**	**Reference**
BOØ-01	28.06.2001	E-mail, inquiry about interview	SW	
BOØ-01	28.06.2001	E-mail, information	SW	
BOØ-02	28.06.2001	E-mail, inquiry about interview	SW	
BOØ-03	29.06.2001	Interview	SW	
BOØ-04	01.07.2001	Transcription	SW	

Table 7.9 Log containing actions for witness
Bernt Olav Økland, second review

During the analysis the researcher often needed to record thoughts about the data. This can be done in writing or by speech. What the different persons involved in the case were doing at the time of the theft was important, and that can be described as the role they had. It is also conceivable that each investigator will have his or her view of the data. The main points in this second review are summarised in the next subsection.

7.1.4 Results from the analysis

The analysis resulted in identification of some problems and their solution.

1. In the interviews it became clear that it was difficult to understand where people had been located during the theft, even though all the involved were familiar with the surroundings. As a result it became clear that the system had to have the possibility to include maps and/or floor plans (which also could be used in the interview situation).

   In this case this would mean a floor plan for the department.

2. Some people had stayed in the same geographical area during the interesting time frame, others had moved. As a result the information system must have the ability to pinpoint different geographical locations for each person at different timeframes and the direction of movement and speed between the geographical locations.

   Interesting time frames in this case was before the theft, during the theft, and after the theft.

3. Of importance was also whether the information was first- or second hand (reliability) and this should be incorporated into the information system.

4. Some of the students were new to the department so not all knew their names, and in some cases it was difficult to find out who the witnesses was talking about. Only one of the witnesses remembered which clothes he was wearing the day in question. As a result multiple descriptions of persons must be entered into the information system although probably some of the descriptions refer to the same person. It must also be possible to link one description to different witnesses.

   Examples:
   One witness description:
   "He [the stranger] looked ordinary. I think he was about 1,85 cm or something like that, maybe. A little taller than me [the witness stated that she was 1,75, 6, 7 cm high]. He [the stranger] was wearing a light grey blue jacket, light clothes, blond, dark blond."

Another witness description:
"I think he [the stranger] is about my height, 1,80 cm [the witness stated that he was approx. 1,80 cm]. He was nicely dressed, nothing particular, fair clothes. He was dark blond I think, and his hair was short. He was wearing a jacket, probably khaki."

A third description:
"Fair fellow, does not remember anything else about his looks, he left shortly after with a bag."

5. A case includes different items and the information system must contain the items with descriptions.

   Examples from this case; the laptop, keyboard, mouse, wallet, portable disk, bag, door leading to the department (which was locked), door to reading room no 1 (which was not locked).

   It can be difficult to decide what an item is. The laptop can be an item in itself, or an item can be seen as the laptop with keyboard and mouse.

   In this case (since the keyboard was not stolen, but the mouse was) it would be best to represent these three items separate.

6. What the different persons were doing at the time of the theft was important, and the information system should be able to include these roles.

7. Statements that are difficult to relate to items or particular persons are also interesting and can be in conflict or correspondence. It is important that particularly statements that are in conflict can be related. These statements can give opportunities for further investigation. The statements can be given by different persons, or one person can give one statement in one interview and a conflicting statement in another interview.

   Example from this case. Two witnesses talking about (what they at least believe is the same moment time).
   One witness:

"There were probably more persons present, but they did not sit in the kitchen just then."
Another witness:
"No, I was not in the Data reading room, I was sitting in the kitchen."

8. Another interesting aspect was which persons had been in contact with other persons. At the time of the event this is important because information can be verified. After the event it is interesting because through talking about the event the witnesses can have altered their perception of what was going on.

   Examples from this case:
   The owner of the laptop sat talking to a person in the kitchen when the theft was done.

   The owner of the laptop talked to another person after the theft.

   The owner talked to yet another person after the theft. This person gave the owner of the laptop the name of a student sitting on one of the labs during the theft.

   There had also been some communication after the theft through e-mail.

9. The interviews were transcribed, but as an extra source the information system should contain the sound files as well.

10. The documents related to the interviews in the case should also be included in the information system.

    In this case it would be the e-mails from the witnesses, and the e-mails exchanged between the witnesses.

11. Each investigator will probably have his or her view of the data. The information system must be able to record this.

12. The information system should be able to hold the investigator's thoughts about the data, either in writing, or as speech.

These results conclude the work with the mock-up case and the rest of the chapter will be related to the work with the models for the computerised information system for Kripos.

7.2 Initial analysis and results

The analysis description in this section can be divided into two parts; before and after the data gathering at Kripos 23.01. – 01.02.2002. Analysis and results before this data gathering is described in subsection 7.2.1 through 7.2.3 and based on work with the mock-up case for the stolen laptop (described in section 6.4. and 7.1) and data gathered at Nordic course in criminal intelligence analysis (described in section 6.5). Analyses and results after the data gathering at Kripos 23.01. – 01.02.2002 (described in section 6.6) are described in subsection 7.2.4 through subsection 7.2.6.

The first part of the initial period of analysis was focussed on the data, and can be divided into three different parts

1. The different data sets and their area of use were identified (subsection 7.2.1)
2. The different functions and characteristics for the data were determined (subsection 7.2.2.)
3. Using the purpose of reconstructing the course of events involved in a crime interesting information was singled out and a classification of the interesting information was made (subsection 7.2.3)

The second part of this analysis period was to obtain an overview of the intelligence process as defined by Kripos (see subsection 4.1, and subsection 6.5.1 and 6.6.1) and which data that are interesting in each step of the process. The analysis can be divided into two different parts:

1. The first sketches and EER-models for the computerised information system was drawn (subsection 7.2.4 and subsection 7.2.5)
2. Drawing the models to be used in the data gathering 26.11.2002 (subsection 7.2.6)

7.2.1 Data sets and their area of use

In a criminal investigation there are several different data sets originating from different sources. The sets will have different interest for the analyst depending on how the information was gathered, and what the information is about. Table 7.10 gives an overview of the datasets involved in an investigation together with a description and the analyst's interest in the information.

Data set	Description	Analyst's interest
Telephone log	The structure in the datasets will include telephone number and geographical localization of sender and receiver, length of the conversation, and the subscriber's name.	The analyst will be interested in examining if there is any pattern in the data.
House-to-house-investigation	Every household will be asked the same questions. The questions can include time and place, description of the perpetrator, description of what the witness saw, and a description of what the witness was doing on the time in question.	The analyst will check for correspondence and/or conflicts in the information.
Evidence	Evidence can include information about all physical items that can be tied to the scene of the crime, diaries or other documents that refer to the incident together with analyses of e.g. biological material.	The analyst will need to know which physical evidence that has been gathered and if the evidence with certainty can be tied to the perpetrator or not.
Interviews/ interrogations	Interviews/interrogations will be unstructured interviews, but they will have some elements in common. The investigator will give a description of the person being interviewed or interrogated. The description will consist of name, address, personal details and a description of the person. The witness or the suspect will give a description at the moment(s) in time that are under investigation. The most important information in this respect is time, place, activity, description of themselves, and description of what they saw and who they met.	The analyst will check for correspondences and/or conflicts in what the different witnesses/ suspects have given of information or if there is correspondence and/or conflicts in what the witnesses/suspects have said in different interviews.
Tips from the general public	Tips from the general public will include different aspects of the investigation, and the information can be incomplete and anonymous.	The analyst will try to attach meaning to these tips and evaluate the tips against other information gathered in the case.
Existing registers	Electronically stored data (e.g. fingerprints, former arrests)	The analyst will also need to check information in existing registers. E.g. it may be necessary to check if a person has been arrested or punished prior this investigation.

Table 7.10 Types of data sets in a crime investigation with the analyst's interest in the data

7.2.2 Functions and characteristics of the data sets

As mentioned in section 6.1 the criminal intelligence analysis can be divided into six phases, but it was also pointed out that the focus of this research was transforming data to information. This transformation can be divided into four functions; data gathering, data structures, presentation, and use. There are also four characteristics that should be present for each data element; reliability (e.g. evaluation of first or second hand information), completeness, precision, and determination of time. The characteristics are to be secured in the data gathering, protected in the data structures and models of presentation, and utilised through the use of the information system. The analyst will depend on being able to view all data on a subject; there is no room for lack of data or data that do not concern the subject. Degree of reliability is for the investigator to determine during the investigation, and the reliability will vary with the source of the information. Determination of time is one main focus during an investigation, and it is often a difficult task. Examples of problems connected to the characteristics for data gathering, data structures, and presentation for two of the data sets are presented in table 7.11. Some of the characteristics and functions will represent different problems for the structured and the unstructured data. The chosen data sets represent both types; telephone logs which will consist of structured data and interviews/interrogations which will consist of unstructured data.

Functions / Characteristics	Gathering	Data structures*	Presentation	Use
Reliability				
Telephone logs (structured data)	Data gathered from telephone companies will be reliable	None	None	Which telephone numbers have been connected at which point in time?
Interviews/ Interrogations (unstructured data)	Problems can be related to: - the witness - the surroundings - time	Problems with retrieving all relevant data (difficult to determine what is relevant)	The models must be able to compare data that describes the witness, the surroundings and the time in addition to data about the committed crime	The information are emphasised according to degree of reliability
Completeness				
Telephone logs (structured data)	Depends on the telephone company's specifications	None	The requirement for completeness can be in conflict with the time used to retrieve the data	Search for patterns in the data
Interviews/ Interrogations (unstructured data)	Depends on previous gathered information, interview/ interrogation methods and tools used in the interviews/ interrogations	Problems with retrieving all relevant data (difficult to determine what is relevant)	The requirement for completeness can be in conflict with the time used to retrieve the data	Search for conflicts/ correspondence/ shortcomings in the information
Precision				
Telephone logs (structured data)	Depends on the telephone company's specifications	None	None	Easier to compare information at a high degree of precision
Interviews/ Interrogations (unstructured data)	Depends on data gathering techniques	Problems with retrieving relevant (and only relevant) data (difficult to determine what is relevant)	None	Easier to compare information at a high degree of precision
Determination of time				
Telephone logs (structured data)	Accurate	None	None	Secure determination of time regarding the course of events
Interviews/ Interrogations (unstructured data)	Depends on the investigator's degree of accuracy during recording/Witnesses memory	Problems regarding the accuracy of the data	None	Secure determination of time regarding the course of events

* All data structures must be dynamic in order to support each analyst's (analyst group's) perspective on the information

Table 7.11 Problems in data sets related to functions and characteristics

The problems listed in table 7.11 are of two types; problems a computerised information system can deal with (listed in the columns data structures and presentation), and problems that need to be addressed by the analyst (listed in the column use). The border between these types will be changing, depending on the development in e.g. artificial intelligence. This debate is not to be discussed in this thesis, but as an example on problems that can be solved through data structures are problems related to time, and problems that falls upon the analyst to solve are the question of reliability of information given by witnesses. The problem of the witness' determination of time will be solved by introducing a date and time frame (figure 7.12) that can be changed during the investigation. The reliability can be incorporated as well by introducing the witness' own perception of the accuracy of date and time frame (determined by a percentage). The same date and time frame can be used for the investigation as such. Often in the beginning of the investigation the date and time frames can be quite broad, but through more and more information narrowing down the time frame can be possible.

From date	From time	To date	To time	Percentage
16.04.2001	17.00	16.04.2001	17.45	80

Table 7.12 Time and date frame with accuracy percentage

7.2.3 Classification of data

The practical work at the course in criminal intelligence analysis and the work with the mock-up case gave an overview of the interesting information that are needed to reconstruct the course of events involved in a crime. Even though the different cases have different information that are interesting (e.g. a theft, a murder, a gun, or a laptop), an attempt to classify this information was carried out. As described during the work with the mock-up case persons, items, relationships and statements were interesting bits of information. To be able to use a computerised information system effectively and efficiently when analysing interesting information a classification of the information as a basis for data structures was needed. This classification would of course introduce some stringency, but on the other hand it would make the analyst think in terms of information that is vital in an investigation.

Table 7.13 gives an overview of the different classes the information was divided into together with a description and examples of each class. The classification in table 7.15 will

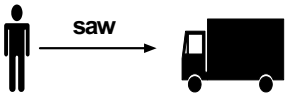
define a hierarchy of information. At the top level is the class event. At the next level the class entity and item will occur. The class role and statement can be connected to each instance of entities. Location, motion, direction, and time (represented as a date and time frame) can be connected to each instance of event, entity and item. The class relationship can be connected to instances of event, entity, item and statement. In addition to the explanation of the class relationship in table 7.13, relationships will be described further after the presentation of the table.

Class	**Description**	**Examples**
Event	The event under investigation	A theft, a murder
Entity	Can move and act	A person, a dog
Item	Physical objects	A laptop, a gun
Role	What the person was doing	Drinking coffee, walking the dog
Statement	Statements not classified as an entity or an item, but still interesting, either because the statement is consistent or inconsistent with other statements	One person has stated being in two places at the same time. A person has been placed at different locations by different witnesses.
Location	Locations included in the crime	The scene of the crime, places people have been
Motion	Entities or items in motion	One witness passed the crime scene in a car.
Direction	Entities or items in motion	The direction the witness in a car passed the crime scene
Time	Time can be connected to entities, items, statements and/or relationships	One witness saw a car on the scene of the crime
Relationship	Relationships between two or more entities, items and/or statements	One witness saw a car on the scene of the crime

Table 7.13 Classification of data used during criminal investigation

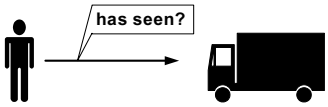
In an investigation there will be many complex relationships, and during the course of the investigation investigators/analysts will form an opinion about the data. The category relationship will therefore have two types of relationships; one type with basis in the data and one type established with basis in the analyst's thoughts about the data. Examples of the two types are shown in figure 7.3.

1) Relationships established with basis in the data.



This example depicts a witness describing that he saw a car.

2) Relationships established with basis in the analyst's thoughts about the data.



This example depicts an analyst's wondering if a person has seen a car. This kind of relationship can emerge from a witness stating that he was at a specific location at a specific time (not stating anything about seeing a car), and another witness stating that he saw a car at that location at the same time.

Figure 7.3 Examples of different types of relationships between data.

This analysis session concluded with the first data gathering at Kripos that took place at the end of January 2002, and the analysis after this event will be described in the following subsections.

7.2.4 Initial sketches for the computerised information system

Nine initial sketches will be described in this subsection. Some sketches include numbers in the heading, and these numbers refers to the intelligence process.

Sketch 1 is an overview of the intelligence process. The intelligence process is followed, but the division of stages has been altered (data gathering and dispatch are not included in the sketches or models).

Sketch 2 is an elaboration of sketch 1. The new item added is the log. A log shall be connected with every event. The log should include which analyst/investigator that has entered/modified the data at which point in time. The format for the log will be presented later in this chapter.

Sketch 3 gives an overview of evaluation and preparation and shows the different data sources that may be relevant. The sources are divided into internal data sources in that particular case (tips, house to house investigation, report from investigation, interviews, crime scene inspection, autopsy report, and offender profiling) and other data sourced (data from external databases and telephone logs). The sketch also shows which datasets that should undergo information and person evaluation (see subsection 7.2.1 for a further explanation). The information system should include pictures (e.g. from autopsies to show injuries) and sound files (e.g. from interviews). A summary of interviews are now transcribed and then signed by the interviewee. A sound file would give a more accurate representation than the summary.

Sketch 4 gives an overview of analysis – integration, and shows a grouping of verified and unverified data (see section 5.1.) as they occur, without interpretation from the analyst. The sketch includes the class entity, item and statement, the subclasses person, animal, car, and weapon, and the relationships between them. If two or more analyst works with the data each analyst will have a view connected with the log dedicated to each of them.

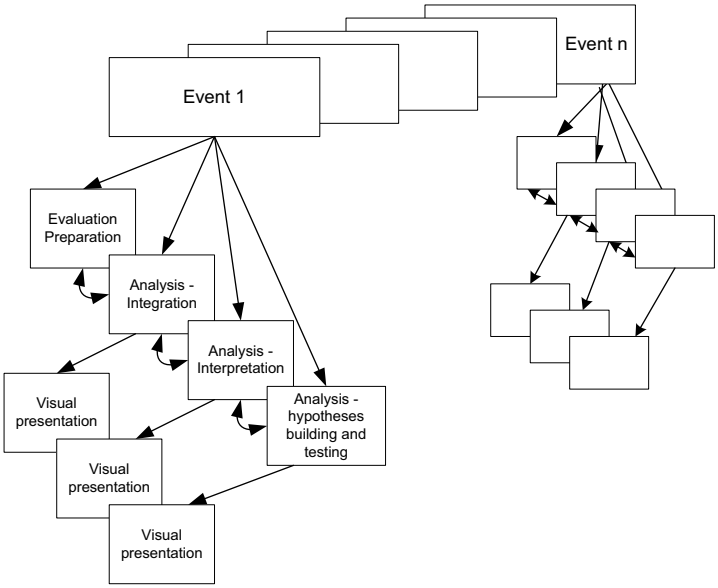
Sketch 5 gives an overview of analysis – interpretation. In addition to grouping the facts it also shows the analyst's interpretations of the verified and unverified data i.e. reflect their own evaluations and predictions about the important aspects. The blue arrows are meant to represent the analyst's thoughts about the data, and the black arrows are from sketch 4, and they are based on the relationships expressed in the data; "the facts".

Sketch 6 gives an overview of analysis – interpretation and hypothesis building. In building hypotheses verified and unverified information, interpretations, evaluations and predictions are combined in a hypothesis that focus on further data gathering. The blue arrows are meant to represent the analyst's thoughts about the data (interpretation), the black arrows are based on the relationships expressed in the data; "the facts". The green arrows depicts where the data in the hypothesis can come from.

Sketch 7 gives an overview of the elements of a hypothesis. A hypothesis consists of evaluations, interpretations and predictions. Predictions are recommendations of which steps that will give the most valuable information in further work. A hypothesis also includes verified and unverified information about items, entities, statements, and relationships.

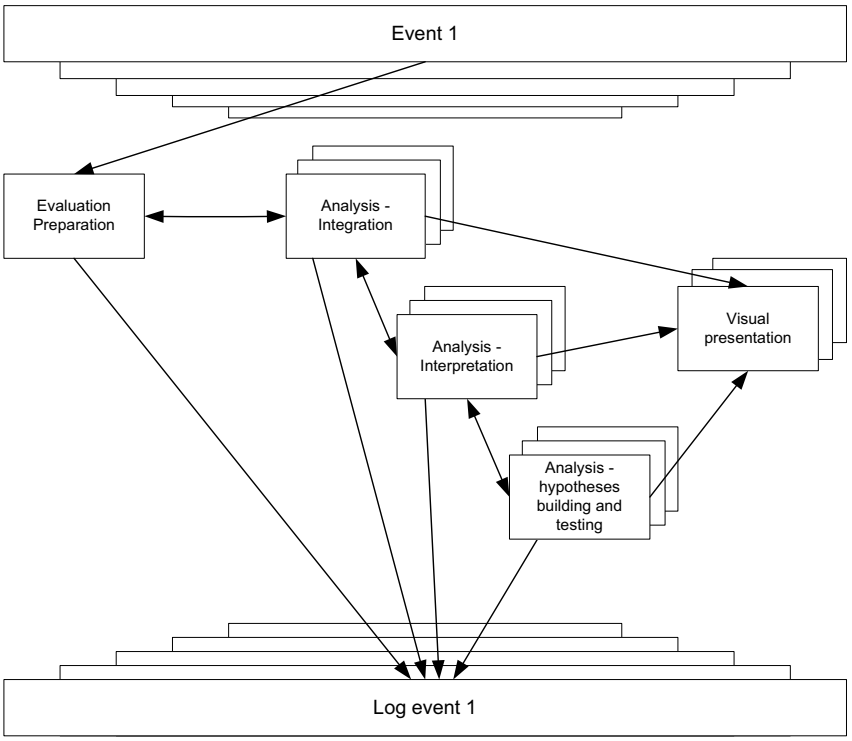
Sketch 8 gives an overview of analysis – report findings. In this step conclusions and recommendations are developed using only verified information. The blue arrows are meant to represent the analyst's thoughts about the data (interpretation), the black arrows are based on the relationships expressed in the data; "the facts". The green arrows depicts where the data in the hypothesis can come from.

Sketch 9 gives an overview of analysis – conclusions and recommendations. Recommendations are based on verified information, not unverified information.



The overall categorisation will be based on events.
An event can
- include one or more action(s)
- be a crime already committed
- be information about planned illegal actions (crime control)
- be project based cases where several action related to each other through modus and/or type of crime

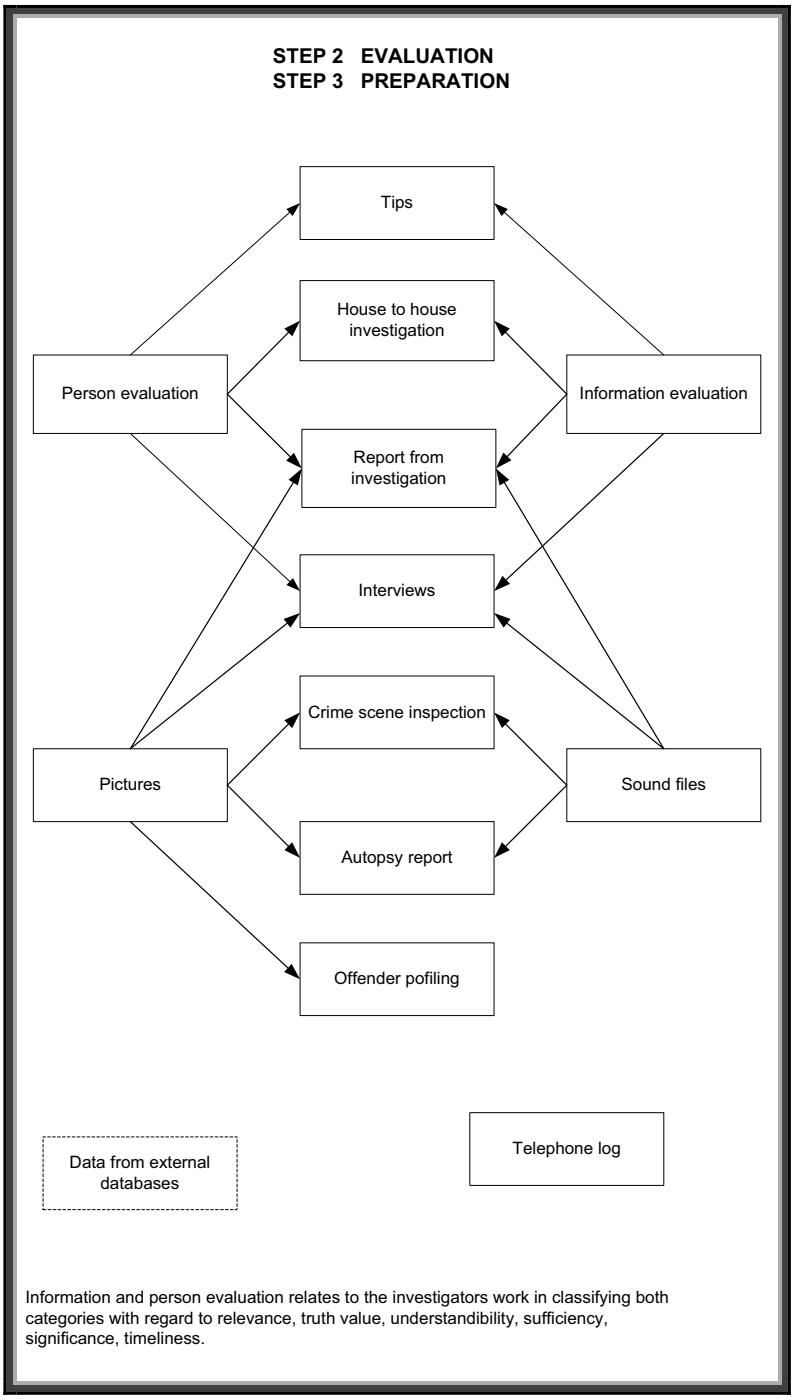
Sketch 1 – Overview of the intelligence process (1)



The overall categorisation will be based on events.
An event can
- include one or more action(s)
- be a crime already committed
- be information about planned illegal actions (crime control)
- be project based cases where several actions are related to each other through modus operandi and/or type of crime

The overall categorisation are intended to be the foundation of both operative and strategic criminal intelligence analysis, i.e. support the different types of analysis used within operative and and strategic criminal intelligence analysis.

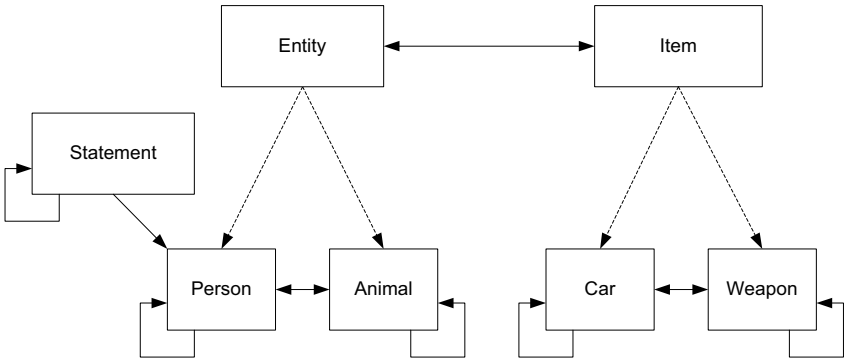
Sketch 2 – Overview of the intelligence process (2)



Sketch 3 – Overview of evaluation and preparation.

STEP 4 ANALYSIS
INTEGRATION

Grouping of verified and unverified data
as they occur, without interpretation



One view for each analyst.
In this step the model is ment to reflect the analyst's view of the data from step 2 and 3 regarding

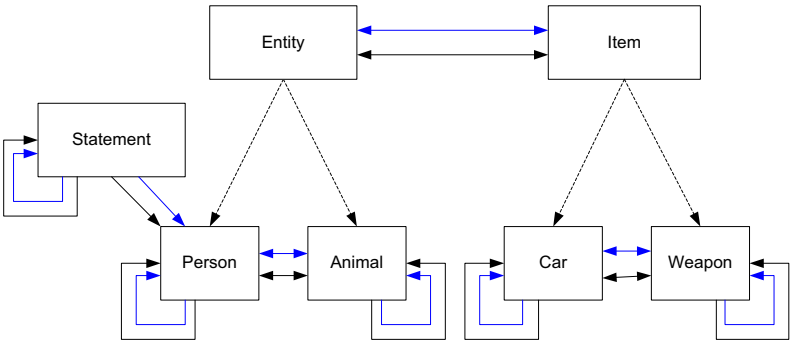
- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.

Sketch 4 – Overview of analysis – integration.

STEP 4 ANALYSIS
INTERPRETATION

Going beyond the "facts" in the verified and unverified data



One view for each analyst .
In this step the model is ment to reflect the analyst's interpretation of the data, i.e. reflect his or her own evaluations and predictions about the important aspects

- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.

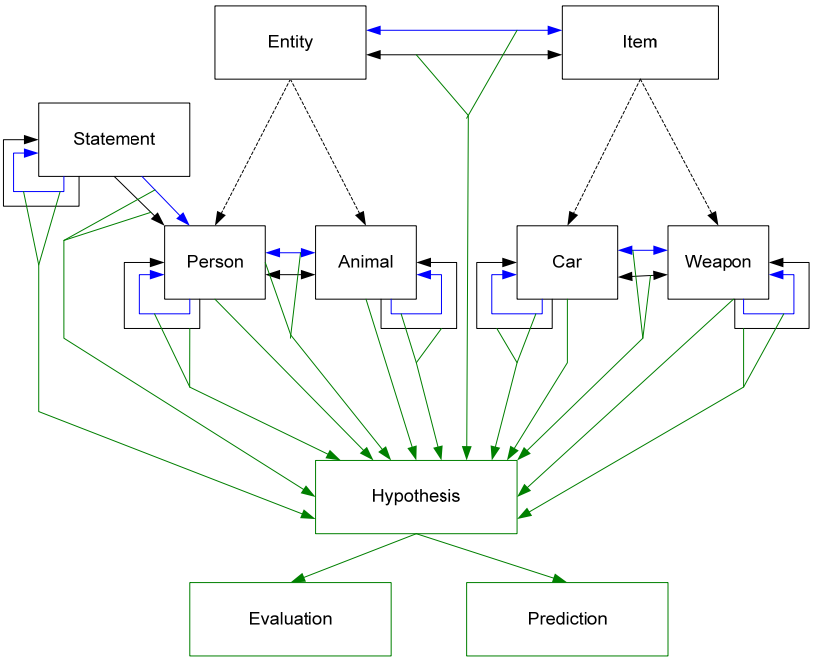
- Analyse conflicting data. What does the conflict consist of? Which data are most likely to be true?
- Analyse supporting data. Why and/or how do the data support each other? Is it likely that these data are true?

Data, evaluations and predictions are combined in a hypotheses that focus on further data gathering.

Sketch 5 – Overview of analysis – interpretation.

STEP 4 ANALYSIS
INTERPRETATION AND HYPOTHESIS BUILDING

Going beyond the "facts" in the verified and unverified data



One view for each analyst and hypothesis.
In this step the model is ment to reflect the analyst's interpretation of the data, and to reflect his or her own evaluations and predictions about the important aspects

- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.

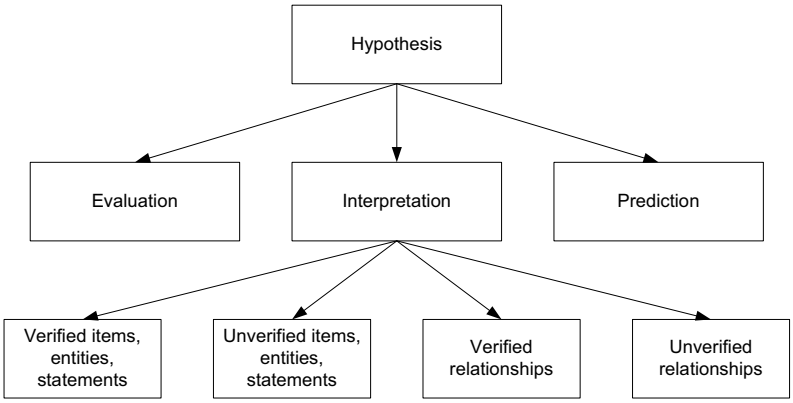
Important questions during the work
- Are there any data that conflict with other data?
  What does the conflict consist of? Which data are most likely to be true?
- Are there any data that support other data?
  Why and/or how do the data support each other? Is it likely that these data are true?

Verified and unverified data, interpretations, evaluations and predictions are combined in a hypothesis that focus on further data gathering.

Sketch 6 – Overview of analysis – interpretation and hypothesis building.

STEP 4 ANALYSIS
INTERPRETATION AND HYPOTHESIS BUILDING

Going beyond the "facts" in the verified and unverified data



One view for each analyst and hypothesis.
In this step the model is ment to reflect the analyst's interpretation of the data, and to reflect his or her own evaluations and predictions about the important aspects

- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.

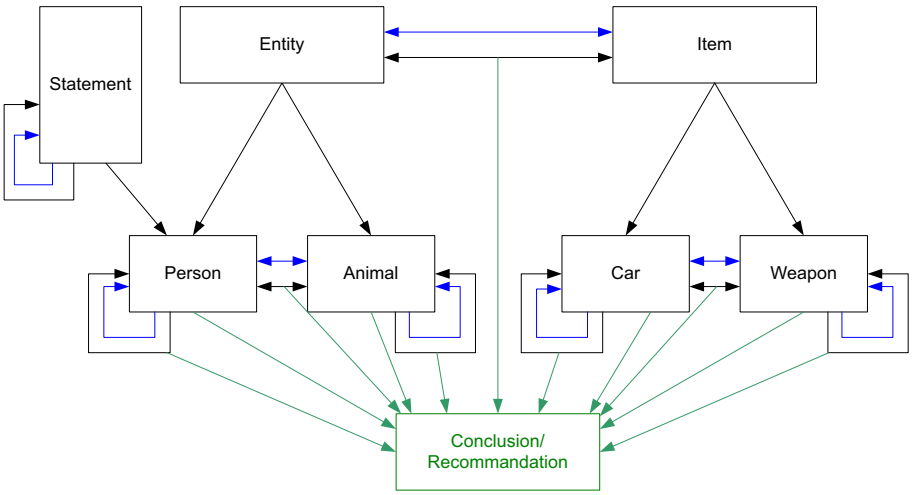
Important questions during the work
- Are there any data that conflict with other data?
  What does the conflict consist of? Which data are most likely to be true?
- Are there any data that support other data?
  Why and/or how do the data support each other? Is it likely that these data are true?

Verified and unverified data, interpretations, evaluations and predictions are combined in a hypothesis that focus on further data gathering.

Sketch 7 – Analysis – interpretation and hypothesis building. Elements of a hypothesis.

STEP 4 ANALYSIS
REPORT FINDINGS

Develop conclusions and recommendations using verified information



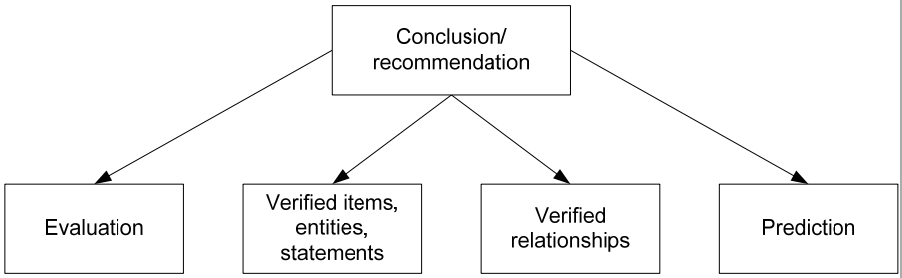
In hypothesis/conclusion there is to be one occurence for each prediction and/or evaluation. which also shall be stored with the hypothesis.
All types of data in the previous models can be verified or unverified. It is important in each step to mark the data as verified or unverified, and to change the status of the data when data are confirmed, not confirmed.

In this step it is only the verified data that can be used in addition to the analyst 's predictions and evaluations.

Sketch 8 – Analysis – Report findings.

STEP 4 ANALYSIS
CONCLUSIONS AND RECOMMENDATIONS

Only verified information



In conclusion/recommandation all data should be verified. Data in the previous models can be verified or unverified. It is important in each step to mark the data as verified or unverified, and to change the status of the data when data are confirmed.

There may be several final reports dependent on area of use (prosecution, strategy, further investigation, or developing guidelines).

Sketch 9 – Overview of analysis – conclusions and recommendations.

7.2.5 EER-models and further sketches

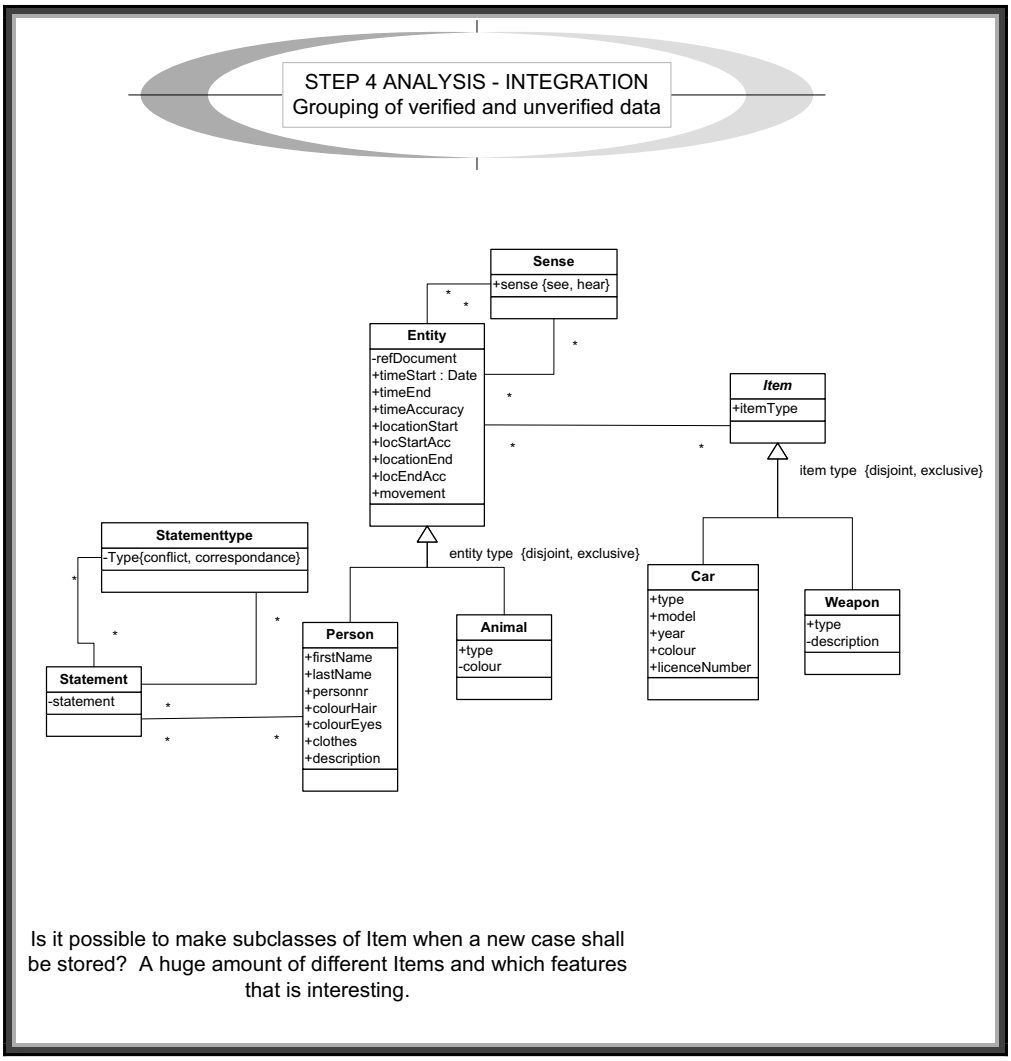
The first EER-models are graphical representations of the analysis step (integration, interpretation and hypothesis building). The models are, at this stage, drawn for each layer without visualisation of how the different models are linked together. These first attempts are focused on the data classification and each step in the process. The firs three EER-models focus on integration and the fourth EER-model focus on interpretation and hypothesis building.

Explanation of the notation for the EER-models can be found in appendix 21.

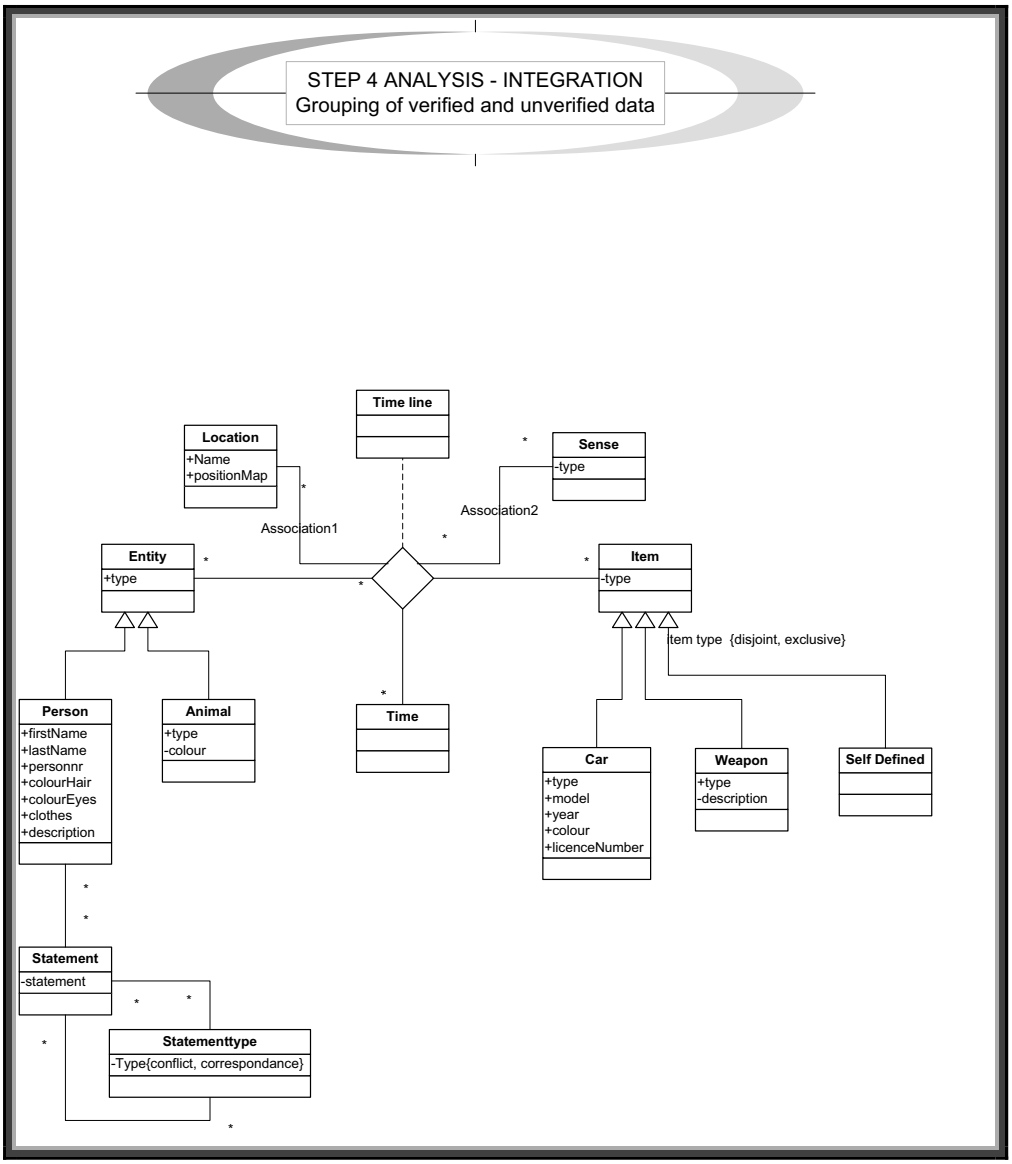
The numbers in the name of the EER-models corresponds to the steps in the criminal intelligence process as described by Kripos (see also section 4.1 and 6.5).

1. Data gathering
2. Evaluation
3. Preparation
4. Analysis

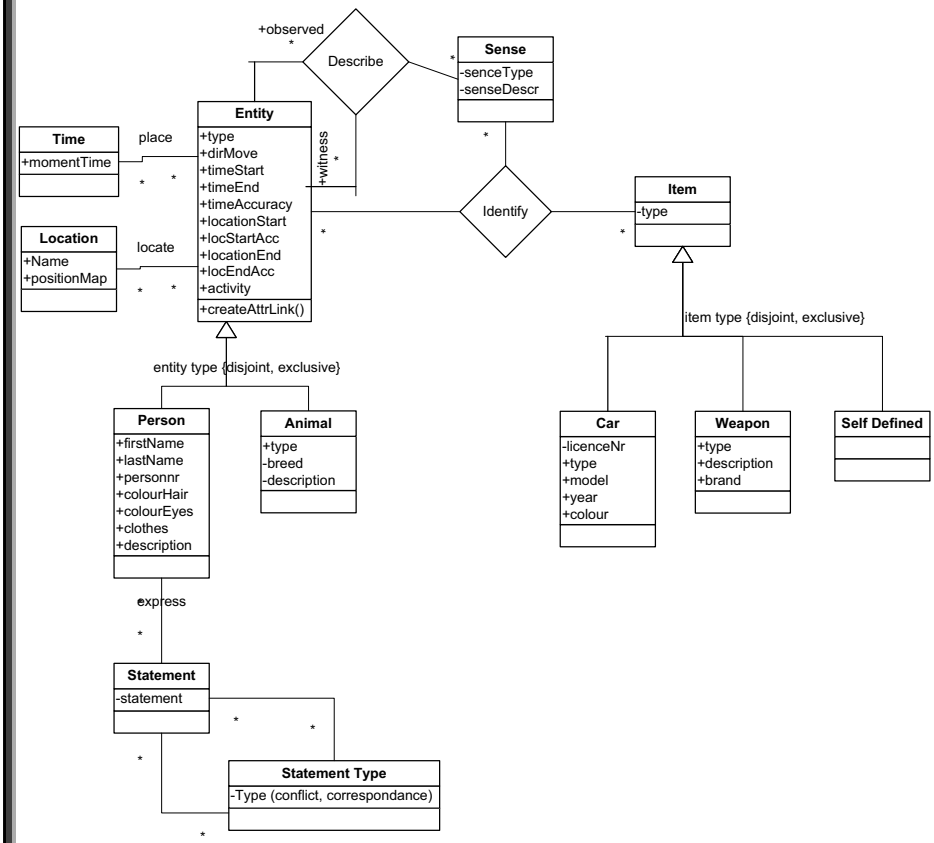
   Consisting of integration, interpretation, hypothesis development, and inferences, conclusions, hypotheses
5. Distribution



EER-model 1 – Analysis – Integration (1)



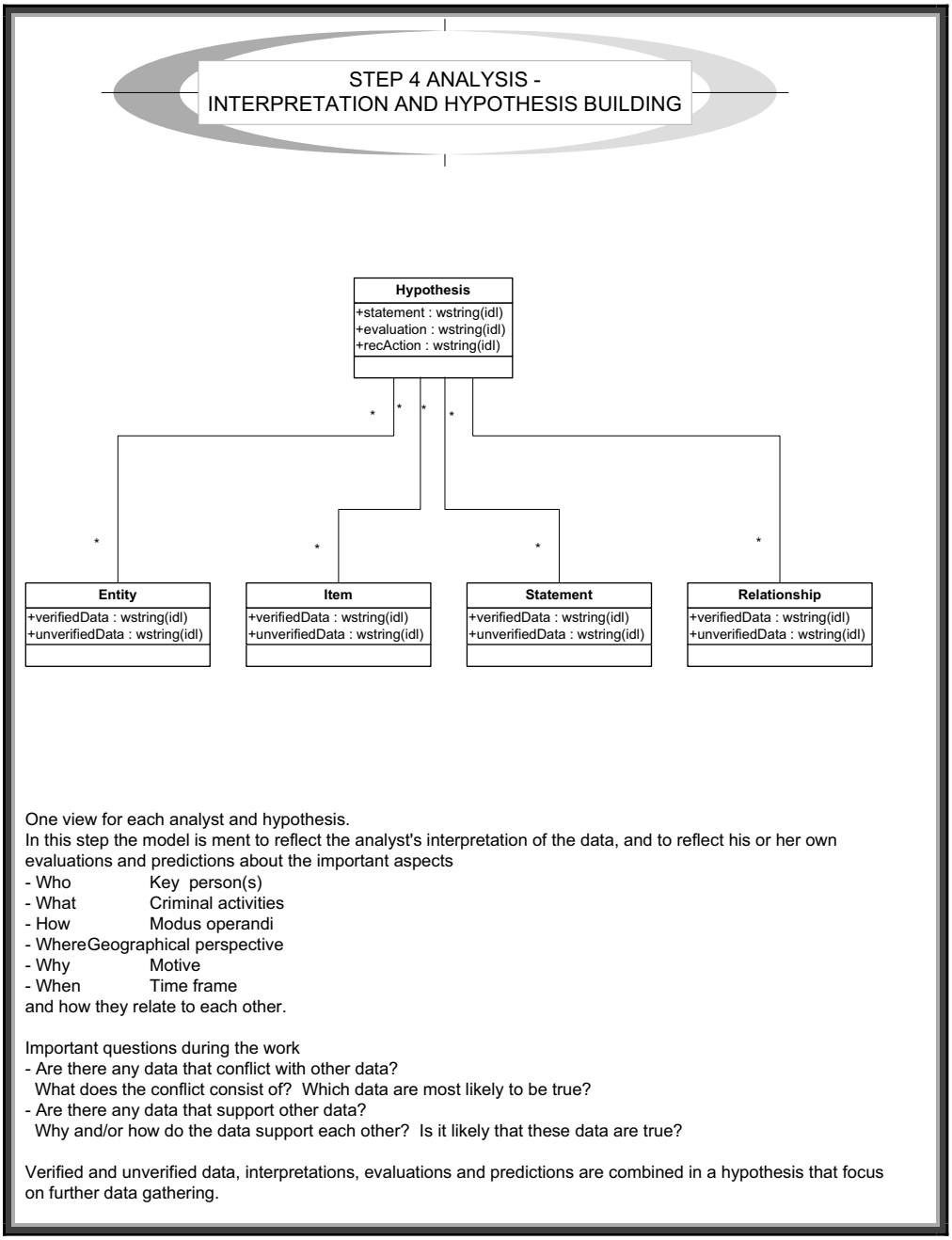
EER-model 2 – Analysis – integration (2)



One view for each analyst.
In this step the model is ment to reflect the analyst's view of the data from step 2 and 3 regarding
- Who Key person(s)
- What Criminal activities
- How Modus operandi
- WhereGeographical perspective
- Why Motive
- When Time frame

and how they relate to each other.

EER-model 3 – Analysis – integration (3)



EER-model 4 – Analysis – interpretation and hypothesis building

7.2.6 Models to be used in data gathering 26.11.2002

After these initial sketches and EER-models, the next step in the analysis process was to develop models for the next data gathering.

At this stage the different layers in the data model was determined;

- Evaluation and preparation
- Analysis – integration
- Analysis – interpretation and hypothesis building
- Analysis – conclusions and recommendations

Table 7.14 gives an overview of the new sketches and EER-models prepared for the next data gathering (the models are included after table 7.15). For each sketch/EER-model it is also described which sketches/EER-models they are a continuation of and some changes from the initial sketches and EER-models.

Name of model to be used in data gathering	**Type**	**Earlier sketches/models**	**Changes**
Overall view of the process in operational and strategic criminal intelligence work	Sketch	Continuation of sketch 1 and 2	Data gathering and distribution included
Step 2 Evaluation and step 3 Preparation	Sketch	Continuation of sketch 3	No changes
Step 4 Analysis – integration	EER-model	Continuation of sketch 4 EER-model 1, 2 and 3	Each model includes more entities and redefining of old ones (e.g. subclass 'weapon' and 'self defined' has become one subclass called 'object')
Step 4 Analysis – interpretation and hypothesis building	EER-model	Continuation of sketch 5, 6, and 7 EER-model 4	Major changes
Step 4 Analysis – conclusion and recommendations	EER-model	Continuation of sketch 8 and 9	Major changes

Table 7.14 Overview of models to be used in data gathering 26.11.2002.

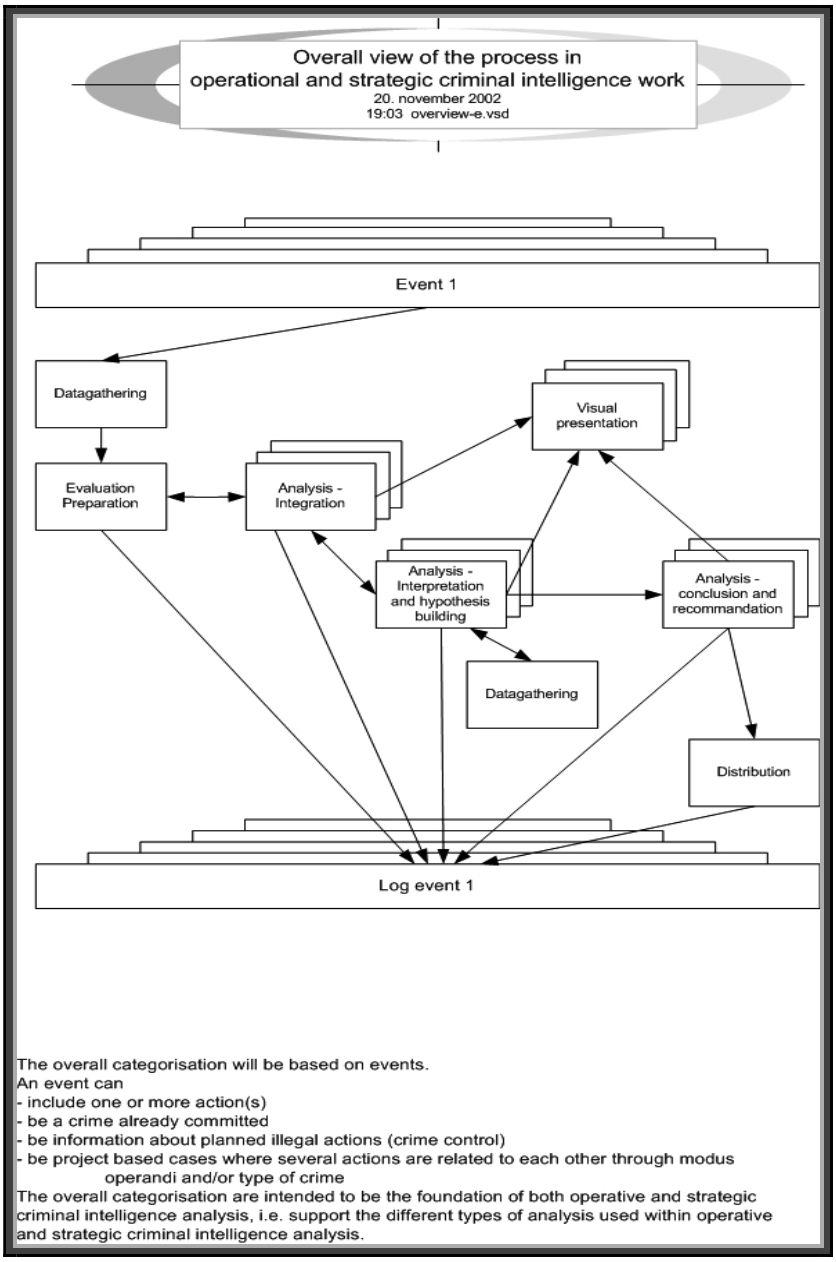
Table 7.15 gives a description of the different entities in the EER-models prepared for the next data gathering. The table also includes a description of the interesting data (attributes) for each entity. An initial classification of interesting data in criminal intelligence analysis is presented in table 7.13.

Main category	**Description**	
Event	The event under investigation. An event can - include one or more action(s) - a crime already committed - be information about planned illegal actions - be project bases where several actions are related to each other through modus operandi and/or type of crime An event can e.g. be a theft, a murder, or a series of thefts.	
Entity name	**Description**	**Comments on attributes**
Name of EER-model: Step 4 Analysis – Integration		
Action	In cases with only one action (e.g. one murder) the event and action will be the same.	Described by type of crime and which date the crime was committed. Interesting data about actions can be weather conditions, the environment in which the action took place, and a further description
Time	(Estimated) time for the action	
Location	Location the action took place	Location can be described by name or a broader geographical reference.
Activity	Which activity the entity was engaged in. In table 7.13 described as Role. E.g. walking the dog.	
Sense	Describing the witness/suspects sense. E. g. did the witness hear or see the described event?	
Entity	An entity can move and act. Examples: A person, a dog	Movement can be described with direction. Geographical position can be described with start position, end position, and accuracy. Time can be described with a time frame (start/end) and accuracy.
Person		Interesting data about persons can be colour of hair or eyes, which clothes the person was wearing, and a further description.
Animal		Interesting data about animals can be type (dog, cat), breed and a further description.
Statement	Statements not classified as an entity or an item, but still interesting, either because the statement is consistent or	

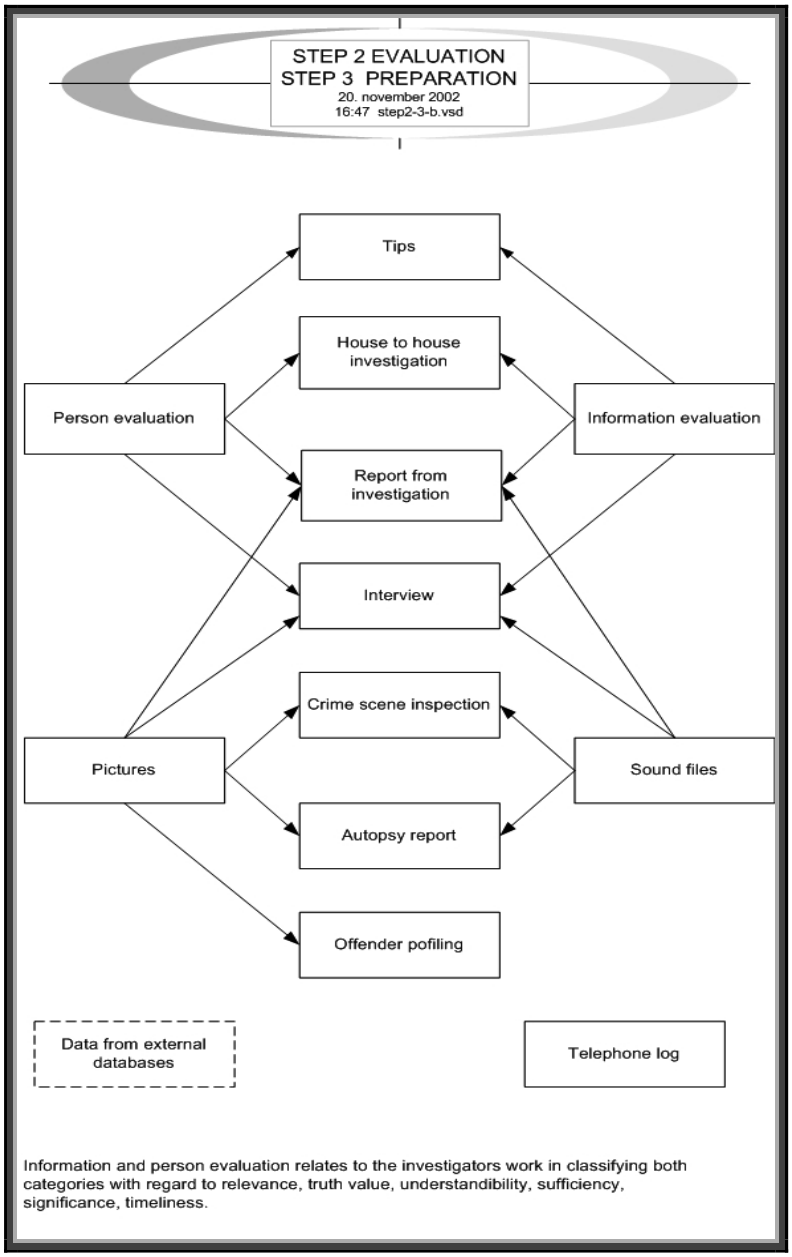
	inconsistent with other statements One person has stated being in two places at the same time. A person has been placed at different locations by different witnesses.	
Statement Type		A statement can be in conflict or correspondence with other statements (either by different witnesses/suspects or the same witness/suspect)
Item	Physical objects. E.g. a laptop, a gun.	
Car		Interesting data about cars can be licence number, type, model, year, and colour
Object		An object can be different kinds of physical objects (except cars). Interesting information about these objects can be type, brand, size, shape, and a further description
Name of EER-model: Step 4 Analysis – Interpretation and hypothesis building		
Hypothesis	Analyst's reconstruction of the past building on both verified and unverified information.	Description of the event (action).
Action	In cases with only one action (e.g. one murder) the event and action will be the same.	Described by type of crime and which date the crime was committed. Interesting data about actions can be weather conditions, the environment in which the action took place, and a further description. Document reference for included data is important.
Statements	Analyst's interpretation of how an event or action(s) may have happened and which persons that was involved.	Both verified and unverified information is used, and it is important to distinguish between verified and unverified information. Document reference for the included data is important.
Recommended actions	Recommendations for further investigation and/or termination of investigation	Which new information that is needed in the continuation of the investigation and a prediction of what a further investigation may find.

Name of EER-model: Step 4 Analysis		
Report	Description of the investigation/analysis. Only verified information is included in a report.	Receiver of the report and which event that is included. Receiver is interesting because it determines which information is to be included in the report.
Action	In cases with only one action (e.g. one murder) the event and action will be the same.	Described by type of crime and which date the crime was committed. Interesting data about actions can be weather conditions, the environment in which the action took place, and a further description. Document reference for included data is important.
Conclusion	Analyst's reconstruction of the past building on only verified information.	Includes the analyst's interpretation of how an event or action(s) may have happened and which person that was involved. Document reference for included data is important.
Recommendations	Any recommendations from the analyst to the receiver of the report.	

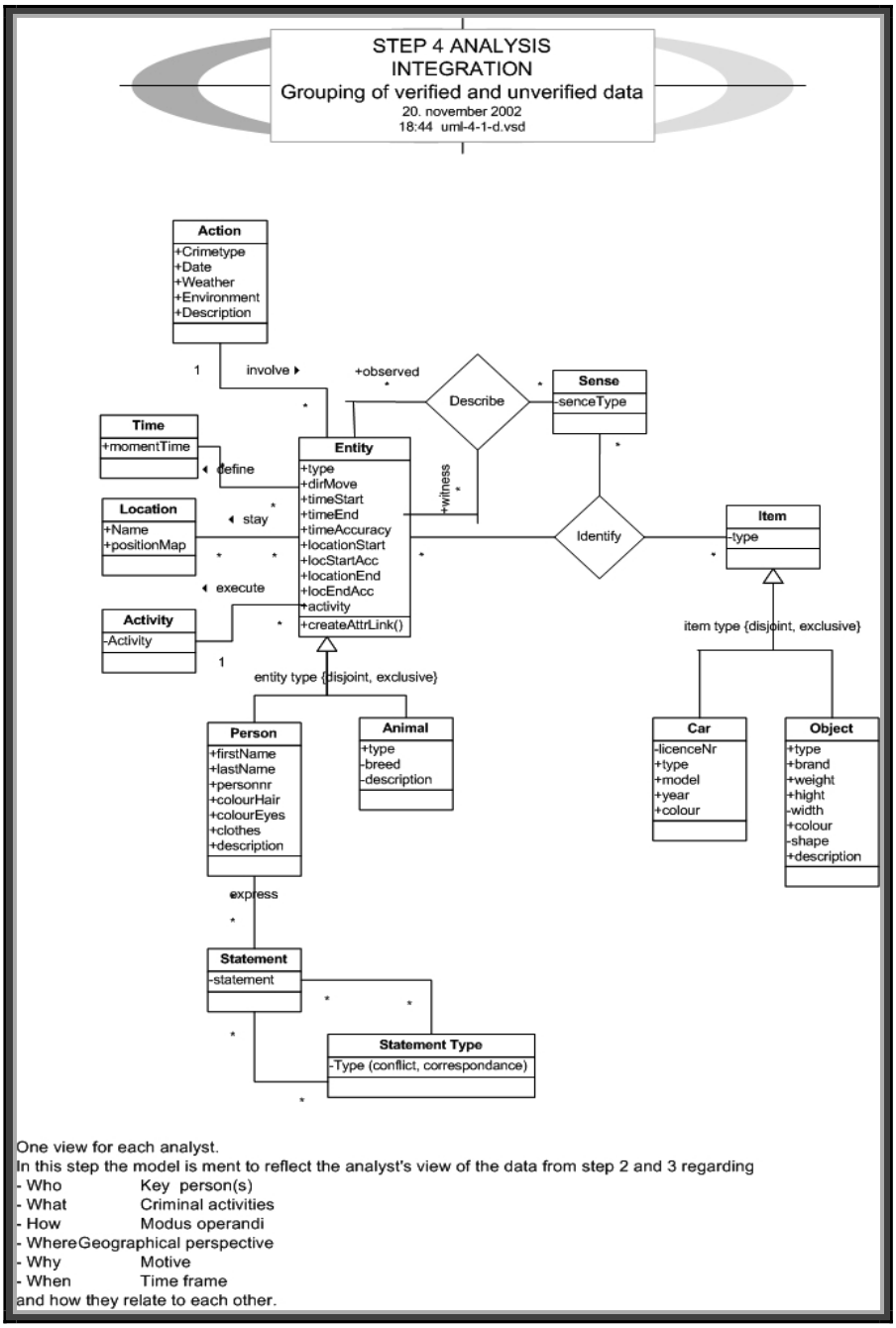
Table 7.15 Description of entities in EER-models to be used in data gathering 26.11.2002.



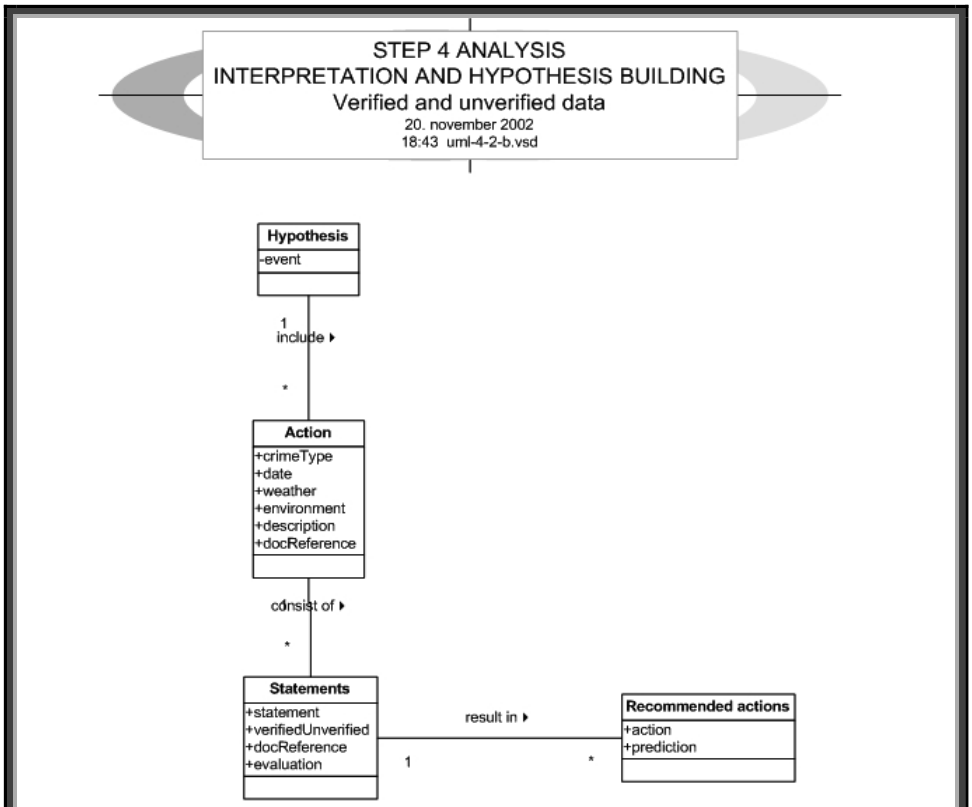
Model to be used in data gathering 26.11.02
Overall view of the process in operational and strategic criminal intelligence work.



Model to be used in data gathering 26.11.02
Step 2 Evaluation and Step 3 Preparation



Model to be used in data gathering 26.11.02
Step 4 Analysis - Integration



One view for each analyst and hypothesis
In this step the model is ment to reflect the analyst's interpretation (evaluation) of the data, and to reflect his or her own predictions about recommended actions regarding the important aspects

- Who Key person(s)
- What Criminal activities
- How Modus operandi
- WhereGeographical perspective
- Why Motive
- When Time frame

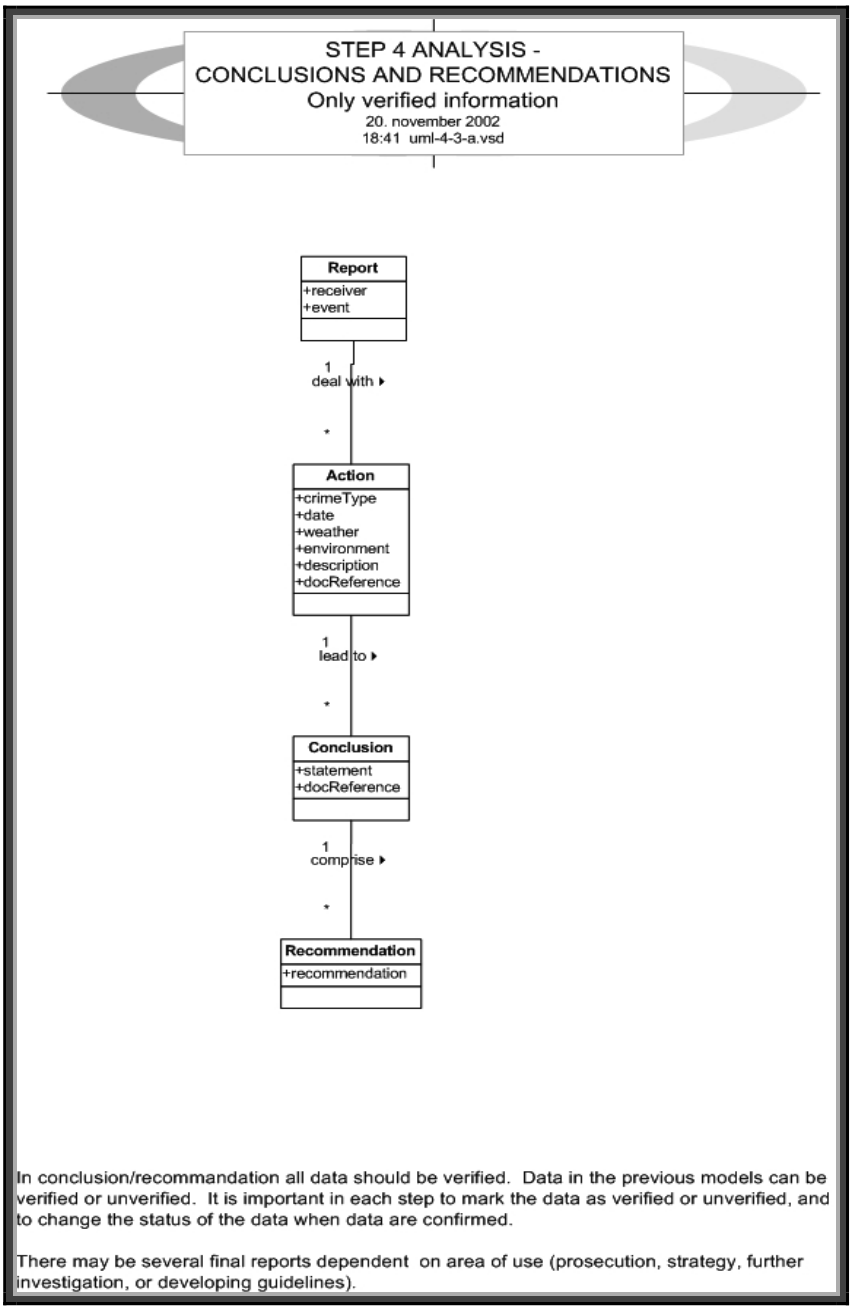
and how they relate to each other.

Important questions during the work

- Are there any data that conflict with other data?
  What does the conflict consist of? Which data are most likely to be true?
- Are there any data that support other data?
  Why and/or how do the data support each other? Is it likely that these data are true?

Verified and unverified data, interpretations (evaluations) and predictions are combined in a hypothesis that focus on further data gathering.

Model to be used in data gathering 26.11.02
Step 4 Analysis - Interpretation and hypothesis building



Model to be used in data gathering 26.11.02
Step 4 Analysis – conclusions and recommendations

7.3 Jack the Ripper

The data gathering 02.06.2003 consisted of a presentation and a meeting. The EER-models were the main focus both for the presentation in the morning and the meeting in the afternoon. Every employee in the Department for Tactical Investigation (*Taktisk etterforsknings-avdeling*) was invited to attend the presentation in the morning, and for this presentation additional EER-models with data from the case of the serial killer called "Jack the Ripper" (also called the "Whitechapel Murderer" and the "Leather Apron") was prepared. The EER-models with data from Jack the Ripper can be found in this section, but the reader are directed to appendix 8 for the EER-models without data from Jack the Ripper.

Jack the Ripper killed a number of prostitutes in the East end of London in 1888. The exact number of prostitutes killed by Jack the Ripper is being debated, but there is a general agreement that at least five prostitutes were killed by him, some is of the opinion that as many as 7 or 9 can have been killed by the Ripper. There are numerous books and articles written about Jack the Ripper, and since the case was never solved a lot of the books and articles contain theories of his identity (even though the identity is not established, the Ripper is always referred to as him). This research used an internet source (Ryder, 2006) which not only refers to the "facts" (much of the evidence gathered at the time of the murders have been lost) of the case, but also refers to other works about the serial killer.

Since the data from Jack the Ripper is old, not all parts of the EER-models are of interest (e.g. electronic trace), and therefore only parts of the models were used. The data used relates to two events; the murder of Mary Ann Nichols which took place on Buck's Row August 31st 1888; the murder of Anne Chapman which took place at 29th Harbury Street September 8th 1888. The data also include two depositions regarding Ann Chapman's murder. The depositions were given by witnesses Emily Walter and Elizabeth Long.

The EER-models labelled A, B and C shows which section of the models that was used, and EER-models labelled A_1, B_1, C_1 and C_2 shows these sections with data from Jack the Ripper. EER-model A, A_1, B and B_1 relates to layer "Evaluation and preparation", while EER-model C, C_1 and C_2 relates to layer "Analysis – Integration".

In EER-model A_1 the data used shows the difference between the entities “case” and “event” by using data regarding the murders of Mary Ann Nichols and Anne Chapman. A map is also provided to show the streets where the murders took place.

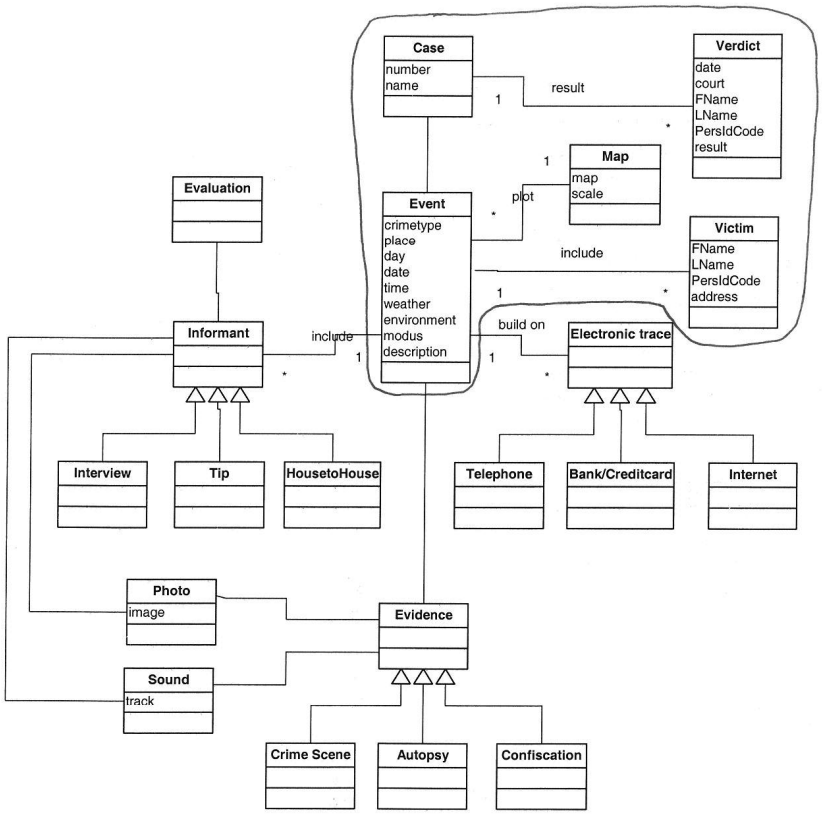
In EER-model B_1 the depositions from Emily Walter and Elizabeth Young are used to describe the murder of Annie Chapman.

In EER-model C_1 and C_2 the data from the depositions in EER-model B_1 are integrated as the first step in the analysis. Examples of interesting statements which can not be classified into other entities can be found in both models.

Presentation of the EER-models concludes this section. In the next section final analysis and results will be presented as a conceptual data model, a data flow model, and the structure of the automated log.

Evaluation/preparation and closure
Overview of entities

In this overview attributes are given for the entities 'case', 'event', 'map', and 'verdict'. Data from these entities will be connected to the subsequent models, but will not be shown in the subsequent models.

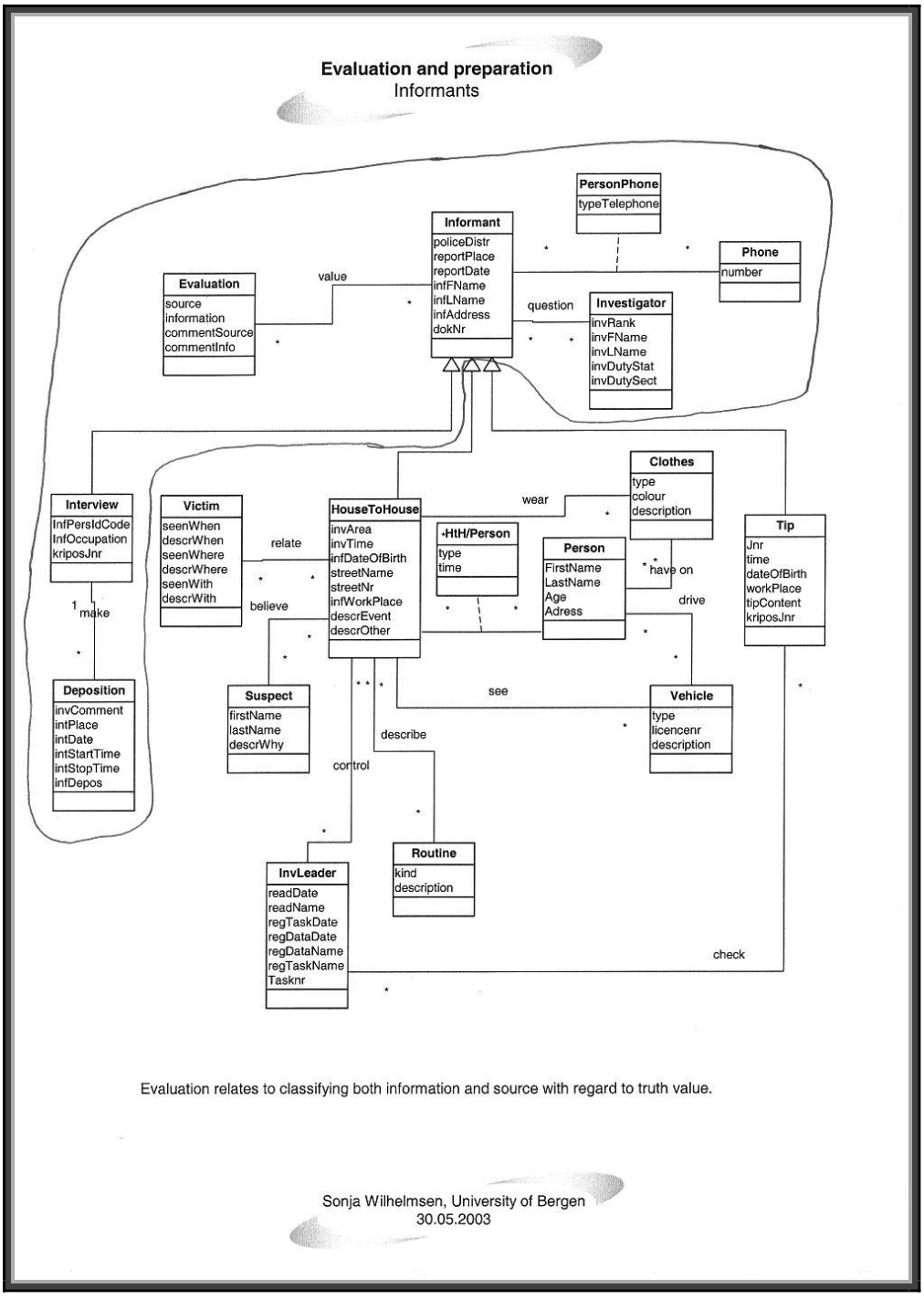


A case can include one or more event(s) that deal with
- a crime already committed
- information about planned illegal actions (crime control)
- investigation projects based on crimes related to each other through modus operandi and/or type of crime

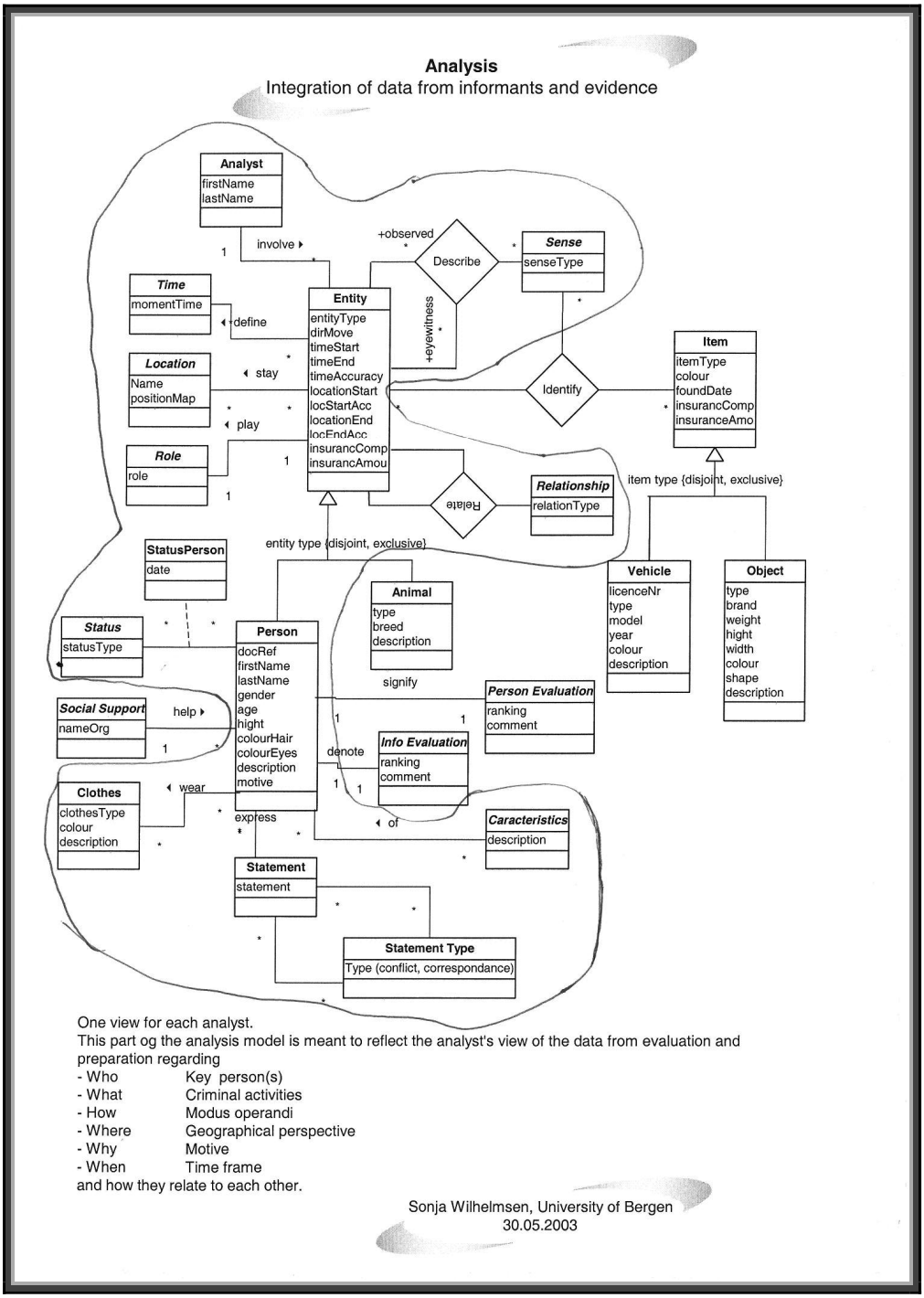
The model are intended for both operative and strategic criminal intelligence analysis, i.e. support the different types of analysis used within operative and strategic criminal intelligence analysis.

Sonja Wilhelmsen, University of Bergen
31.05.2003

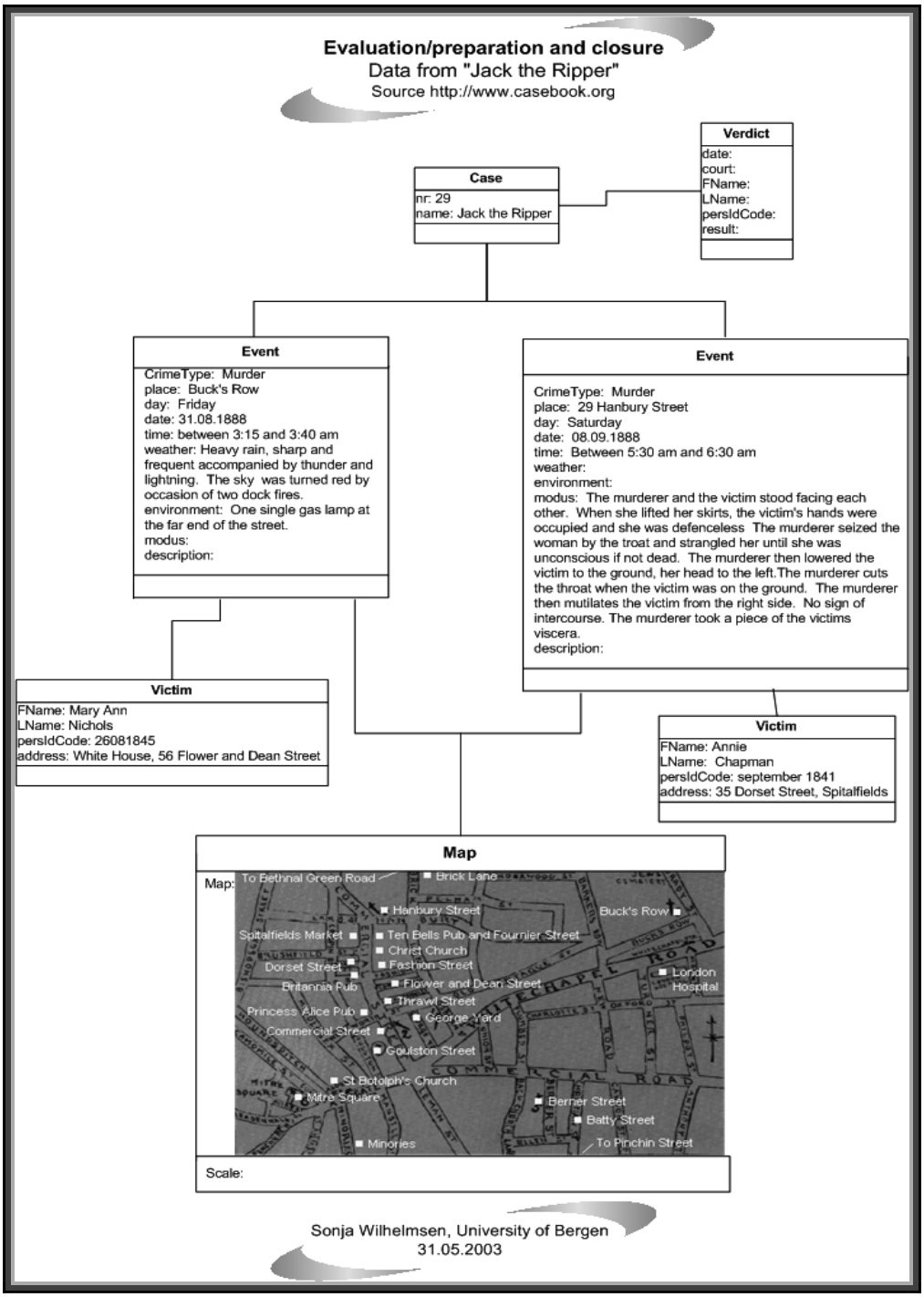
EER-model A. Section of "Evaluation/preparation and closure" used for displaying data from the case of "Jack the Ripper".



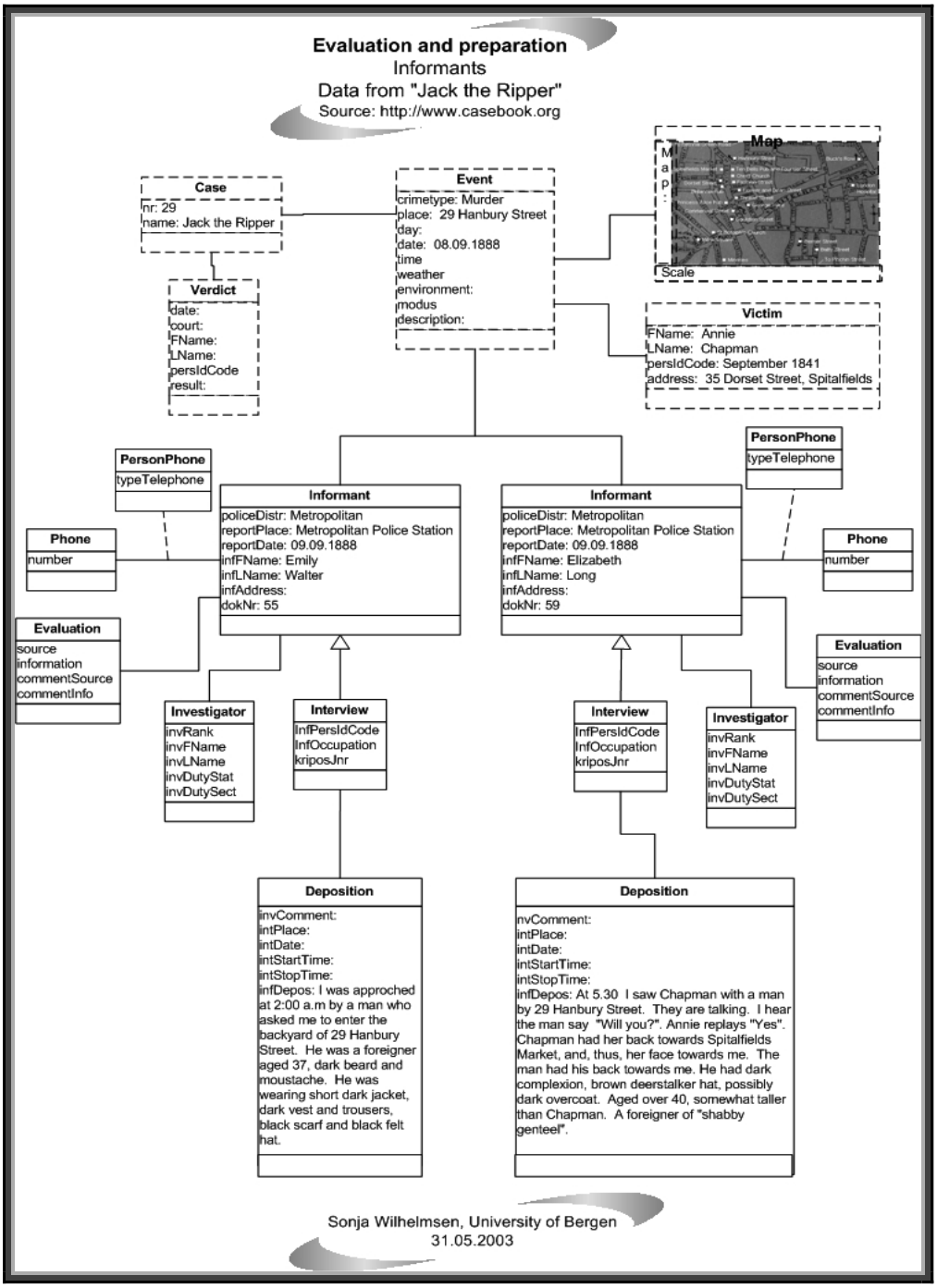
EER-model B. Section of "Evaluation and preparation - informants" used for displaying data from the case of "Jack the Ripper".



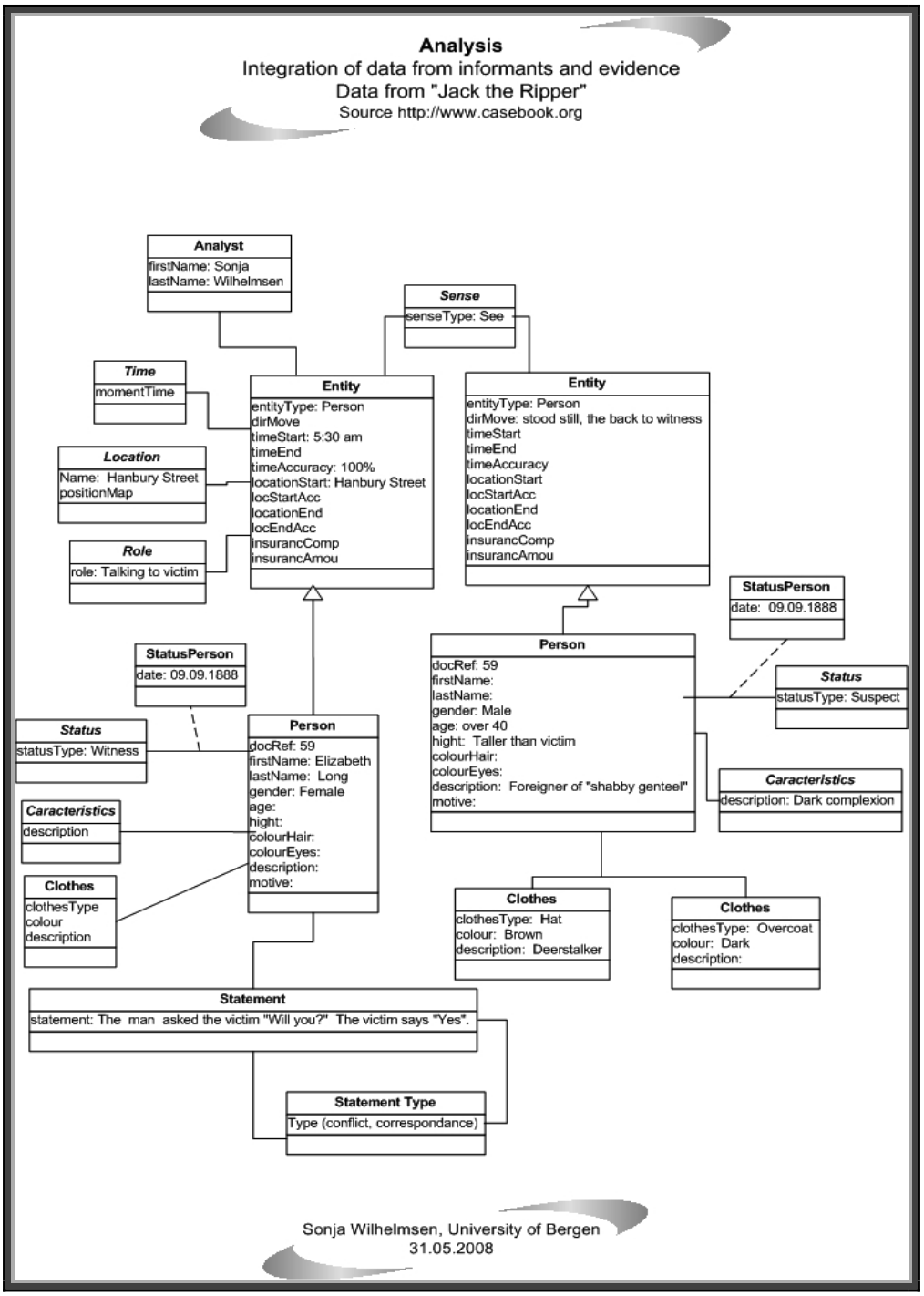
EER-model C. Section of "Analysis - Integration of data from informants and evidence" used for displaying data from the case of "Jack the Ripper".



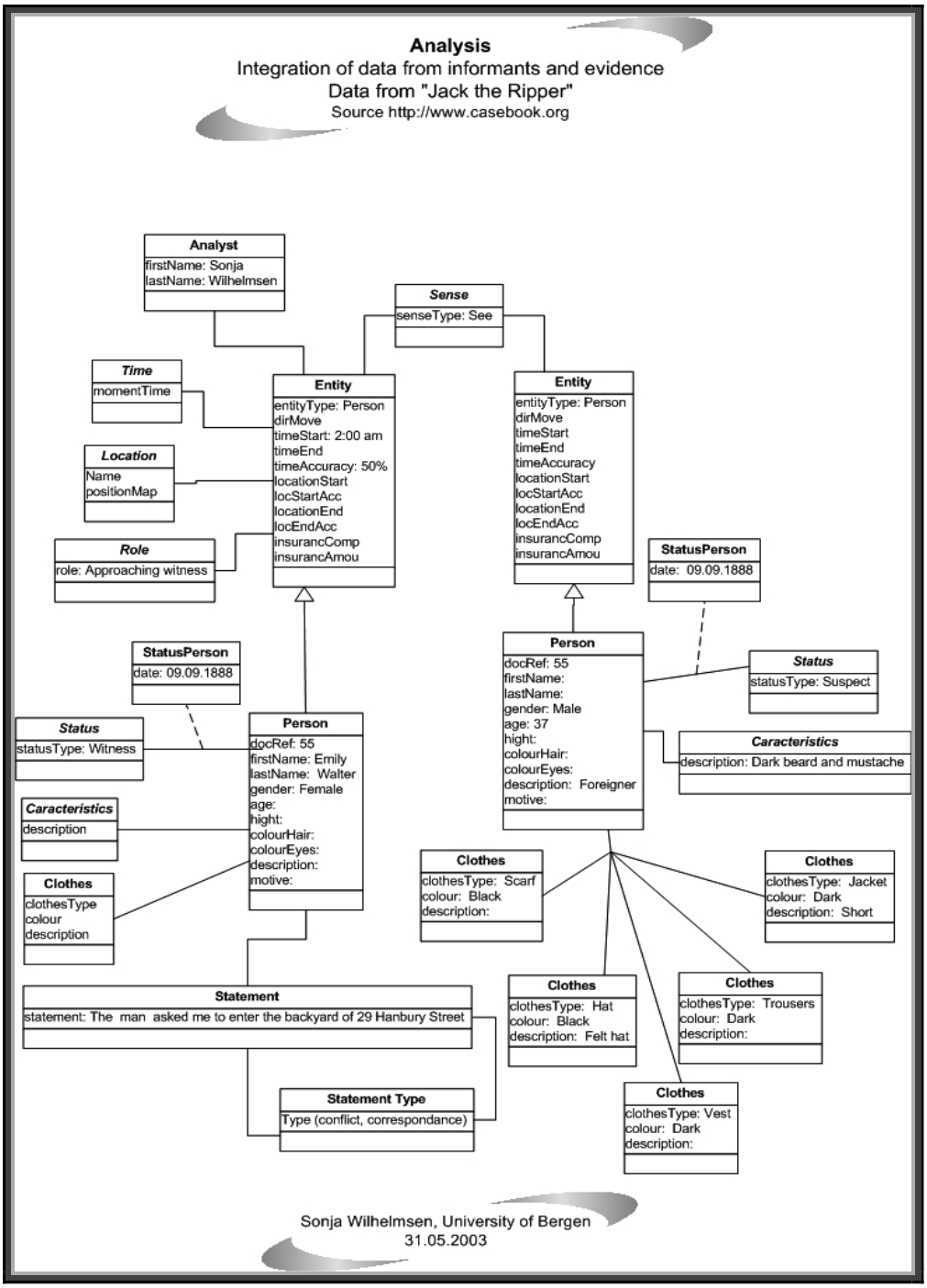
EER-model A_1. Section of "Evaluation/preparation and closure" with data from the case of "Jack the Ripper".



EER-model B_1. Section of "Evaluation and preparation - informants" with data from the case of "Jack the Ripper".



EER-model C_1. Section of "Analysis - Integration of data from informants and evidence" with data from the case of "Jack the Ripper".



EER-model C_2. Section of "Analysis - Integration of data from informants and evidence" with data from the case of "Jack the Ripper".

7.4 Final analysis and results

In this section the final data flow model (subsection 7.4.1), the conceptual data model (subsection 7.4.2), and the automated log (subsection 7.4.3) aree presented. However, the reader is also directed to section 2.1 where the model for current communication patterns (figure 2.1) and the model for ideal communication patterns (figure 2.2) are presented and subsection 4.3.1 where the extended intelligence process (figure 4.6) and the layered data model are presented (figure 4.7).

7.4.1 Data flow models

The data flow model consists of a context diagram and a system overview (see appendix 22 for an overview of the notation). The context diagram will be presented first, thereafter the systems overview.

Context diagram

The context diagram includes an unusual way of representing the relationship between the sources and the system for criminal intelligence analysis. The first and last level in the conceptual data model is placed at the border for the criminal intelligence analysis system. This representation is chosen because the layer 'Evaluation and preparation' is perceived as not being entirely for the investigator, nor the analyst. This layer links the investigation and the analysis together. 'Concluding comments' are not a part of criminal intelligence analysis, but the layer is important for other kinds of law enforcement analysis, and should therefore be included in the system. This representation also allowed the researcher to investigate the sources for the two layers. If the layer 'evaluation and preparation' and 'concluding comments' had been seen as an investigation tool, these would have been considered the source for the criminal intelligence analysis system.

In the context diagram sources represent e.g. the function tactical investigation, not the person employed as a tactical investigator. This entails that when e.g. an intelligence analyst gathers tactical information he or she performs the task of tactical investigation and shall act accordingly; the information obtained shall be recorded in the data store 'Evaluation and preparation'.

Sources/sinks

‘Tactical investigation’

The tactical investigator records all results from the investigation in the layer ‘Evaluation and preparation’. The analyst can request further tactical investigation from the tactical investigator.

‘Technical investigation’

Results from forensic analyses are recorded in the layer ‘Evaluation and preparation’ in form of a report. The analyst can request further technical investigation from the technical investigator.

‘Sexual assault group’

The sexual assault group monitors Internet for sexual abuse or racialist statements. Information from this group is recorded in the layer ‘Evaluation and preparation’ in form of a report. The analyst can request further information from the ‘sexual assault group’.

‘Criminal investigative analysis (criminal profiling)’

Criminal investigative analysis (criminal profiling)’ is an analysis usually carried out after the criminal intelligence analysts have completed their analyses. The criminal investigative analysis will use data from the criminal intelligence analysis as well as data from the investigation. Even though the result from the criminal investigative analysis is not used in criminal intelligence analysis the analysis report is included in the layer ‘Evaluation and preparation’. Inclusion of this report secure that all types of analysis regarding a case can be found in the information system.

‘Other databases’

Information can also be obtained from other databases (both internal to the police and external), e.g. databases containing intelligence information. This information shall be recorded in the layer ‘Evaluation and preparation’.

‘Court’

The verdict in each event is not part of the criminal intelligence analysis, but shall be recorded in the layer ‘Concluding comments’ in order to follow a case through.

‘Prosecutor’

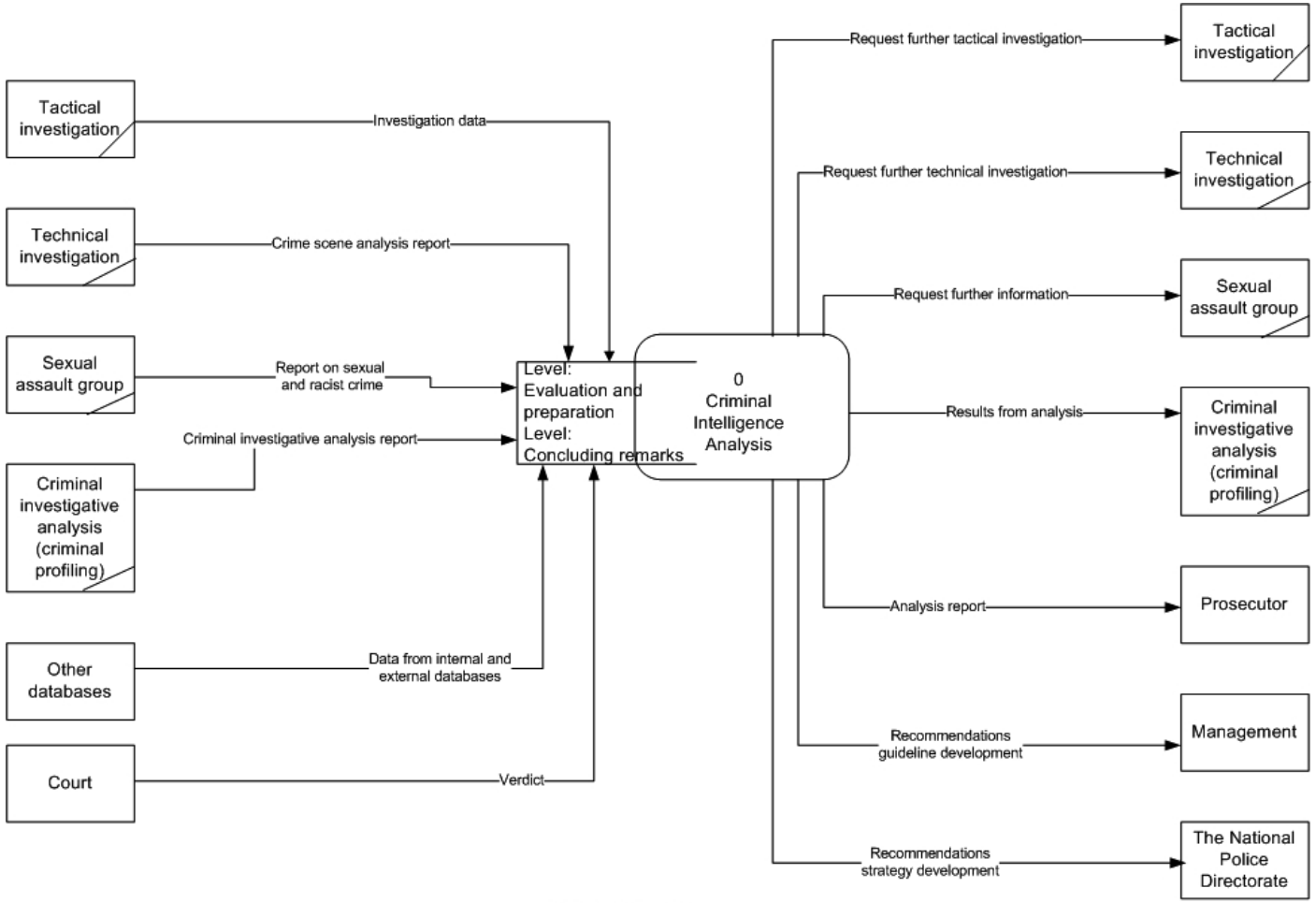
A final analysis report is sent to different recipients, and the recipients can vary from case to case. In the context diagram these recipients are represented with the prosecutor.

‘Management’

The analyst can give, on the basis of the analysis in a case, recommendations for guideline development to the management.

‘The National Police Directorate’

The analyst can give, on the basis of the analysis in a case, recommendations for further strategy development.



Context diagram

System overview

During execution of processes 1.0, 2.0, 3.0 and 4.0 the analyst is guided by the following aspects when choosing data of interest

- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame
- and how they relate to each other

Important questions during the work

- Are there any data that conflict with other data?
  - What does the conflict consist of?
  - Which data are most likely to be true?
- Are there any data that support other data?
  - Why and/or how do the data support each other?
  - Is it likely that these data are true?

Processes

Process 1.0

During this process the analyst chooses interesting data from the layer ‘Evaluation and preparation’ and, together with his or her own thoughts about the data, saves the data (both verified and unverified information) in the data store ‘View/Integration/Phone’.

Process 2.0

During this process the analyst chooses interesting data from the layer ‘Evaluation and preparation’ and, together with his or her own thoughts about the data, saves the data (both verified and unverified information) in the data store ‘View/Integration/Credit Institution’.

Process 3.0

During this process the analyst chooses interesting data from the layer ‘Evaluation and preparation’ and, together with his or her own thoughts about the data, saves the data (both

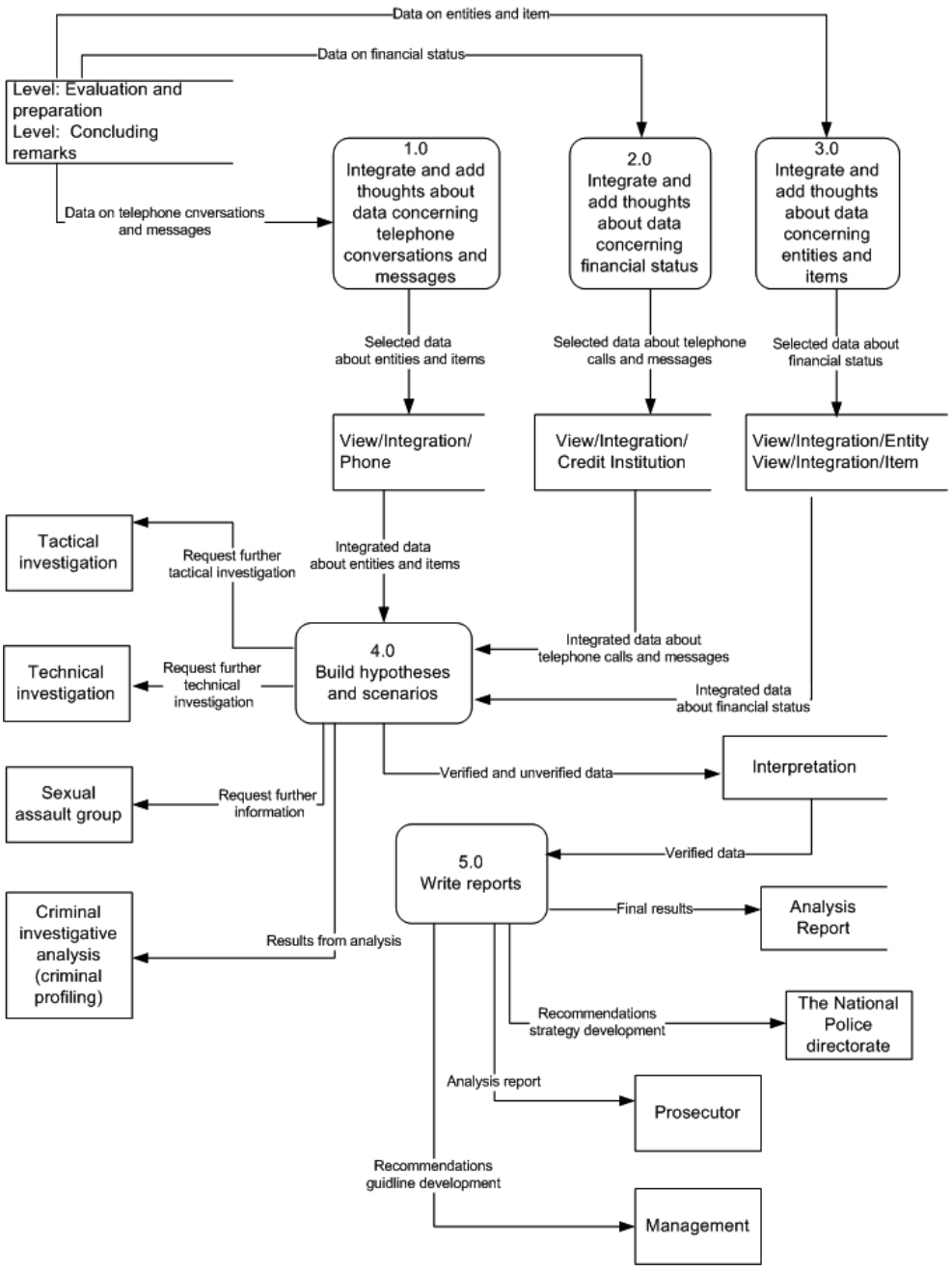
verified and unverified information) in the data stores ‘View/Integration/Entity’ or ‘View/Integration/Item’.

Process 4.0
In this process the analyst chooses investigation data and intelligence data (verified and unverified information) from the data stores ‘View/Integration/Phone’, ‘View/Integration/Credit Institution’, ‘View Integration/Entity’ and ‘View/Integration/Item’, and, together with interpretations (evaluations) and predictions, constructs hypotheses that can be illustrated by scenarios (see table 6.5 in subsection 6.5.1 for an overview of the different types of scenarios). Hypotheses and scenarios are stored in (both verified and unverified information) the data store ‘Interpretation’. The hypotheses focus on further data gathering and requests can be made to the sources ‘Tactical investigation’, ‘Technical Investigation’, ‘Sexual assault group’ or ‘Criminal investigative analysis (criminal profiling)’.

Process 5.0
The analyst uses data (only verified data) stored in the data store ‘Intepretation’ to write reports. Several analysis reports can be written in one case depending on area of use (prosecution, strategy, or guidelines development). Sinks can be ‘The National Police Directorate’, ‘Prosecutor’ or ‘Management’

The data stores involved in each process are explained in detail in tables 7.22 – 7.25.

System overview



7.4.2 Conceptual data model

As shown in figure 4.7 the conceptual data model is divided into layers. Each layer corresponds to the phases of the extended intelligence process (except the steps data gathering and distribution) shown in figure 4.6. Before the conceptual EER-model and tables describing the different entities in the EER-model, some general comments will be provided.

A criminal investigation usually includes two types of information; verified and unverified. Verified information (investigation information) is usually obtained during the investigation of a particular case. Unverified information (intelligence information) is information gathered without investigating a particular case, and the information is often obtained during undercover police work or from the police orderly book. Unverified information can change into verified information if the information can be confirmed during the investigation of a particular case. As figure 7.4 shows unverified information can be used during investigation and analysis, but reports can not contain unverified information. It is therefore vital to keep track of which information that is unverified. This can be achieved by displaying the data item in a different colour, or with a specific code added to the data item. Data recorded in 'Concluding comments' originates from the courts and will always contain verified information.

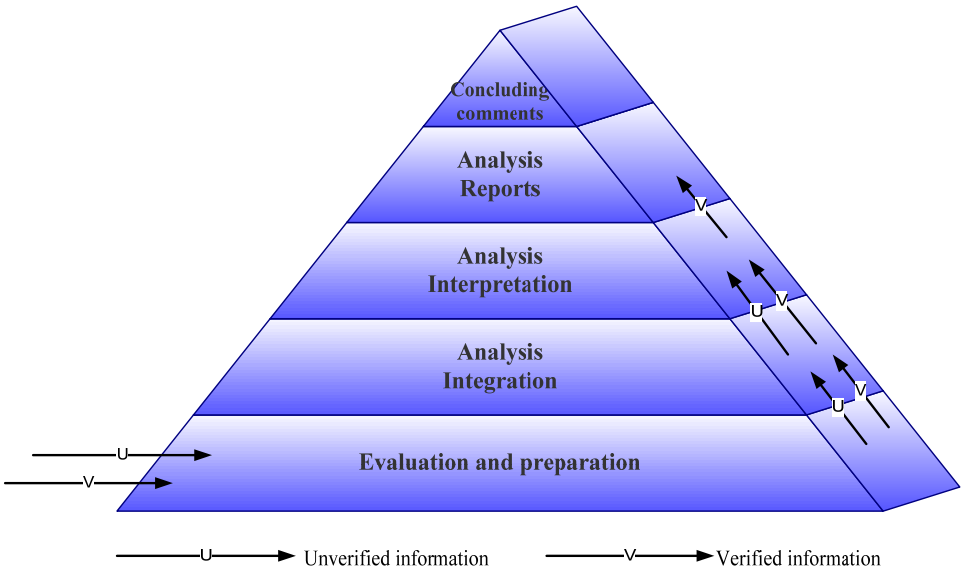


Figure 7.4 Use of verified and unverified information between the different layers in the conceptual data model

As shown in figure 7.3 the information system will contain two types of relationships; one established with basis in the data and one established with basis in the analyst's thoughts about the data. Relationships will also be established between entities in the different layers, not only between the different entities within one layer. Figure 7.5 gives an overview of when the two types of relationships are used. At the layers of 'Evaluation and preparation' and 'Analysis reports', and between the layers of 'Analysis - Interpretation' and 'Analysis - Reports' only relationships established with basis in the data are used. The reasoning behind this is

- Layer 'Evaluation and preparation'
  If the investigator (or the analyst) recommends further investigation, the task will be recorded in the entity called "Investigation Tasks" by the Senior Investigation Officer (*etterforskningsleder*). It is important that the data in this layer is kept as the information source specifies it.
- Layer 'Analysis – Reports'
  No new thoughts about the data are added in this layer.
- Relationships between 'Analysis – Interpretation' and 'Analysis – Reports'
  No new thoughts about the data are transferred between these two layers, however the origin of the relationship (at the layer called 'Analysis – interpretation') can be values established with basis in the data or in the analyst's thoughts about the data.

The layer 'Concluding comments' will consist of one entity with relationship to the entity 'Event' in the layer 'Evaluation and preparation' and this relationship is established with basis in the data.

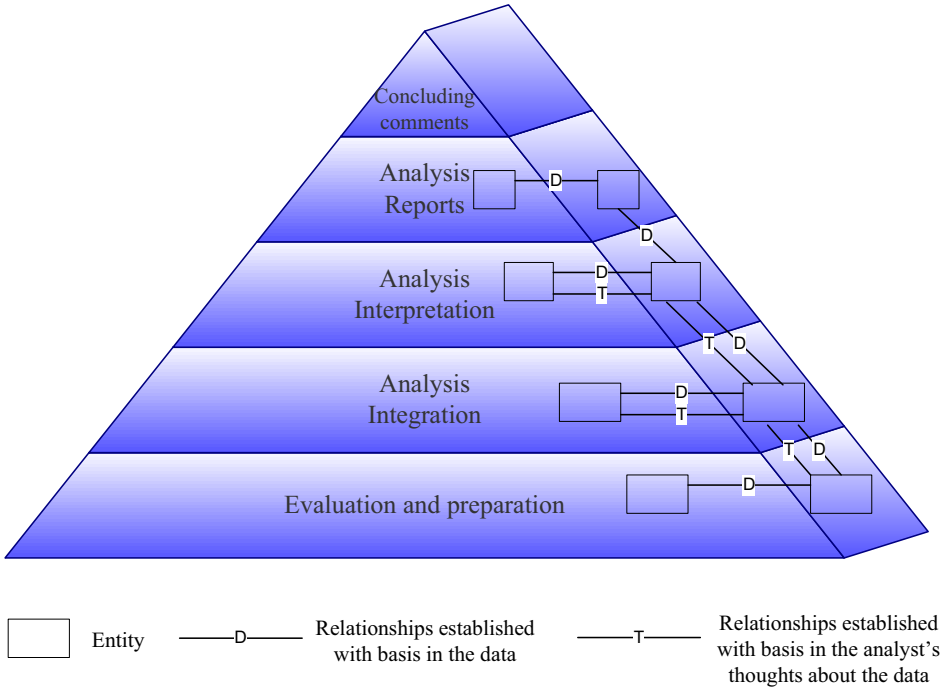


Figure 7.5 Use of different kinds of relationships within and between layers in the conceptual data model.

In the EER-models relationships between entities in each layer are displayed only by one symbol, and the symbol depicts which entities that can be connected and the cardinality of the relationship. However, each of these relationships can be of the types described in figure 7.5. A single relationship symbol is used for the sake of simplicity in the models. Relationships between layers that originate in an attribute that is represented with a text field shall be connected to the interesting text within the attribute, not only to the attribute itself. The interesting text should also be highlighted when displayed to show that there has been established a relationship to another attribute.

The different layers are described in several EER-models as table 7.16 shows.

Layer	EER-model	Content of EER-model
	a	Main data structure across layers.
Evaluation and preparation	b	Overview of main data structure.
	c	Entities: Case and Event with related entities. Detailed data structure
	d	Generalisation hierarchy: Report. Entity: Information System. Detailed data structure.
	e	Generalisation hierarchy: Information Source. Detailed data structure.
	f	Generalisation hierarchy: Confiscation. Detailed data structure.
Analysis – Integration	g	Overview of main data structure
	h	Generalisation hierarchy: View – Integration – Phone. Detailed data structure.
	i	Generalisation hierarchies: Entity and Item. Detailed data structure
Analysis – Interpretation	j	Detailed data structure.
Analysis - Report	k	Detailed data structure
Concluding remarks	l	Detailed data structure

Table 7.16 Overview of EER-models.

The EER-models (see appendix 21 for an explanation of the notation) are based on the categorisation which started in the initial analysis (see subsection 7.2.3), but the categorisation has also been further developed. Table 7.17 – 7.25 will provide descriptions of the different layers, entities and relationships between the layers. The description of each layer will consist of two tables; one that describes the main categories of the data represented in the EER-models as generic entities or entities; and one that lists the relationships between the different layers. Relationships between layers can, as relationships within the different layers, be of the types described in figure 7.5. The EER-models are included after table 7.25.

Main categories (generic entities/ entities)	Description	Subset categories (subset entities)
Case	A case is described by a name and a case number and can include one or more events.	
Event	An event (e.g. a theft, a murder) can be a) a crime already committed b) investigation projects based on crimes related to each other through modus operandi and/or type of crime	
Investigation Task	Used by the Senior Investigation Officer (*etterforskningsleder*) to keep track of the different tasks in the investigation, the name of the investigator responsible for the task, and why the task is prioritised. (See table 6.4. which gives an overview of information related to usefulness (*anvendbarhet*)).	
Map	A map or other visual information (e.g. floor plans of a building) about the place where the crime was committed with the possibility of adding indications of e.g. movements.	
Press Release	Press releases are stored in order to keep track of which information that is made public and when it was released to the public.	
Suspect	Personal official information about the suspect(s) in a case and when the person was considered to be a suspect	
Victim	Personal official information about the victim(s)	
Account List	A list of unique accounts that is of interest and gathered from official sources during the investigation. Described by account number and persons with formal access to the accounts.	
Telephone Book	A list of unique telephone numbers that is of interest and gathered from official sources during the investigation. Described by telephone number and owner of the telephone.	
Report	Reports from: a) forensic analysis regarding physical evidence b) criminal investigative analysis (criminal profiling) regarding the perpetrator(s) c) electronic traces obtained by the sexual assault group regarding sexual offences and racialist statements on the Internet d) Other reports of interest from the police (e.g. the orderly book)	Forensic Profiling Internet Other Reports
Information Source	Data gathered from witnesses, suspects and accused. Includes description of what they were doing at the time of the crime and what they were wearing.	Interview Tip House To House Bugging Surveillance
Routine	Particular routines performed in the witness' neighbourhood (e.g. mail delivery) represented with time and description	
Vehicle	Descriptions of vehicles a witness have observed or own.	

Main categories (generic entities/ entities)	Description	Subset categories (subset entities)
Visitor	Description(s) of visitor(s) at a witness' house.	
Perpetrator	Description(s) of the person(s) a witness believes to be the perpetrator.	
Companion	A witness' description(s) of any companion(s) of a perpetrator at the scene of the crime.	
Information System	Data gathered from external (both within and outside the police) databases and registers	
Confiscation	Data concerning electronic traces and objects. 'Confiscation Electronic Trace' include data from a) transcripts from telephone companies b) transcripts from banks and credit card companies c) transcripts from e.g. transport operators (airline companies, road toll companies) 'Confiscation Object' include data about and from confiscated physical objects	Electronic Trace Telephone Finance Various Trace Objects Mobile Phone Computer Equipment
Telephone Call	Called telephone number date, time, duration and geographical location obtained from confiscated transcripts	
SMS/MMS	The telephone number a message is sent to, together with date, time, and content of message for a confiscated transcript of a telephone number	
Transaction	Amount, direction, time and date of transactions from the confiscated transaction for an account or credit card number	
Phone Info	Information found in confiscated mobile phones	
Sim Card Info	Information found on sim cards in confiscated mobile phones.	
Storage Device	Store devices to computers with information.	
Information	Information found in storage devices for computers	
Evaluation Source	Investigator's determination of reliability of the information source (see also table 6.4)	
Evaluation System	Investigator's determination of the reliability of the information systems (see also table 6.4)	

Table 7.17 Layer: Evaluation and preparation.
Overview and description of main categories (generic entities/entities).
Overview of subset categories (subset entities).

Main categories (generic entities/ entities)	Description	Subset categories (subset entities)
View	Covers one analyst's (or a group of analyst's) integration of the data. Each analyst (or group of analysts) can have one or more views (corresponding to how many times the analyst analyses the data).	
Analyst	Data about the analyst (name, duty station and police district).	

Main categories (generic entities/ entities)	Description	Subset categories (subset entities)
Integration	For each data element that is integrated in the view a document reference, source type, source accuracy is incorporated. Also stored is the data's status as verified or unverified data.	
Entity	An entity can move (e.g. person, dog), and act.	Person Animal
Time	Represented with a moment time for start and end of the entity's involvement in the event together with an estimate of the accuracy.	
Location	Represented with a direction of movement from a particular point to a particular point together with an estimate of the accuracy.	
Coordinates	Map coordinates related to the start and end point of the movement.	
Role	Which role the entity had on the scene of the crime.	
Statement	Statements not classified (by the analyst) as an entity or an item, but still interesting, either because the statement is consistent or inconsistent with other statements	
Statement Type	Represents conflict or correspondence with other statements.	
Relationship	An entity's relationship (e.g. sister, mother, owner) to another entity.	
Sense	The sense the entity used to obtain data (e.g. hear, see).	
Item	Physical objects (e.g. car, gun) that have a connection to the investigation.	Vehicle Object
Social Support	Name of institution and type of support given to an entity.	
Computer Info	Information from confiscated computers (e.g. accessed internet addresses) related to an entity.	
Phone	The telephone number for a confiscated telephone or a transcript	
Phone Call	Called telephone number, date, time, duration and geographical location obtained from confiscated telephones and/or transcripts	
Message	The telephone number a message is sent to, together with date, time, and content of message for a confiscated telephone or transcript	
Access	Name and address of people with access to the telephone	
Credit Institution	The account number or credit card number for which a transcript is confiscated	
Money Transfer	Amount, direction, time and date of transactions for the confiscated account number or credit card number	
Account Name	Name and address for owner and/or proxy for the account	

Table 7.18 Layer: Analysis - integration.
Overview and description of main categories (generic entities/entities).
Overview of subset categories (subset entities).

Main categories (generic entities/ entities)	Description	Subset categories (subset entities)
Interpretation	Covers one analyst's (or a group of analyst's) interpretation (evaluation) of the data presented as scenarios or hypotheses. Each analyst (or group of analysts) can have one or more views (corresponding to how many times the analyst analyses the data).	
Scenario	Date, time, and document reference of data used in the different types of scenarios (relationship, commodity flow, event, and activity diagrams). See table 6.5 for a description of the different scenarios used during an investigation.	Relationship Commodity Flow Event Activity
Relationship Description	Date, time and type of relationships used in a relationship diagram.	
Person Organisation	Name and address of persons and organisations a commodity flows through.	
Flow Description	When, where and a description of the commodity hand over.	
Hypothesis	Includes data on who, what, how, where, why, when and how they relate to each other (see also table 6.6)	
Recommendation	Recommendation for further actions in the investigation and what the outcome of those actions might be.	
Premise	The premises a hypothesis builds on, including data about document reference, and type of information (verified/unverified information).	

Table 7.19 Layer: Analysis - interpretation.
Overview and description of main categories (generic entities/entities).
Overview of subset categories (subset entities).

Main categories (generic entities/ entities)	Description	Subset categories (subset entities)
Analysis Report	One or more reports from the investigation/analysis of a case. Different content to different recipients.	
Author	The investigator(s) and/or analyst(s) responsible for the reports.	
Introduction	Explains background, mandate and purpose of the investigation and analysis.	
Method	Gives an overview of technical terms and methods used in the investigation.	
Investigation	Gives an overview of the investigation and the result for each type of investigation.	
Conclusion	What the investigation has resulted in.	

Table 7.20 Layer: Analysis - reports.
Overview and description of main categories (generic entities/entities).
Overview of subset categories (subset entities).

Main categories (generic entities/ entities)	Description	Subset categories (subset entities)
Verdict	The court's judgement represented by name of the accused, date, which court, name of judge, duration of the trial and the verdict.	

Table 7.21 Layer: Concluding remarks.
Overview and description of main categories (generic entities/entities).
Overview of subset categories (subset entities).

Layer: Analysis - Integration		Relationships (*,*) to generalisation hierarchies and entities in layer 'Evaluation and preparation'
Generalisation hierarchy (generic and subset entities)	Related entities	
View/Integration/ Phone (h)		Confiscation/Electronic Trace/Telephone (f) Confiscation/Objects/Mobile Phone (f)
	Phone Call	Confiscation/Objects/Mobile Phone/Phone Info (f)
	Message	Confiscation/Electronic Trace/Telephone/ SMS/MMS (f) Confiscation/Objects/Mobile Phone/Sim Card Info (f)
	Access	Confiscation (f) Telephone Book (c)
View Integration/Credit Institution (h)		Confiscation/Electronic Trace/Finance (f)
	Money Transfer	Confiscation/Electronic Trace/Finance/ Transaction (f)
	Account Name	Confiscation (f) Account List (c)

Layer: Analysis - Integration		Relationships (*,*) to generalisation hierarchies and entities in layer 'Evaluation and preparation'
Generalisation hierarchy (generic and subset entities)	**Related entities**	
View/Integration/Entity/ Person and Animal (i)		Information System (d) Information Source (e) Routine (e) Vehicle (e) Visitor (e) Perpetrator (e) Companion (e) Confiscation/Objects (f)
	Time	Information System (d) Information Source (e) Routine (e) Vehicle (e) Visitor (e) Perpetrator (e) Companion (e) Confiscation/Electronic Trace/Various Trace (f) Confiscation/Objects/Mobile Phone and Computer (f)
	Location	Information System (d) Information Source (e) Routine (e) Vehicle (e) Visitor (e) Perpetrator (e) Companion (e) Confiscation/Electronic Trace/Various Trace (f) Confiscation/Objects/Mobile Phone and Computer (f)
	Coordinates	Map (c)
	Role	Information System (d) Information Source (e) Routine (e) Vehicle (e) Visitor (e) Perpetrator (e) Companion (e) Confiscation/Electronic Trace/Various Trace (f) Confiscation/Objects/Mobile Phone and Computer (f)
	Statement	Report/Internet (d) Information System (d) Information Source (e) Routine (e) Vehicle (e) Visitor (e) Perpetrator (e) Companion (e) Confiscation/Electronic Trace/Telephone (f) Confiscation/Objects/Mobile Phone and Computer (f)
	Statement Type	

Layer: Analysis - Integration		Relationships (*,*) to generalisation hierarchies and entities in layer 'Evaluation and preparation'
Generalisation hierarchy (generic and subset entities)	**Related entities**	
	Relationship	Information System (d) Information Source (e) Routine (e) Vehicle (e) Visitor (e) Perpetrator (e) Companion (e) Confiscation/Electronic Trace Telephone/SMS/MMS (f) Confiscation/Mobile Phone/Computer (f)
	Sense	Information System (d) Information Source (e) Routine (e) Vehicle (e) Visitor (e) Perpetrator (e) Companion (e) Confiscation/Electronic Trace/Various Trace (f) Confiscation/Electronic Trace/Telephone/SMS/MMS (f) Confiscation/Mobile Phone/Computer (f)
	Social Support	Information System (d) Information Source (e) Routine (e) Vehicle (e) Visitor (e) Perpetrator (e) Companion (e)
	Computer Info	Report/Internet (d) Confiscation/Objects/Computer (f)
View/Integration/Item/ Vehicle and Object (i)		Report/Forensic/Internet and Other Reports (d) Information System (d) Information Source (e) Routine (e) Vehicle (e) Visitor (e) Perpetrator (e) Companion (e) Confiscation/Objects (f)

Table 7.22 Relationships between layer 'Evaluation and preparation' and 'Analysis integration'. (Letters in parenthesis refers to detailed EER-models)

Layer: Analysis - Interpretation		**Relationships (*,*) to generalisation hierarchies and entities in layer 'Evaluation and preparation'**	**Relationships (*,*) to generalisation hierarchies and entities in layer 'Analysis – Integration'**
Generalisation hierarchy (generic and subset entities)	**Related entities**		
Interpretation/Scenario/ Relationship (j)			View/Integration/Phone (h) Phone Call (h) Message (h) View/Integration/Entity (i) Time (i) Location (i) Statement (i) Computer Info (i)
	Relationship Description		Relationship (i) Sense (i) Computer Info (i) Statement (i)
Interpretation/Scenario/ Commodity Flow (j)			Money Transfer (h) View/Integration/Item/ Vehicle and object (i) Social Support (i)
	Person Organisation		View/Integration/Phone/Message (h) Integration/Entity/Person (i) Statement (i) Computer Info (i)
	Flow Description		View/Integration/Phone/ Message (h) Time (i) Location (i) Role (i) Statement (i)
Interpretation/Scenario/ Event (j)		Case/Event (c)	
Interpretation/Scenario/ Activity (j)		Case/Event (c)	

Layer: Analysis - Interpretation		**Relationships (*,*) to generalisation hierarchies and entities in layer 'Evaluation and preparation'**	**Relationships (*,*) to generalisation hierarchies and entities in layer 'Analysis – Integration'**
Generalisation hierarchy (generic and subset entities)	**Related entities**		
Interpretation/Scenario/ Hypothesis (j)			
	Recommendation	Investigation task (c)	
	Premise		View/Integration/Phone and Credit Institution (h) View/Integration Entity and Item (i) Time (i) Location (i) Role (i) Relationship (i) Sense (i) Social Support Statement (i) Computer Info (i)

Table 7.23 Relationships between layer 'Analysis - Integration' and layers 'Evaluation and preparation' and 'Analysis - Interpretation'. (Letters in parenthesis refers to detailed EER-models.)

Layer: Analysis - Report **Entities**	**Relationships (*,*)** **to generalisation hierarchies and entities** **in layer 'Analysis – Interpretation'**
Analysis Report (k)	
Introduction (k)	
Method (k)	
Investigation (k)	View/Interpretation/Scenario (j) View/Interpretation/Hypothesis (j) Premise
Conclusion (k)	

Table 7.24 Relationships between layer 'Analysis – Report' and 'Analysis - Interpretation'. (Letters in parenthesis refers to detailed EER-models)

Layer: Concluding remarks **Entity**	**Relationships (*,*)** **to generalisation hierarchies and entities in layer 'Evaluation and preparation'**
Verdict (l)	Case/Event (c)

Table 7.25 Relationships between layer 'Concluding remarks' and 'Evaluation and preparation'. (Letters in parenthesis refers to detailed EER-models)

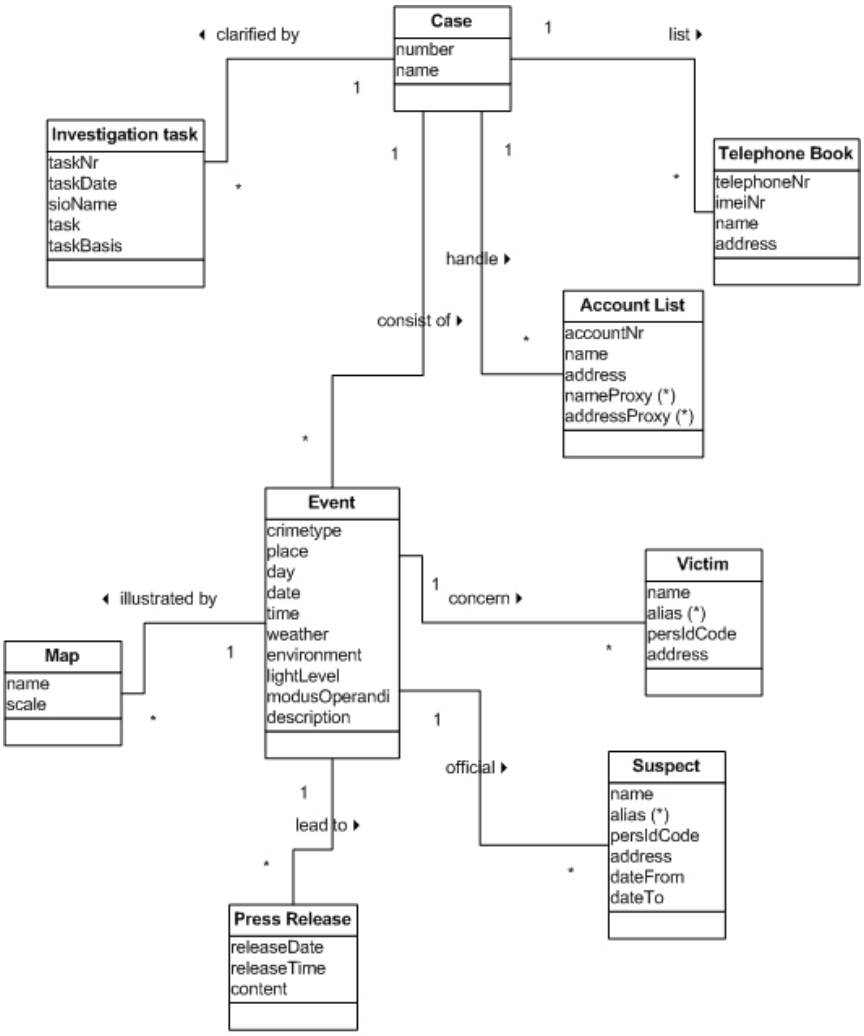
The EER-models conclude this subsection. In the next subsection (subsection 7.4.3) a presentation of the log function for the computerised information system is given.

EER-model a.

Main data structure across layers.

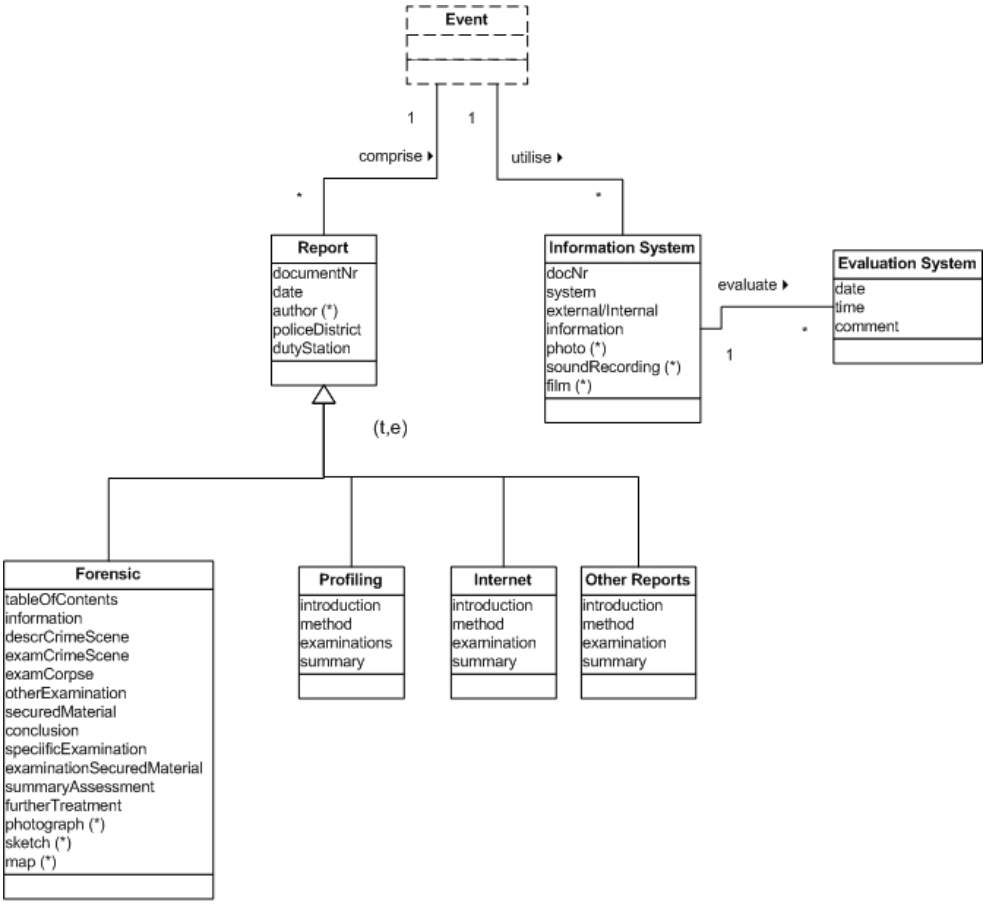
EER-model b.

Layer: Evaluation and preparation.
Overview of main data structure.



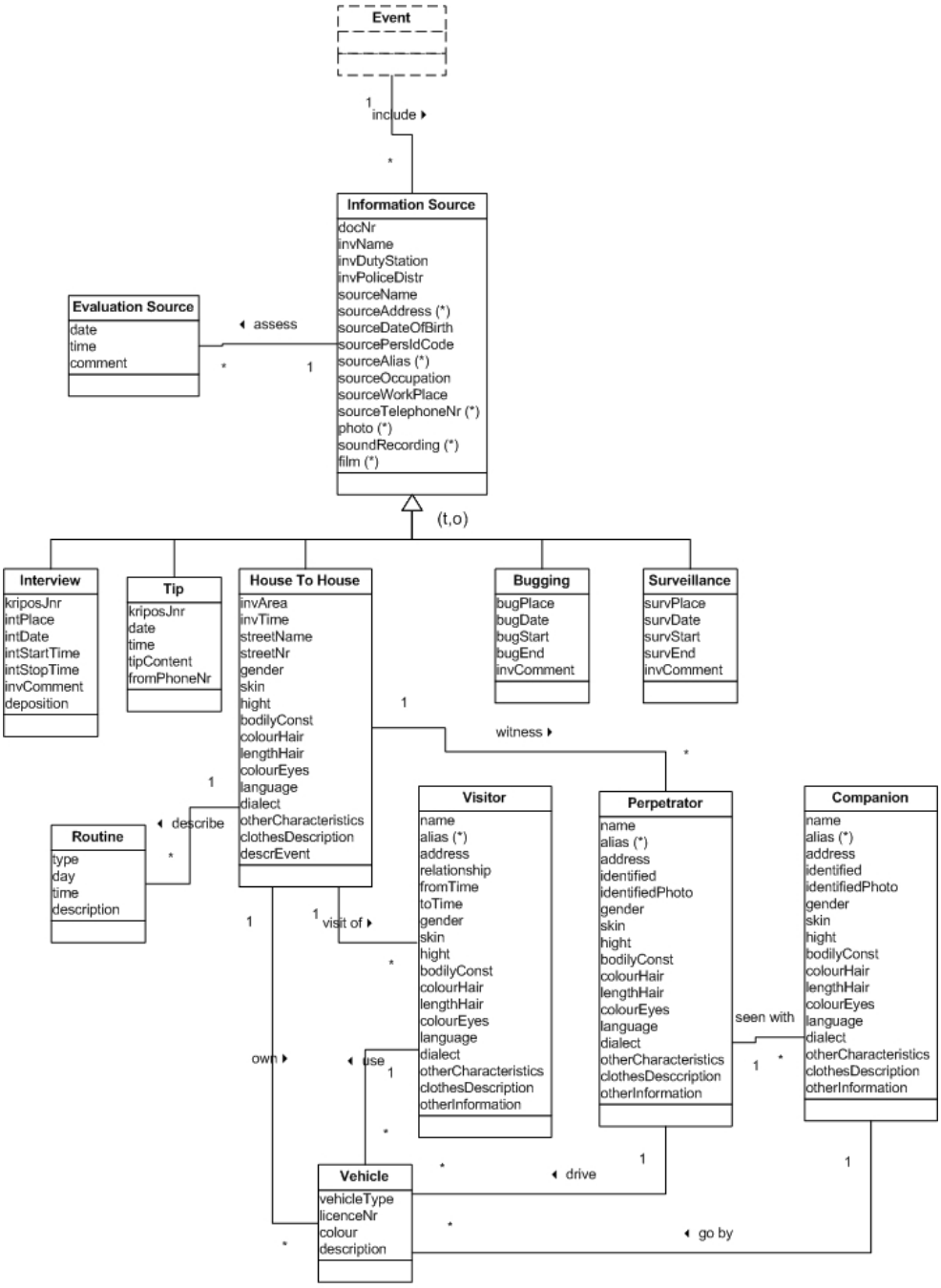
EER-model c.

Layer: Evaluation and preparation.
Entities: Case and Event with related entities.
Detailed data structure.



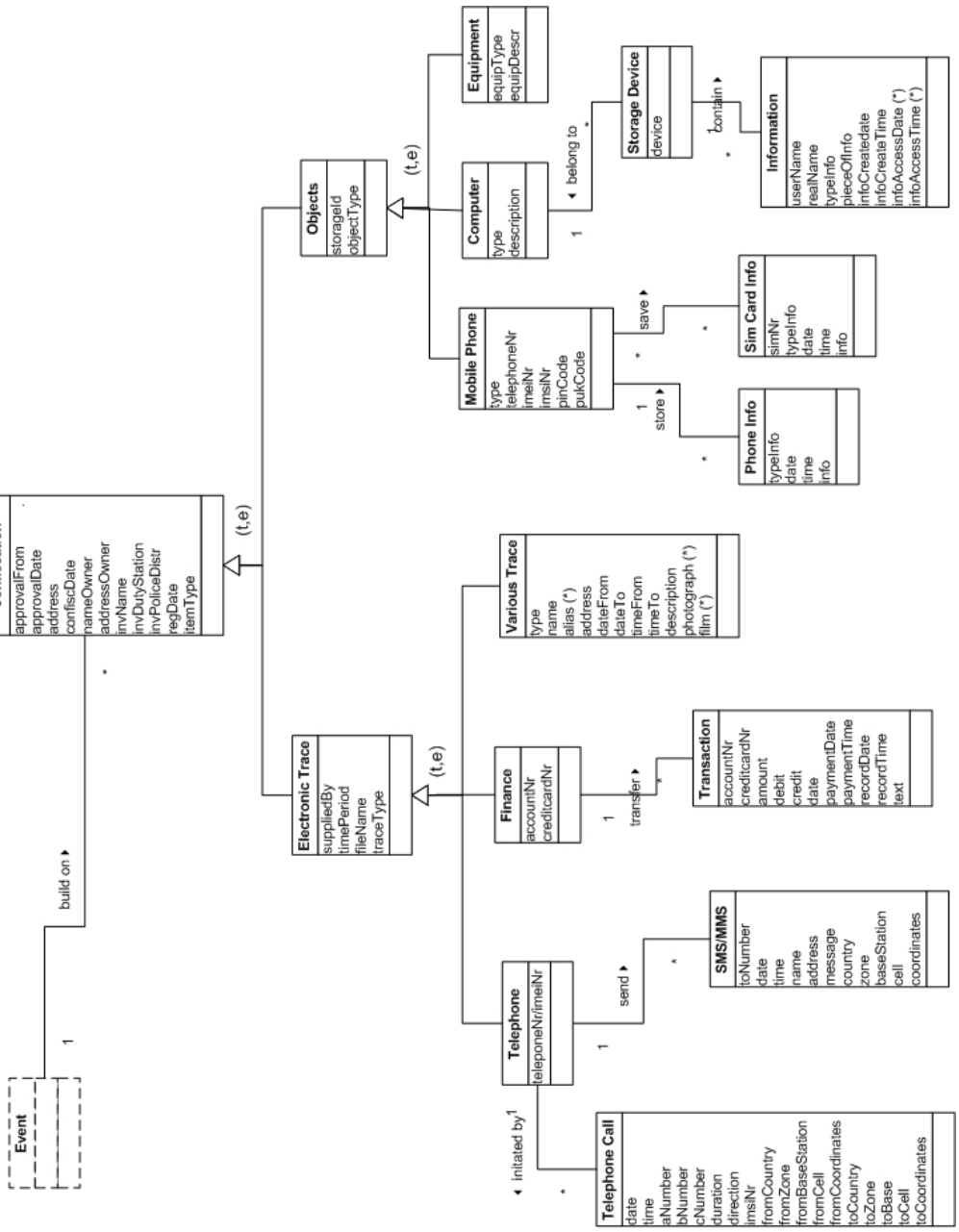
EER-model d.

Layer: Evaluation and preparation.
Generalisation hierarchy: Report.
Entity: Information System.
Detailed data structure.



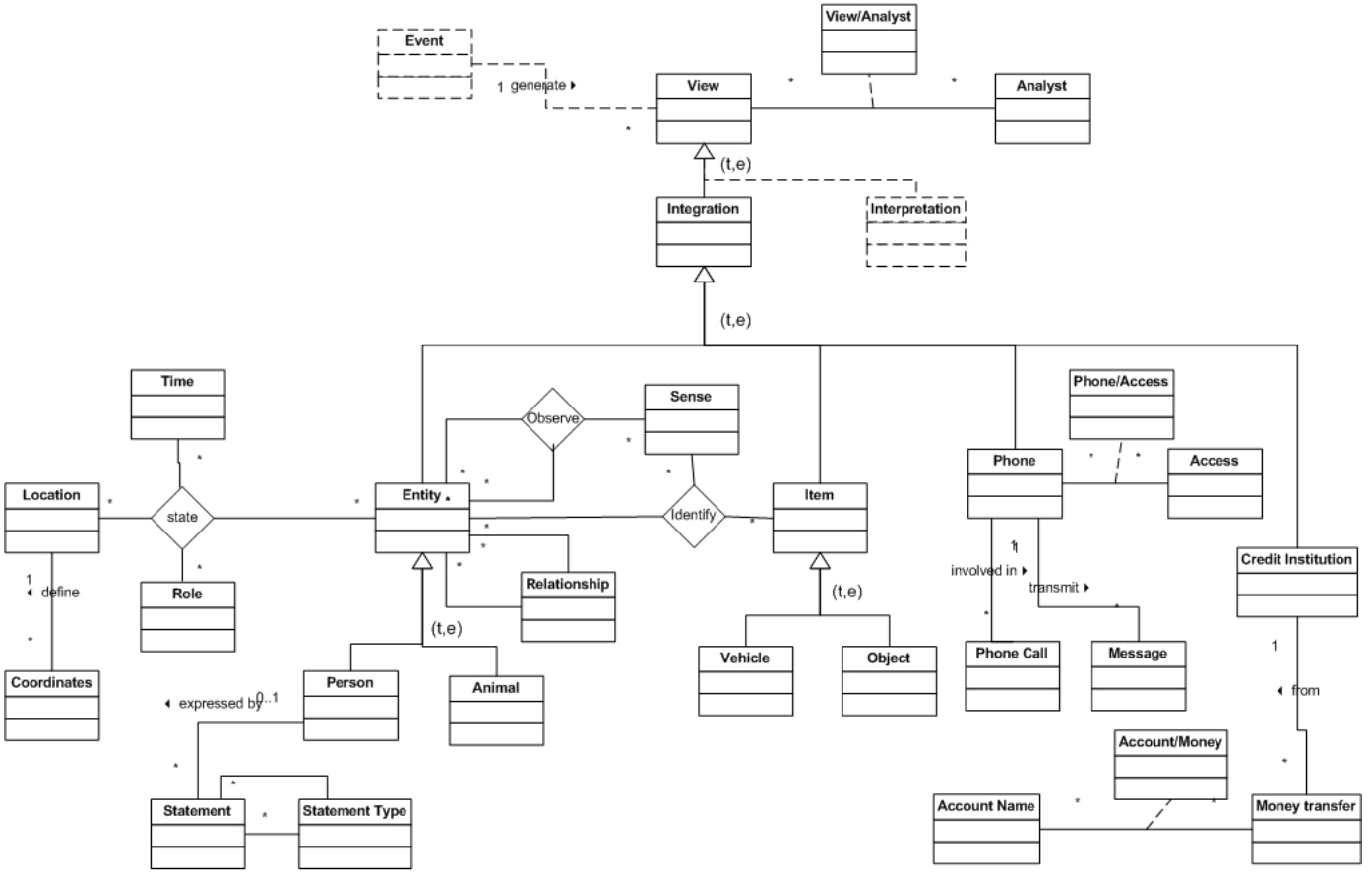
EER-model e.

Layer: Evaluation and preparation.
Generalisation hierarchy: Information Source.
Detailed data strucure.



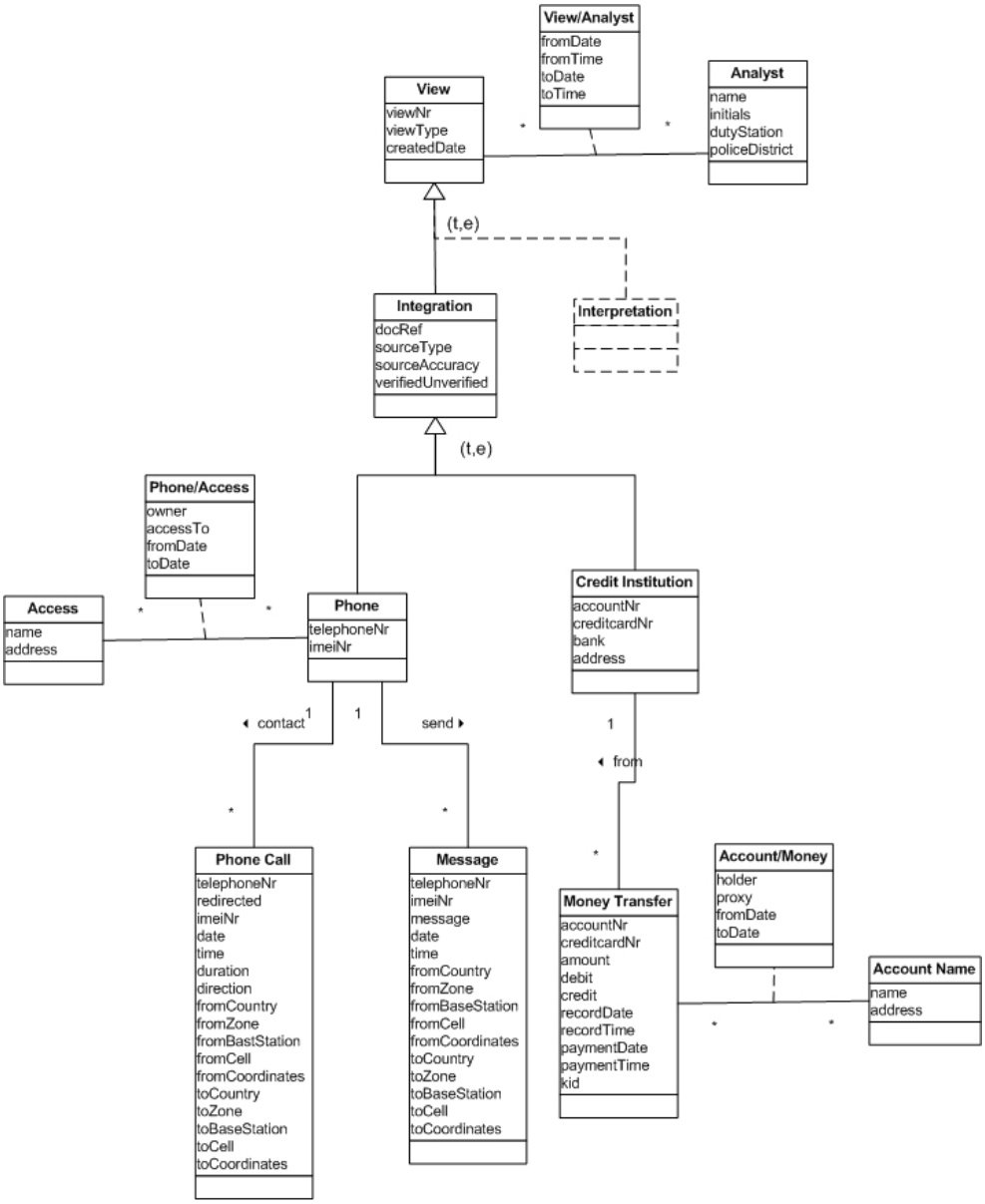
EER-model f.

Layer: Evaluation and preparation.
Generalisation hierarchy: Confiscation.
Detailed data structure.



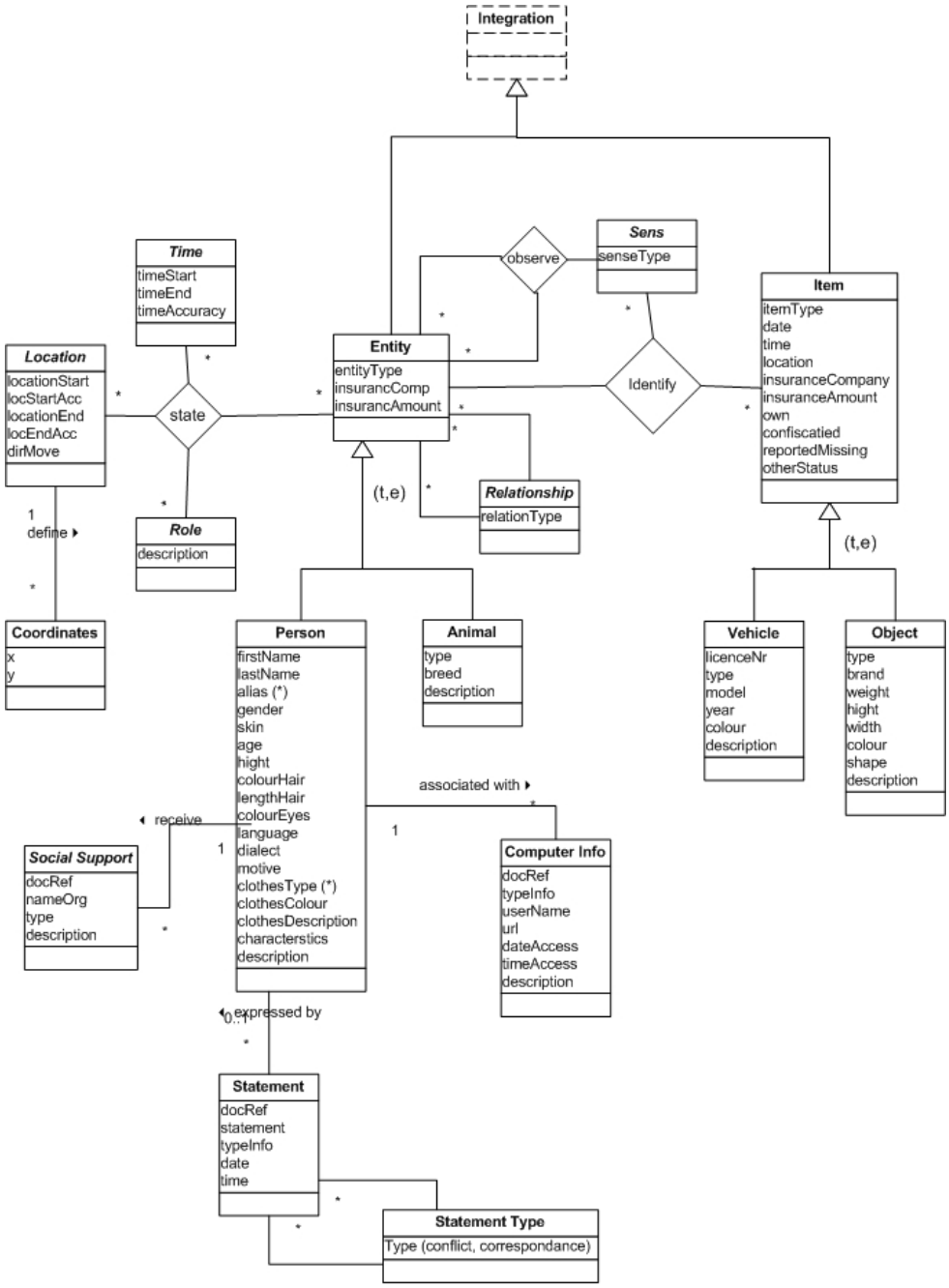
EER-model g.

Layer: Analysis – Integration.
Overview of main data structure.



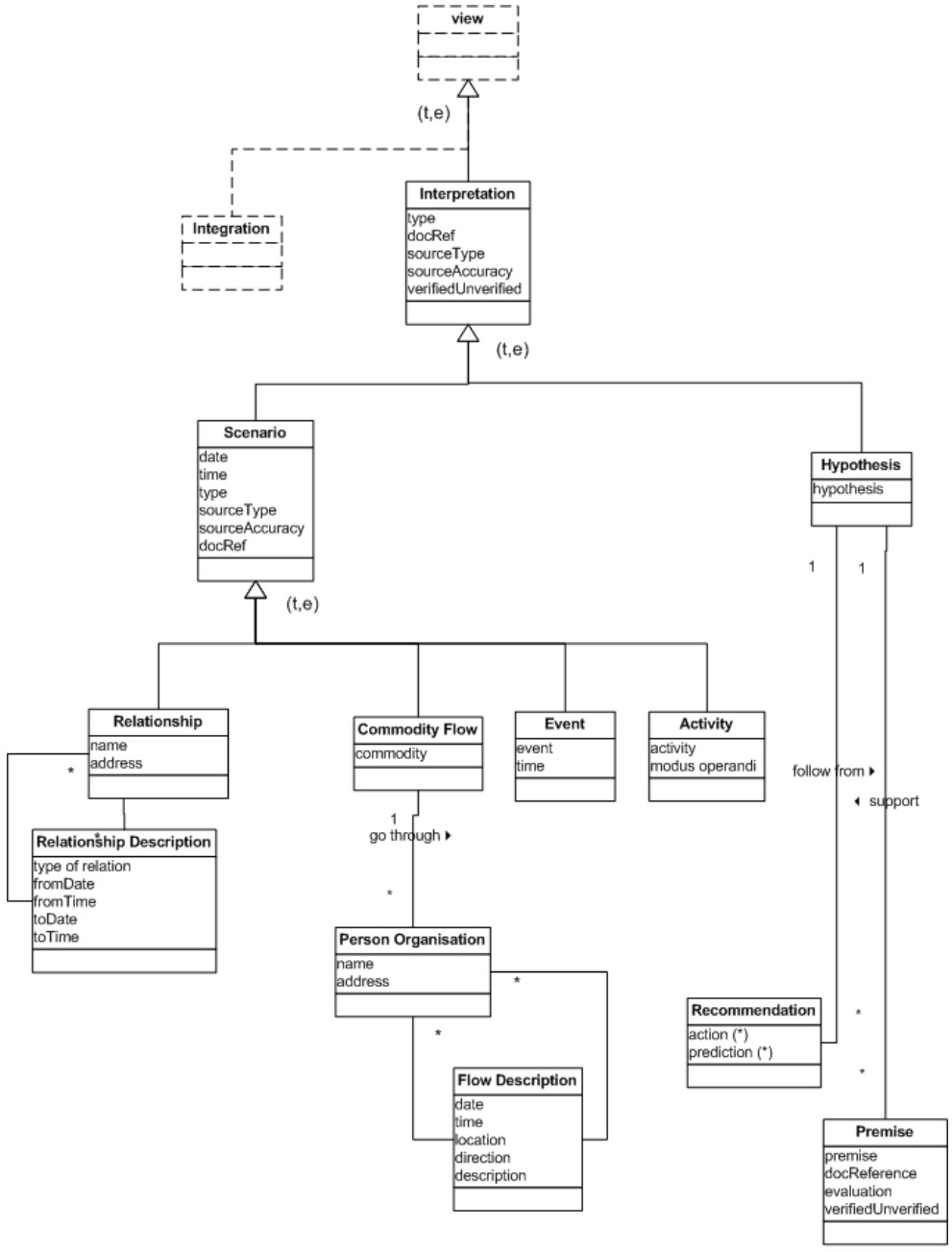
EER-model h.

Layer: Analysis – Integration.
Generalisation hierarchy: View – Integration - Phone
Detailed data structure.



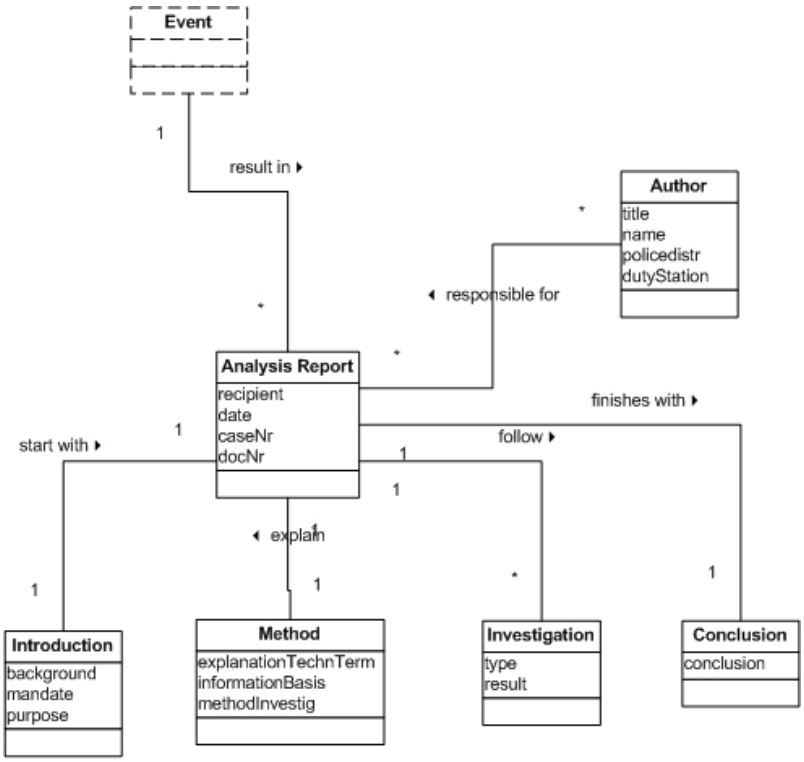
EER-model i.

Layer: Analysis – Integration.
Generalisation hierarchies: Entity and Item.
Detailed data structure.



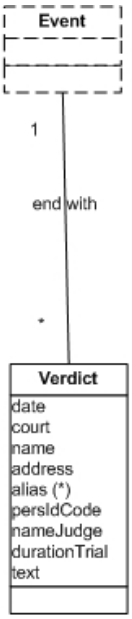
EER-model j.

Layer: Analysis - Interpretation.
Detailed data structure.



EER-model k.

Analysis – Report.
Detailed data structure.



EER-model 1. Level: Concluding remarks. Detailed data structure.

7.4.3 Log function

The computerised information system also includes a log function recording all events. The specifications are related to each layer in the conceptual data model. Before the specifications are presented an explanation of some of the terms used in the specification are needed:

'user-id' refers to the identification a user needs to log on to the system

'attribute-value' refers to the content of the attribute

'function' refers to created, changed, accessed or deleted

'date' refers to the date recorded by the computer

'time' refers to the time recorded by the computer

'view-nr' refers to a number specified by the computer

'report-nr' refers to a number specified by the computer

Layer: Evaluation and preparation.

For each attribute value accessed, created, changed, or deleted
log 'user-id' and 'attribute-value' and 'function' and 'date' and 'time'

For each relationship value accessed, created, changed, or deleted
log 'user-id' and 'attribute-value' and 'function' and 'date' and 'time'

If any attribute value is accessed more than 10 times and less than 30 times
then display attribute value in blue colour
if any attribute value is accessed between 30 and 40 times
then display attribute value in green colour
if any attribute value is accessed more than 40 times
then display attribute value in red colour

Layer: Analysis – integration.

If View Integration is created
then log 'view-nr' and 'user-id' and 'date' and 'time'

For each attribute value accessed, created, changed, or deleted in View Integration
log 'user-id' and 'attribute-value' and 'function' and 'date' and 'time'

For each relationship value accessed, created, changed, or deleted in View Integration
log 'user-id' and 'attribute-value' and 'function' and 'date' and 'time'

Layer: Analysis – interpretation.

If View Interpretation is created
then log 'view-nr' and 'user-id' and 'date' and 'time'

For each attribute value accessed, created, changed, or deleted in View Interpretation
log ‘user-id’ and ‘attribute-value’ and ‘function’ and ‘date’ and ‘time’

For each relationship value accessed, created, changed, or deleted in View Interpretation
log ‘user-id’ and ‘attribute-value’ and ‘function’ and ‘date’ and ‘time’

Layer: Analysis – report.
If Analysis Report is created
then log ’report-nr’ and ’user-id’ and ’date’ and ’time’

For each attribute value accessed, created, changed, or deleted in Analysis Report
log ‘user-id’ and ‘attribute-value’ and ‘function’ and ‘date’ and ‘time’

For each relationship value accessed, created, changed, or deleted in Analysis Report
log ‘user-id’ and ‘attribute-value’ and ‘function’ and ‘date’ and ‘time’

Layer: Concluding remarks.
For each attribute value accessed, created, changed, or deleted
log ‘user-id’ and ‘attribute-value’ and ‘function’ and ‘date’ and ‘time’

For each relationship value accessed, created, changed, or deleted
log ‘user-id’ and ‘attribute-value’ and ‘function’ and ‘date’ and ‘time’

The log specifications conclude this chapter. In the next chapter the reader can find a summary of the research, a discussion of the research, an overview of future research, and some personal comments from the researcher.

CHAPTER 8
DISCUSSION

There has been no more pervasive, persistent, and futile fallacy handicapping the social sciences than the use of the physical model for the understanding of social structures. [….]This figurative type of thinking ignores the essential difference between the socially contrived nature of social systems and the physical structure of the machine or the human organism.
Katz and Kahn (1978, p. 37)

This last chapter provides a summary of the research (section 8.1), a discussion of the research (section 8.2), identification of further research (section 8.3), and personal comments from the researcher (section 8.4).

8.1 Summary of research

This summary is structured in the same way as the previous chapters. Hence a summary of the theoretical framework is presented first (subsection 8.1.1), thereafter a summary of theoretical views on organisations (subsection 8.1.2) and information systems (subsection 8.1.3). The last summary of theoretical aspects, is the summary of investigation and analysis of criminal actions (subsection 8.1.4). After these theoretical summaries, we turn to the empirical investigation (subsection 8.1.5) and results from the empirical investigation (subsection 8.1.6).

8.1.1 Theoretical framework

An investigation into the Aristotelian, mechanistic and systems worldview has been carried out (see chapter 2). Table 2.1 (in section 2.1) summarises the three different worldviews for; view of nature, core element, epistemology, knowledge, reasoning, methodology, and method. Francis Bacon, one of the first modern thinkers, has been chosen as a representative of the mechanistic worldview. Particular interest is placed on his four types of idols (Bacon, 1952) and that we have to free our mind from the idols before we can gain knowledge (see

subsection 2.3.1). Another aspect of Bacon's science, is that he replaces scholastic deduction (used in the Aristotelian worldview) with induction and observation with experiments. The reductionist epistemology of the mechanistic worldview is in the systems worldview replaced with a holistic epistemology. A holistic epistemology is also a part of the Aristotelian worldview. Although Bertalanffy (Klir, 1972) states that the Aristotelian view "The whole is more than the sum of its parts" is valid for the systems worldview, the holistic epistemology is different, see table 2.1 (in section 2.1) for a comparison. In the mechanistic worldview the unity of science is represented through reduction into physical events (Bertalanffy, 1968) but the systems worldview holds that it is not possible to reduce "the biological, behavioural and social levels to the lowest level which is the constructs and laws of physics" (Bertalanffy, 1968, p. 49). The systems worldview, as does the Aristotelian worldview, holds that human actions always are directed towards a goal. According to M'Pherson (M'Pherson, 1974) the main interest for a systems scientist is systems that is behavioural and purposive. Systems can be hierarchically arranged (see table 2.2 in section 2.4) with structures and frameworks at the lowest level and transcendental systems at the highest level (Boulding, 1956;Checkland, 1981). Important concepts in the systems worldview are 'system', 'object', 'relationship', 'environment' and 'border'. Definitions are provided by e.g. Hall and Fagen (Hall & Fagen, 1956) (see section 2.4) who also emphasise that the border between the system and the environment are defined by an agent and that the agent's understanding of the borders will shape the agent's understanding of the system and influence the agent's actions.

We now leave the summary of the theoretical framework. The next subsection includes a summary of the literature review presented in chapter 3 of this thesis; organisations.

8.1.2 Organisations

As with most theoretical constructs, several definitions of organizations exist, e.g. March and Simon's view of formal organisations; "Organizations are systems of coordinated action among individuals and groups whose preferences, information, interests, or knowledge differ." (March, Guetzkow, & Simon, 1993, p. 2). Another view is that organisations are not established as ends in themselves (Morgan, 1977), they are instruments created to achieve other ends. The goal oriented activity is usually supported by instruments developed for that purpose, and the fundamental concepts are tasks, goals, aims, and objectives (see section 3.1).

Since Kripos is an organization within the public administration, an investigation into this subject is included in the research (see section 3.2). Woodrow Wilson, a pioneer in the field of public administration, writes (Wilson, 1887) that public administration is a part of politics in the same ways as a machine is part of a manufactured product, but at the same time it is raised above the level of technical detail because its greater principles are connected with political wisdom. According to Kickert (Kickert, 1997), it is not possible to achieve a universal theory that is true anywhere at any time and Dahl (Dahl, 1947) has identified three problems in creating a science of public administration; the place of normative values must be made clear; the nature of man must be better understood and his conduct must be more predictable; it must be possible to discover principles and generalities in comparative studies across boundaries and peculiar historical experiences. Different comparisons of public administrations were carried out, e.g. between the systems in Norway and the United States (Christensen & Peters, 1999) using the independent variables of structure and culture. Rainey et al. (Rainey, Backoff, & Levine, 1976) summarise the literature on differences between public and private organisations, and divide the main points into environmental factors, organisation-environment transactions, internal structures, and process as different between public and private organisations. However, the public sector is often equalised with the budget, forgetting about the legislative perspective (Lane, 2000), and the fact that an organisation is governmental has less influence than variables such as size, task, and technology (Rainey, 2003). Public organisations have, until recently, relied on the hierarchical structure, but the arrival of New Public Management (Lane, 2000) in the 1980's introduced contractualism as the new structure for governmental organisations. Graham Allison (Allison, 1983) started the debate concerning public and private organisations. There are two directions (Lægreid, Roness, Rørvik et al., 2004) in this debate, one distinguishes between the two types of organisations, and the other does not. Those who distinguish between private and public organisations emphasise the following characteristics for public organisations; democratic considerations; responsibility towards the citizens outweighs the responsibility towards special groups; there exists a higher demand for openness, insight, and fair treatment; and predictability.

Theoretical aspects of criminal justice organisations are reviewed in section 3.3. Criminal justice organisations can be divided into the 'rational goal model' and the 'functional-systems model' (Feeley, 1973) which are based on Etzioni's (Etzioni, 1960) discussion of the 'goal-model' and the 'system-model'. Feely (Feely, 1973) argues that the 'rational goal model' and

Weber's 'rational legal model' can be joined in the administration of criminal justice because the means and goals merge. In western tradition the criminal justice system can be seen as a system for achieving justice, a goal that usually acquires meaning operationalised in terms of procedure, i.e. means. In the 'functional-systems model' the criminal justice system is based on cooperation, exchange, and adaptation more than adherence to formal rules and defined "roles". An organisation in the criminal justice system can have many goals, and these can be conflicting. The 'due process model' and the 'crime control model' (Packer, 1968) represent two separate value systems which compete for priority in the criminal process. The emphasis for the 'due process model' is the rights of the individual and adherence to rules. The emphasis for the 'crime control model' is on regulation of criminal conduct. Stojkovic et al. (Stojkovic, Klofas, & Kalinich, 2004) use five characteristics linked to administrators in order to highlight goals in criminal justice organisations (see table 3.1 in section 3.3), while Wright (Wright, 1981) points out the fact that there is no monolithic and unifying set of values in our society, nor should there be. The criminal justice system should therefore give the opportunity to express a diversity of ideas to promote a smoothly running justice system, and at the same time it should represent a check of the powers in the same system. The basis for Wright's conclusions was the idea of a monolithic system for the administration of justice, where the common theme is a well-integrated system with a common set of goals pursued through a compatible set of strategies and techniques. Employees in most police organisations have different levels of skill and competence (Evan, 1993), and police organisations are multidimensional hierarchical (King, 2005). King identifies five hierarchies; the skills hierarchy, the reward hierarchy, the seniority hierarchy, the status hierarchy, and the authority hierarchy (see subchapter 3.3.1).

An organisation's internal structure and environment are reviewed in section 3.4. Mintzberg defines organizational structure "**simply as the sum total of the ways in which it divides its labor into distinct tasks and then achieves coordination among them**." (Mintzberg, 1979, p. 2, authors bold face type), and he identifies five mechanisms for coordination; mutual adjustment, direct supervision, standardisation of work processes, standardization of work outputs, and standardization of worker skills. He further states that different views of organisations are based on how these basic elements should be organised. Several classifications, or views, of organisations have been published (e.g. Morgan (Morgan, 1997), Hatch (Hatch, 1997), and Scott (Scott, 2003)). Scott (Scott, 2003) provides a layered model of organisations where all systems are seen as open systems belonging to the rational, natural,

and open system perspective (see table 3.2 in section 3.4) for dominant theoretical models within each perspective). An overview of some of the theoretical models (Weber's Theory of Bureaucracy, Open Systems Theory, and Institutional Theory) is outlined in table 3.3 (in section 3.4) which is adapted from Evan's (Evan, 1993) comparison of six models using key concepts, major assumptions, unit of analysis, key propositions, and problem areas. Scott builds on Leavitt's (Leavitt, 1965) model of organisations. Leavitt identifies four internal elements; structure, technology, people (actors), and task. Scott's model (Scott, 2003) also have four internal elements (social structure, goal, participants, and technology), but unlike Leavitt he adds a fifth element; the environment (see figure 3.4 in section 3.4). The social structure denotes the regularised aspects of the relationships between participants; the normative structure (values, norms, expectations); the cultural-cognitive structure (shared beliefs and understanding of situation and interest); and the behavioural structure (actual behaviour). The goal is seen as one of the most important concepts, and is defined as conceptions of desired ends, achieved through the participants' performance of task activities. Participants are more than just employees; other stakeholders are included in this term. Technology is a part of every organisation, but there are variations of how technology is understood. When the focus is on technology, the organisation is seen as a place where work and energy are used on materials to transform input to output.

Mintzberg (Mintzberg, 1979) states that an organisation's environment often is discussed according to the characteristics of the environment, and offers five hypotheses based on four characteristics; (1) Stability (ranging from stable to dynamic); (2) Complexity (ranging from simple to complex); (3) Market diversity (ranging from integrated to diversified); (4) Hostility (ranging from munificent to hostile). Four basic forms of environments are identified from the characteristics stability and complexity (see table 3.4 in section 3.4). An environment is complex if it requires the organisation to have sophisticated knowledge of e.g. products and customers, but simple if the knowledge can be rationalised (broken down into easily comprehensile components).

The last aspect of organisations reviewed in the research is the organizational culture (see section 3.5). Mintzberg (Mintzberg, 1989) defines the organisational culture to be the sixth part of an organisation (the other five being operating core, middle line, strategic apex, technostructure, and support staff). Mintzberg uses the term 'ideology' instead of 'culture' (see figure 3.6 in section 3.5). Martin (Martin, 2002) writes that most definitions of the term

'culture' use the word 'shared' and refer to culture as the distinct or unique in a particular context. According to Martin culture can be viewed as integration (harmony and homogeneity), differentiation (separation and conflict), and fragmentation (multiplicity and flux). Schein's (Schein, 1985, 2004) definition of culture emphasises that culture is a pattern of shared basic assumptions learned by a group whilst solving problems. The basic assumptions has worked well enough to be considered valid and are therefore taught to new members of the group as a way to perceive, think and feel in relation to these problems. A culture (Schein, 1991) is also a property of a human group, and the human group must therefore be defined before the culture can be defined. The culture in an organisation (Schein, 1992) has three different levels; basic underlying assumptions, espoused values, and artefacts.

The overview of organisational culture concludes the summary of theoretical views on organisations, and the next subsection provides a summary of chapter 4 in this thesis; Information systems.

8.1.3 Information systems

The first theoretical concept discussed in this section is information which varies both within and between disciplines (Liebenau & Backhouse, 1990) (see section 4.2). Several hundred definitions exist (Yuexiao, 1988), and more than 40 academic fields dealing with information is identified (Machlup & Mansfield, 1983). Machlup and Mansfield states that, beyond the name, it is not easy to find common elements to all the things called information. Sandra Braman (Braman, 1989) has developed a hierarchy of definitions in the area of policy studies which, according to Kirk (Kirk, 1999), is applicable to organisations. The hierarchy is based on definitions from many different fields, and has four levels; information as a resource; information as a commodity; information as perception of pattern, and information as a constitutive force in society. When information is viewed as a resource, information is seen as pieces unrelated to bodies of knowledge and information flows. Information is not seen to have any power in itself. The social structure is seen as haves and have-nots (two classes), and information can, like physical entities be processed. When information is viewed as a commodity an information production chain is also required. The information production chain includes information creation, processing, storage, transportation, distribution, destructing and seeking. Information is granted economic power. The exchange of information includes people and related activities. The social structure is seen to include

buyers, sellers and the organisation required to sustain a market. When information is viewed as perception of patterns, context is added to the definition. Information is affected by motive and other environmental and causal factors, and it also has effects in itself. Perception of pattern and context shift from observer to observer, and information is granted power of its own, although the effects of this power are isolated in themselves (e.g. uncertainty is reduced according to one specific, single question, without concern for trends or structural effects). Contextualised knowledge is seen as a greater power than knowledge. When information is seen as a constitutive force in society, information has an active role in shaping context, it affects other elements in the environment, and it creates social structure itself. Information is not just embedded in social structure. Information, its flows and use are granted an enormous power in constructing our social (and ultimately physical) reality.

Buckland (Buckland, 1991) views information from the user's point of view (see section 4.2) and identifies three principle uses; information-as-process (someone's knowledge is changed when they are informed), information-as-knowledge (communicated knowledge regarding some fact, subject, or event), and information-as-thing (information is used attributively for objects such as data and documents because they are regarded to be informative). Buckland (Buckland, 1991) states that the view of information as uncertainty reduction (in Braman's hierarchy (Braman, 1989) placed at the level of information as perception of pattern) is a special case of information-as-knowledge. Buckland also claims that information sometimes increases uncertainty. Buckland (Buckland, 1991) identifies the key characteristic of knowledge (and by that information-as-knowledge) to be intangibility and knowledge is personal, subjective and conceptual. However, when knowledge is to be communicated it must be represented in some physical way (e.g. a mark, signal, or communication), and this representation is seen as knowledge-as-thing. Buckland also distinguishes three kinds of information-receiving situations. These situations are viewed from the perspective of the person being informed and include communication (information are conveyed in e.g. a conversation or a letter), retrieval-based information services (information is sought and retrieved by the user, and this situation is explained to be more complex than a communication situation) and observation (e.g. observing an event, conducting an experiment, or contemplating evidence that has not been communicated or retrieved). Retrieval based information systems have two foundations; a role (facilitate access to information) and a mission (support whoever funds the information system). A retrieval-

based information system should be open (van Rijsbergen, 1996), so that the retrieval process can be influenced of the user's expertise and knowledge.

In the field of Information Systems, a distinction is made between data, information, knowledge, and wisdom. The terms are usually represented as a hierarchy (see figure 4.2 in section 4.2). The hierarchy has many names (Sharma, 2005) and different fields of investigation reports different origins. In Information Science and Knowledge Management the hierarchy is often called "Information Hierarchy" or "Information Pyramid". Zeleny (Zeleny, 1987) describes data as knowing nothing, information as knowing what, knowledge as know how, and wisdom as know why. Ackoff (Ackoff, 1989) describes a hierarchy consisting of (from the top) wisdom, understanding, knowledge, information, and data (see section 4.2) and states that each includes the categories beneath.

According to Ackoff (Ackoff, 1989) computers are adept to extract information from data (computerised information systems). Through programming the computers are 'taught' to understand something. Computerised expert systems are knowledge systems with an expert's knowledge programmed into it. These systems are rarely learning systems. The ability to learn on one's own are intelligence, and 'Artificial intelligence' systems are, in Ackoff's view, often mislabelled because they do not have the ability to learn on their own. Systems generating understanding of purposeful systems and as such able to facilitate and accelerate learning and adaptation exist, but they are generally man-machine systems.

The next view of information treated in this thesis, is Langefor's (Langefors, 1994) infological equation (IE) (see section 4.2). Langefors states that not every individual will receive the intended information from even simple data, and that designing information systems takes on very complex, humanistic dimensions. The equation has many consequences, among others that IE refutes positivistic ambition, data do not contain information, words do not have unique meaning, user involvement in data design is necessary, and knowledge atoms do not exist.

The last view of information treated in this thesis illustrates the relationships between data, information and knowledge as defined by Alter (Alter, 2006). Formatted, filtered or summarised data creates information which through interpretation, decisions and actions create results. Both information and results contribute to accumulated knowledge which

again is part of the processes of converting data into information and information into results (see figure 4.3 in section 4.2). Data is described to include facts, images, or sounds, and they may or may not be useful for a particular task. Information is data that is appropriate for a particular use, and knowledge is a combination of instincts, ideas, rules and procedures, and can be divided into tacit (unrecorded knowledge) and explicit knowledge (articulated and often codified in documents or databases).

The next topic treated in this thesis (see section 4.3) is information systems in an organisational context. Even though classification of information systems are still fragmented (Alter, 2004), information systems in an organisational context are often related to a hierarchy of organisational levels (Andersen, 1994; Gottschalk, 2004; Laudon & Laudon, 2006) which also corresponds to decisions made in organisations (Anthony, 1965). Executive support systems are linked to the strategic level and strategic planning; management information systems (MIS) and decision support systems (DSS) are linked to the management level and management control; and transaction processing systems (TPS) are linked to the operational level where operational control and operational performance are carried out. The boundaries between the different systems are not clear but Laudon & Laudon (Laudon & Laudon, 2006) offer a description which can be found in table 4.1 (in section 4.3), and Arnott and Pervan (Arnott & Pervan, 2005) offer a description of the evolution of the DSS field. The illustration can be found in figure 4.4 (in section 4.3).

McNurlin and Sprague (McNurlin & Sprague, 2003) classify information systems according to work types. The two classes are 'procedure based' and 'knowledge based' information systems, and the characteristics of each type are related to the information workers job procedures and knowledge rather than data type, business function or job title. Amongst other characteristics (see table 4.2 in section 4.3 for a full overview) procedure based information work focuses on process, efficiency, and handling of data while knowledge based information work focuses on problems, goals, effectiveness, and handling of concepts. Procedure based information work is predominantly handled by clerical workers and knowledge based information work is handled by managers and professionals.

The next theory investigated in this research, is the work system framework (see figure 4.5 in section 4.3) developed by Alter (Alter, 1999, 2002). The work system includes humans and/or machines performing a business process. In order to perform this process information,

technology, and other resources are used. An organisation contains multiple work systems. An understanding of a work system includes understanding of the business process, participants, information, technology, product, and customers. In this context the information system performs six operations; capture, transmit, store, retrieve, manipulate, and display information. Information systems serve work systems, but are also seen as work systems. The environment includes organisational, cultural, competitive, technical and regulatory aspects within which the work system operates, and the infrastructure includes human, informational, and technical resources which the work system relies on. Information systems can support both individual and multiple work systems (see table 4.3 and 4.4 in section 4.3 for the information system's roles with examples).

The next topic investigated in this research, is systems development, and particularly requirements gathering and analysis (see section 4.4). The field of information systems is relatively young, it was established in the l960's (Davis, 2006). One of the pioneers was Børje Langefors who emphasised (Langefors, 1966; Langefors & Sundgren, 1975) that design should focus on what a data base should be capable of doing (the infological approach), more than how it should be done (the datalogical approach). However, the infological approach should be combined with the datalogical approach. The datalogical design should be regarded as a natural extension of the infological design.

Another approach to systems development is the 'web' of social, technological, and cultural phenomena which constitutes the systems development (see section 4.4). The web is defined by Hirschheim, Lyytinen and Klein (Hirscheeim, Lyytinen & Klein, 1995). The components of the 'web' are not completely independent, nor completely dependent. Information system development is seen as a change process that is not deterministic because developers are often uncertain that the planned intervention can be carried out, and if the resulting object system will have the desired properties. The intentions for the information system development are expressed by objectives which are related to general value-orientations and represent what 'one ought-to-do' or 'what-is-good'. The development process is carried out by a formally organised group, and the group has similarities with social institutions. The environment should be seen as 'webs' of conditions and factors 'which surround development processes'. A graphical representation of the information system development process can be found in figure 4.9 in section 4.4.

Hirschheim and Klein (Hirschheim & Klein, 1989) define four paradigms of information systems development (see figure 4.10 in section 4.4); functionalism, social relativism, radical structuralism, and neohumanism. The developer archetype connected with each of these paradigms is for functionalism the expert or platonian 'Philosopher King', for social relativism it is the catalyst or 'facilitator', for radical structuralism it is the warrior for social progress or the 'partisan', and for neohumanism it is the emancipator or social 'therapist'. The four paradigms are also distinguished with regard to how the systems development proceeds and which elements are used in defining the information system (see table 4.5 in section 4.4).

Another approach to information systems development is proposed by Andersen et al. (Andersen, 1990) (see section 4.4). This approach is based on two views; the product-oriented (named 'systems development performance') and process-oriented (named 'system development management)'. Examples of the two views are (Iivari, Hirschheim & Klein, 2004) organisational alignment, requirements construction, user interface design, and software design for 'system development performance', and project organising, people management, risk management, and quality assurance for 'system development management'.

Iivari, Hirschheim and Klein (Iivari, Hirsccheim & Klein, 2004) have identified five knowledge areas in information systems development; technology knowledge, application domain knowledge, systems development process knowledge, intra- and interorganisational context, and application knowledge (see figure 4.10 in section 4.4 for a graphical illustration). The five domains are social constructions existing independently of any individual perception of them, and they represent the underlying social constructions embodying information system development. The domains are not completely independent, each area can logically, practically and historically draw on more than one domain to create new meanings.

Requirements determination (Flynn, 1992) is the least well defined activity in the development process (see section 4.4). The activity includes, but is not limited to, requirements acquisition and requirements analysis; it is also the least technical task and the most organisation dependent task. Requirements are not as clearly defined and fixed as is commonly supposed. Lewis (Lewis, 1994) calls requirements analysis 'data analysis' and he describes it as the process of investigating the nature and structure of the data used in a problem situation. The specification of the information content is called conceptual layout

(Kent, 2000), as opposed to the physical layout of the database or the multiple views held by different applications. Klein and Hirschheim (1987) states that no data modelling approach can avoid philosophical assumptions and outline the ontological and epistemological grounds for data analysis (see figure 4.12 in section 4.4 for a graphical representation of the ontological positions (realism and nominalism) and the epistemological assumptions (positivism and interpretivism). The ontological assumptions concern the nature of the 'Universe of Discourse' (UoD) which the resulting schema of the data modelling will represent, and the epistemological assumptions relates to the nature of knowledge of UoD and how this knowledge is acquired. Only two (Klein & Hirschheim, 1987) positions are of primary significance for data modelling; the realist-positivist (defines an objectivist paradigm) and nominalist-interpretivist (defines a subjectivist paradigm) positions. In the objectivist view differing opinions about UoD must be a reflection of human error, while in the subjectivist view the UoD is a question of the social construction of reality. In the objectivist view inconsistencies between different views are unwarranted and a threat to data integrity, while in the subjectivist view inconsistencies in views are not necessarily a sign of error (Gause & Weinberg, 1989). The data model in the objectivist view is seen as a 'reflection of' reality - the data corresponds to facts. The data model (Klein & Hirschheim, 1987) in the subjectivist view is seen as consisting of subjective meanings constructing reality. Entity based data models were developed within the objectivist view, but they are widely used also in the subjectivist paradigm. In this view the entities do not refer to objective facts, but to perceived objects. One entity-based model is the entity-relationship model (ER-model) developed by Chen (Chen, 1976, 1977, 1983, 2002). Constructs used in this model are entities, relationships, and attributes. Relationships are seen as associations between entities, and the attribute express the information about an entity or relationship. The ER-models have been extended to include hierarchies (generalisation and aggregation) and are then called 'extended entity-relationships models' (EER-models).

In this research another aspect of the requirements analysis was to capture the flow of data (see section 4.4); this is described as a function-driven approach to information systems development as opposed to data-driven approaches (Batini, Ceri, & Navathe, 1992). Data flow diagrams (DFD) are a network representation of a system, and the system can be automated, manual or mixed (DeMarco, 1979). The four elements in a DFD are the dataflow (the pipeline for information packets), the process (which transforms the incoming data flow to the outgoing data flow), the data stores or files (which are temporary repositories of data),

and the source/sink (which represent a person, organisation or another system outside the system that is being analysed).

The overview of information system development concludes the summary of information systems. The next subsection contains a summary of chapter 5 in this thesis; investigation and analysis of criminal actions.

8.1.4 Investigation and analysis of criminal actions

The first topic investigated was the difference between criminal intelligence and criminal investigation (see section 5.2). The word intelligence (Warner, 2002) can refer to a product, a process and the individual organisations that shape raw data into a finished intelligence product as well as the larger community of these organisations. The word intelligence also often refers to the military or agencies like MI5 (Security Service) or MI6 (Secret Intelligence Service) in Great Britain. However, in this research intelligence is related to criminal actions and defined as a goal oriented gathering, systematisation and analysis of information (Auglend, Røsandhaug, & Mæland, 1998). Criminal investigation on the other hand, is a purposeful fact gathering activity to assess if a penal law has been violated and if the perpetrator fulfils the three other conditions for criminal offence (Rieber-Mohn, 1996). A crime (Ellingsen, 2001) does not necessarily include only two parties, the perpetrator and the victim. A crime can also be performed by criminal groups, companies or organisations. According to Oxford Dictionary of Law (2003), criminal actions can also be a failure to act, and that the act or failure to act is deemed by statute or law to be a public wrong. When deemed public wrong, the act (or failure to act) can be punishable by the state in criminal proceedings. Hans Gross has been central to the modern debate regarding criminal investigation, and he emphasises the importance of induction (Gross, 1911), which includes both observation and deduction as the empirical method in the study of criminal cases. He also emphasises the need to establish empirical laws because they in the study of nature yield regularities, and these regularities can be used in similar cases, but they will be disregarded in other cases.

The second topic investigated was analysis in law enforcement organisations (see section 5.3). According to Vellani and Nahoun (Vellani & Nahoun, 2001) there has been a shift from an offender-based to target-based foundation in criminological theory. The two views are

considered to be alternatives and analysis methods for both viewpoints exist. Several terms are used to describe the different forms of analysis, and the terms are also used interchangeably. In addition to definitions used by Interpol (Interpol, 2008) and the Trevi definition of crime analysis (Read & Oldfield, 1995), four texts (Bruce, 2004; Gottlieb, Singh & Arenberg, 1994;Osborne & Wernicke, 2003; Peterson, 1998) about law enforcement analysis were investigated. An overview of different terms and comparisons can be found in table 5.3, 5.4, and 5.5 (in section 5.3). However, the terms used in this research are those used by Kripos hence the reader is referred to section 5.1.

The terms data, information, and knowledge have been extensively described earlier in this summary and in section 4.2. In connection with crime analysis Bruce (Bruce, 2004) explains the conversion of data to information through the process of analysis, which is the focus for a criminal analyst, and the conversion of information to knowledge through the process of communication, which also falls within the crime analyst's area of expertise. A graphical representation of the process of converting data into knowledge can be found in figure 5.4 (in section 5.4), and examples taken from a typical police agency can be found in table 5.6 (in section 5.4). Morgan et al. (Morgan, Holland, Hardy et al., 1993) define criminal intelligence analysis to consist of six steps and through these six steps data is transformed into real-world actions (see table 5.7 in section 5.4).

The last topic investigated was eyewitness testimonies (see section 5.5). According to O'Hara and O'Hara (O'Hara & O'Hara, 2003), the tools an investigator can use are the three "I's"; Information, Interrogation, and Instrumentation. Information is the most important of the tree "I's" and describes the knowledge that the investigator gather from other persons. The second "I", interrogation, includes skilful questioning of witnesses and suspects, and the success of information depends on the intelligent selection of informative sources. The third "I", instrumentation, includes all technical methods e.g. fingerprints, criminal record systems, DNA analysis, modus operandi files, communication systems, and surveillance equipment. Even though there has been progress in forensic science (or instrumentation), eyewitnesses are important even today (O'Hara & O'Hara, 2003), and in some cases (e.g. robbery or assault) eye witness testimonies can provide all elements needed in a criminal case. Because eyewitness testimonies are considered important, the eye witness testimony has long been an area of investigation. In modern times the investigation was started by Elizabeth Loftus in the 1970's (Wells, Memon, & Penrod, 2006). Wells et al. divide the variables affecting witness

accuracy into two sets; system variables (variables the criminal justice system has control over) and estimator variables (variables outside the criminal justice system's control). System variables include how witnesses are instructed before a line-up, and methods for interviewing eyewitnesses, and estimator variables include cross-race versus within-race identifications. Witness errors can be classified as factors determining perception, retention and retrieval of events, and recognising people (Lofthus & Doyle, 1992) (Ainsworth, 1998). Turnbull (Bromby & Hall, 2002) has identified eight reliability factors regarding time (time elapsed since event and/or duration of observation), distance, visibility, observation, familiarity with the perpetrator, reasons for remembering the event, and errors in description. In addition to psychological causes of errors, a witness may use deception (or lies), i.e. deliberate attempt (successful or unsuccessful) to create a belief the communicator considers being untrue (Memon, Bull & Vrij, 2003).

We now leave the theoretical investigation. The next subsection gives a summary of chapter 6 in this thesis: the empirical investigation, and an overview of the theoretical views informing the research.

8.1.5 The empirical investigation

First in this subsection the reader will find an overview of the theoretical views informing the research. Then the methodologies and methods used in the empirical investigation will be presented. Before the different data gatherings, the research purpose, focus, goal, and question are presented.

Theoretical views informing the research

Although the review of the theoretical background included both the Aristotelian and the mechanistic worldview, it is the systems worldview (see section 2.1 and 2.4 for a review) that has informed the research. The systems worldview emphasise that the world exist and that it is intelligibly ordered (Laszlo, 1972). Laszlo's realist position also holds that we can have some knowledge of it, although this knowledge is not perfect (Midgley, 2002). Nature is described according to relationships within and between wholes and context. The core element is process rather than substance, the epistemology is holistic, and observation and empirical testing are used as means to obtain knowledge which are aposteriori. The reasoning is inductive, and the methodology is synthetic, and analytic. The systems worldview is not

multidisciplinary, but each branch of science uses methods from their own discipline (see table 2.1 in section 2.1 and section 2.4). Important concepts in the systems worldview, and this research, are; system, objects, attributes, relationships, and environment (see section 2.4 for definitions). The lines between the system and the environment are not definite, but "In a sense, a system together with its environment makes up the universe of all things of interest in a given context." (Hall & Fagen, 1956, p. 67).

In addition to the systems world view Sir Francis Bacon's four forms of idols (Bacon, 1952) have informed the research. The four forms of idols (see subsection 2.3.1 for a further description) build on the theory that we have to free our minds from the idols before we can gain knowledge. The use of induction is an appropriate way to banish idols. The cultures have been investigated with focus on complexity of relationships between the different cultures, i.e. the fragmentation perspective (see section 3.5).

The view of information used in the research corresponds to 'Information as perception of pattern' (Braman, 1989) (see section 4.2). In this view information is seen in context; information can be affected by motive and other environmental and causal factors; information has effects itself; information has a past, present and future. Information is granted contextualised power. The simplest definition of this level in Braman's hierarchy (Braman, 1989) focuses on reduction of uncertainty, more complex definitions centre on context. However, according to Buckland (1991), information can also increase uncertainty. A view also adopted in this research was that there are three kinds of information-receiving situations (Buckland, 1991); communication, retrieval-based information services, and observation (see section 4.2), and that a retrieval situation is more complex than a communication situation. In communications information is conveyed (intentionally and more or less directly) as a conversation, letter, or a lecture. Retrieval based information systems are artefacts. They involve selecting, collecting, retrieving, and searching, and they have two foundations; a role (facilitate access to information) and a mission (to support whoever funds it). When information is received by other means (e.g. observing an event, conducting an experiment, or contemplating any evidence that has not been communicated or retrieved) it is called observation. Retrieval-based information systems should also be open (van Rijsbergen, 1996), i.e. the process of retrieval can, in any stage, be influenced of the knowledge and expertise of the user.

The relationships between data, information, and knowledge used in this research are defined by Alter (Alter, 2006) (see section 4.2). Formatted, filtered or summarised data create information which through interpretation, decisions and actions create results. Both information and results contributes to accumulated knowledge which again is part of the processes of converting data into information and information into results (see figure 4.3 in section 4.2). Data is described to include facts, images, or sounds. Information is data that is appropriate for a particular use, and knowledge is a combination of instincts, ideas, rules and procedures, and can be divided into tacit (unrecorded knowledge), and explicit knowledge (articulated and often codified in documents or databases).

Information systems are in this research defined in accordance with Alter's (Alter, 1999) 'work system framework' (see section 4.3). The framework builds on work systems which consist of human participants and/or machines performing a business process. An organisation typically includes multiple work systems and operates through them. Information systems are defined as a work system whose internal functions are limited to processing information. Information systems can support one or multiple work systems. The 'work system framework' builds on the systems worldview.

Information systems development (see figure 4.9 in section 4.4), which has been a large part of the research, is, in accordance with the definition given by Hirschheim, Lyytinen and Klein seen as (Hirschheim, Lyytinen, & Klein, 1995, p. 15, author's italics.)

> "a *change process* taken with respect to *object systems* in a set of *environments* by a *development group* to achieve or maintain some *objectives.* "

The social relativist paradigm (see section 4.4 and figure 4.10) for information systems development has informed the research. In this view (Hirschheim & Klein, 1989) the developer archetype is seen as a catalyst or 'facilitator'. The system development process starts from within, by improving subjective understanding and cultural sensitivity through adapting to internal forces. The elements used in defining the information system are subjectivity of meanings, symbolic structures affecting evolution of sense-making, and sharing of meaning of evolutionary social change.

The research also adopts the view of information systems development described by Iivari, Hirschheim and Klein (Iivari, Hirschheim, & Klein, 2004). They emphasise that the

information system developer should have, or gain during the development process, knowledge on five ontological domains (see section 4.4 and figure 4.11); the technology domain, the application domain, the domain of IS development processes, the domain of IS applications, and the domain of intra- and interorganisational context. Since the research focused on requirements determination, which according to Flynn (Flynn, 1992) is the least technical, and most organisation dependent task, the technology domain was not emphasised in this research (apart from investigating the current information systems and technologies in use at Kripos). Emphasis has been placed on gaining knowledge of the four other domains.

A time consuming task in the research has been the development of a conceptual data model. Klein and Hirschheim state that (Klein & Hirschheim, 1987, p. 8)

> "No data modelling approach can avoid philosophical assumptions, because data modelling is a process of inquiry that has intrinsic similarities with classic scientific theory construction."

From the epistemological positions of positivism and interpretivism, and the ontological positions of realism and nominalism, Klein and Hirschheim (see section 4.4 and figure 4.12) identify four possible paradigms. However, only two are significant for data modelling; the realist positivist (objectivist) and nominalist-interpretivist positions (subjectivist). The view adopted in this research is the subjectivist paradigm in which the data model is seen to consist of subjective meanings constructing reality. Even though the entity based models (ER-models) were developed in the objectivist paradigm, they are widely used within the subjectivist paradigm (Klein & Hirschheim, 1987). EER-models (Extended ER-models) are used in this research to develop a conceptual model of the computerised information system, and data flow models are used to visualise the boundaries for the computerised information system.

We now leave the theoretical views informing the research, and turn to the empirical investigation. The research purpose, focus, goal, and question are presented first, followed by an overview of the research methodology and methods, and last the data gatherings.

Research purpose, focus, goal, and question

The research has been guided by the following research purpose, focus, goal, and question.

Research purpose

The research purpose was to enable investigators of criminal cases to reconstruct the course of events involved in a crime as completely and accurately as possible with particular emphasis on increasing the human investigator's understanding of the events, actions and timelines involved in a crime.

Research focus

The research focus was criminal intelligence analysis, particularly case analysis and comparative case analysis.

Research goal

The initial research goal was to develop a model for a computerised information system to be used in the reconstruction process, and to decide the borders for the information system.

During the research two sub goals were added

- *Understand and critically document the process involved in criminal intelligence analysis*
- *Understand and describe the possible boundaries and barriers that may prevent effective and efficient criminal intelligence analysis*

Research question

The initial research question was as follows:

- *Is it possible to represent diverse knowledge in dynamic data structures and thereby improve an applied field of criminal intelligence analysis?*

During the research the initial research question was refined into the sub questions:

- *Does the understanding of the applied process of criminal intelligence analysis influence the electronic representation in the communication system?*
- *Do the boundaries and barriers of the criminal intelligence analysis process fall in line with the boundaries of the proposed model for the computerised system?*

Research methodology and methods

Within the systems worldview, methodology (see table 2.1 in section 2.1, and section 6.2) is seen to be synthetic and analytic, and each branch of science use methods from their own discipline. Both qualitative and quantitative measurements can be used. Since there has been performed little, at least publicly available, research within criminal intelligence analysis a methodology based on qualitative measurements was chosen. The methods consisted of participant observation, document analysis, unstructured talks/interviews and structured interviews with open-ended questions. In addition telephone conversations and e-mail was used. A mock-up case based on a real event was constructed at the beginning of the empirical investigation, and for this case data was gathered through interviews and questionnaires with open-ended questions distributed through e-mail to possible witnesses of the crime.

Reliability and validity (see section 6.2) in qualitative research are subject to much debate (Ritchie and Lewis, 2003). One way of securing reliability of qualitative research suggest two levels; carry out internal checks on the quality of the data and its interpretation; provide information about the research process to the reader/enquirer of the research. Use of triangulation, or multiple methods, can be seen as an alternative to validation (Flick, 2002;Denzin & Lincoln, 2005). Internal checks of the data quality were carried out throughout the research, and multiple methods were used during the data gatherings.

Data gatherings

The empirical investigation consisted of nine data gatherings:

1. *Mock-up case for a stolen laptop (based on a real event)*
2. *Nordic course in Tactical Criminal Intelligence Analysis*
3. *Data gathering at Kripos (2 weeks)*
4. *Review of EER-models*
5. *Review of EER-models*
6. *Presentation and discussion of models at Kripos (two meetings)*
7. *Data gathering at Kripos (3 days)*
8. *Presentation and discussion of models at Kripos*
9. *Data gathering at Kripos*

A chronological overview of the nine data gatherings can also be found in table 6.2 (in section 6.3), and a chronological overview of events (outside Kripos) with impact on the research is presented in table 6.3 (in section 6.3). It is often difficult to plan work in criminal investigation and analysis. This resulted in some planned events had to be postponed, and some appointments within each event had to be postponed or appointments were arranged with other employees.

Permissions to publish transcripts from data gatherings were given (see appendix 10 and 17).

1. Mock-up case for a stolen laptop (based on a real event).

A mock-up case (based on a real event) involving a stolen laptop at the Department of Information Science at University of Bergen was created to gain a better understanding of the investigation and analysis process (see section 6.4). Data was gathered through unstructured interviews and questionnaires with open-ended questions distributed through e-mail to possible witnesses of the crime. The questions focused on characteristics of the witness, and the perpetrator (see section 6.4). The interviews were transcribed, and analyses of the data were carried out by reviewing the data twice. Spreadsheets were used to classify the information. During the interviews it became clear that, even though both the researcher and the witnesses were familiar with the physical surroundings, misunderstandings occurred.

2. Nordic Course in Tactical Criminal Intelligence Analysis.

The researcher was the first civilian considered for taking part in the Nordic Course in Criminal Intelligence Analysis, and after some discussion participation was permitted. The researcher participated in the same manner as the rest of the participants, analysing cases and being trained in the different types of analysis. No computers were used, every analysis was performed manually (see section 6.5). Although the course lasted for three weeks, the researcher, for practical reasons, only participated the last two weeks. In addition to training in the different analysis techniques, the course also included introductions to the different forms of analyies, and the intelligence process. The first task carried out in each analysis was evaluation of the information, thereafter deciding the different analysis techniques to use, and dividing the group into teams of two members. Each team used one technique to analyse the data. After the different analyses were finished, the group discussed the different results, developed a hypothesis, and presented the results in plenum. Inductive logic was prescribed along with being as objective as possible. However, in the final stage of an analysis,

developing a hypothesis, the analyst goes beyond the facts to provide the investigator with a worthwhile goal. Hypotheses are usually aimed at further investigation. Every analysis was carried out with the main goal of reconstructing the course of event as correct as possible, focusing on; who is involved; what are they doing; how are they doing it; where does it happen; when did or will it happen; and why are they doing it. A description of the intelligence process is included in section 4.1 and subsection 6.5.1.

3. Data gathering at Kripos.

The first data gathering at Kripos (see section 6.6) lasted two weeks, and included unstructured interviews/talks with several employees carrying out different tasks during a criminal investigation (see table 6.7 for a full overview). The areas of expertise included criminal intelligence analysis, investigation, information technology, intelligence information, criminal investigative analysis (criminal profiling), telephone log analysis, and forensic evidence. In addition the researcher was given access to solved cases in order to analyse which information was deemed important in a criminal investigation and the form of the documents used by investigators and analysts. A summary of the field notes can be found in subsection 6.6.1.

4. and 5. Review of EER-models.

Data gathering four and five (see section 6.7 and 6.8) focused on comments to conceptual EER-models developed by the researcher before each data gathering. Unstructured interviews with the employee at Kripos assigned to be the contact for the research was carried out. The unstructured interviews were recorded and transcribed (the transcripts (in Norwegian) can be found in appendix 12 and 14). A summary of the comments (in English) can be found in section 6.7 and 6.8. EER-models with corrections made during the data gathering can be found in appendix 11 and 13.

6. Presentation and discussion of models at Kripos.

The sixth data gathering (see section 6.9) had two purposes; present the conceptual EER-models to the employees at The Department for Tactical Investigation (Taktisk etterforskningsavdeling) (between 20 and 25 employees participated in the meeting); discuss the conceptual EER-models with representatives from Kripos (see section 6.9 for a list of representatives). In addition to conceptual EER-models the researcher prepared a letter of introduction (see appendix 7). Parts of the EER-models displaying data from the case of the

serial killer called "Jack the Ripper" were also used in the meeting where the employees participated (see section 7.3). Some of the comments from the meetings can be found in section 6.9.

7. Data gathering at Kripos.

The seventh data gathering lasted three days. Three unstructured interviews were carried out with representatives from criminal investigative analysis (criminal profiling), forensic investigation and evidence, and sexual abuse and racial statements (see table 6.9 in section 6.10). Focus for this data gathering was to collect information to further develop the conceptual EER-models and the data flow diagrams. A summary of the field notes can be found in subsection 6.10.1.

8. Presentation and discussion of models at Kripos.

The purpose for the eight data gathering was to get final feedback on the EER-models and data flow models. The meeting lasted from 09.30 till 15.00 and every model was discussed in detail with representatives from Kripos (see section 6.11). The discussion was mostly directed towards details in the models, and some comments can be found in section 6.11 and EER-models with corrections made during the data gathering can be found in appendix 15.

9. Data gathering at Kripos.

The final data gathering did not focus on the conceptual models for the computerised information system, but on questions relating to the planning- and decision making process as it is carried out at Kripos, and on the information systems used at Kripos. An interview guide (in both Norwegian and English can be found in appendix 16) with open ended questions was sent to the interviewees before the interviews. Four interviews (lasting between 30 minutes and one hour) were conducted, but three interviewees gave permission to use the results in the research. All interviews were recorded and transcribed. Transcripts from the three interviews where permission was given can be found in appendix 18, 19 and 20 (the transcripts are in Norwegian). A summary of the transcripts (in English) can be found in subsections 6.12.1, 6.12.2, and 6.12.3 together with some background information of the interviewees.

We now leave the empirical investigation, and the next subsection gives a summary of chapter 7 in this thesis: results.

8.1.6 Research results

The empirical data was compared to different theoretical views. The analyses and comparisons resulted in the following characterisation of Kripos and the criminal intelligence process.

Investigation of criminal cases is a formal, organised activity, and organisations are seen as "systems of coordinated action among individuals and groups whose preferences, information, interests, or knowledge differ." (March, Guetzkow & Simon, 1993, p. 2). The fundamental concepts in organisations are tasks, goals, aims and objectives, and instruments are usually developed to aid some kind of goal-oriented activity (Morgan, 1977).

Different aspects of organisations were investigated through a literature review of an organisation's internal structure and its environment (see section 3.4). According to these literature reviews Kripos is defined as an (see section 3.4.1) open, bureaucratic, and decentralised organisation. In this research Kripos' environment has been defined as stable and complex (see subsection 3.4.1). Schein's definition of culture (Schein, 2004) (see section 3.5) is used in the research. This definition emphasises that a group share basic assumptions, and that these basic assumptions are learned through solving problems. The employees at Kripos belong to different groups (e.g. scientists and investigators) with their own culture (see subsection 3.5.1).

The formal, organised activity of investigating criminal cases is executed by law enforcement organisations (see section 3.3) in the public domain (see section 3.2). Views adopted in this research are that employees in most police organisations have different levels of competence or skill as described by Evan (Evan, 1993) (see subsection 3.3.1), that the employees have their own culture (see section 3.5 and subsection 3.5.1), and that police organisations are multidimensional hierarchical (King, 2005) (see subsection 3.3.1). The five hierarchies identified are: the skills hierarchy, the reward hierarchy, the seniority hierarchy, the status hierarchy, and the authority hierarchy. Kripos is also a part of a hierarchical criminal justice sector (see section 3.1).

Law enforcement organisations can have many goals and these goals can be conflicting (Packer, 1968) (see section 3.3). Kripos' goal in this research are defined by the research purpose; enable investigators of criminal cases to reconstruct the course of events involved in

a crime as completely and accurately as possible. The research goal also places emphasis on increasing the human investigator's understanding of the events, actions and timelines involved in a crime. The research is based on the 'due process model' (Packer, 1968) which emphasises the rights of the individual and adherence to rules. Adherence to the rules in investigating criminal cases does not exclude the application of personal experience and knowledge (see section 3.3 and subsection 3.3.1).

An investigation into the theoretical concepts of intelligence and investigation (see section 5.2), terms used to describe analysis in law enforcement organisations (see section 5.3), the concept of information in criminal investigation (see section 5.4), and eyewitness testimonies which many still regard the most important type of data in criminal intelligence analysis (see section 5.5). However, this research used the definitions and descriptions obtained through the empirical research at Kripos (see section 5.1). Information obtained from intelligence is called unverified information, and information obtained from investigation is called verified information. The different forms of law enforcement analysis can be found in table 5.1 and 5.2 (in section 5.1).

After this characterisation of Kripos and the criminal intelligence process, a presentation of the research results follows.

Research results

Each data gathering was followed by an extensive analysis of the empirical data and the analyses resulted in the descriptions of:

- *Kripos and its place in the judicial system*
  (see section 3.1 and appendix 1 – 5)
- *The analytic work at Kripos (including the criminal intelligence process)*
  (see section 4.1 and 5.1, and subsection 6.5.1. 6.6.1, and 6.10.1)

In addition to the descriptions the research results can be divided into

1. *Identification of possible communication break down points and a specification of an ideal communication pattern between and within law enforcement organisations*
2. *The extended intelligence process*
3. *Conceptual EER-model for a computerised information system*

4. *Data flow model showing the borders and main processes for criminal intelligence analysis*
5. *Log function for the computerised information system*

1. Identification of possible communication break down points and a model for ideal communication between and within law enforcement organisations.

The possible break-down points for communication (see section 2.1) within and between law enforcement organisation are visualised in figure 2.1 (in section 2.1) using current communication patterns between three tribes (planners/strategists, detectives, and uniformed division in the police force). Sharing of knowledge and experience is vital because misinformation and/or disinformation in these organisations can have very unfortunate consequences and a model for ideal communication pattern between the same tribes as in figure 2.1 (in section 2.1) are presented in figure 2.2 (in section 2.1).

2. The extended intelligence process.

The intelligence process used by Kripos consists of; data gathering, evaluation, preparation, analysis (integration, interpretation, hypothesis development, inferences, conclusions, hypothesis), and distribution (see figure 4.1 in section 4.1). During the research an extended intelligence process was developed. In the extended intelligence process distribution is not seen as the last step, concluding comments are (see figure 4.6 in subsection 4.3.1). Concluding comments include information about the verdict in each case.

3. Conceptual EER-model for a computerised information system.

The conceptual EER-model for a computerised information system corresponds to the extended intelligence process. The EER-model consists of five layers (see table 7.16 in subsection 7.4.2 and figure 4.7 in subsection 4.3.1 for an overview); Evaluation and preparation, Analysis – Integration, Analysis – Interpretation, Analysis Reports and Concluding Comments. In the model a distinction is made between unverified and verified information (see figure 7.4 in subsection 7.4.2). The EER-model also includes two kinds of relationships (see figure 7.3 in subsection 7.2.3); relationships established with basis in the data and relationships established with basis in the analyst's thoughts about the data. How these two kinds of relationships are used in the EER-model is shown in figure 7.5 (in section 7.4.2). Categorisation of data was refined through several iterations, and the final categorisation can be found in table 7.17 – 7.25 in subsection 7.4.2. The conceptual EER-

model also includes sound files (e.g. from interviews and interrogations), images (e.g. photos, floor plans, maps) and film (e.g. from surveillance). The possibility for making comments on the images are included (e.g. place persons on a floor plan with direction of movement). Views for each analyst are incorporated into the conceptual EER-model (the final EER-model is included last in subsection 7.4.2). Time and date are included as frames (from – to) with a percentage for accuracy (see table 7.12in subsection 7.2.2). Inclusion of the last step (concluding comments) makes it possible for the computerised information system to support several types of analysis (work systems) (see subsection 4.3.1). An entity for investigation tasks is also included in the EER-model.

The EER-model was developed through several iterations, and initial and intermediary results can be found in chapter 7 (section 7.1 – 7.3) and appendices 6 - 9. The mock-up case for the stolen laptop resulted in the identification of several problems and their solutions. The twelve problems and their solutions are listed in subsection 7.1.4. The reader can also find a floor plan with entities and their movements in figure 7.1 and 7.2, an overview of data sets and their area of use in table 7.10, and problems in data sets related to function and characteristics in table 7.11.

4. ***Data flow model showing the borders and main processes for criminal intelligence analysis.***

The data flow model is represented with a context diagram showing the borders for the criminal intelligence analysis system, and a system overview showing the main processed in criminal intelligence analysis (see subsection 7.4.1). The context diagram includes an unusual way of representing the relationship between the sources and the system for criminal intelligence analysis. The first and last levels in the conceptual data model (evaluation/preparation and concluding comments) are placed at the border for the criminal intelligence analysis system showing that this computerised information system is the link between investigation and analysis and not exclusive to either investigation or analysis. Sources are still included to give an overview of information needed in criminal intelligence analysis.

For intermediary results and descriptions the reader is directed to section 4.1, and 5.1, subsection 6.5.1, 6.6.1, and 6.10.1, and appendix 9).

5. Log function for the computerised information system.

An automated log is included into the computerised information system (see subsection 7.4.3). The log shall record events (access, create, change, delete) for both attribute values and relationship values, and for each event specific additional information shall be recorded.

Intermediary results for the log function can be found in appendix 9.

After this description of research results a discussion of the results follows in the next section.

8.2 Discussion of the research results

In chapter 1 it was stated that the contribution to knowledge from this research could be argued to be of three related areas

1. *Increased understanding of information needs in criminal intelligence analysis*
2. *Increased understanding of the process of communication in law enforcement organisations*
3. *Increased understanding of data gathering methods*

1. Increased understanding of information needs in criminal intelligence analysis

Throughout the research much attention was paid to the different tribes within Kripos, and hence the borders of the criminal intelligence analysis system. In this research criminal intelligence analysis is seen as the link tying the criminal investigation together; the analysis includes information from both tactical and technical investigation and hypotheses are prepared with regards to who, what, how, where, why, when and how they relate to each other. These considerations were the foundation for the conceptual EER-model and data flow model. However, the information from tactical and technical investigation is not used in the same manner. Information from tactical investigation are analysed by the criminal intelligence analyst, information from the technical investigation is not. The information is thus represented in different manners; information from technical investigation is included as the result of the forensic analyses, information from tactical investigation are included in the system as it is entered into the system by the tactical investigator. Hence, the data in the systems differs according to the degree of trustworthiness; information analysed by forensic scientist has a high degree of trustworthiness in that it is based on physical evidence. Information gathered by tactical investigators can have a high degree of trustworthiness (e.g.

electronic trace), but information gathered from witnesses and suspects does not automatically have the same trustworthiness, and this information can be compared to information from forensic analyses and electronic traces to increase the trustworthiness.

A result of using the four forms of idols identified by Bacon (Bacon, 1952) in the research, is that different analysts will view the information in different ways, and a possibility for recording the analyst's thoughts about the data was incorporated into the computerised information system.

Even though a computerised information system does not ensure effective and efficient sharing of information, this research suggests that attention to borders, relationships, and cultures, can result in less fragmented information systems. However, this is not synonymous with a standardisation of all information systems within an organisation. A balance of information systems spanning borders (e.g. the criminal intelligence analysis system) and information systems specialised to a particular tribe (or task) (e.g. fingerprint analysis) is recommended. Electronic transfer of data between the different systems is recommended in order to avoid sources of error.

A rather wide perspective was utilised to establish the borders for the information system, but an even wider perspective could have been beneficial for the research. Economic crimes are in Norway investigated by an organisation which investigates only economic fraud. An investigation into this division could have been worthwhile since economic fraud and organised crime is tightly coupled. The police districts could also have been included in the investigation in order to see even wider connections.

The research focused on information systems in law enforcement organisations, but since both other organisations in the public domain and private organisations share many of the same features investigated in this research, the same approach would benefit also these organisations.

2. Increased understanding of the process of communication in law enforcement organisations

A well developed computerised information system is one component that can ensure effective and efficient information sharing. However, an information system also includes humans, and to ensure efficient and effective information sharing an understanding of the communication between them are important. During the research possible break down points were identified, and these are illustrated in figure 2.1 (in section 2.1).

Being able to achieve an ideal form of communication (illustrated in figure 2.2 in section 2.1) is difficult. Many different considerations must be taken when communicating information to others. In some cases weighing the pros and cons for solving the case if information from the investigation is transferred to other investigations is required. A reluctance of sharing information can also stem from the fact that much information is obtained with great personal costs and the sensitive nature of the information. However, an awareness of the different kind of boundaries (on the personal level between different tribes and on the organisational level between different departments or organisations) is vital. Different tribes (e.g. forensic analysts and criminal intelligence analysts) can have different interpretations of the evidence at hand, and these interpretations can point to different results. Established communication channels where each part of the investigation are communicated and compared can secure that all aspects of an investigation are considered.

Many organisations include employees with different skills and have a hierarchical structure, and adherence to differences and similarities across the different borders should be emphasised in the same way as this research suggests. Particularly in reengineering processes it is important to pay attention to communication across different types of borders.

3. Increased understanding of data gathering methods

The systems worldview is not multidisciplinary, the methodology is both synthetic and analytic, it incorporates both qualitative and quantitative measurements, and each branch of science uses its own methods (see section 2.1 and 2.4). During this research many different methods have been used; participant observation, document analysis, unstructured interviews/talks, and structured interviews with open-ended questions, but one common feature was that they focused on the qualitative aspects of the data. The researcher also constructed a mock-up case based on a real event involving a stolen laptop. In this work the

researcher interviewed witnesses and victim in the case, thereafter the interview transcripts were analysed.

The systems worldview allowed the researcher to see criminal intelligence analysis in a wider perspective, and pay particular attention to the border of the system under investigation. However, when dealing with computerised information systems, at some point a reduction of the information to be included in the system is necessary, and the EER-models and data flow models were used as means to perform this reduction.

The participant observation performed during the Nordic Course in Criminal Intelligence Analysis allowed the researcher to gain knowledge which otherwise would have been difficult to obtain; an opportunity to work with representatives from different cultures in law enforcement organisations; and the opportunity to use analysis methods on cases. The document analysis was aimed at finding the different pieces of information interesting to the criminal intelligence analyst. The unstructured interviews/talks allowed the experts to communicate to the researcher how they perceived their field of expertise, and that of others. The result of these data gatherings enabled the researcher to create formal interviews at the end of the research.

The different data gathering methods gave the researcher an opportunity to see a criminal investigation from different points of view, i.e. take into account the possible different users of the information system, and create a greater understanding of the work performed by the different tribes in the organisation.

Even though this research focused on organisations in the public domain, specifically organisations within law enforcement, it can be argued that other research areas can benefit from using several different data gathering methods, particularly for research areas where little research is available.

We will now leave the research that has been carried out and look to the future. The next section will identify possible follow-up research.

8.3 Further research

This subchapter describes possible follow-up research utilising the same framework as the research described in this thesis; Method development for law enforcement, effective and efficient sharing of information and experience in investigation and intelligence.

The research described in this section is related to an overall research question:

- Is effective and efficient information and experience sharing influenced by the borders of social systems and structures, and/or organisational borders and structures in organisations within law enforcement and intelligence?

As identified in the research described in this thesis, information gathering in law enforcement organisations is characterised by sensitive data and a time consuming process, but much of the information is time critical, and its value can change dramatically over a short period of time. Effective and efficient sharing of information is therefore critical. Sharing such information requires a high degree of trust towards collaborating organisations, and this may lead to a culture where each individual and/or organisation acquires ownership of knowledge and experience that is counterproductive to effective and efficient sharing of time critical information. The research also identified several tribes within law enforcement organisations and the interface between them could constitute possible break down points in communication. A tribe was defined as a social group with its own norms and practices, and the group also exhibits emotional ownership of their knowledge.

In the following several events in the law enforcement and intelligence community are mentioned. These events are interesting in order to further investigate the results of the research described in this thesis.

Lately several events have changed the investigation and intelligence community. The terror attacks on the World Trade Centre and the Pentagon on September 11th 2001 did not only change USA, but the world. NRK.no presented one of their articles under the heading "Full terror war against USA's power centres" (researcher's translation) with a picture of the Twin Towers. The picture has been imprinted in the memory of most people. Since this incident USA has focused more on security and intelligence, and one of the results is the establishment of "Department of Homeland Security" in 2003 (Department of Homeland Security, 2008).

The new department consisted of 22 former agencies; three has later been abolished by a reorganisation in 2005.

Interesting questions in situations of reorganisations in law enforcement and intelligence organisations are:

- What is the result of the reorganisation?
- Which effects does the reorganisation have on power structures and information distribution?
- Are the different organisational cultures considered?
- Does the reorganisation (particularly in cases of mergers) result in more effective and efficient information sharing or simply more complex organisations?

Another more recent change is that the intelligence community in USA has started to use a new electronic information system called Intellipedia (Central Intelligence Agency, CIA, 2008). This information system is built on the same idea as Wikipedia, an Internet encyclopaedia where everyone can enter and/or change information. Even though Intellipedia is built on the same idea as Wikipedia the use is restricted to members of the intelligence community.

Similar questions are raised in this context:

- What impacts do such changes have on the information sharing?
- How does the change affect the power structures?
- Does the trust between employees in different departments or different tribes increase or decrease when systems like Intellipedia is used?

However, the increased terror threat is not just directed towards the USA. On May 20th 2003 Al-Qaida published through the Arabic TV-channel Al-Jazeera that Norway was a target, and more recently this was repeated in 2006. One of the responsibilities to the Directorate for Civil Protection and Emergency Planning (Direktoratet for samfunnssikkerhet og beredskap (DSB), 2006) in Norway, is to make sure that the country has working emergency plans across sectors and levels. As a test on how the plans work under real conditions DSB, carried out "Exercise Oslo 2006" for 2 days on October 17th and 18th 2006. Personnel from all functions needed in such an event participated, from operative personnel to strategic decision-

makers at the department level, and representatives for the Prime Minister's office. Other representatives came from the national television broadcasting channel and telephone services. The police will of course be a part of such an exercise.

Interesting questions related to "Exercise Oslo 2006":

- Did any breakdowns in the communication occur during "Exercise Oslo 2006"?
- If communication break down points are identified, did they occur at the interface between different tribes, departments or organisations?
- If communication break down points are identified, did technical inadequacy influence the breakdown points in the communication?

In addition to terror threats organised crime has also started to grow alarmingly in Norway (Justis- og Politidepartementet, 2005), and lately the police have allocated much of its resources to defend this kind of crime. These two growing threats pose real challenges to law enforcement. Organised crime and some isolated crimes are investigated by Kripos. Economic and environmental fraud is, in Norway, investigated by an agency dedicated to this purpose, Økokrim (The Norwegian National Authority for Investigation and Prosecution of Economic and Environmental Crime) (Økokrim.no). However, economic and environmental fraud, organised crime and e.g. crimes involving drugs or murders are often connected.

With this background the following questions are interesting:

- Does the division of investigation tasks into different organisational units negatively influence the investigation of organised crime, economic and environmental fraud?
- If the investigation is negatively influence, can the influence be traced back to borders between tribes and/or organisations?

The police are in Norway dominated by male employees (Politiets Fellesforbund, 2007).

In this context the following research question is identified:

- Do the tribes in the police force (e.g. the detective tribe) also include sub-tribes consisting of either male or female members?

The identification of further research concludes the research work, and the last section in this thesis provides some personal comments from the researcher.

8.4 Personal comments

In chapter 1, Introduction, I started with my personal motivation for carrying out systems analysis, one being hat I had observed the difficulties in conversations between users and IT-professionals. During this research I gained firsthand experience in how difficult it can be to gain knowledge of an investigation area completely unknown to the system developer; the complexity and difficulties of police work. During this research I have come to appreciate the work they carry out even more.

During the process, I had the opportunity to present the research several times both to Kripos, and other organisations. Some presentations included just me and one representative from Kripos; other presentations were carried out for a larger audience. These presentations taught me how it sometimes is necessary to take a step back from the research and try to see it in new ways. It is all too easy to be caught up in the research details and take for granted that people not involved in the research, and with different backgrounds, have the same knowledge of the research, which they obviously do not. In other words; I could also benefit from being aware of Bacon's four forms of idols.

It has sometimes been difficult some times to keep focus during the research, particularly when I visited the libraries. There were so many interesting books that strictly speaking were not relevant for my research (as my supervisor kindly made me aware of once or twice). The lesson learnt from this is that in order to obtain the goal during such a long process you have to be able to visualise the goal throughout the process, even during the side steps.

By performing the research, writing the research application and milestones, and documenting the research in this thesis I have gained some insight and competence in the academic profession. Since I am not a native English speaker, and the empirical research was carried out using the Norwegian language, I have also struggled with translations and in that struggle I have gained more experience using the English language.

REFERENCES

Ackoff, R. (1989). From data to wisdom. Presedential address to ISGSR, june 1988. *Journal of Applied Systems Analysis*, 16, 3-9.

Ackoff, R.L., & Emery, F.E. (1972). *On purposeful systems.* Chicago: Aldine

Ackoff, R.L. (1999). *Re-creating the corporation : a design of organizations for the 21st century.* New York: Oxford University press

Ainsworth, P.B. (1998). *Psychology, law and eyewitness testimony.* Chichester: Wiley

Allison, G.T. (1983). Public and Private Management: Are they Fundamentally Alike in All Unimportant Respects? In J.L. Perry, & K.L. Kraemer (Eds.), *Public management: public and private perspectives.* Palo Alto, Calif.: Mayfield.

Alter, S. (1980). *Decision support systems: current practice and continuing challenges.* Reading, Mass.: Addison-Wesley

Alter, S. (1999). A general, yet useful theory of information systems. *Communications of the Association for Informations Systems*, 1(Article 13).

Alter, S. (2002). The work system method for understanding information systems and information systems research. *Communications of the Association for Information Systems*, 9, 90-104.

Alter, S. (2004). A work system view of DSS in its fourth decade. *Decision Support Systems*, 38(3), 319-327.

Alter, S. (2006). *The work system method. Connecting people, processes, and IT for business results.* Larkspur, CA: The Work System Press

Alvesson, M. (1996). *Communication, power and organization.* Berlin: Walter de Gruyter

Alvesson, M. (2002). *Understanding organizational culture.* London Thousand Oaks, Calif.: Sage

Andersen, E.S. (1994). *Systemutvikling.* Bekkestua: Nki

Andersen, N.E. (1990). *Professional systems development: experience, ideas and action.* New York: Prentice Hall

Anthony, R.N. (1965). *Planning and control systems: a framework for analysis.* Boston: Division of Research Graduate School of Business Administration Harvard University

Aristotle, & Barnes, J. (1984). *The complete works of Aristotle: the revised Oxford translation.* Princeton, N.J.: Princeton University Press

Arnott, D., & Pervan, G. (2005). A critical analysis of decision support systems research. *Journal of information technology*, 20(2), 67-87.

Ashmos, D.P., & Huber, G.P. (1987). The Systems Paradigm in Organization Theory: Correcting the Record and Suggesting the Future. *The Academy of Management Review*, 12(4), 607 - 621.

Association for Information systems (www.aisnet.org/award/bios/langefors.html (accessed 20.111.2007))

Aubry, A.S., & Caputo, R.R. (1980). *Criminal interrogation.* Springfield, IL: Charles C. Thomas

Audi, R. (2001). *The architecture of reason: the structure and substance of rationality.* Oxford: Oxford University Press

Auglend, R.L., Røsandhaug, K., & Mæland, H.J. (1998). *Politirett.* Oslo: Ad notam Gyldendal

Avgerou, C., Siemer, J., & Bjørn-Andersen, N. (1999). The academic field of information systems in Europe. *European Journal of Information Systems*, 8(2), 136-153.
Avison, D.E., & Myers, M.D. (1995). Information systems and anthropology: an anthropological perspective on IT and organizational culture. *Information Technology & People*, 8(3), 43-56.
Avison, D.E., & Fitzgerald, G. (2006). Methodologies for Developing Information Systems. In D. Avison,S. Elliot,J. Krogstie, & J. Pries-Heje (Eds.), *The Past and Future of Information Systems: 1976n2006 and Beyond IFIP 19th World Computer Congress, TC-8, Information System Stream, August 21n23, 2006, Santiago, Chile.* Boston, MA: International Federation for Information Processing.
Bacon, F. (1952). Advancement of learning; Novum Organum; New Atlantis. In R.M. Hutchins (Ed.), *Great Books of the western world.*
Banner, D.K., & Gagné, T.E. (1995). *Designing effective organizations : traditional & transformational views.* Thousand Oaks, Calif.: Sage
Barnard, C.I. (1938). *The functions of the executive.* Cambridge, Mass.: Harvard University Press
Batini, C., Ceri, S., & Navathe, S.B. (1992). *Conceptual database design : an entity-relationship approach.* Redwood City, Calif.: Benjamin/Cummings
Bellinger, G., Castro, D., & Mills, A. (2004) Data, Information, Knowledge, and Wisdom (http://www.systems-thinking.org/dikw/dikw.htm (accessed 25.07.2006))
Bertalanffy, L.v. (1950). An Outline of General System Theory. *The British Journal for the Philosophy of Science*, 1(2), 134-165.
Bertalanffy, L.v. (1956). General System Theory. *General Systems,*(1), 1-10.
Bertalanffy, L.v. (1968). *General system theory: foundations, development, applications.* New York ,: George Braziller
Biografias y Vidas. http://www.biografiasyvidas.com/biografia/w/weber_max.htm (accessed 19.11.2007)
Bohman, J. (1991). *New philosophy of social science: problems of indeterminacy.* Cambridge: Polity Press
Booch, G. (1994). *Object-oriented analysis and design with applications.* Redwood City, Calif.: Benjamin/Cummings
Boulding, K. (1966). The economics of knowledge and the knowledge of economics. *American Economic Review*, 56(2), 1-13.
Boulding, K.E. (1956). General Systems Theory. The Skeleton of Science. *Management Science*, 2(3), 197-208.
Boyne, G.A. (2002). Public and private management: What's the difference? *Journal of Management Studies*, 39(1), 97-122.
Bozeman, B., & Bretschneider, S. (1986). Public management information systems: Theory and prescription. *Public Administration Review*, 46(Special Issue), 475-487.
Bozeman, B. (1993). A Theory of Government 'Red Tape'. *Journal of Public Administration Theory and Research*, 3(July), 273-303.
Braman, S. (1989). Defining Information. An approach for policymakers. *Telecommunications Policy*, 13(3), 233-242.
Braman, S. (2004). Where has media policy gone? Defining the field in the Twenty-first century. *Communication Law and Policy*, 9(2), 153 - 182.
Braman, S. (2006). *Change of State. Informationn, Policy and Power.* Cambridge: Massachusetts Institute of Technology
Bretschneider, S. (1990). Management information systems in public and private organizations: An empirical test. *Public Administration Review*, 50(5), 536-545.

Bromby, M.C., & Hall, M.J.J. (2002). The development and rapid evaluation of the knowledge model of ADVOKATE: an advisory system to assess the credibility of eyewitness testimony. In T.J.M. Bench-Capon,A. Daskalopulu, & R.G.F. Winkels (Eds.), *Legal Knowledge and Information Systems. Jurix 2002: The Fifteenth Annual Conference.* Amsterdam: IOS Press.

Brown, M.F. (2001). *Criminal investigation. Law and practice.* Butterworth-Heinemann

Bruce, C.W. (2004). Fundamentals of crime analysis. In C.W. Bruce,S.R. Hick, & J.P. Cooper (Eds.), *Exploring Crime Analysis.* North Charleston, South Carolina: BookSurge, LLC.

Buckland, M. (1991). *Information and Information Systems.* Westport, USA: Praeger Publishers

Capra, F. (1983). *The turning point: science, society, and the rising culture.* London: Fontana

Capra, F. (1996). *The web of life: a new synthesis of mind and matter.* London: Harper Collins Publishers

Carnap, R. (1934). *Unity of Science* London: Kegan Paul, Trench &Co

Central Intelligence Agency (CIA) (2008). *Intellipedia Marks Second Anniversary.* (https://www.cia.gov/news-information/featured-story-archive/2008-featured-story-archive/intellipedia-marks-second-anniversary.html. Accessed: 04.02.2009))

Chalmers, A.F. (1982). *What is this thing called science?An assessment of the nature and status of science and its methods.* Milton Keynes: Open University Press

Checkland, P. (1981). *Systems thinking, systems practice.* Chichester: Wiley

Chen, P. (1976). The entity-relationship model: Towards a unified view of data. *Acm Transactions on Database Systems*, 1(1), 9-36.

Chen, P. (1977). The entity-relationship model - a basis for the enterprise view of data, *AFIPS National Computer Conference* (pp. 77-84). Dallas, Texas.

Chen, P. (1983). English sentence structure and entity-relationship diagrams for the enterprise view of data. *Information Sciences*, 29, 127-149.

Chen, P. (2002). Entity-relationship modeling: Historical events, future trends, and lessons learned. In M. Broy, & E. Cenert (Eds.), *Software Pioneers: Contributions to software engineering* (pp. 100-114). Berlin: Springer-Verlag.

Chen, W., & Hirschheim, R.A. (2004). A paradigmatic and methodological examination of information systems research from 1991 to 2001. *Information systems Journal*, 14(3), 197-235.

Choo, C.W. (2006). *The knowing organization: how organizations use information to construct meaning, create knowledge, and make decisions.* New York: Oxford University Press

Christensen, T., & Peters, B.G. (1999). *Structure, culture, and governance: a comparison of Norway and the United States.* Lanham, Md.: Rowman & Littlefield Publ.

Clark, R.M. (2004). *Intelligence analysis. A target-centric approach.* Washington, D.C.: CQ Press

Cleveland, H. (1982). Information as a Resource. *The Futurist*, 16(6), 34-39.

Codd, E.F. (1972). Further normalization of the database relational model. In R. Rustin (Ed.), *Courant Computer Symposia 6: Data Base Systems* (pp. 33-64). Englewood Cliffs: Prentice-Hall.

Cooley, M. (1987). *Architect or bee? : the human price of technology*. London: Hogarth Press

Creswell, J.W., & Plano Clark, V.L. (2006). *Designing and conducting mixed methods research*: SAGE Publications

Dahl, R.A. (1947). The science of public administration: Three problems. *Public Administration Review*, 7(1), pp. 1 - 11.
Dahl, R.A. (1957). The Concept of Power. *Behavioural Science*, 2, 201-215.
Darwall, S.L. (2002). *Contractarianism, contractualism.* Oxford, UK ; Malden, MA: Blackwell Pub.
Davis, G.B. (2000). Information systems conceptual foundation: Looking backward and forward. In J. Stage,J.I. DeGross, & R. Baskerville (Eds.), *Organizational and social perspectives on information technology: IFIP TC8 WG8.2 International Working Conference on the Social and Organizational Perspective on Research and Practice in Information Technology, June 9-11, 2000, Aalborg, Denmark* (pp. x, 525 s.). Boston: Kluwer Academic.
Davis, G.B. (2004). Preface. In K. Viborg Andersen, & M.T. Vendelø (Eds.), *The Past and future of information systems* (pp. X, 274 s.). Amsterdam: Elsevier Butterworth-Heinemann.
Davis, G.B. (2006). Information Systems as an Academic Discipline. In D. Avison,S. Elliot,J. Krogstie, & J. Pries-Heje (Eds.), *The Past and Future of Information Systems: 1976n2006 and Beyond IFIP 19th World Computer Congress, TC-8, Information System Stream, August 21n23, 2006, Santiago, Chile.* Boston, MA: International Federation for Information Processing.
DeMarco, T. (1979). *Structured analysis and system specification.* New York: Yourdon
Denzin, N.K. (1989). *The research act: a theoretical introduction to sociological methods* Englewood Cliffs, N.J.: Prentice Hall.
Denzin, N.K., & Lincoln, Y.S. (2005). Introduction. In N.K. Denzin, & Y.S. Lincoln (Eds.), *The Sage handbook of qualitative research.* Thousand Oaks, Calif.: Sage.
Department of Homeland Scurity (2008). *History: Who Became Part of the Department?* (http://www.dhs.gov/xabout/history/editorial_0133.shtm (accessed 04.02.2009))
DeWitt, R. (2004). *Worldviews: An introduction to the history and philosophy of science.* Malden, Mass.: Blackwell Publ.
Direktoratet for samfunnssikkerhet og beredskap (DSB) (2006). *Exercise Oslo 2006.* (http://www.dsb.no/article.asp?articleid=1864&Framework=engelsk&leftmenu=v_ovelse_oslo&rank=7&oppslag=1 (accessed 04.02.2009))
Doyle, J.M. (2005). True Witness. Cops, courts, science, and the battle against misidentification. New York: Palgrave Macmillian.
Eliot, T.S. (1934). *The Rock.*: Faber & Faber
Ellingsen, D. (2001). *Kriminalitet og rettsvesen.* Oslo-Kongsvinger: Statistisk sentralbyrå.
Emery, F., & Thorsrud, E. (1976). *Democracy at work the report of the Norwegian industrial democracy program.* Leiden: Martinus Nijhoff Social Sciences Division
Emery, F.E. (1965). Causal texture of organizational environments. *Human relations*, 18(1), 21-32.
Emery, F.E., Trist, E., & Thorsrud, E. (1969). *Form and content in industrial democracy : some experiences from Norway and other European countries.* London: Tavistock
Emery, F.E., & Trist, E.L. (1973). *Towards a social ecology: contextual appreciation of the future in the present.* London: Plenum.
Emery, M. (2000). The Current Version of Emery's Open Systems Theory. *Systemic Practice and Action Research*, 13(5), 623-643.
Etzioni, A. (1960). Two approaches to Organizational Analysis: A Critique and a Suggestion. *Administrative Science Quarterly*, 5(2), 257-278.
Evan, W.M. (1993). *Organization theory : research and design.* New York: Macmillan

Faye, J., & Agazzi, E. (2001). The problem of the unity of science: proceedings of the Annual Meeting of the International Academy of the Philosophy of Science, Copenhagen-Aarhus, Denmark, 31 May-3 June 2000. River Edge, N.J.: World Scientific.
FBI (a), Federal Bureau of Investigation, Directorate of Intelligence. *Intelligence Defined.* (http://www.fbi.gov/intelligence/di_defined.htm (accessed 19.03.2008))
FBI (b), Federal Bureau of Investigation, Directorate of Intelligence. *The Intelligence Cycle.* (http://www.fbi.gov/intelligence/di_cycle.htm (accessed 19.03.2008))
Feeley, M.M. (1973). Two Models of the Criminal Justice System: An Organizational Perspective. *Law and Society Rewiew*, 7(3), 407-425.
Fimreite, A.L., & Grindheim, J.E. (2001). *Offentlig forvaltning.* Oslo: Universitetsforlaget.
Fisher, W.R. (1984). Narration as Human Communication Paradigm: The Case of Public Moral Argument. *Communication Monographs*, 51, 1-22.
Fisher, W.R. (1987). *Human communication as narration: toward a philosophy of reason, value, and action.* Columbia, S.C.: University of South Carolina Press
Fitzgerald, B. (1996). Formalized systems development methodologies: a critical perspective. *Information Systems Journal*, 6(1), 3-23.
Flick, U. (2002). *An introduction to qualitative research.* London: Sage.
Flynn, D.J. (1992). *Information systems requirements: determination and analysis.* London: McGraw-Hill
Forensic Solutions LLC (2005) (www.forensic-science.com/ (accessed 19.03.2008)).
François, C. (1999). Systemics and cybernetics in a historical perspective. *Systems Research and Behavioral Science*, 16(3), 203-219.
Frost, P.J. (1985). *Organizational culture.* Beverly Hills, Calif.: Sage Publications
Galliers, R.D. (2004). Reflections on information systems strategizing. In C. Avgerou,C. Ciborra, & F. Land (Eds.), *The social study of information and communication technology. Innovation, Actors, and Contexts*. Oxford University Press, USA.
Gane, C., & Sarson, T. (1979). *Structured systems analysis: tools and techniques.* Englewood Cliffs, N.J.: Prentice-Hall
Gause, D.C., & Weinberg, G.M. (1989). *Exploring requirement : quality before design.* New York: Dorset House Publ.
Gharajedaghi, J. (2004) Systems Methodology. (http://www.acasa.upenn.edu/JGsystems.pdf) (accessed 19.11.2007))
Giarratano, J., & Riley, G. (1998). *Expert systems: principles and programming.* Boston: PWS Publ. Co.
Glaser, B.G., & Strauss, A.L. (1967). *The discovery of grounded theory: strategies for qualitative research.* Chicago: Aldine.
Gorry, G.A., & Morton, M.S.S. (1971). A framwork for management information systems. *Sloan Management Review*, 13(1), 55-70.
Gottlieb, S., Singh, R., & Arenberg, S. (1994). *Crime analysis: from first report to final arrest* Montclair, Calif.: Alpha
Gottschalk, P. (2004). *Informasjonsledelse fra strategiutvikling til gevinstrealisering.* Oslo: Universitetsforlaget.
Grassberger, Roland (1956). Pioneers in Criminology. XIII. Hans Gross (1847-1915). The Journal of Criminal Law, Criminology, and Police Science, (47)4 (397-405).
Great Britain Joint Intelligence Committee (2006). National Intelligence Machinery. (http://www.intelligence.gov.uk/downloads.aspx (accessed 19.03.2008))
Gross, H., & Howe, R.M. (1949). *Criminal investigation: a practical textbook for magistrates, police officers and lawyers.*

London: Sweet & Maxwell.
Gross, Hans (1911). *Criminal psychology; a manual for judges, practitioners, and students.* (http://etext.lib.virginia.edu/toc/modeng/public/GroCrim.html (accessed 19.03.2008)) Transcribed from: Criminal psychology : a manual for judges, practitioners, and students / Hans Gross, J.U.D. ; translator, Horace M. Kallen, Ph.D. Montclair, N.J. : Patterson Smith Publishing Corporation, 1968. (Patterson Smith reprint ser ies in criminology, law enforcement, and social problems ; no. 13) Originally published: Boston : Little, Brown, and Co., 1911.
Grønmo, S. (1996). Forholdet mellom kvalitative og kvantitative tilnærminger i samfunnsforskningen. In H. Holter, & R. Kalleberg (Eds.), *Kvalitative metoder i samfunnsforskningen.* Oslo: Universitetsforlaget.
Hall, A.D., & Fagen, R.E. (1956). Definition of System. *General systems: Yearbook of the International Society for Systems Sciences*, 1(Yearbook of the Society for the Advancement of General Systems Theory), 18-28.
Hammersley, M. (1992). *What's wrong with ethnography? Methodological explorations.* London: Routledge.
Hatch, M.J. (1997). *Organization theory: modern, symbolic and postmodern perspectives.* New York: Oxford University Press
Hatch, M.J., & Cunliffe, w.A.L. (2006). *Organization Theory.* New York: Oxford University Press
Hayes, S.C., Hayes, L.J., & Reese, H.W. (1988). Finding the philosophical core: A review of Stephen C. Pepper's world hypotheses: A study in evidence. *Journal of the experimental analysis of behavior*, 50, 97-111.
Hevner, A.R., March, S.T., Park, J., & Ram, S. (2006). Design Science in Information Systems Research. In J.L. King, & K. Lyytinen (Eds.), *Information Systems. The State of the Field.* Chichester: John Wiley & Sons.
Heylighen, F. (2004) Cybernetics and Systems Thinkers. *Principa Cybernetica Web*. (http://pespmc1.vub.ac.be/CSTHINK.html) (accessed 04.10.2006)).
Hirschheim, R., & Klein, H.K. (1989). Four Paradigms of Information Systems Development. *Communications of the ACM*, 32(10), 1199-1216.
Hirschheim, R.A., Lyytinen, K., & Klein, H. K. (1995). *Information systems development and data modeling: conceptual and philosophical foundations.* Cambridge: Cambridge University Press
Horton, K.S. (2000). The exercise of power and information systems strategy: the need for a new perspective. *Proceedings of the Eighth European Conference on Information Systems,* (pp. 676-683), Vienna.
Housman, Edward M. (2000) The Nature of Information. Bulletin of The American Society for Information Science, 26(4). (http://www.asis.org/Bulletin/May-00/housman.html (accessed 19.01.2009)
Iivari, J. (1991). A paradigmatic analysis of contemporary schools of IS development. *European Journal of Information System,* 1(4), 249-272.
IALEIA (2004) *Law enforcement analytic standards.* Global Justice Information Sharing Initiative/International Association of Law Enforcement Intelligence Analysts (www.it.ojp.gov/documents/law_enforcement_analytic_standards.pdf (accessed 19.03.2008))
Iivari, J., & Hirschheim, R. (1996). Analyzing information systems development: A comparison and analysis of eight IS development approaches. *Information Systems*, 21(7), 551-575.

Iivari, J., Hirschheim, R., & Klein, H.K. (1998). A Paradigmatic Analysis Contrasting Information Systems Development Approaches and Methodologies. *Information systems Research*, 9(2), 164-192.
Iivari, J., Hirschheim, R.A., & Klein, H.K. (2004). Towards a distinctive body of knowledge for information systems experts: coding ISD process knowledge in two IS journals. *Information Systems Journal*, 14(4), 313-342.
Inbau, F.E., Reid, J.E., Buckley, J.P., & Jayne, B.C. (2001). Criminal interrogation and confessions. Boston: Aspen Publishers, 4th. ed.
Interpol (2008). About Interpol. (http://www.interpol.com/public/icpo/default.asp (accessed 19.03.2008))
Interpol (2008). Criminal Intelligence Analysis. (http://www.interpol.int/Public/cia/default.asp (accessed 19.03.2008))
Jackson, P. (1998). *Introduction to expert systems* Harlow: Addison-Wesley
Johnson, N. (2000). State and society in Britain: Some contrasts with German experioence. In H. Wollmann, & E. Schrøter (Eds.), *Comparing public sector reform in Britain and Germany: key traditions and trends of modernisation* (pp. XII, 375 s.). Aldershot: Ashgate.
Joseph, S.M. (2002). *The trivium. The liberal arts of logic, grammar, and rhetoric.* Philadelphia: Paul Dry Books, Inc.
Justis- og Politidepartementet (2005). St.meld. nr. 42 (2004-2005) Politiets rolle og oppgaver.
Justis- og Politidepartmentet (2006). Oppfølging av vitner i straffesaker.
Kast, F.E., & Rosenzweig, J.E. (1973). *Contingency views of organization and management.* Chicago: Science Research Associates a subsidiary of IBM
Katz, D., & Kahn, R.L. (1978). *The social psychology of organizations.* New York: Wiley.
Kent, W. (2000). *Data and Reality.*: AuthorHouse
Kickert, W.J.M. (1997). Introduction. In W.J.M. Kickert, & European Group of Public Administration (Eds.), *Public management and administrative reform in Western Europe.* Cheltenham: Edward Elgar.
King, W.R. (2005). Toward a better understanding of the hierarchical nature of police organizations: Conception and measurement. *Journal of Criminal Justice*, 33(1), 97-109.
Kipnis, D. (1990). *Technology and power.* New York: Springer-Verlag
Kirk, J. (1999). Information in organisations: directions for information management. *Information Research*, 4(3).
Klein, H.K., & Hirschheim, R.A. (1987). A comparative framework of data modelling paradigms and approaches. *The Computer Journal*, 30(1), 8-15.
Klein, H.K., & Myers, M.D. (1999). A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems. *MIS Quarterly*, 23(1), 67-93. (http://links.jstor.org/sici?sici=0276-7783%28199903%2923%3A1%3C67%3AASOPFC%3E2.0.CO%3B2-Q (accessed 19.03.2008))
Klein, J. (Fall 2004 Edition) Francis Bacon. (http://plato.stanford.edu/archives/fall2004/entries/francis-bacon/ (accessed 19.11.2006))
Klir, G.J. (1972). Trends in general systems theory. pp. viii, 462 s.). New York: Wiley-Interscience.
Knights, D., & Roberts, J. (1982). The Power of Organization or the Organization of Power? *Organization Studies*, 3(1), 47-63.
Koestler, A. (1967). *The ghost in the machine* New York: Macmillan
Kriminalpolitisentralen (2004). Årsrapport 2003.

Kriminalpolitisentralen (2005). Årsrapport 2004.
Kripos (2000). Nordisk kurs i kriminalanalyse.
Kuhn, T.S. (1962). *The structure of scientific revolutions.* Chicago: University of Chicago Press
Lane, J.-E. (2000). *The public sector : concepts, models and approaches.* London: Sage
Lane, J.-E. (2005). *Public administration and public management. The principle-agent perspective.* Abingdon: Routledge,an imprint of Taylor & Francis Books Ltd
Langefors, B. (1966). *Theoretical analysis of information systems.* Lund: Studentlitteratur.
Langefors, B., & Sundgren, B. (1975). *Information systems architecture.* New York: Petrocelli
Langefors, B. (1995). *Essays on infology summing up and planning for the future.* Lund: Studentlitteratur
Langefors, B. (2005). Reflections, thoughts, and episodes. In J.J. Bubenko,J. Impagliazzo, & A. Sølvberg (Eds.), *History of Nordic Computing.* (pp. 1 - 7). New York: Springer.
Larsen, T.J., & Levine, L. (2005). Searching for management information systems: coherence and change in the discipline. *Information Systems Journal*, 15(4), 357-381.
Laszlo, E. (1972). *Introduction to systems philosophy: toward a new paradigm of contemporary thought.* New York: Gordon and Breach.
Laudon, K.C., & Laudon, J.P. (2006). *Management information systems: managing the digital firm.* Upper Saddle River, N. J.: Pearson/Prentice Hall
Leavitt, H.J. (1965). Applied organizational change in industry: Structural, technological and humanistic approaches. In J.G. March (Ed.), *Handbook of organizations* (pp. 1145-1170). Chicago: Rand McNally.
Lee, A.S., Liebenau, J., DeGross, J.I., & International Federation for Information Processing (1997). *Information systems and qualitative resarch: Proceedings of the IFIP TC8 WG 8.2 International Conference on Information Systems and Qualitative Research, 31st May-3rd June 1997 Philadelphia, Pennsylvania, USA.* London: Chapman & Hall
Levine, H.G., & Rossmoore, D. (1994/1995). Politics and the function of power in a case study of IT implmentation. *Journal of Management Information Systems*, 11(3), 115-134.
Lewis, J., & Ritchie, J. (2003). Generalizing for Qualitative Research. In J. Lewis, & J. Ritchie (Eds.), *Qualitative research practice: a guide for social science students and researchers.* London: Sage Publications.
Lewis, P.J. (1994). *Information-systems development: systems thinking in the field of information-systems.* London: Pitman.
Liebenau, J., & Backhouse, J. (1990). *Understanding information: an introduction.* London: Macmillan.
Lincoln, Y.S., & Guba, E.G. (1985). *Naturalistic inquiry.* Beverly Hills, Calif.: Sage.
Loftus, E.F., & Doyle, J.M. (1992). *Eyewitness testimony: civil and criminal.* New York: Kluwer Law Book Publishers.
Loftus, E.F. (1996). *Eyewitness testimony.* Cambridge, Mass.: Harvard University Press.
Lægreid, P., Roness, P.G., Røvik, K.A., & Christensen, T. (2004). *Organisasjonsteori for offentlig sektor: instrument, kultur, myte.* Oslo: Universitetsforlaget.
Machlup, F. (1980). *Knowledge: Its creation, distribution and economic significance.* Princeton, N.J.: Princeton University Press.
Machlup, F., & Mansfield, U. (1983). *The Study of information interdisciplinary messages.* New York: Wiley.
March, J.G., Guetzkow, H., & Simon, H.A. (1993). *Organizations.* Cambridge, Mass.: Blackwell Business.

Martin, J. (1992). *Cultures in organizations: Three perspectives.* New York: Oxford University Press
Martin, J. (2002). *Organizational culture: Mapping the terrain.* Thousand Oaks, Calif.: Sage Publications
McMullin, B. (2000). John von Neumann and the Evolutionary Growth of Complexity: Looking Backwards, Looking Forwards. *Artificial Life*, 6(4), 347-361.
McNurlin, B.C., & Sprague, R.H. (2003). *Information systems management in practice.* Upper Saddle River, N.J.: Pearson/Prentice Hall
Memon, A., Bull, R., & Vrij, A. (2003). *Psychology and law: Truthfulness, accuracy and credibility.* Chichester, West Sussex: Wiley
Merton, R.K. (1949). *Social theory and social structure toward the codification of theory and research.* Glencoe, Ill.: Free Press
Meyerson, D., & Martin, J. (1987). Cultural Change: An Integration of Three Different Views. *Journal of Management Studies*, 24(6), 623 - 647.
Michels, R. (1915). *Political parties: A sociological study of the oligarchical tendencies of modern democracies.* Glencoe, Ill.: Free Press
Midgley, G. (2000). *Systemic Intervention: Philosophy, Methodology, and Practice.* New York: Kluwer Academic/Plenum Publishers.
Midgley, G. (2002). Systems Thinking, Volume I, General Systems Theoory, Cybernetics and Complexity. London: Sage Publication Inc.
Miles, M.B., & Huberman, A.M. (1994). *Qualitative data analysis: an expanded sourcebook.* Thousand Oaks, Calif.: Sage
Miller, J.G. (1965a). Living systems: Basic concepts. *Behavioral Science*, 10, 193-237.
Miller, J.G. (1965b). Living systems: Cross-level-hypotheses. *Behavioral Science*, 10, 381-411.
Miller, J.G. (1965c). Living Systems: Structure and process. *Behavioral Science*, 10, 337-379.
Mingers, J. (2001). Combining IS Research Methods: Towards a Pluralist Methodology. *Information Systems Research*, 12(3), 240-259.
Mintzberg, H. (1979). *The structuring of organizations: A synthesis of the research.* Englewood Cliffs, N.J.: Prentice-Hall
Mintzberg, H. (1989). *Mintzberg on management: inside our strange world of organizations.* New York: Free Press
Moore, J.H., & Chang, M.G. (1980). Design of Decision Support Systems. *Data Base*, 12(1, 2), 15-28.
Morgan, G. (1997). *Images of organization.* Thousand Oaks, Calif.: Sage
Morgan, K., Holland, L., Hardy, P., Casey, J., Quinn, T., Leathly, V., Mead, R., Smith, G., & Oldfield, R. (1993). Next Generation Criminal Intelligence Systems, *The next generation information technologies and systems conference.* Haifa, Israel.
M'Pherson, P.K. (1974). A perspective on systems science and systems philosophy. *Futures*, 6(3), 219-239. (http://www.sciencedirect.com/science/article/B6V65-45M2MKP-4/2/3e75d75a695e6a6d167acb9c6302de11 (accessed 19.03.2008))
Myers, M. D. "Qualitative Research in Information Systems," *MIS Quarterly* (21:2), June 1997, pp. 241-242. *MISQ Discovery*, archival version, June 1997, http://www.misq.org/discovery/MISQD_isworld/. *MISQ Discovery*, updated version, last modified: January 4, 2008 (www.qual.auckland.ac.nz (accessed 19.03.2008)
Neumann, J.v., & Burks, A.W. (1966). *Theory of self-reproducing automata.* Urbana: University of Illinois Press
Newell, A., & Simon, H.A. (1972). *Human problem solving.* Englewood Cliffs, N.J.: Prentice-Hall

Nunamaker, J.F.J., & Chen, M. (1990). Systems development in information systems research., *System Sciences, Proceedings of the Twenty-Third Annual Hawaii International Conference on System Sciences.* pp. 631-640).
Nurminen, M.I. (1988). *People or computers: three ways of looking at information systems.* Lund: Studentlitteratur.
Nurminen, M.I. (1997). Paradigms for Sale: Information systems in the process of radical change. *Scancinavian Journal of Information Systems*, 9(1), 25-42.
Nutt, P.C. (1999). Public-private differences and the assessment of alternatives for decision making. *Journal of Public Administration Theory and Research*, 9(2), 305-350.
O'Hara, C.E., & O'Hara, G.L. (2003). *Fundamentals of criminal investigation.* Springfield: Charles Thomas
Orlowski, W., & Baroudi, J.J. (1991). Studying information technology in organizations: research approaches and assumptions. *Information Systems Research*, 2, 1-28.
Osborne, D., & Wernicke, S. (2003). *Introduction to crime analysis. Basic resources for criminal justice practice.* Binghamton, NY: Haworth Press, Inc.
Packer, H.L. (1968). *The limits of the criminal sanction.* Stanford, Calif.: Stanford University Press
Pepper, S.C. (1942). *World hypotheses: a study in evidence* Berkeley, Calif.: University of California Press.
Perrow, C. (1986). *Complex organizations a critical essay.* New York: McGraw-Hill
Peterson, M.B. (1998). *Applications in criminal analysis a sourcebook.* Westport: Praeger.
Pettigrew, A.M. (1972). Information Control as a Power Resource. *Sociology*, 6, 187-204.
Pfeffer, J. (1992). *Managing with power: politics and influence in organizations.* Boston: Harvard Business School Press.
Phillips-Wren, G., Mora, M., Forgionne, G., Garrido, L., & Gupta, J. (2006). A Multicriteria Model for the Evaluation of Intelligent Decision-making Support Systems (i-DMSS). In J.N.D. Gupta,M. Mora T, & G.A. Forgionne (Eds.), *Intelligent Decision-making Support Systems Foundations, Applications and Challenges.* London: Springer-Verlag London Limited.
Politets data- og materielltjeneste (2004). *Ny arkitektur for politiets systemer*.
Politidirektoratet (2004). *The Police in Norway.*
Politiet (2006). *Årsrapport 2005 Kripos.*
Politiet (2007). *Årsmelding 2006 Kripos.*
Politiets Fellesforbund (2007). *Politiet er dominert av menn.* (http://www.pf.no/id/4964 (accessed 04.02.2009))
Politiregisterutvalget (2003) NOU 2003:21. Kriminalitetsbekjempelse og personvern - politiets og påtalemydnighetens behandling av opplysninger. (http://www.regjeringen.no/Rpub/NOU/20032003/021/PDFS/NOU200320030021000DDDPDFS.pdf (Accessed 21.01.2008))
Power, D.J. (2001). Supporting Decision-Makers: An Expanded Framework. *Informing Science eBook, June 2001*. (http://www.informingscience.org/proceedings/IS2001Proceedings/abstracts/PowerSUMSupp.htm (accessed 19.03.2008))
Power, D.J. (2002). *Decision support systems: concepts and resources for managers.* Westport, Conn.: Quorum Books
Psykologibasen.dk. (http://psykologibasen.dk/Bertalanffy.jpg (accessed 19.11.2007))
Rainey, H.G., Backoff, R.W., & Levine, C.H. (1976). Comparing public and private organizations. *Public Administration Review*, 36(2), pp. 233 - 244.

Rainey, H.G., Pandey, S.K., & Bozeman, B. (1995). Public and private managers' perception of red tape. *Public Administration Review*, 66(6), 567-574.
Rainey, H.G., & Kingsley, G. (1998). Risk culture in public and private organizations. *Public Administration Review*, 58(2), 109-118.
Rainey, H.G. (2003). *Understanding & managing public organizations.* San Fransisco: John wiley & Sons, Inc.
Read, T., & Oldfield, D. (1995). Local Crime Analysis., *Crime Detection & Prevention Series. Paper 65.* London: Police Research Group. Home Office Police Department.
Rieber-Mohn, G.F. (1996). Etterforskning og påtalemyndighet. *Nytt i strafferetten*(2), 20-47.
Riksadvokaten. (http://www.riksadvokaten.no/bin/main.cgi?kilde=Info/pol_paat.xml (accessed 08.09.06)).
Riksrevisjonen (2004). Dokument nr. 3:5 (2003-2004). Riksrevisjonens undersøkelse av Kripos.
Robson, C. (2002). *Real world research: a resource for social scientists and practitioner-researchers.* Oxford: Blackwell.
Royal, R.F., & Schutt, S.R. (1976). *The gentle art of interviewing and interrogation: A professional manual and guide.* Upper Saddle River, NJ: Prentice Hall
Russell, B. (1945). *A history of western philosophy.* New York: Simon and Schuster
Ryder, Stephen P. (2006) *Jack the Ripper.* (www.casebook.org (accessed 19.03.2008))
Ryle, G. (1949). *The concept of mind.* London: Hutchinson.
Sage, A.P. (1991). *Decision Support Systems Engineering.* John Wiley & Sons, Inc.
Salancik, G.R., & Pfeffer, J. (1977). Who Gets Power - And How They Hold on to It: A Strategic-Contingency Model of Power. *Organisational Dynamics*, 6, 3-21.
Schein, E.H. (1991). What is culture? In P.J. Frost,L.F. Moore,M.R. Louis,C.C. Lundberg, & J. Martin (Eds.), *Reframing organizational culture* (pp. 243-253). Newbury Park, Calif.: Sage.
Schein, E.H. (1992). *Organizational culture and leadership.* San Francisco: Jossey-Bass
Schein, E.H. (1996). Culture: The Missing Concept in Organization Studies. *Administrative Science Quarterly*, 41, 229-240.
Schein, E.H. (2004). *Organizational culture and leadership.* San Francisco: Jossey-Bass
Scott, W.R. (2001). *Institutions and organizations.* Thousand Oaks, Calif.: Sage Publications
Scott, W.R. (2003). *Organizations: rational, natural, and open systems.* Upper Saddle River, N.J.: Prentice Hall : Pearson Education International
Selznick, P. (1957). *Leadership in administration: a sociological interpretation.* Evanston, Ill.: Row Peterson
Shannon, C.E., & Weaver, W. (1949). *The mathematical theory of communication.* Urbana: University of Illinois Press.
Sharma, N. (2005) The origin of the "Data Information Knowledge Wisdom" Hierarchy. (http://www-personal.si.umich.edu/~nsharma/dikw_origin.htm (accessed 25.09.2007)).
Shuy, R.W. (1998). *The language of confession, interrogation, and deception.* Thousand Oaks, Calif.: Sage
Silverman, D. (2001). *Interpreting qualitative data: methods for analysing talk, text and interaction.* London: Sage.
Simon, H.A. (1947). *Administrative behavior: a study of decision-making processes in administrative organization.* New York: The Macmillan Company.
Simon, H.A. (1976). *Administrative behavior: a study of decision-making processes in administrative organization.* New York: Free Press.

Smith, M. N., & King, P.J.H. (2002). *Incrementally visualising Criminal Networks.* Proceedings of the Sixth International Conference on Information Visualisation (IV'02) (pp. 76-81).
Smith, J.M., & Smith, D.C.P. (1977). Database Abstractions: Aggregation and Generalization. *ACM Transactions on Database Systems*, 2(2), 105-133.
Sprague, R.H. (1980). Guest Editor's Introduction. *Selected papers on decision support systems from the 13th Hawaii International Conference on System Sciences*, 1(4-5), 2-7.
Sprague, R.H. (1986). DSS in Context. In E.R.a.S. McLean, H. G. (Ed.), *Desicion Support Systems: A Decade in Perspective.* Amsterdam, The Netherlands: Elsevier Science Publishers B.V.
Sprague, R.H., & Watson, H.J. (1996). *Decision support for management.* Upper Saddle River, N.J.: Prentice Hall.
Stark, W. (1998). The fundamental forms of social thought. *The International Library of Socology.* London: Routledge.
Stigen, A. (1983). *Tenkningens historie.* Oslo: Gyldendal.
Stojkovic, S., Klofas, J., & Kalinich, D. (2004). Introduction. In S. Stojkovic,J. Klofas, & D. Kalinich (Eds.), *The Administration and management of Criminal Justice Organizations.* Long Grove, Illinois: Waveland Press, Inc.
Stowell, F.A., West, D., & Stansfield, M. (1997). Action research as a framework for IS research. In J. Mingers, & F.A. Stowell (Eds.), *Information Systems: an emerging discipline?* New York: McGraw-Hill.
Summers, R., Oppenheim, C., Meadows, J., McKnight, C., & Kinnell, M. (1999). Information Science in 2010: A Loughborough University View. *Journal of the American Society for Information Science*, 50(12), 1153-1162.
Technical Working Group on Eyewitness Evidence (1999). Eyewitness Evidence. A guide for Law Enforcement.: U.S. Department of Justice.
Technical Working Group on Eyewitness Evidence (2003). Eyewitness Evidence: A Trainer's Manual for Law Enforcement.: U.S. Department of Justice.
The centre for legal + court technology. Courtroom 21. (http://boxmind.leeds.ac.uk/lectures/court21/lecture.asx (accessed 04.02.2008))
The Crown Prosecution Service (2004). No witness, no justice. The National Victim and Witness Care Programme.
The Free Library by Farlex. (2008). Aristotle. (http://aristotle.thefreelibrary.com/ (accessed 19.03.2008)).
The Free Library by Farlex. (2008). Francis Bacon. ((http://bacon.thefreelibrary.com/ (accessed 19.03.2008)).
The official cite of the U.S. Constitution (http://www.usconstitution.com/inagaddrwoodrowwilson.htm (accessed 19.11.2007)).
Thierauf, R.J. (1991). *Executive information systems: a guide for senior management and MIS professionals* New York: Quorum books.
Trist, E.L. (1977). A concept of organizational ecology. *Australian Journal of Management*, 2, 162-175.
Tuomi, I. (1996). The Communicative View on Organizational Memory: Power and Ambiguity in Knowledge Creation Systems., *29th Annual Hawaii International Conference on System Sciences (HICSS-29)*.
Tuomi, I. (2000). Data is more than knowledge: Implications of the reversed knowledge hierarchy for knowledge management and organisational memory. *Journal of Management Information Systems.*, 16(103-117).

Valeta, D.M. (2006). The cultural history of crime. In S. Berger (Ed.), *A Companion to nineteenth-century Europe, 1789-1914. Blackwell companions to European history.* Malden, Mass.: Blackwell Publications.
van Risbergen, C.J. (1996). Information, logic, and uncertainty in information science. In P. Ingwersen, & N.O. Pors (Eds.), *Information science. Integration in perspective.* København: The Royal School of Librarianship.
Vellani, K.H., & Nahoun, J. (2001). *Applied crime analysis.*: Butterworth-Heinemann.
Venkatraman, S.S. (1989). DSS: Is it just an alias for MIS? *ACM SIGCPR Computer Personnel*, 12(2), 4-11.
Walsham, G. (1993). *Interpreting information systems in organizations.* Chichester: Wiley.
Ward, J. (2002). *Strategic planning for Information Systems.* Chichester, England: John Wiley & Sons Ltd.
Warner, M. (2002). Wanted: A Definition of "Intelligence". Understanding Our Craft. *Studies in Intelligence*, Unclassified Studies Volume 46(3). (https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/csi-studies/studies/vol46no3/article02.html (accessed 19.03.2008)).
Watson, J.B. (1913). Psychology as the Behaviorist Views it. *Psychological Review*, 20, 158-177.
Weber, M., Gerth, H.H., & Mills, C.W. (1948). *From Max Weber: essays in sociology.* London: Routledge & Kegan Paul.
Weber, M., & Parsons, T. (1964). *The theory of social and economic organization.* New York: Free Press
Weber, M., Shils, E., & Rheinstein, M. (1966). *Max Weber on law in economy and society.* Cambridge, Mass.: Harvard University Press.
Weinberg, G.M. (1988). *Rethinking systems analysis & design.* New York, NY: Dorset House.
Welke, R. (1983). IS/DSS: DBMS support for information systems development. In C. Holsapple, & A. Whinston (Eds.), *Data Base Management: Theory and Application* (pp. 195-250). Dordrecht: Reidel.
Wells, G.L., Memon, A., & Penrod, S. (2006). Eyewitness Evidence. Improving Its Probative Value. *Psychological Science in the Public Interest*, 7(2), 45-75.
Wilson, W. (1887). The study of administration. *Political Science Quarterly*, 2(2), 197 - 222.
Winfield, I. (1991). *Organisations and Information Technology. Systems, Power and Job Design.* Blackwell Scientific Publications, Oxford.
Wolfram, S. (1989). *Philosophical logic: an introduction.* London: Routledge.
Wright, K.N. (1981). The desirability of goal conflict within the criminal justice system. *Journal of Criminal Justice*, 9(3), 209-218.
Yeschke, C.L. (1987). *Interviewing: An introduction to interrogation.* Newbury Park, CA: Sage
Yuexiao, Z. (1988). Definitions and sciences of information. *Information Processing and Management*, 24(4), 479-491.
Zeleny, M. (1987). Management Support Systems: Toward Integrated Knowledge management. *Human Systems Management*, 7(1), 59-70.
Zitate-online.de. (www.zitate-online.de/thema/gewinn/ (accessed 19.11.2007)).
Zuboff, S. (1988). *In the age of the smart machine: the future of work and power.* New York: Basic Books.
Økokrim, Den sentrale enhet for etterforskning og påtale av økonomisk kriminalitet og miljøkriminalitet. (www.okokrim.no (accessed 04.02.2009)).

Öttingen, A.v. (1882). *Die Moralstatistik: In ihrer Bedeutung für eine Socialethik.* Erlangen: Deichert.

APPENDIX

A. ORGANISATION CHARTS A1
Appendix 1: Organisation chart for Kripos before 01.01.2005 ..... A3
Appendix 2: Organisation chart for Kripos after 01.01.2005 ..... A4
Appendix 3: Organisation chart for Kripos after 01.01.2007 ..... A5
Appendix 4: Organisation chart for the police and prosecution authority before 10.01.2001 ..... A6
Appendix 5: Organisation chart for the police after 10.01.2005 (in English) A7

B. MODELS DEVELOPED FOR DATA GATHERING A9
Models developed for data gathering 26.11.2002 and presented in subsection 7.2.4
Models with data from the case of "Jack the Ripper" are presented in section 7.3 (used in data gathering 02.05.2003)
Appendix 6: Models developed for data gathering 21.02.2003 ..... A11
Appendix 7: Researcher's letter of introduction used 02.06.2003 ..... A19
Appendix 8: Models developed for data gathering 02.06.2003 ..... A20
Appendix 9: Models developed for data gathering 10.11.2003 ..... A29

C. TRANSCRIPTS AND MODELS FROM DATA GATHERING A57
Final models are presented in section 7.4
Appendix 10: Permission agreement form (in English) A59
Appendix 11: Models with corrections made during data gathering 26.11.2002 ..... A60
Appendix 12: Transcript from data gathering 26.11.2002 ..... A65
Appendix 13: Models with corrections made during data gathering 21.02.2003 ..... A86
Appendix 14: Transcript from data gathering 21.02.2003 ..... A95
Appendix 15: Models with corrections made during data gathering 10.11.2003 ..... A104

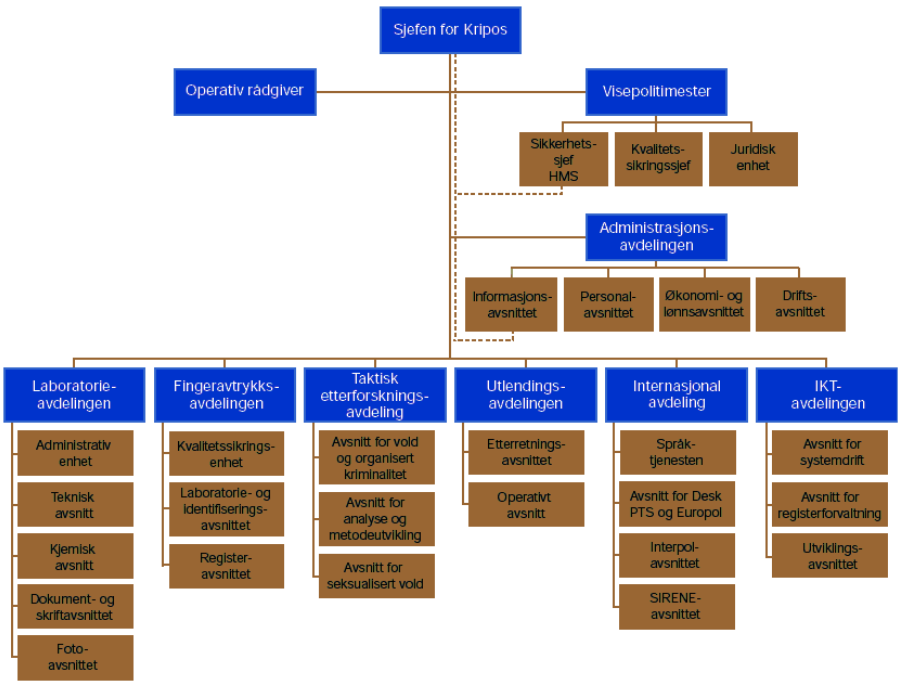
D. TRANSCRIPTS FROM STRUCTURED INTERVIEWS A131
Appendix 16: Interview guide (in Norwegian and English) A133
Appendix 17: Letter to interviewees (in Norwegian) and permission agreement form (in English) A135
Appendix 18: Transcript from interview with NN2 ..... A137
Appendix 19: Transcript from interview with NN4 ..... A144
Appendix 20: Transcript from interview with NN5 ..... A151

E. NOTATIONS A161
Appendix 21: Notation for EER-diagrams A163
Appendix 22: Notation for DFD-diagrams A166

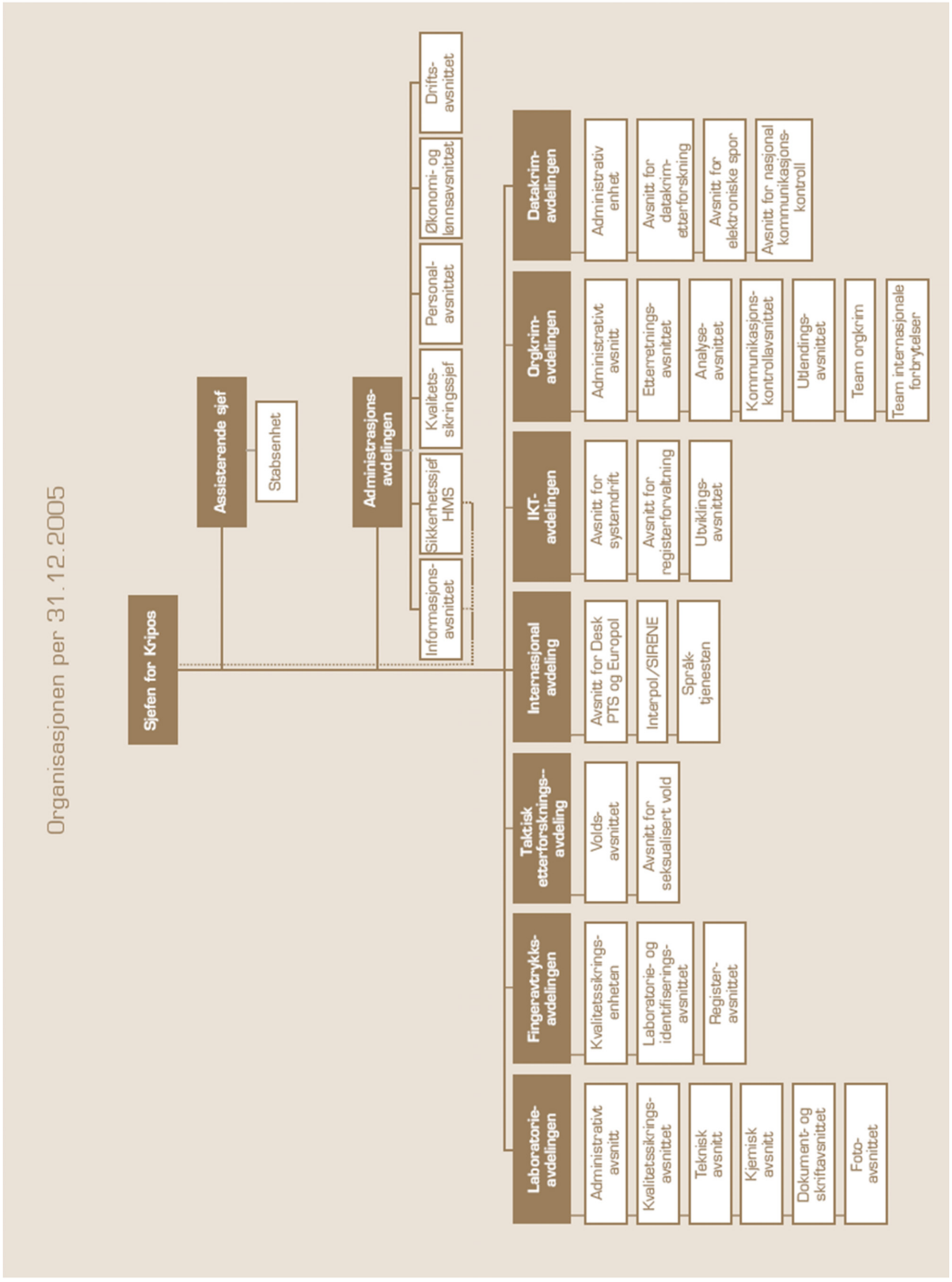
A

A: ORGANISATION CHARTS

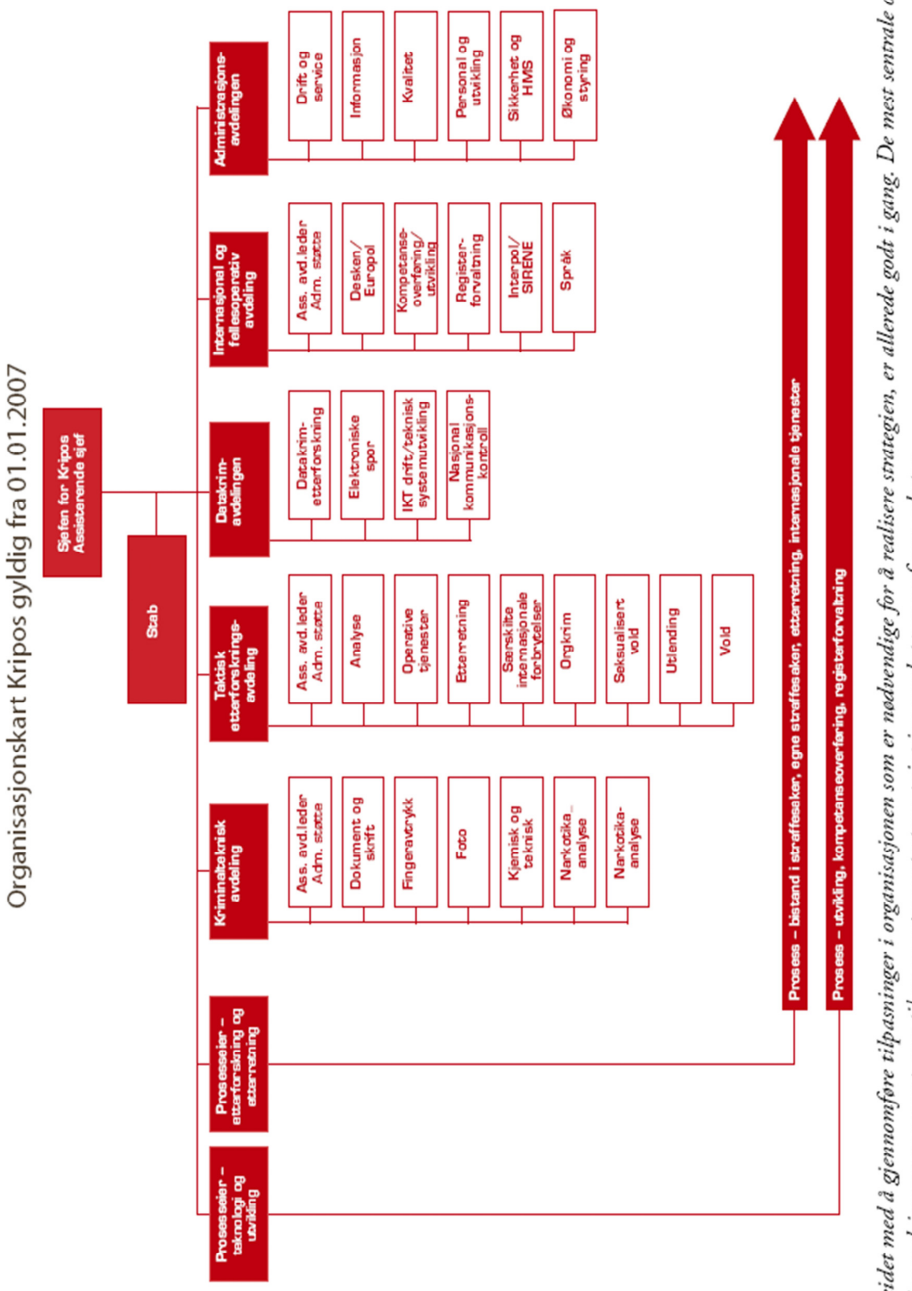
Appendix 1.
Organisation chart for Kripos before 1.1.2005.
Source: Årsrapport 2003 (Kriminalpolitisentralen, 20(



Appendix 2 Organisation chart for Kripos after 1.1.2005.
Source: Årsrapport 2005 Kripos (Politiet, 2006)

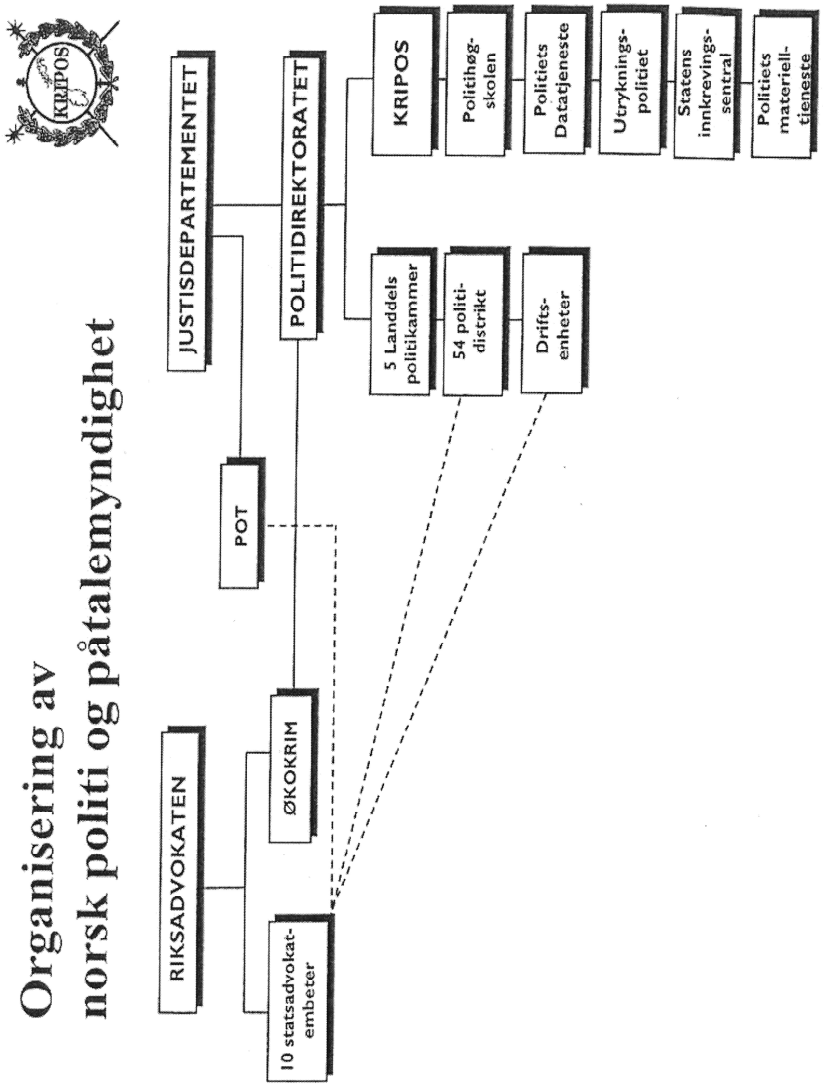


Appendix 3.
Organisation chart for Kripos after 1.1.2007.
Source: Årsmelding 2006 Kripos (Politiet, 2007).

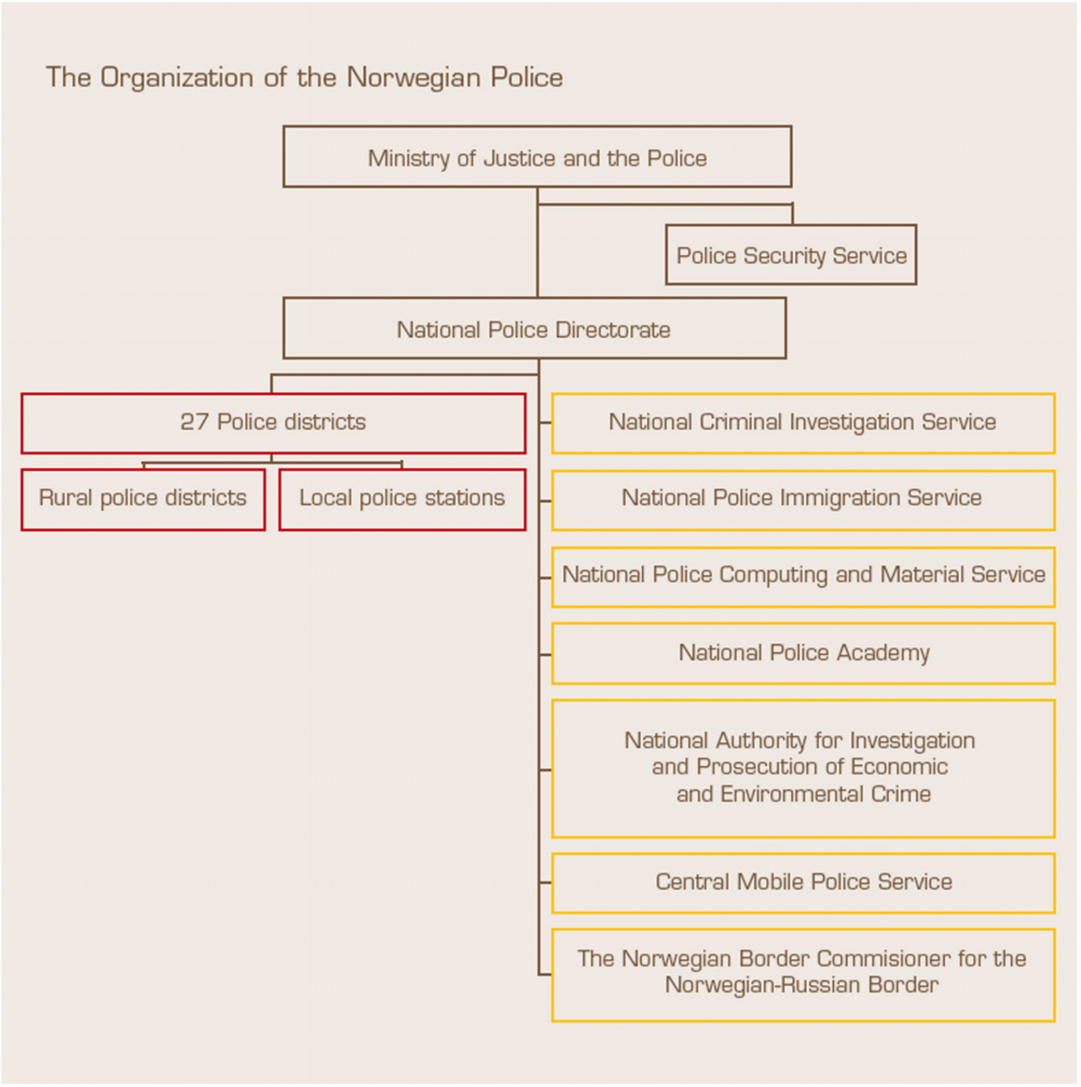


Arbeidet med å gjennomføre tilpasninger i organisasjonen som er nødvendige for å realisere strategien, er allerede godt i gang. De mest sentrale og synlige endringene er overgangen til en mer prosesstyrt organisasjon med større og færre enheter.

Appendix 4.
Organisation chart for the police and prosecution authority before 10.01.2001.

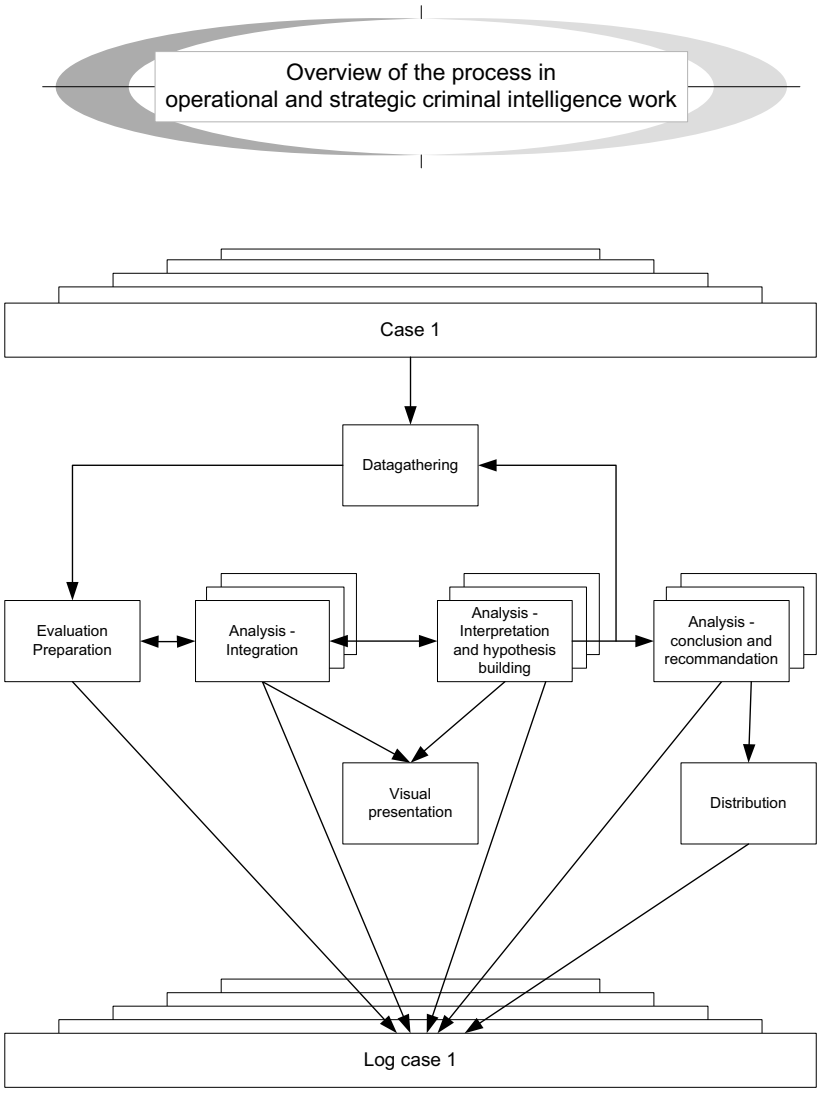


Appendix 5.
Organisation chart for the Police after 10.01.2005.
Source: The Police in Norway (Politidirektoratet, 2004).



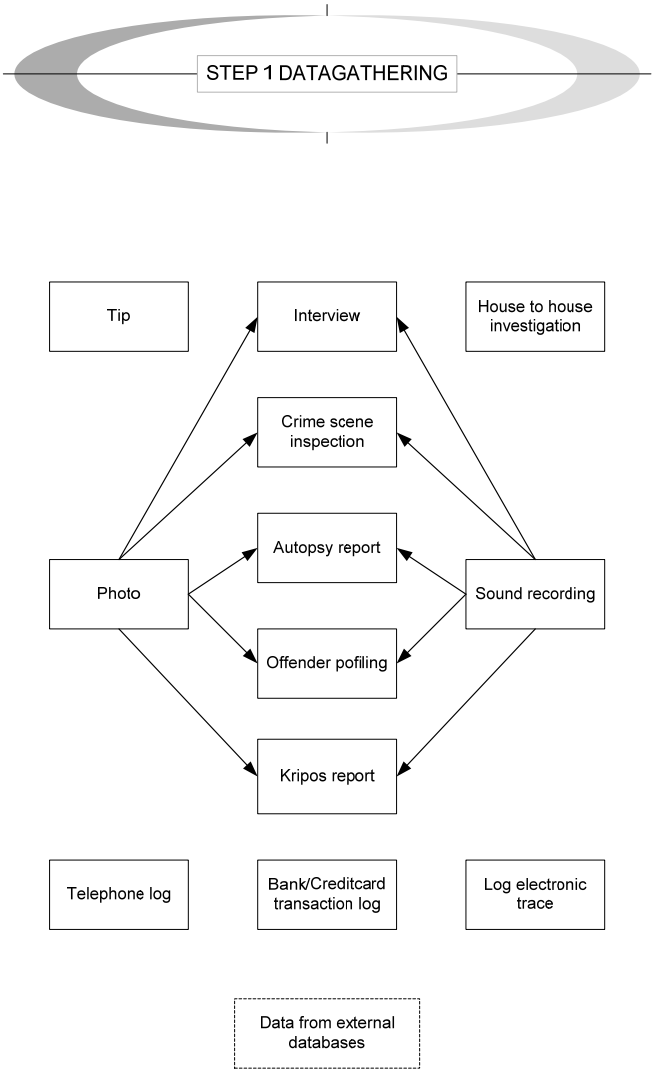
B: MODELS DEVELOPED FOR DATA GATHERING

B

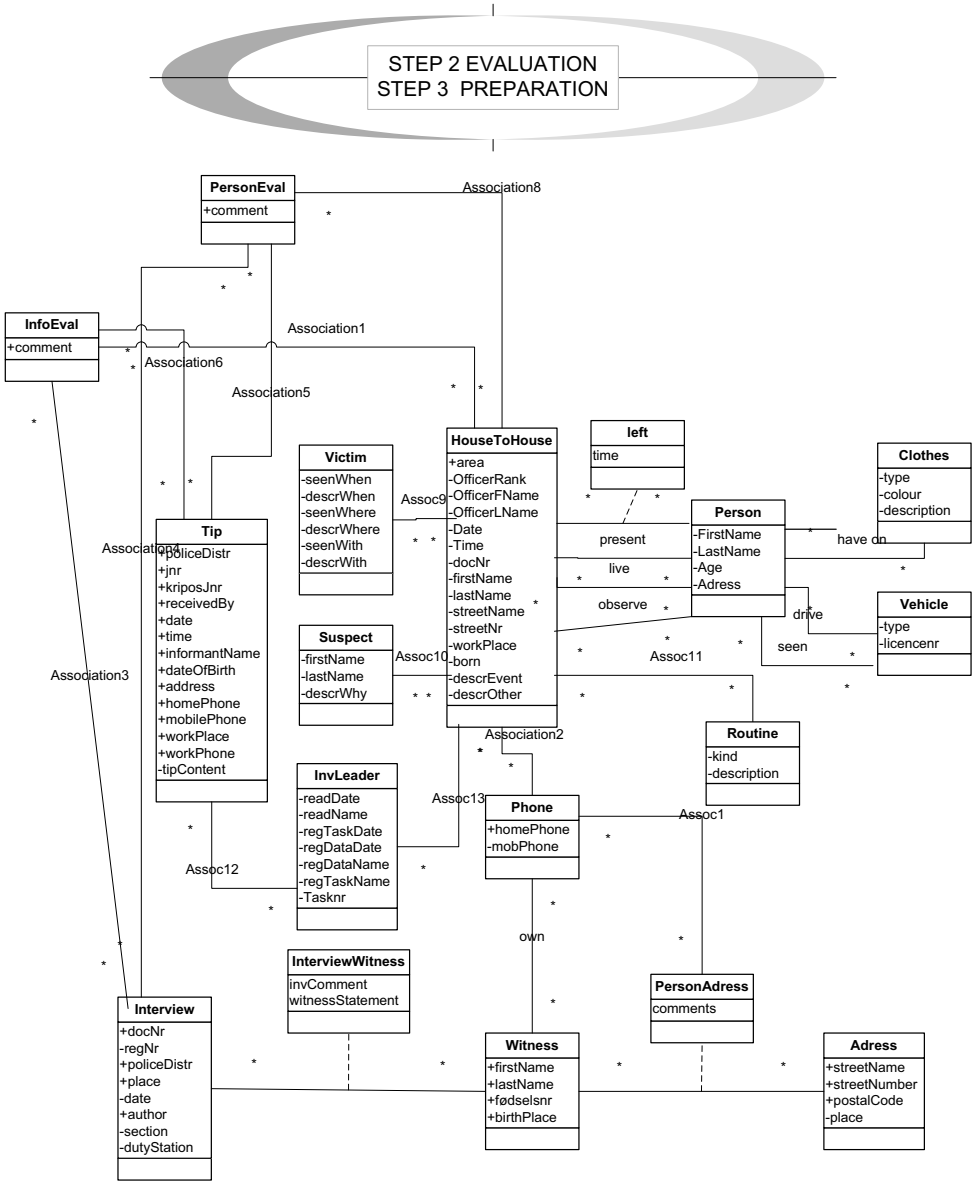


A case can include one or more event(s) that deal with
- a crime already committed
- information about planned illegal actions (crime control)
- investigation projects based on crimes related to each other through modus operandi and/or type of crime

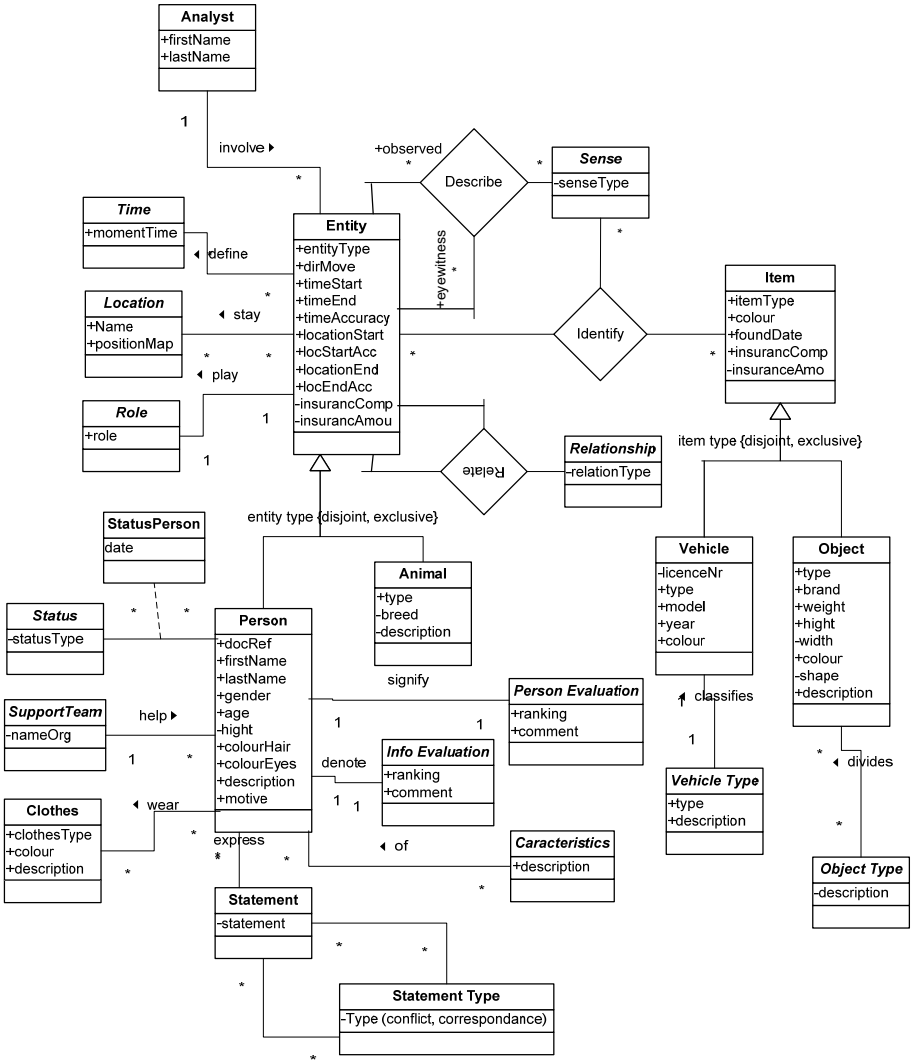
The model are intended for both operative and strategic criminal intelligence analysis, i.e. support the different types of analysis used within operative and strategic criminal intelligence analysis.



The data will originate from different sources and in different forms. This information system will not be electronically linked to other information systems. As a result, interesting and relevant data from these systems (here labelled 'Data from external databases') will be recorded in this system by the analyst during the analysis phase.



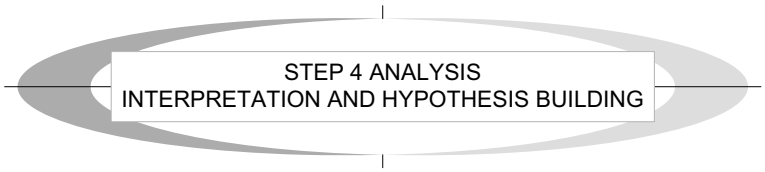
Information and person evaluation relates to the investigators work in classifying both categories with regard to relevance, truth value, understandibility, sufficiency, significance, timeliness.

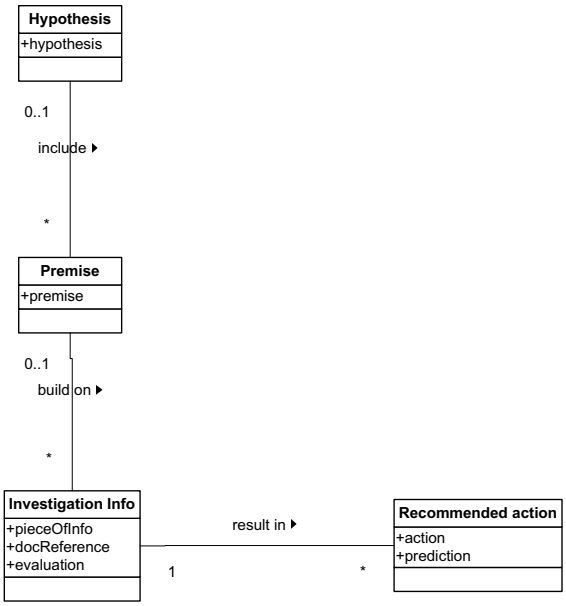


One view for each analyst.
In this step the model is ment to reflect the analyst's view of the data from step 2 and 3 regarding

- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.





One view for each analyst and hypothesis
In this step the model is ment to reflect the analyst's interpretation (evaluation) of the data, and to reflect his or her own predictions about recommended actions regarding the important aspects

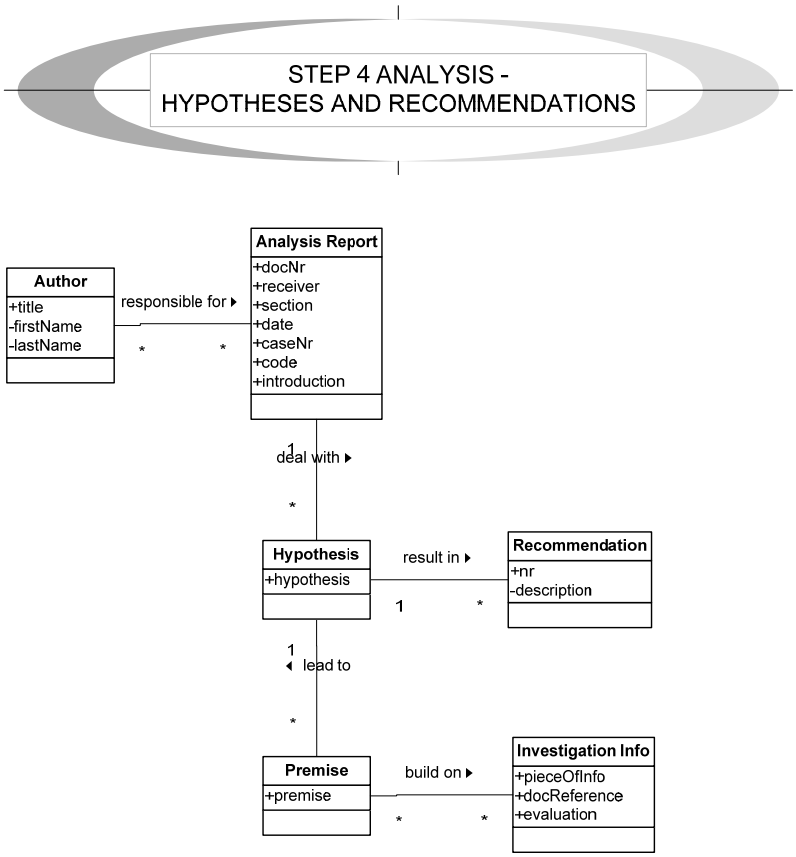
- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.

Important questions during the work

- Are there any data that conflict with other data?
  What does the conflict consist of? Which data are most likely to be true?
- Are there any data that support other data?
  Why and/or how do the data support each other? Is it likely that these data are true?

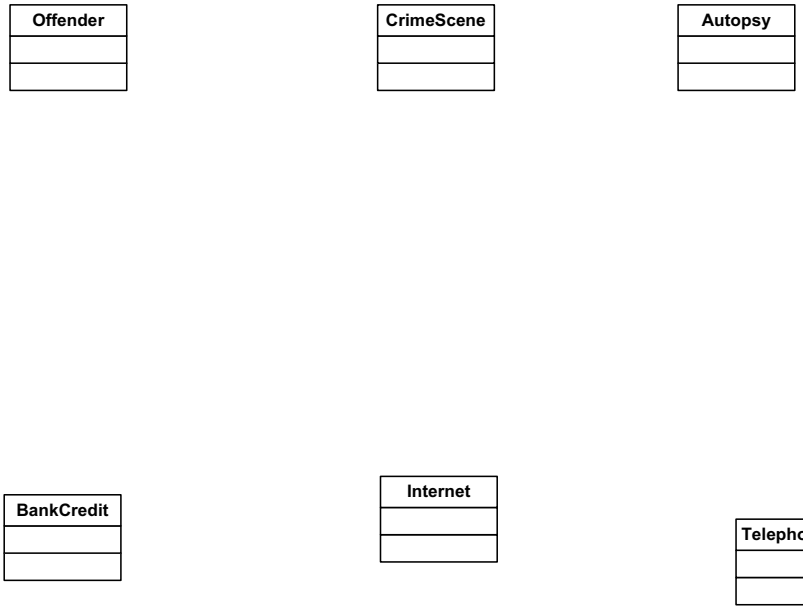
Verified and unverified data, interpretations (evaluations) and predictions are combined in a hypothesis that focus on further data gathering.

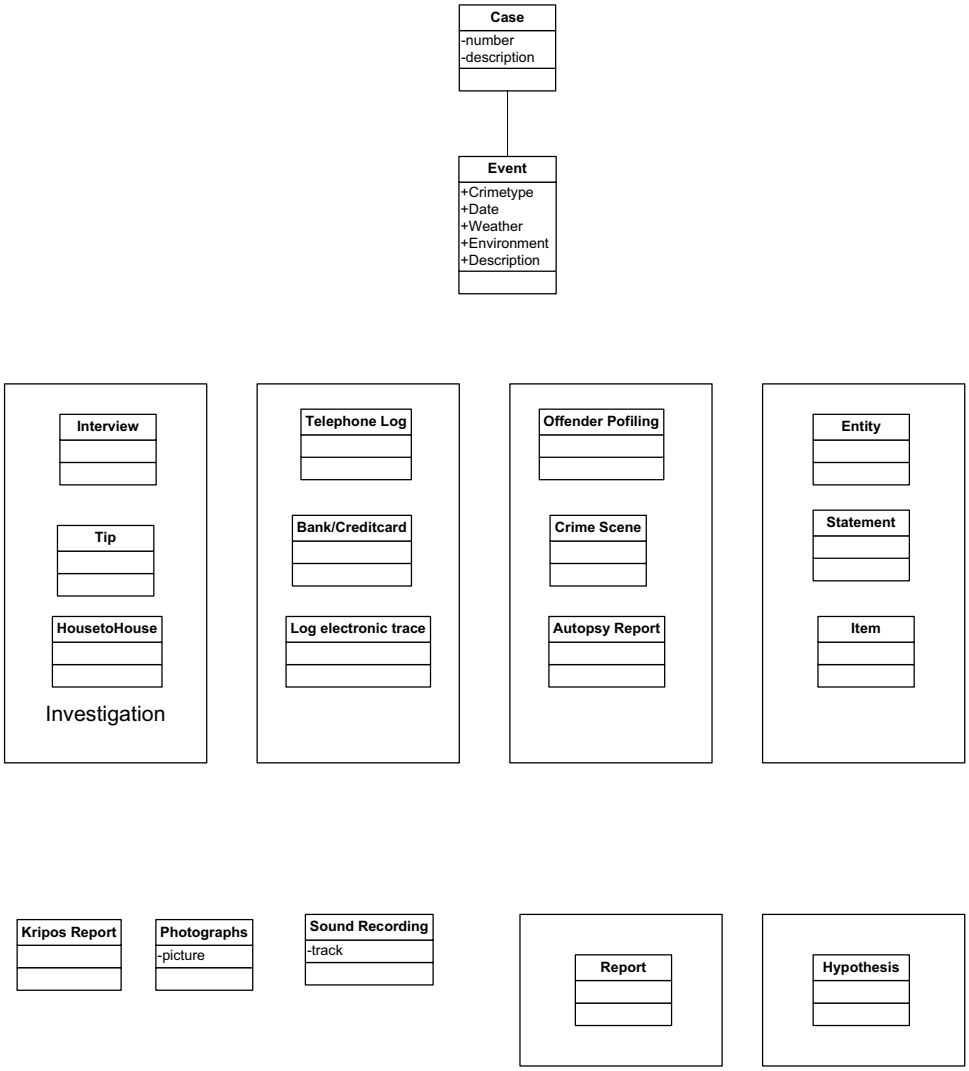


In conclusion/recommandation all data should be verified. Data in the previous models can be verified or unverified. It is important in each step to mark the data as verified or unverified, and to change the status of the data when data are confirmed.

There may be several final reports dependent on area of use (prosecution, strategy, further investigation, or developing guidelines).

STEP
FORENSIC
ELECTRONIC TRACE


Offender
CrimeScene
Autopsy
BankCredit
Internet
TelephoneLog


Case
-number
-description
Event
+Crimetype
+Date
+Weather
+Environment
+Description
Interview
Tip
HousetoHouse
Investigation
Telephone Log
Bank/Creditcard
Log electronic trace
Offender Pofiling
Crime Scene
Autopsy Report
Entity
Statement
Item
Kripos Report
Photographs
-picture
Sound Recording
-track
Report
Hypothesis

Oversikt over forskningsarbeidet innen kriminalanalyse.
Kontaktinformasjon.

Kort oversikt over forskningsarbeidet innen kriminalanalyse.
Formålet med forskningen er at det elektroniske informasjonssystemet skal gi etterforskerne den nødvendige støtte for å kunne kartlegge hendelsesforløpet i en kriminalsak så fullstendig og presist som mulig.

Hovedfokus for mitt forskningsprosjekt er omforming av data til informasjon, det vil si at gjenfinning av informasjon for analyse og modellbygging (av for eksempel trafikkdata) vil være sentrale. Imidlertid er datainnsamling, bearbeiding av data, modellbygging og presentasjon nært knyttet sammen.

Målet for forskningen er å utvikle en konseptuell modell for kriminalanalyse, ikke et ferdig analyse- og modellbyggingsverktøy.

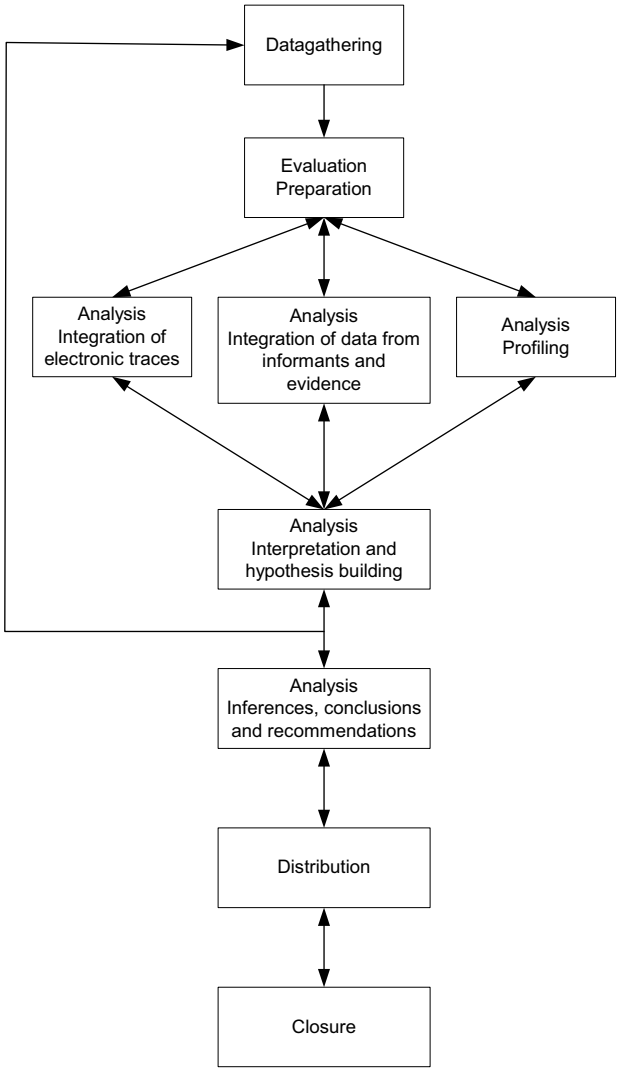
Den foreløpige problemstillingen for forskningen er:
> Er det mulig å representere ulik kunnskap i dynamiske datastrukturer på en slik måte at analysene innen kriminaletterforskning kan forbedres?

Modellforslaget som jeg legger frem i dag er mer fullstendig på noen områder enn andre. Det gjenstår å samle inn en del data som jeg kan bruke som grunnlagsmateriale for de mer ufullstendige delene av modellen.

Kontaktinformasjon.
Jeg arbeider delvis ved Universitetet i Bergen og Høgskolen i Agder, så den letteste måten å komme i kontakt med meg på er via e-post eller mobiltelefon.

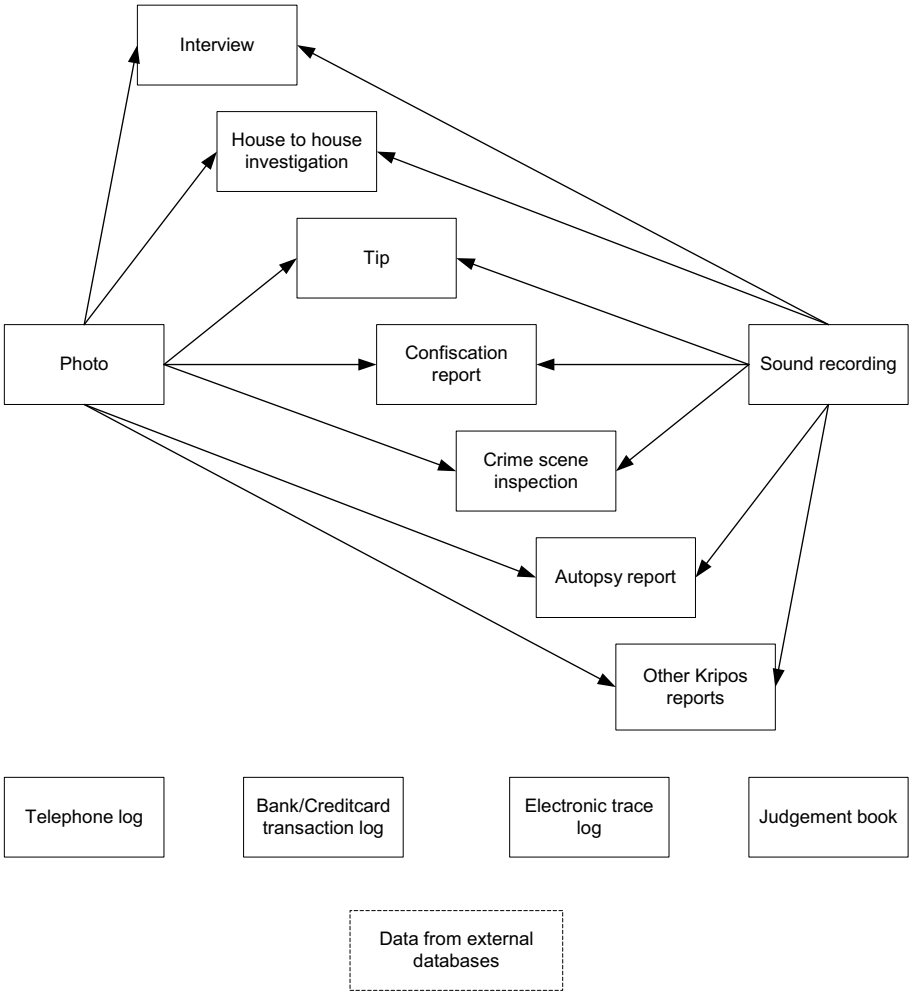
Mobiltelefon: 90 58 97 34
E-post: sonjaw@ifi.uib.no

Overview of the process in operational and strategic criminal intelligence work



Sonja Wilhelmsen, University of Bergen
02.06.2003

Datagathering
Overview of information sources



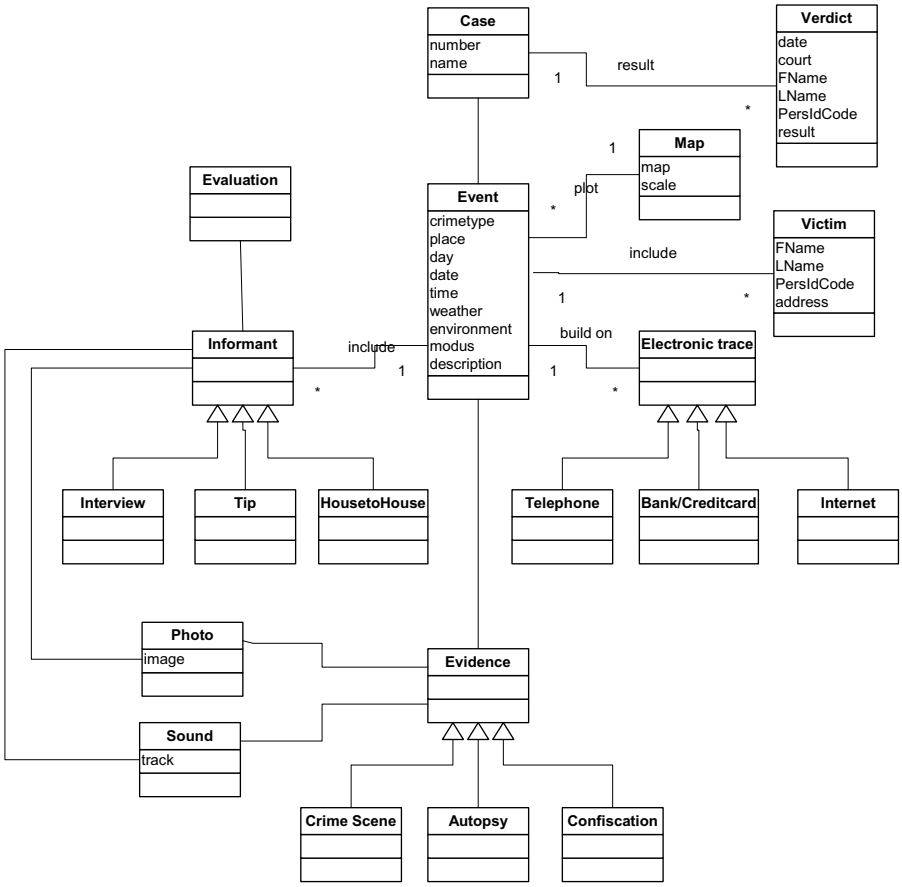
Data/information will originate from different sources and in different forms. The information system will not be electronically linked to other information systems. As a result, interesting and relevant data from these systems (here labelled 'Data from external databases') will be recorded in this system during the evaluation/ preparation phase or the analysis phase.

Sonja Wilhelmsen, University of Bergen
02.06.2003

Evaluation/preparation and closure

Overview of entities

In this overview attributes are given for the entities 'case', 'event', 'map', and 'verdict'. Data from these entities will be connected to the subsequent models, but will not be shown in the subsequent models.

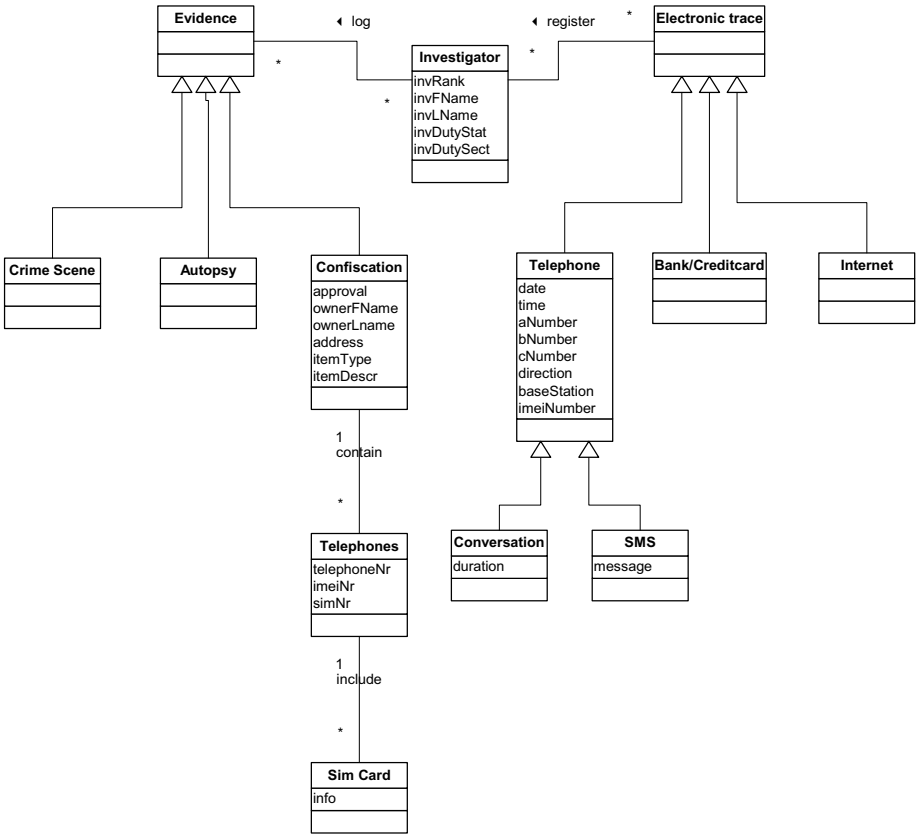


A case can include one or more event(s) that deal with
- a crime already committed
- information about planned illegal actions (crime control)
- investigation projects based on crimes related to each other through modus operandi and/or type of crime

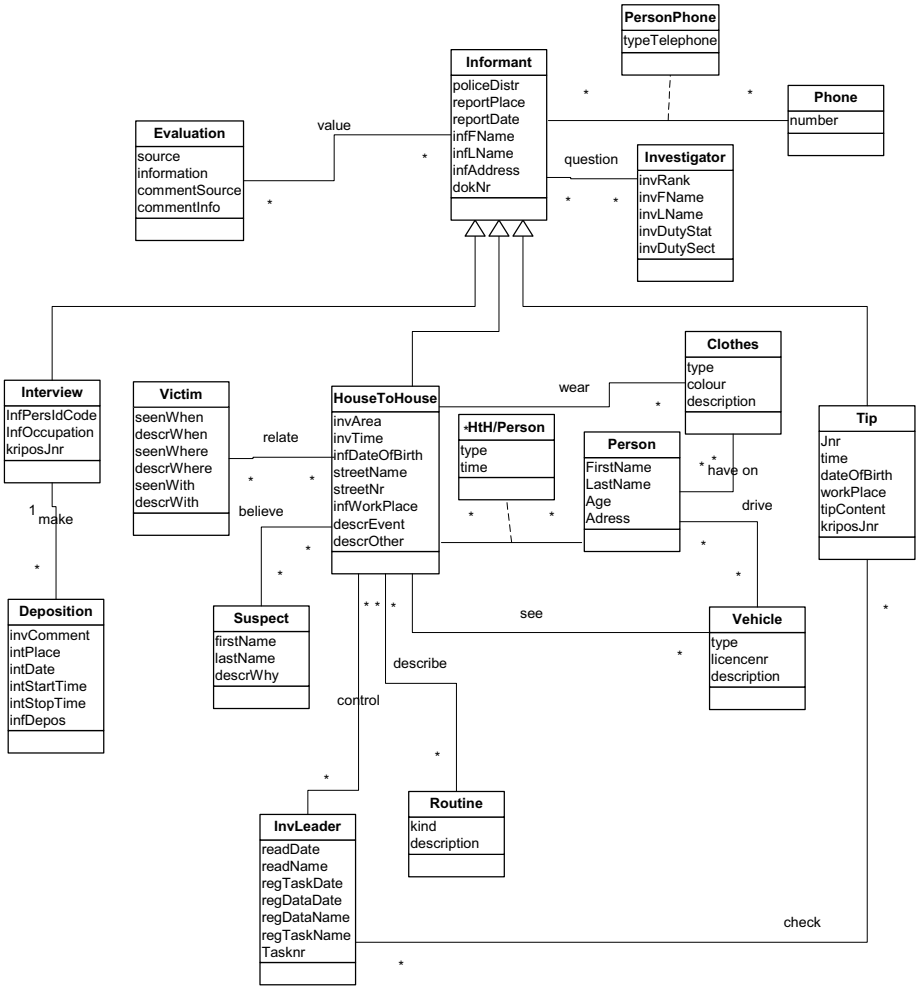
The model are intended for both operative and strategic criminal intelligence analysis, i.e. support the different types of analysis used within operative and strategic criminal intelligence analysis.

Sonja Wilhelmsen, University of Bergen
02.06.2003

Evaluation and preparation
Evidence and Electronic traces

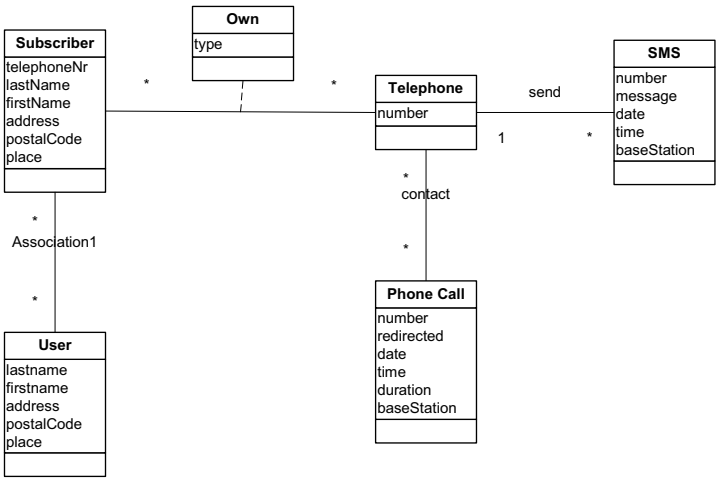


Evaluation and preparation
Informants



Evaluation relates to classifying both information and source with regard to truth value.

Analysis
Integration of electronic traces
Telephone

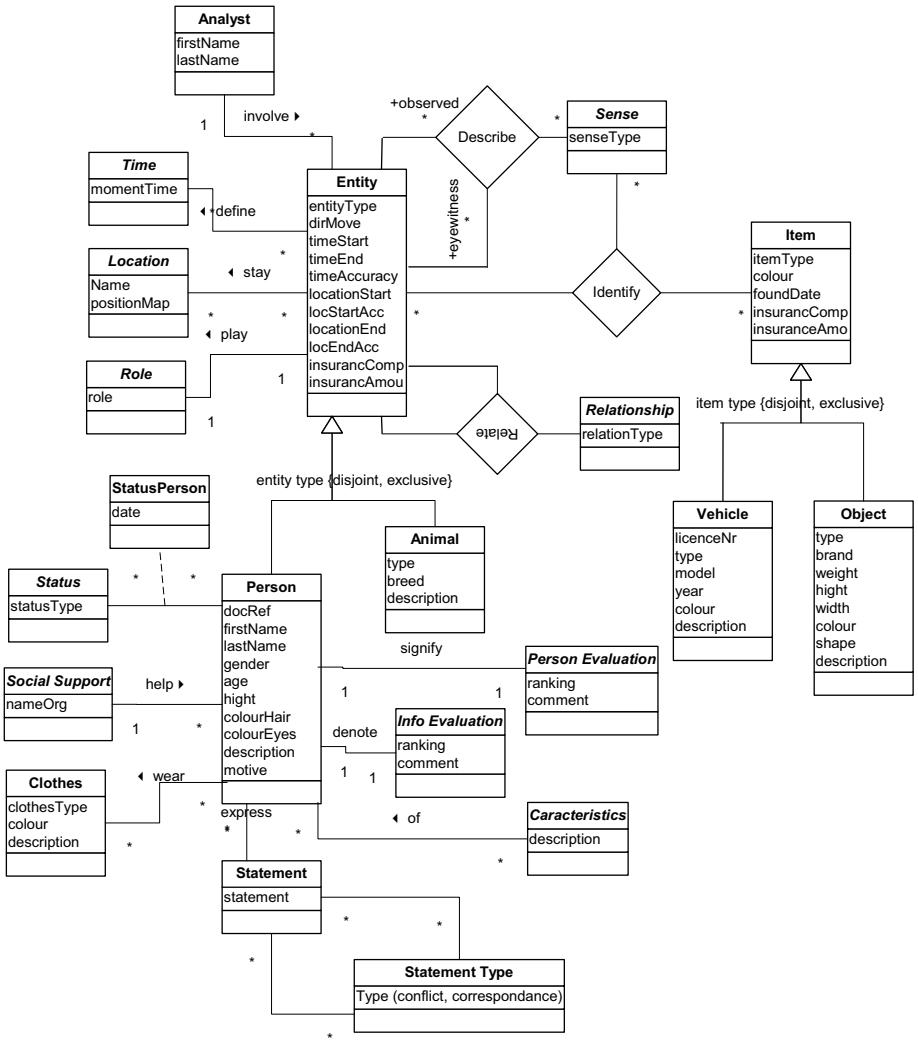


In this step the model is meant to reflect which telephone numbers that have been connected at which point, either by conversation or SMS.

The attribute 'type' in 'Own' is ment to reflect if the phone is at home, at work, a mobile phone or a IMSI-nr.

Analysis

Integration of data from informants and evidence



One view for each analyst.
This part og the analysis model is meant to reflect the analyst's view of the data from evaluation and preparation regarding

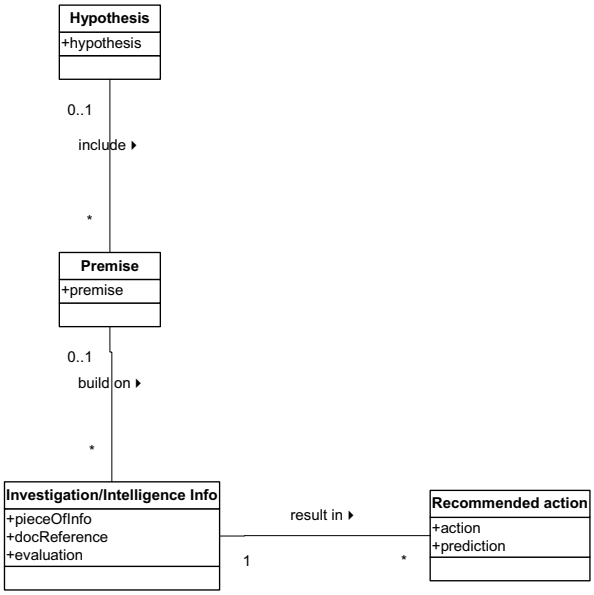
- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.

Sonja Wilhelmsen, University of Bergen
02.06.2003

Analysis

Interpretation and hypothesis building



One view for each analyst and hypothesis
In this step the model is ment to reflect the analyst's interpretation (evaluation) of the data, and to reflect his or her own predictions about recommended actions regarding the important aspects

- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

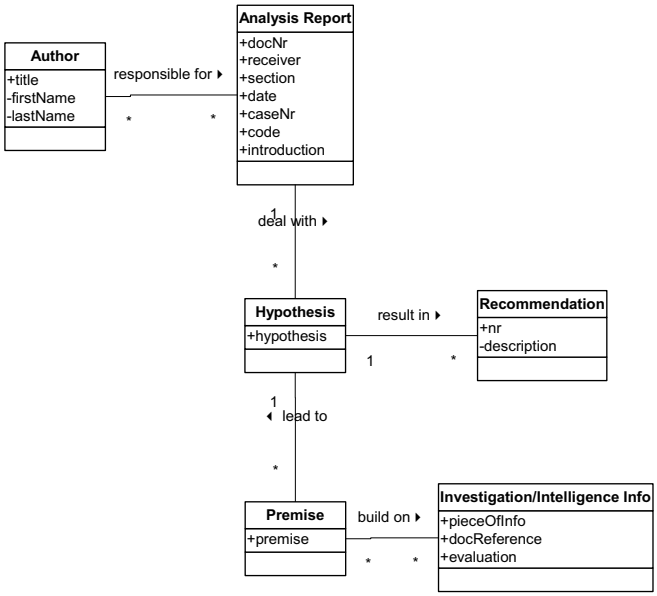
and how they relate to each other.

Important questions during the work
- Are there any data that conflict with other data?
  What does the conflict consist of? Which data are most likely to be true?
- Are there any data that support other data?
  Why and/or how do the data support each other? Is it likely that these data are true?

Verified and unverified data, interpretations (evaluations) and predictions are combined in a hypothesis that focus on further data gathering.

Analysis

Inferences, conclusions, and recommendations



In conclusion/recommendation all data should be verified. Data in the previous models can be verified or unverified. It is important in each step to mark the data as verified or unverified, and to change the status of the data when they are confirmed.

There may be several final reports dependent on area of use (prosecution, strategy, further investigation, or developing guidelines).

PRESENTATION AT KRIPOS
10. NOVEMBER 2003

DATA MODELS

Sonja Wilhelmsen, University of Bergen
05.11.2003

GENERAL COMMENTS TO THE DATA MODELS.

Entities drawn with a dotted line are shown in more than one model.

Categorisation of the data.

In evaluation and preparation the data are divided into four main categories	
Other databases	Data gathered from external databases and registers (both within the police and outside)
Informants	Data gathered from witnesses, suspects and accused.
Evidence	Physical evidence gathered by forensic technicians with lab rapports and autopsy reports, confiscation of equipment, and electronic traces obtained by the sexual assault group.
Electronic traces	Transcripts from telephone companies, banks and credit card companies
In the integration phase of analysis the data are divided into six main categories	
Entity	Entities that can move (person, dog) and that are interesting either as witnesses, suspects or accused
Item	Physical entities (car, gun) that have a connection to the investigation
Statement	Statements made by informants and statements found in confiscated equipment
Internet	Addresses visited found in confiscated equipment and by the sexual assault group
Telephone	Phone calls and SMS/MMS messages exchanged by persons under investigation
Account	Payments between/to/from persons under investigation

COMMENTS TO THE DIFFERENT MODELS.

Evaluation/preparation and finalisation. Overview of entities.

A case can include one or more event(s) that deal with
- a crime already committed
- information about planned illegal actions (crime control)
- investigation projects based on crimes related to each other through modus operandi and/or type of crime.

Evaluations and preparation. Informants and other databases.

Evaluation relates to classifying both information and source with regard to truth value.

Analysis – Integration of data from informants and evidence.

One view for each analyst.
This part og the analysis model is meant to reflect the analyst's view of the data from evaluation and preparation regarding

- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.

Analysis – Integration of electronic traces – Telephone.

In this step the model is meant to reflect which telephone numbers that have been connected at which point, either by conversation or SMS.

The attribute 'type' in 'Own' is ment to reflect if the phone is at home, at work, a mobile phone or a IMSI-nr.

Analysis – Inferences, conclusions, and recommendations.

In conclusion/recommendation all data should be verified. Data in the previous models can be verified or unverified. It is important in each step to mark the data as verified or unverified, and to change the status of the data when they are confirmed.

There may be several final reports dependeing on area of use (prosecution, strategy, further investigation, or developing guidelines).

Analysis – Interpretation and hypothesis building.

and to reflect his or her own predictions about recommended actions regarding the important aspects

- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.

Important questions during the work

- Are there any data that conflict with other data?
  What does the conflict consist of? Which data are most likely to be true?
- Are there any data that support other data?
  Why and/or how do the data support each other? Is it likely that these data are true?

Verified and unverified data, interpretations (evaluations) and predictions are combined in a hypothesis that focus on further data gathering.

Analysis. Profiling.

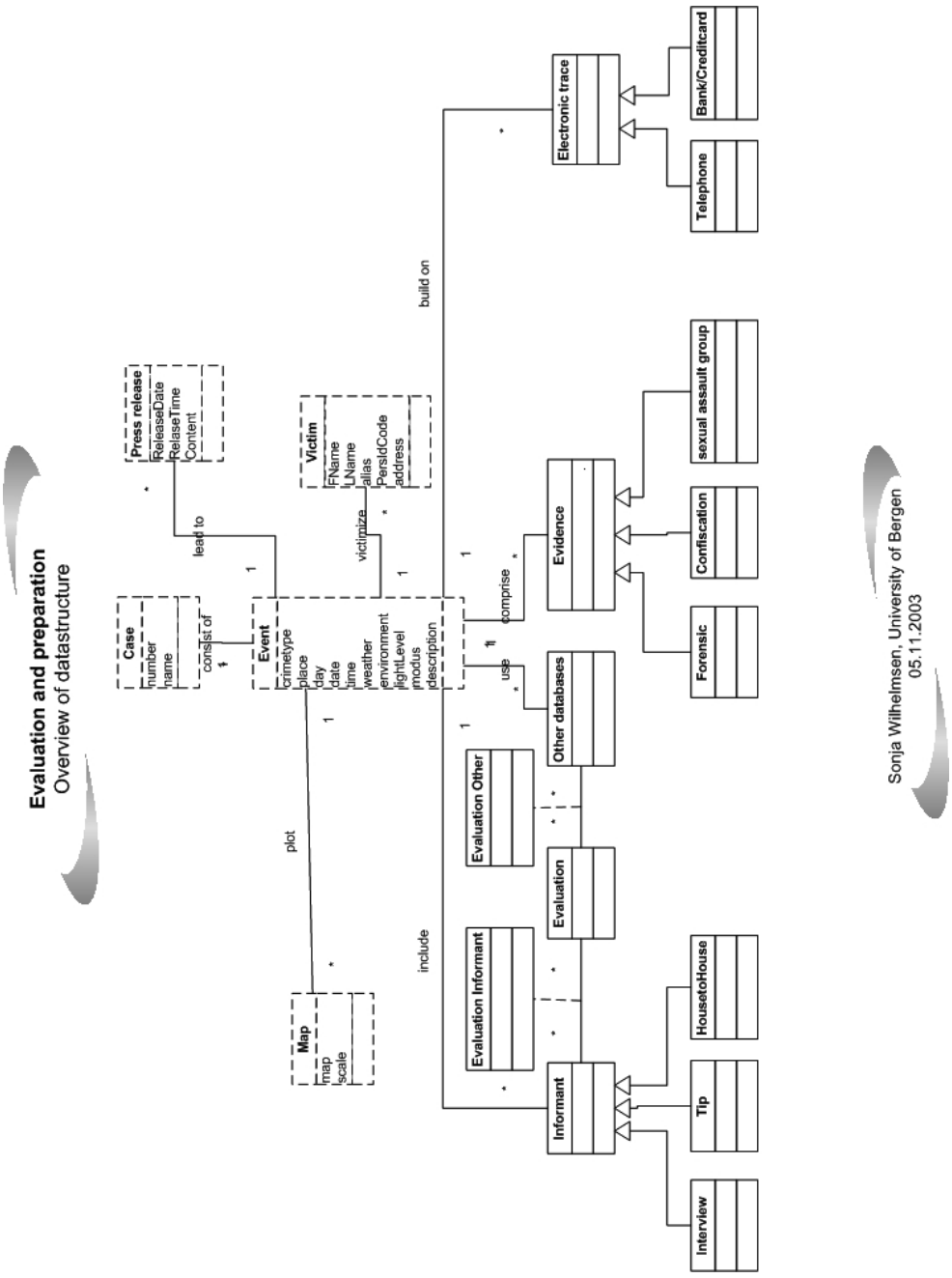
The model shall support writing of the profiling report(s). The profiling will not be elaborated in more detail in connection in my phd.

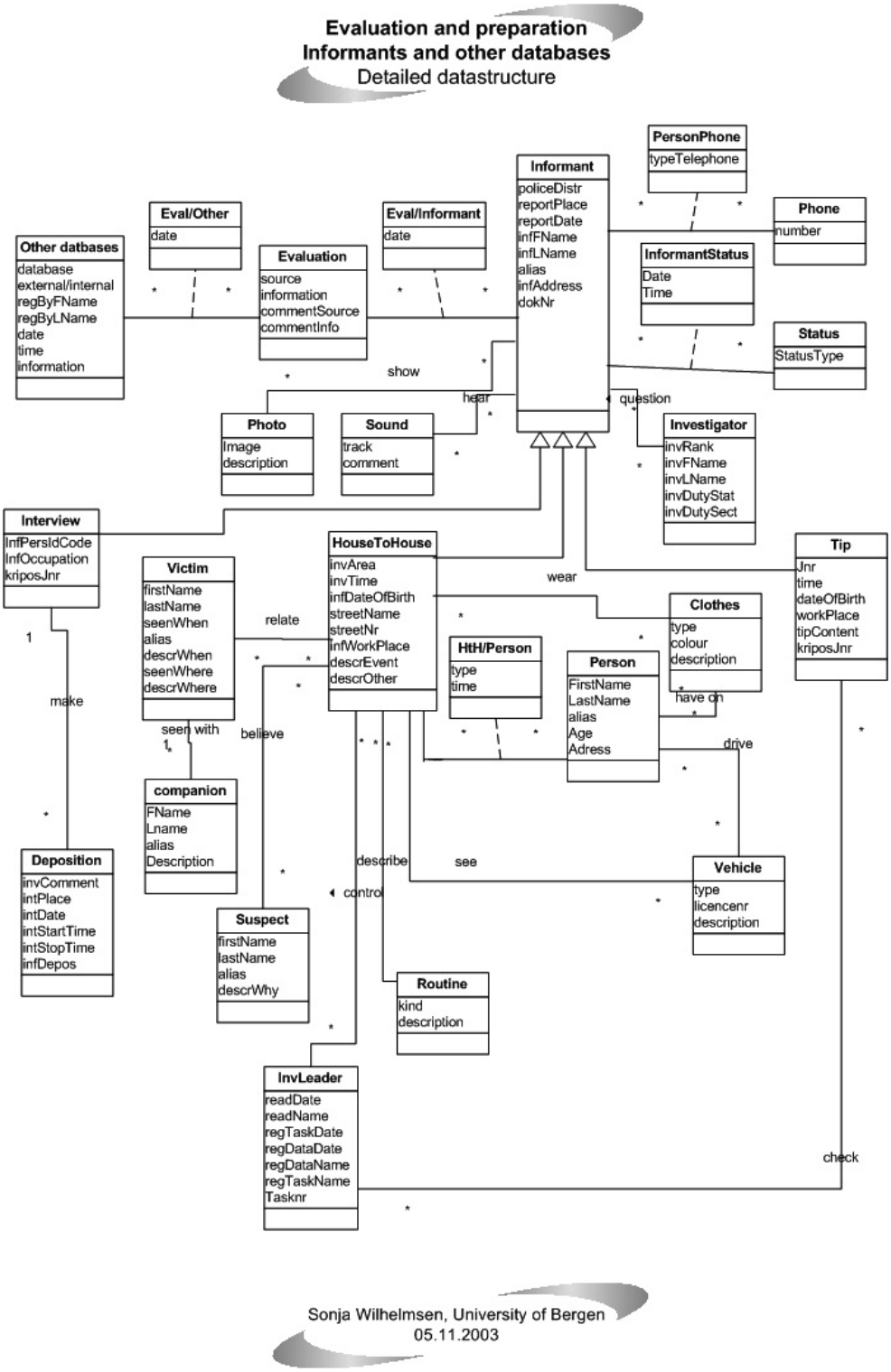
DESCRIPTION OF LINKS BETWEEN THE DIFFERENT DATA MODELS.

Electronic links shall be established between the different phases. A link that originates in an attribute that is represented with a text field shall be connected to the interesting text within the attribute, not only to the attribute itself. The interesting text should also be highlighted (e.g. coloured yellow) to show that there has been established a link to another attribute.

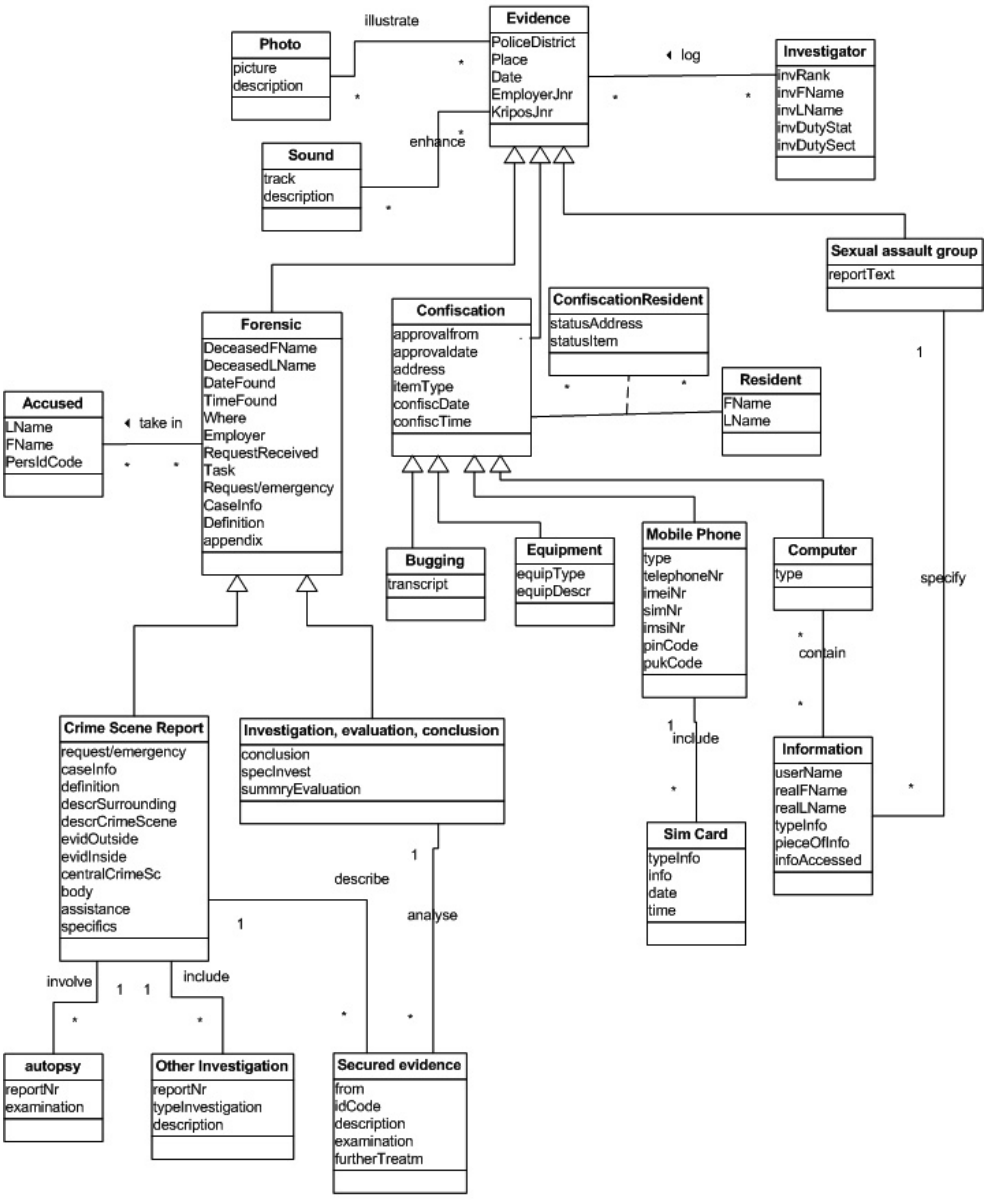
All phases will always be linked to the entities shown with a dotted line in the models.

If links not shall be established to all entities in a phase, the name of the entities are written on the link together with the direction.


Evaluation and preparation
Overview of datastructure
Sonja Wilhelmsen, University of Bergen
05.11.2003
Case
number
name
Press release
ReleaseDate
ReleaseTime
Content
lead to
consist of
Event
crimetype
place
day
date
time
weather
environment
lightLevel
modus
description
Victim
FName
LName
alias
PersIdCode
address
victimize
build on
Map
map
scale
plot
include
use
comprise
Evaluation Informant
Evaluation Other
Evaluation
Other databases
Evidence
Informant
Interview
Tip
HousetoHouse
Forensic
Confiscation
sexual assault group
Electronic trace
Telephone
Bank/Creditcard

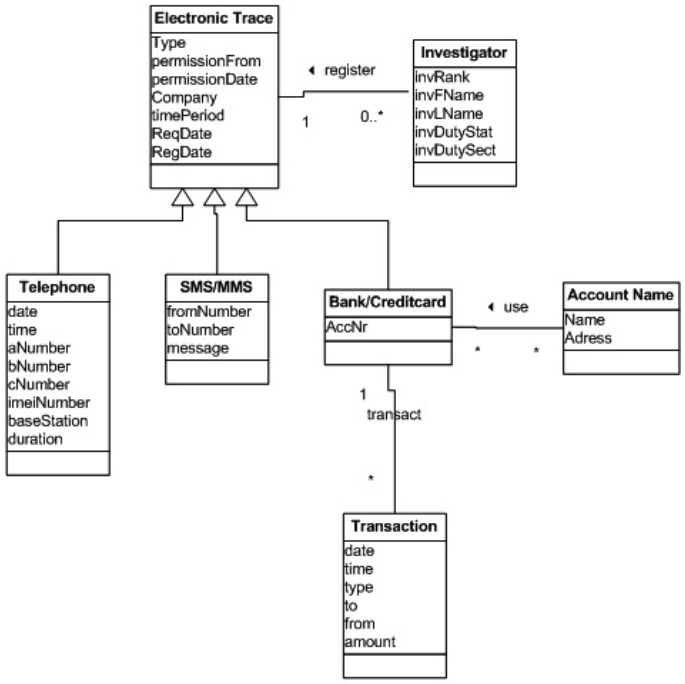

Evaluation and preparation
Informants and other databases
Detailed datastructure
Informant
policeDistr
reportPlace
reportDate
infFName
infLName
alias
infAddress
dokNr
PersonPhone
typeTelephone
Phone
number
InformantStatus
Date
Time
Status
StatusType
Eval/Other
date
Eval/Informant
date
Evaluation
source
information
commentSource
commentInfo
Other datbases
database
external/internal
regByFName
regByLName
date
time
information
show
hear
question
Photo
Image
description
Sound
track
comment
Investigator
invRank
invFName
invLName
invDutyStat
invDutySect
Interview
InfPersIdCode
InfOccupation
kriposJnr
Victim
firstName
lastName
seenWhen
alias
descrWhen
seenWhere
descrWhere
relate
HouseToHouse
invArea
invTime
infDateOfBirth
streetName
streetNr
infWorkPlace
descrEvent
descrOther
wear
Tip
Jnr
time
dateOfBirth
workPlace
tipContent
kriposJnr
Clothes
type
colour
description
HtH/Person
type
time
Person
FirstName
LastName
alias
Age
Adress
have on
drive
1
make
seen with
1
believe
companion
FName
Lname
alias
Description
Deposition
invComment
intPlace
intDate
intStartTime
intStopTime
infDepos
describe
see
control
Vehicle
type
licencenr
description
Suspect
firstName
lastName
alias
descrWhy
Routine
kind
description
InvLeader
readDate
readName
regTaskDate
regDataDate
regDataName
regTaskName
Tasknr
check
Sonja Wilhelmsen, University of Bergen
05.11.2003

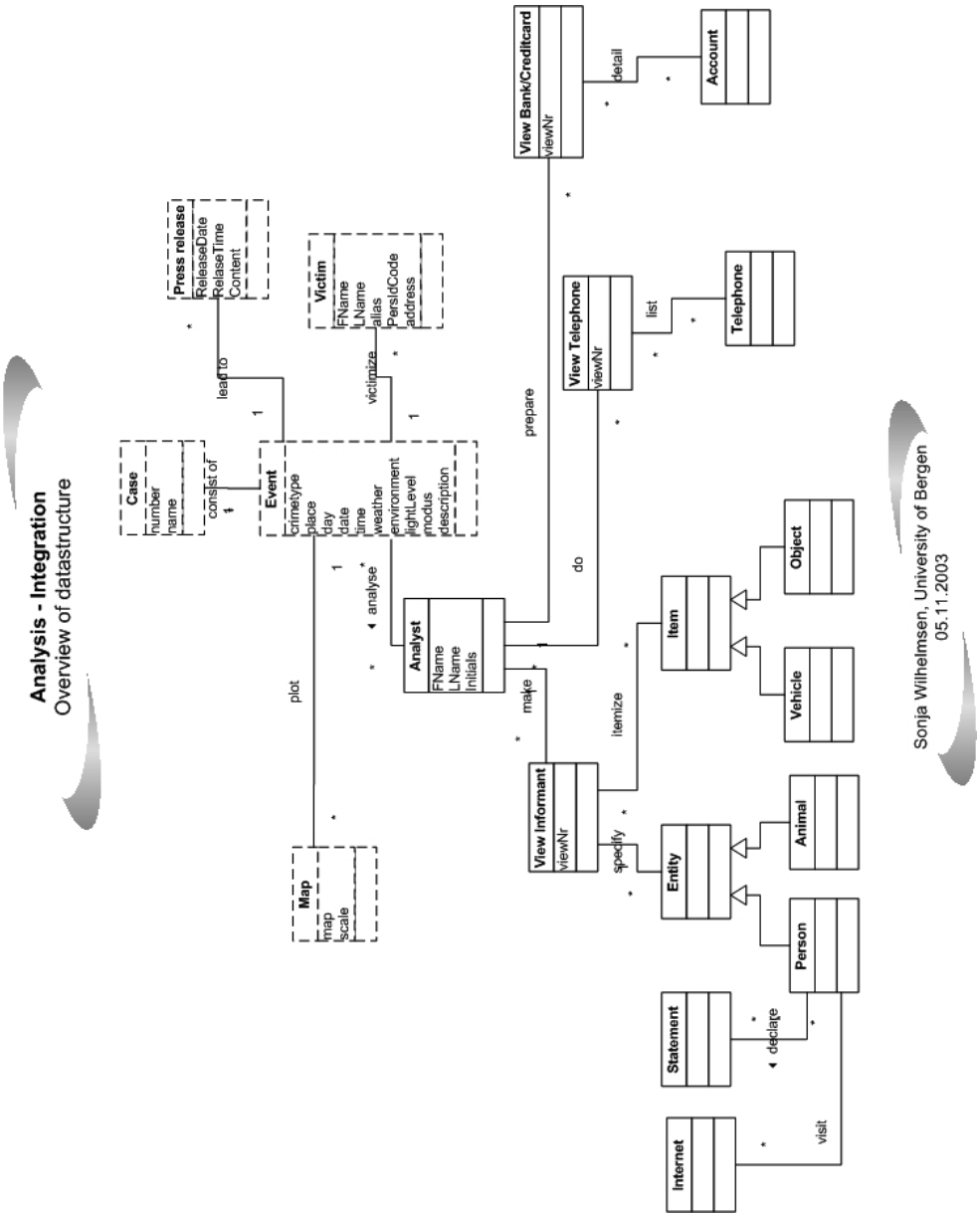
Evaluation and preparation
Evidence
Detailed datastructure

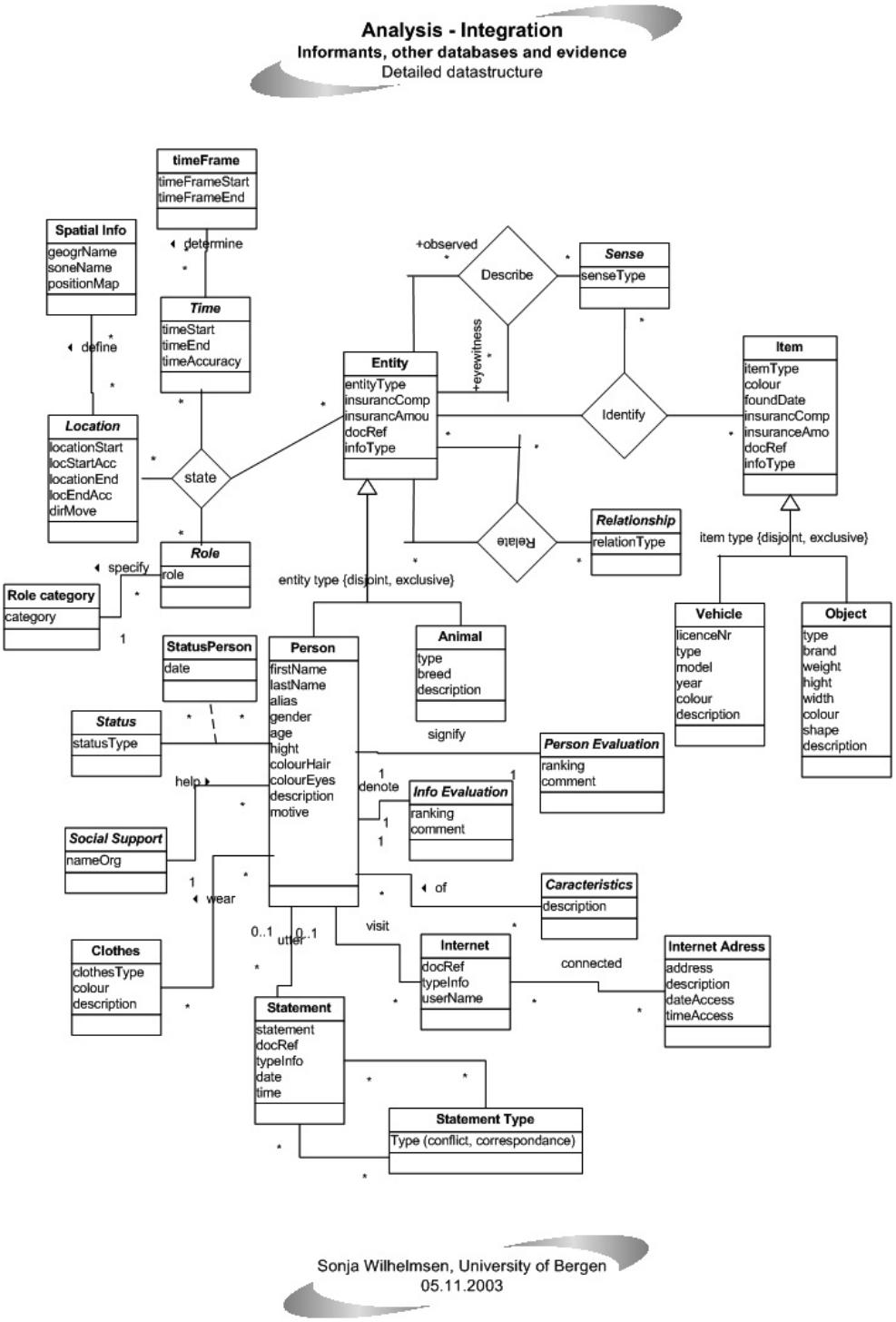


Sonja Wilhelmsen, University of Bergen
05.11.2003

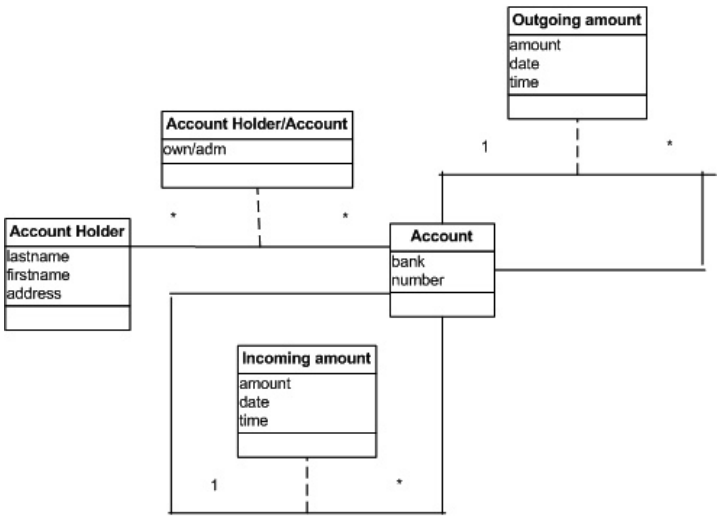
Evaluation and preparation
Electronic traces
Detailed datastructure




Analysis - Integration
Overview of datastructure
Sonja Wilhelmsen, University of Bergen
05.11.2003
Case
number
name
consist of
Press release
ReleaseDate
RelaseTime
Content
lead to
Victim
FName
LName
alias
PersIdCode
address
victimize
Event
crimetype
place
day
date
time
weather
environment
lightLevel
modus
description
analyse
plot
Map
map
scale
Analyst
FName
LName
Initials
make
prepare
do
View Bank/Creditcard
viewNr
detail
Account
View Telephone
viewNr
list
Telephone
View informant
viewNr
specify
itemize
Item
Object
Vehicle
Entity
Animal
Person
Statement
declare
Internet
visit


Analysis - Integration
Informants, other databases and evidence
Detailed datastructure
timeFrame
timeFrameStart
timeFrameEnd
Spatial Info
geogrName
soneName
positionMap
determine
Time
timeStart
timeEnd
timeAccuracy
define
Location
locationStart
locStartAcc
locationEnd
locEndAcc
dirMove
state
Role
role
specify
Role category
category
1
+observed
Describe
Sense
senseType
+eyewitness
Entity
entityType
insurancComp
insurancAmou
docRef
infoType
Identify
Item
itemType
colour
foundDate
insurancComp
insuranceAmo
docRef
infoType
Relate
Relationship
relationType
item type {disjoint, exclusive}
entity type {disjoint, exclusive}
Vehicle
licenceNr
type
model
year
colour
description
Object
type
brand
weight
hight
width
colour
shape
description
StatusPerson
date
Person
firstName
lastName
alias
gender
age
hight
colourHair
colourEyes
description
motive
Animal
type
breed
description
signify
Status
statusType
help
Person Evaluation
ranking
comment
denote
Info Evaluation
ranking
comment
Social Support
nameOrg
wear
of
Caracteristics
description
visit
Clothes
clothesType
colour
description
utter
0..1
Internet
docRef
typeInfo
userName
connected
Internet Adress
address
description
dateAccess
timeAccess
Statement
statement
docRef
typeInfo
date
time
Statement Type
Type (conflict, correspondance)
Sonja Wilhelmsen, University of Bergen
05.11.2003

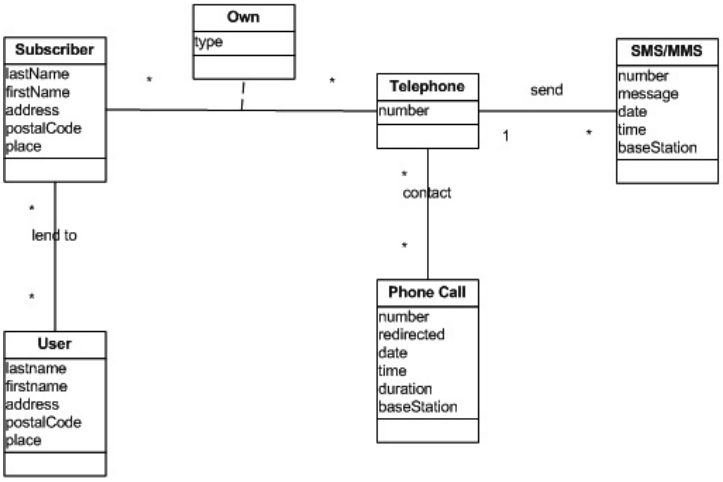
Analysis - Integration
Electronic traces - Bank/Creditcard
Detailed datastructure



Analysis - Integration

Electronic traces - Telepone

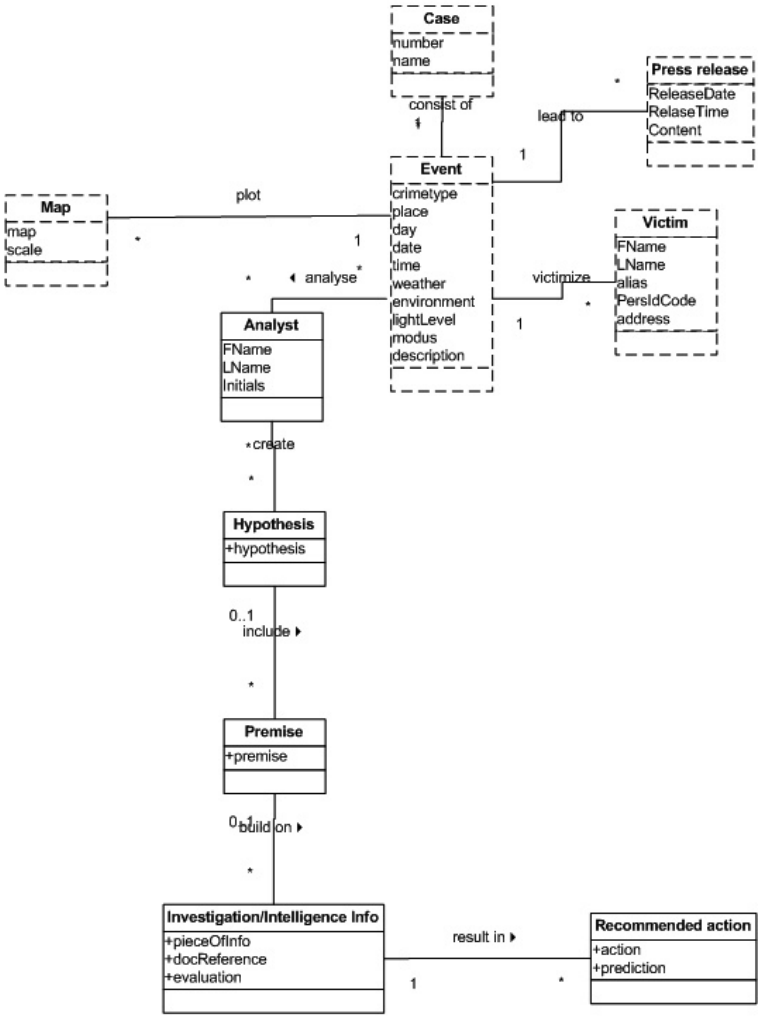
Detailed datastructure



Sonja Wilhelmsen, University of Bergen
05.11.2003

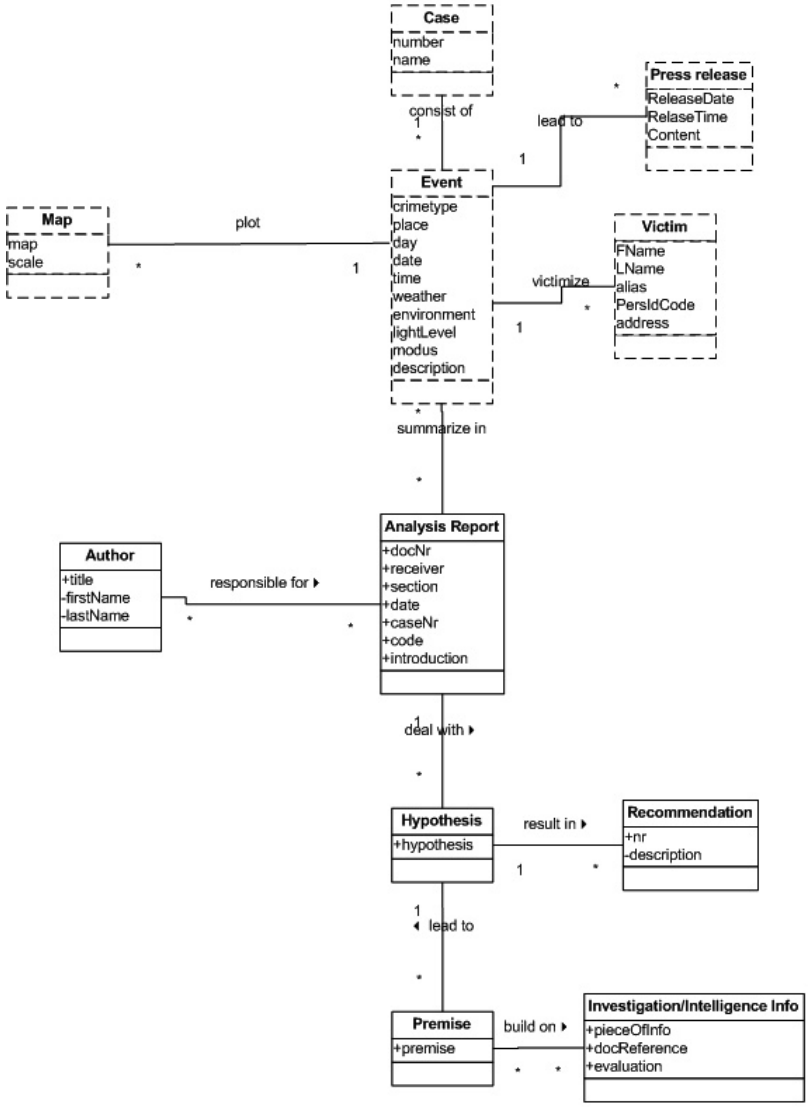
a-electr-tlf-b.vsd
02.11.2003 13:26

Analysis
Interpretation and hypothesis building
Detailed datastructure

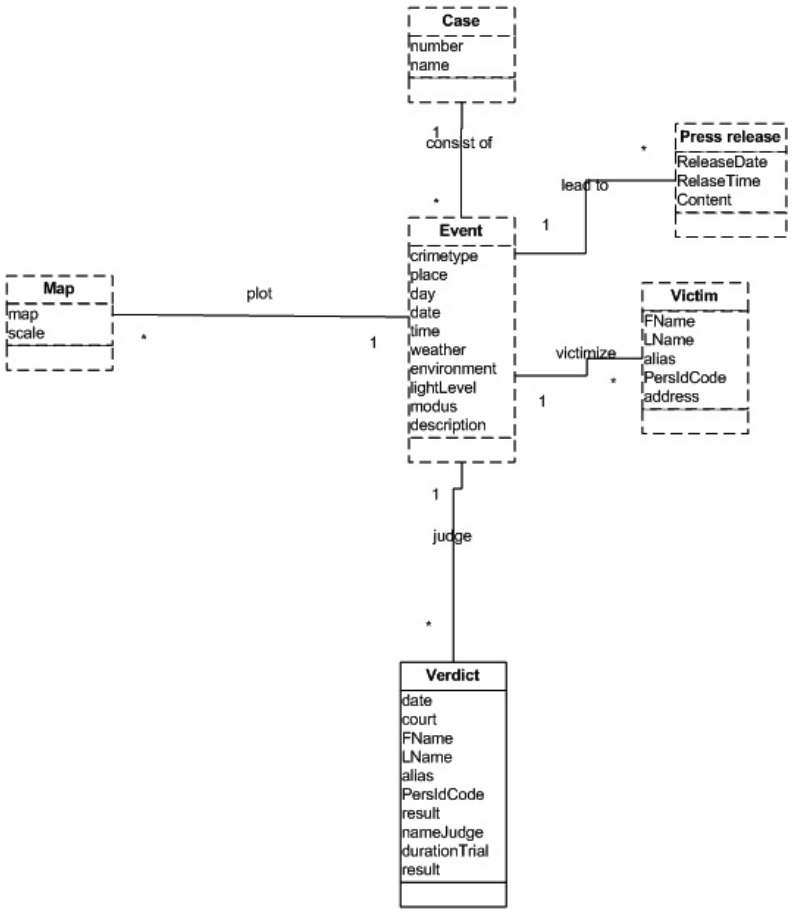


Sonja Wilhelmsen, University of Bergen
05.11.2003

Analysis
Inferences, conclusions, and recommendations
Detailed datastructure



Finalisation
Detailed datastructure



LOG FUNCTIONS FOR DATA AND RELATIONSHIPS.

Evaluation and preparation.

For each attribute value created
log 'user-id' and date and time

For each attribute value changed
log 'user-id' and date and time

For each attribute value accessed
log 'user-id' and date and time

If any attribute value is accessed more than 10 times and less than 30 times
then display attribute value in blue colour
if any attribute value is accessed between 30 and 40 times
then display attribute value in green colour
if any attribute value is accessed more than 40 times
then display attribute value in red colour

Analysis – Integration.

If 'View informant' is created
then log view nr and initials and time and date

For each attribute value created
log view nr and date and time

For each relationship value created for 'state'
For each relationship value created for 'specify'
log view nr and date and time

For each relationship value created 'define'
log view nr and date and time

For each relationship value created for 'determine'
log view nr and date and time

If 'View Telephone' is created
then log view nr and initials and time and date

For each attribute value created
log view nr and date and time

For each relationship value created for 'send'
log view nr and date and time

For each relationship value created for 'contact'
log view nr and date and time

If ‘View Bank/Creditcard’ is created
then log view nr. and date and time

For each attribute value created
log view nr and date and time

For each relationship value created for ‘Outgoing Amount’
log ‘view nr’ and date and time

For each relationship value created for ‘Incoming Amount’
log ‘view nr’ and date and time

Analysis – Interpretation and hypothesis building.

For each attribute value created
log ‘Analyst Initials’ and date and time

For each relationship value created for ‘create’
log ‘Analyst Initials’ and date and time

For each relationship value created for ’include’
log ‘Analyst Initials’ and date and time

For each relationship value created for ’build on’
log ‘Analyst Initials’ and date and time

For each relationship value created for ’result in’
log ‘Analyst Initials’ and date and time

Analysis – Inferences, conclusions, and recommendations

For each attribute value created
log ‘user id’ and date and time

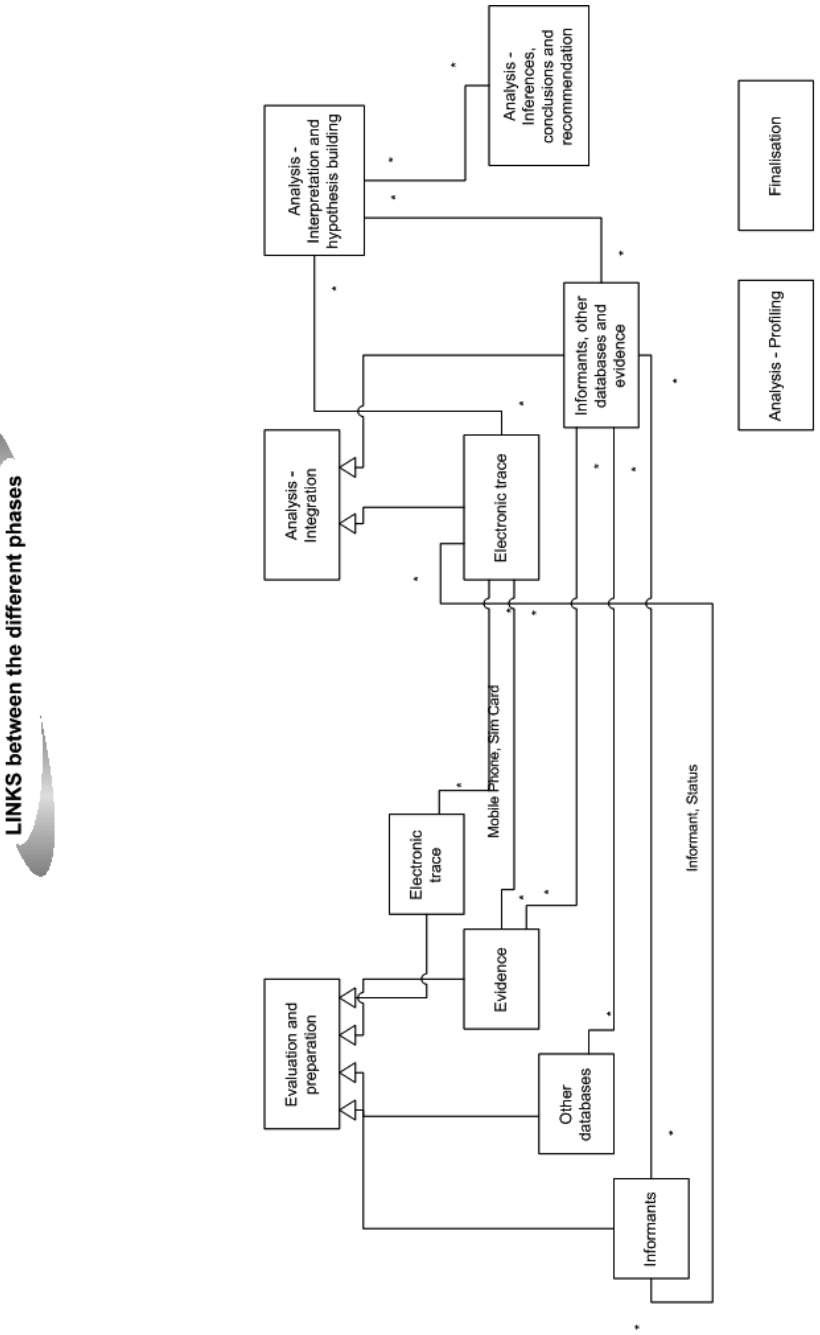
Analysis – Profiling

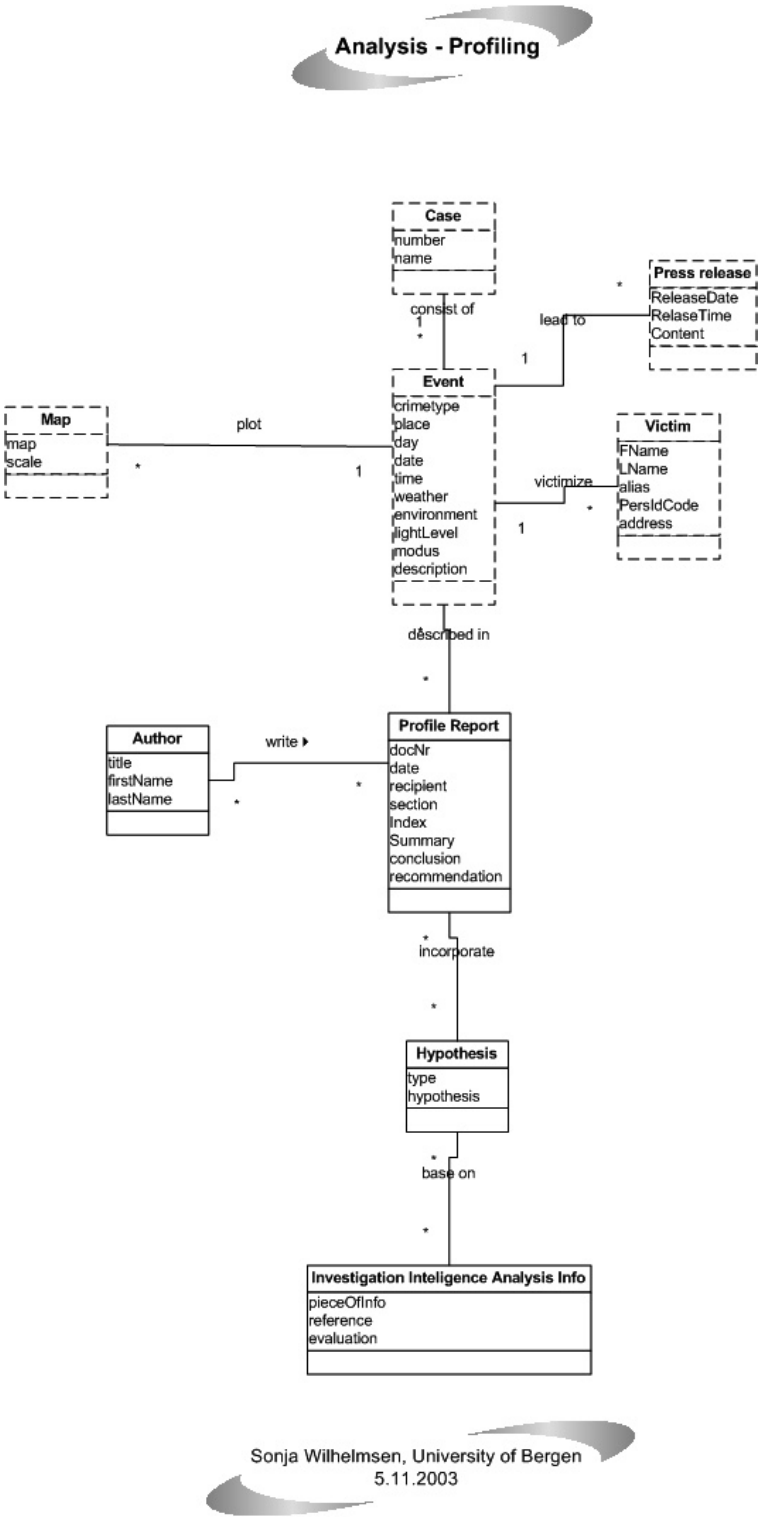
For each attribute value created
log ‘user id’ and date and time

For each relationship value created for ‘base on’
log ‘user id’ and date and time

Finalisation

For each attribute value created
  log ‘user id’ and date and time


LINKS between the different phases
Analysis - Interpretation and hypothesis building
Analysis - Inferences, conclusions and recommendation
Analysis - Integration
Electronic trace
Informants, other databases and evidence
Finalisation
Analysis - Profiling
Electronic trace
Mobile Phone, Sim Card
Evaluation and preparation
Evidence
Other databases
Informant, Status
Informants
Sonja Wilhelmsen, University of Bergen
05.11.2003

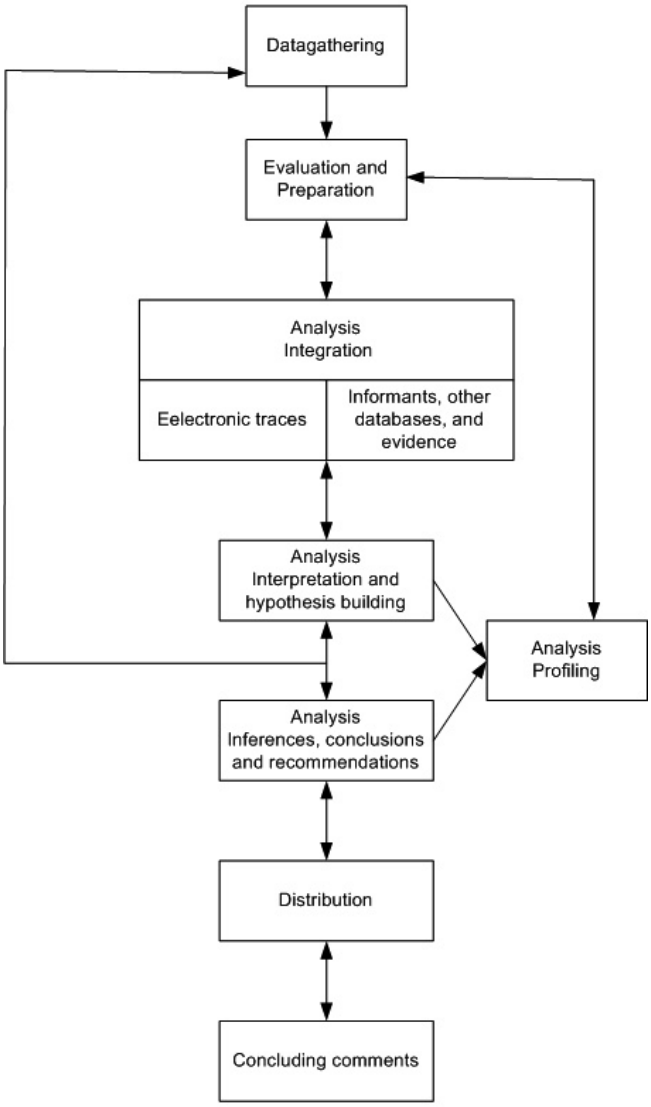

Analysis - Profiling
Case
number
name
consist of
1
*
lead to
*
1
Press release
ReleaseDate
RelaseTime
Content
Event
crimetype
place
day
date
time
weather
environment
lightLevel
modus
description
Map
map
scale
plot
*
1
victimize
*
1
Victim
FName
LName
alias
PersIdCode
address
described in
*
Author
title
firstName
lastName
write
*
*
Profile Report
docNr
date
recipient
section
Index
Summary
conclusion
recommendation
*
incorporate
*
Hypothesis
type
hypothesis
*
base on
*
Investigation Inteligence Analysis Info
pieceOfInfo
reference
evaluation
Sonja Wilhelmsen, University of Bergen
5.11.2003

PRESENTATION AT KRIPOS
10. NOVEMBER 2003

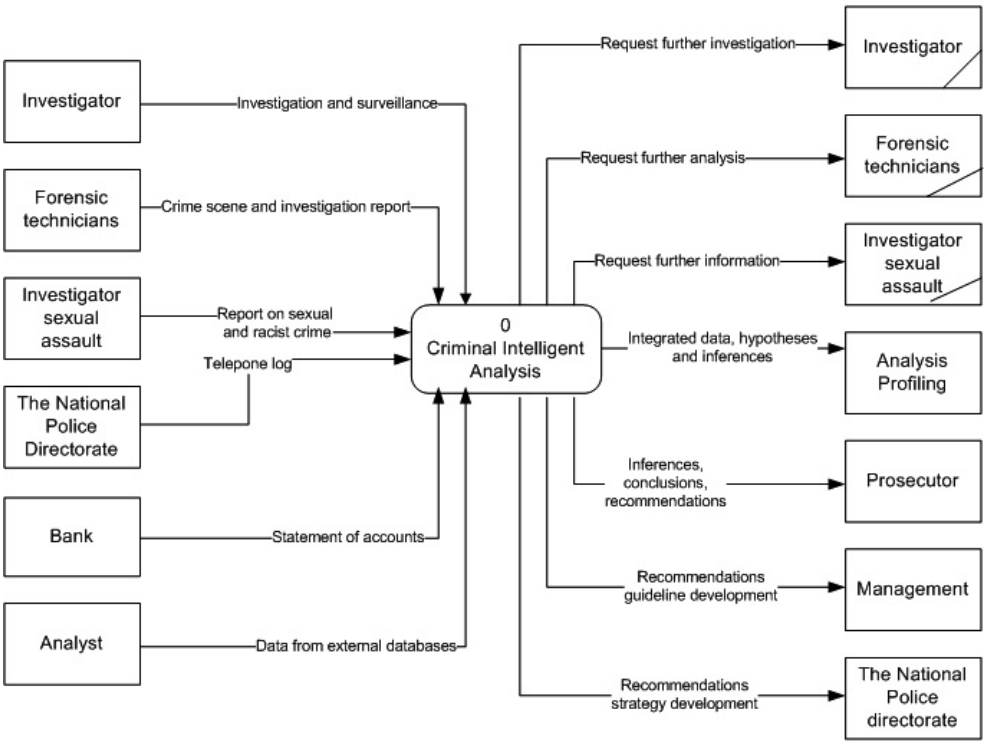
DATA FLOW MODELS

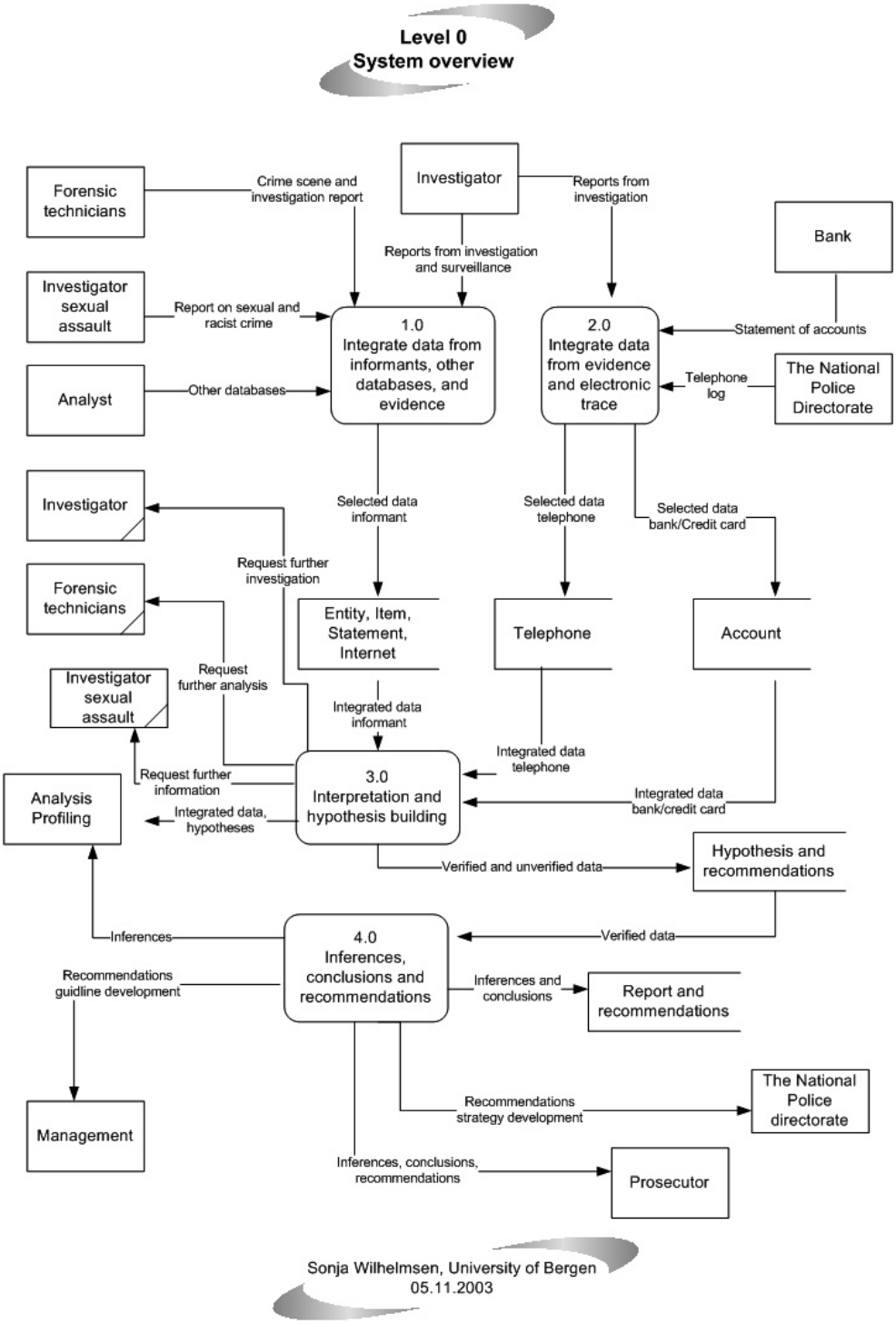
Sonja Wilhelmsen, University of Bergen
05.11.2003

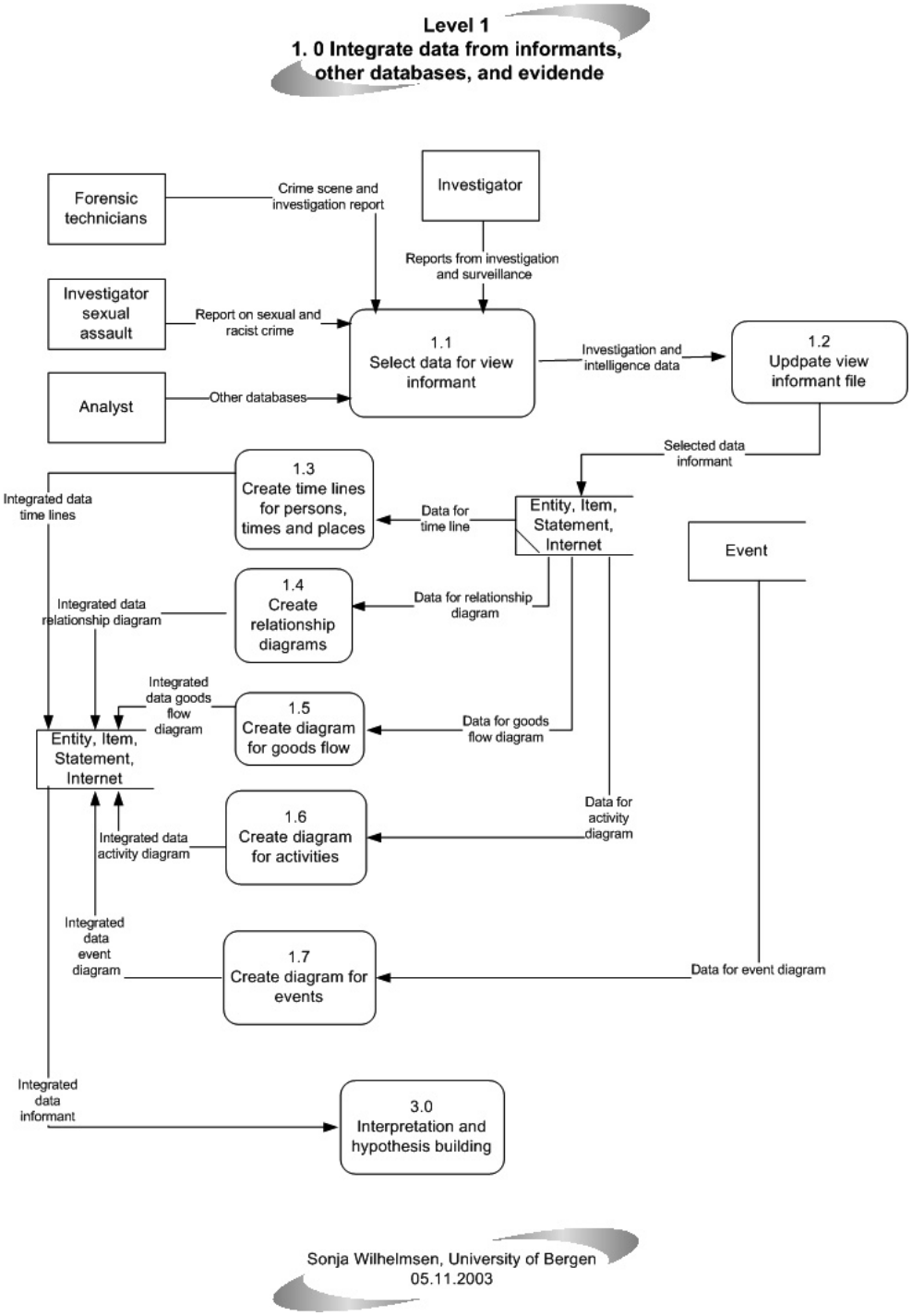
Overview of the process in criminal intelligence work

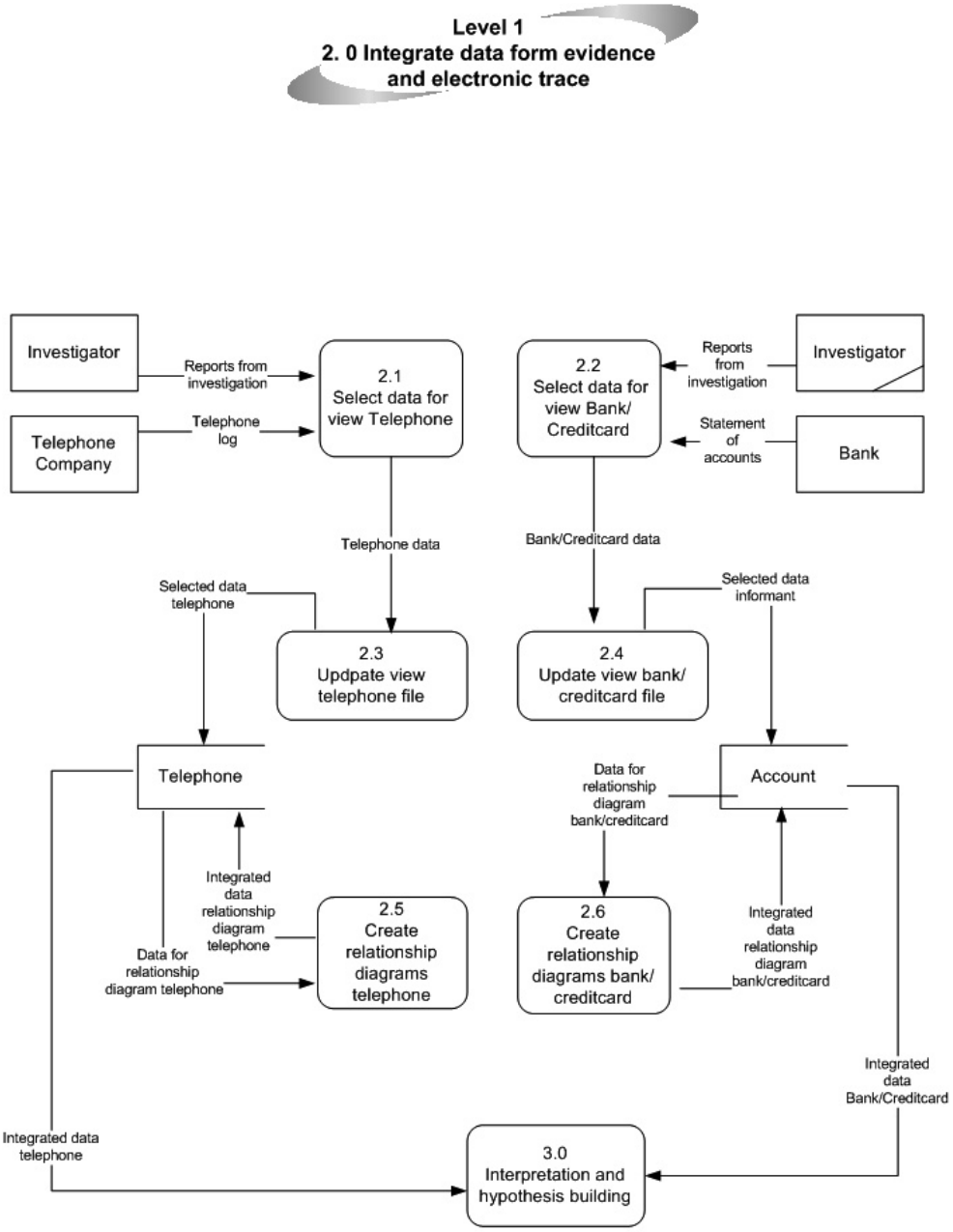


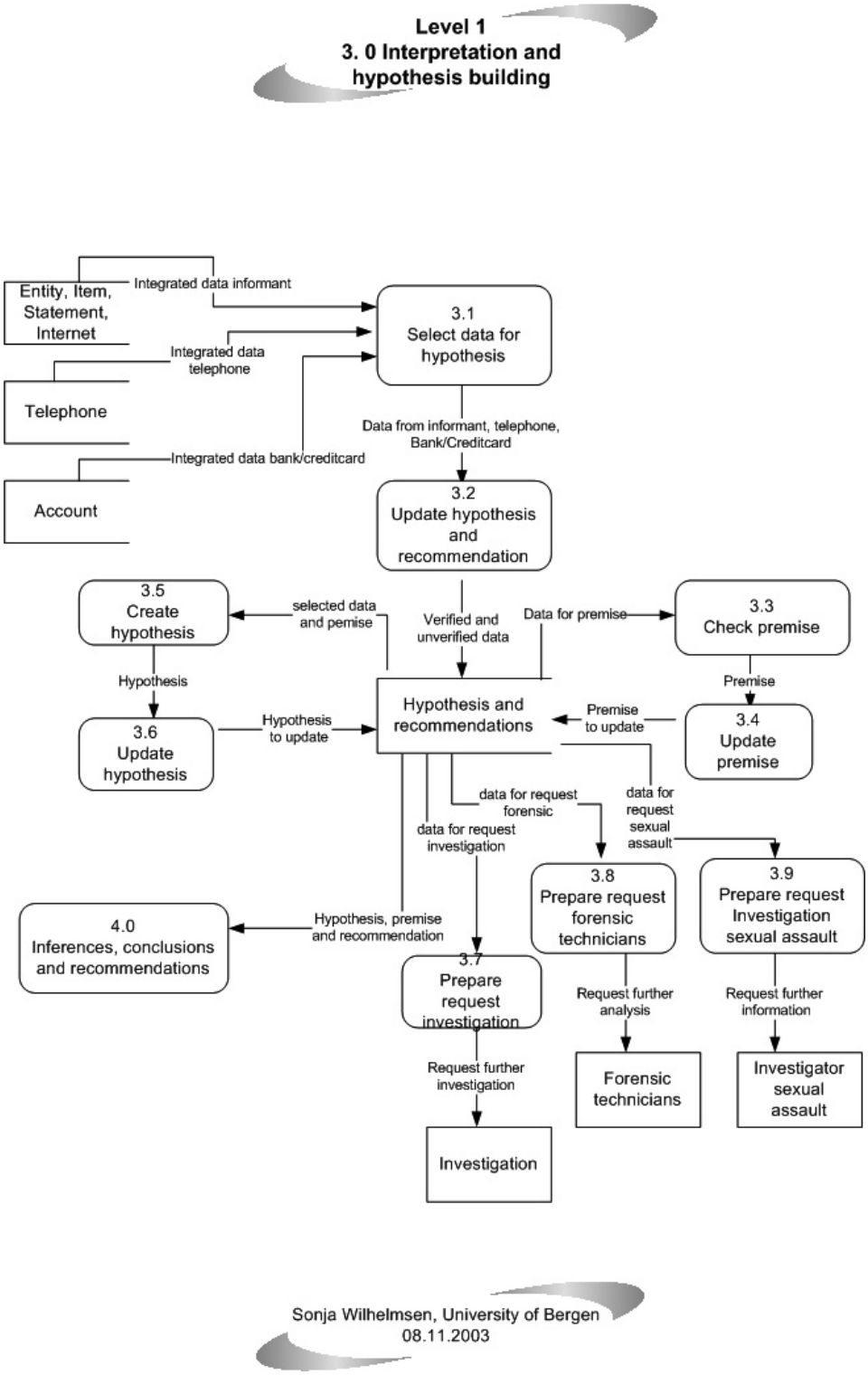
Sonja Wilhelmsen, University of Bergen
05.11.2003

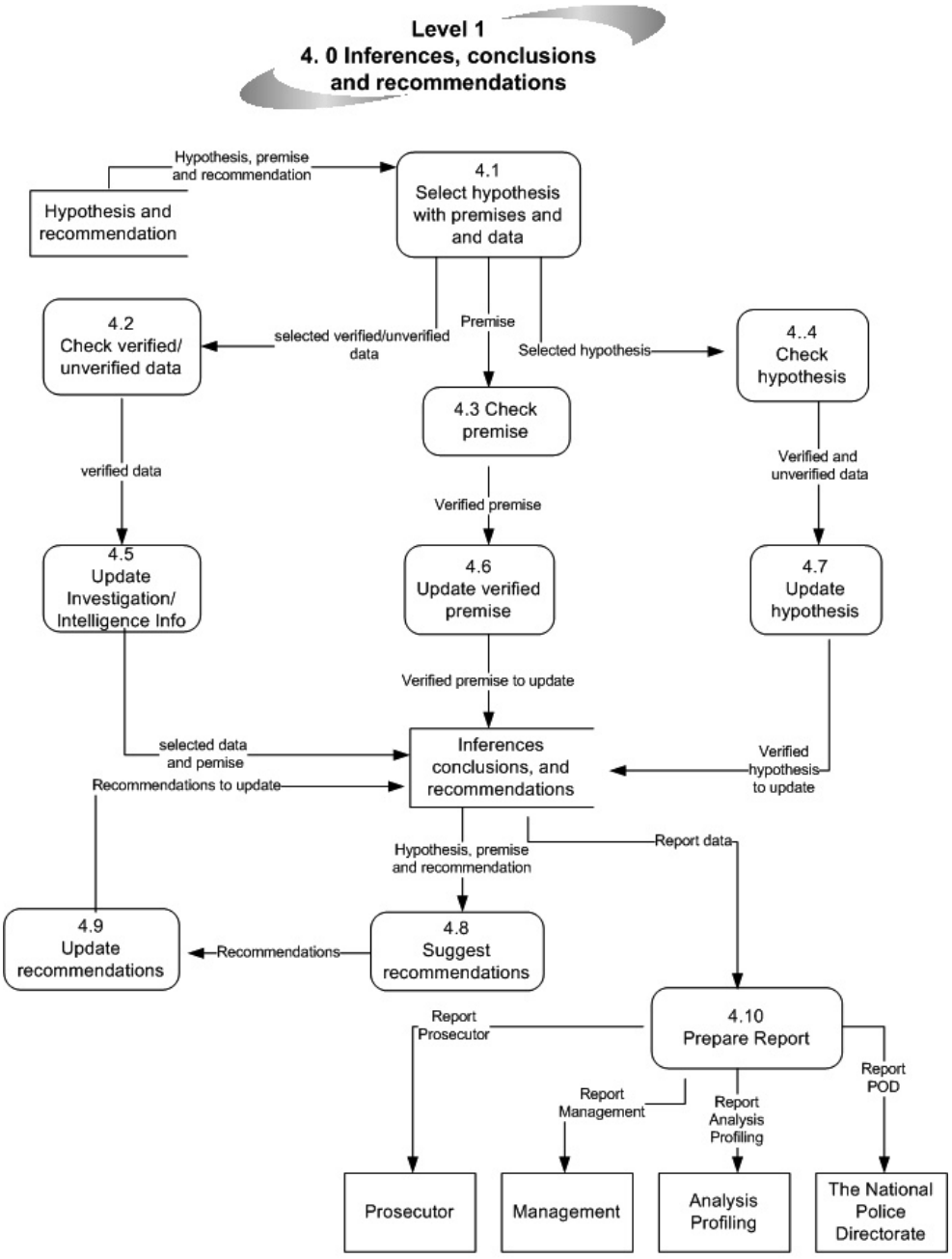

Context diagram
Analysis
Investigator
Forensic technicians
Investigator sexual assault
The National Police Directorate
Bank
Analyst
Investigation and surveillance
Crime scene and investigation report
Report on sexual and racist crime
Telepone log
Statement of accounts
Data from external databases
0
Criminal Intelligent Analysis
Request further investigation
Request further analysis
Request further information
Integrated data, hypotheses and inferences
Inferences, conclusions, recommendations
Recommendations guideline development
Recommendations strategy development
Investigator
Forensic technicians
Investigator sexual assault
Analysis Profiling
Prosecutor
Management
The National Police directorate
Sonja Wilhelmsen, University of Bergen
05.11.2003


Level 0
System overview
Forensic technicians
Crime scene and investigation report
Investigator
Reports from investigation
Reports from investigation and surveillance
Bank
Investigator sexual assault
Report on sexual and racist crime
1.0 Integrate data from informants, other databases, and evidence
2.0 Integrate data from evidence and electronic trace
Statement of accounts
Analyst
Other databases
Telephone log
The National Police Directorate
Investigator
Selected data informant
Selected data telephone
Selected data bank/Credit card
Request further investigation
Forensic technicians
Entity, Item, Statement, Internet
Telephone
Account
Investigator sexual assault
Request further analysis
Integrated data informant
Integrated data telephone
Request further information
3.0 Interpretation and hypothesis building
Integrated data bank/credit card
Analysis Profiling
Integrated data, hypotheses
Verified and unverified data
Hypothesis and recommendations
Inferences
4.0 Inferences, conclusions and recommendations
Verified data
Recommendations guidline development
Inferences and conclusions
Report and recommendations
Management
Recommendations strategy development
The National Police directorate
Inferences, conclusions, recommendations
Prosecutor
Sonja Wilhelmsen, University of Bergen
05.11.2003


Level 1
1. 0 Integrate data from informants, other databases, and evidende
Forensic technicians
Crime scene and investigation report
Investigator
Reports from investigation and surveillance
Investigator sexual assault
Report on sexual and racist crime
1.1 Select data for view informant
Investigation and intelligence data
1.2 Updpate view informant file
Analyst
Other databases
Selected data informant
1.3 Create time lines for persons, times and places
Integrated data time lines
Data for time line
Entity, Item, Statement, Internet
Event
1.4 Create relationship diagrams
Integrated data relationship diagram
Data for relationship diagram
Integrated data goods flow diagram
1.5 Create diagram for goods flow
Data for goods flow diagram
Entity, Item, Statement, Internet
1.6 Create diagram for activities
Integrated data activity diagram
Data for activity diagram
Integrated data event diagram
1.7 Create diagram for events
Data for event diagram
Integrated data informant
3.0 Interpretation and hypothesis building
Sonja Wilhelmsen, University of Bergen
05.11.2003


Level 1
2. 0 Integrate data form evidence and electronic trace
Investigator
Reports from investigation
2.1 Select data for view Telephone
Telephone Company
Telephone log
2.2 Select data for view Bank/ Creditcard
Reports from investigation
Investigator
Statement of accounts
Bank
Telephone data
Bank/Creditcard data
Selected data telephone
Selected data informant
2.3 Updpate view telephone file
2.4 Update view bank/ creditcard file
Telephone
Account
Data for relationship diagram bank/creditcard
Integrated data relationship diagram telephone
Data for relationship diagram telephone
2.5 Create relationship diagrams telephone
2.6 Create relationship diagrams bank/ creditcard
Integrated data relationship diagram bank/creditcard
Integrated data Bank/Creditcard
Integrated data telephone
3.0 Interpretation and hypothesis building
Sonja Wilhelmsen, University of Bergen
08.11.2003


Level 1
3. 0 Interpretation and hypothesis building
Entity, Item, Statement, Internet
Integrated data informant
3.1 Select data for hypothesis
Integrated data telephone
Telephone
Data from informant, telephone, Bank/Creditcard
Integrated data bank/creditcard
Account
3.2 Update hypothesis and recommendation
3.5 Create hypothesis
selected data and pemise
Verified and unverified data
Data for premise
3.3 Check premise
Hypothesis
Premise
Hypothesis and recommendations
Premise to update
3.4 Update premise
3.6 Update hypothesis
Hypothesis to update
data for request forensic
data for request sexual assault
data for request investigation
3.8 Prepare request forensic technicians
3.9 Prepare request Investigation sexual assault
4.0 Inferences, conclusions and recommendations
Hypothesis, premise and recommendation
3.7 Prepare request investigation
Request further analysis
Request further information
Request further investigation
Forensic technicians
Investigator sexual assault
Investigation
Sonja Wilhelmsen, University of Bergen
08.11.2003



Sonja Wilhelmsen, University of Bergen
08.11.2003

C: TRANSCRIPTS AND MODELS FROM DATA GATHERING

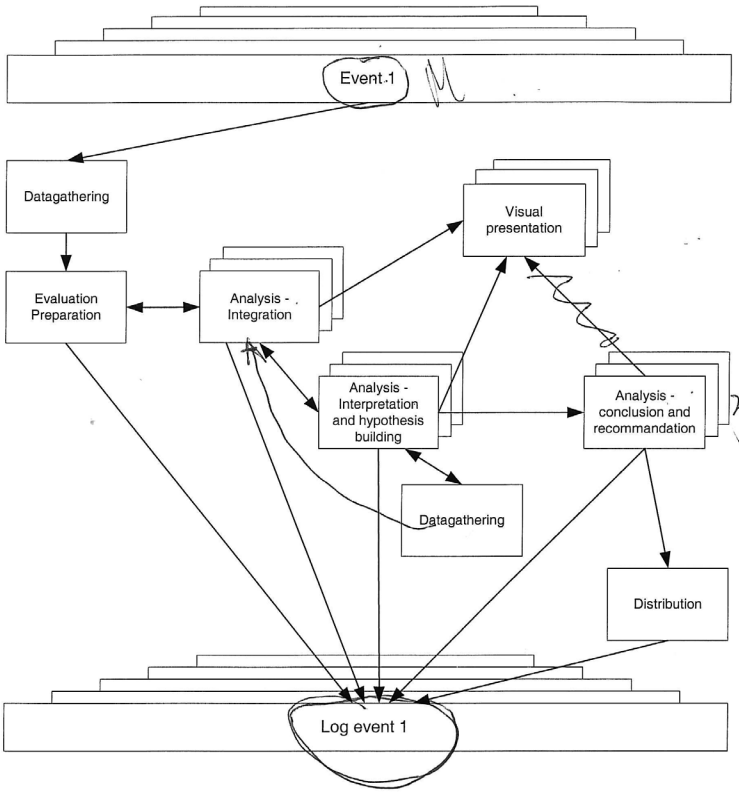
C

Sonja Wilhelmsen has my permission to publish transcripts from two interviews in her doctoral thesis. The interviews were a part of the data gathering for her doctoral research. I have read through the transcripts and have no comments.

Place_____ Date_____

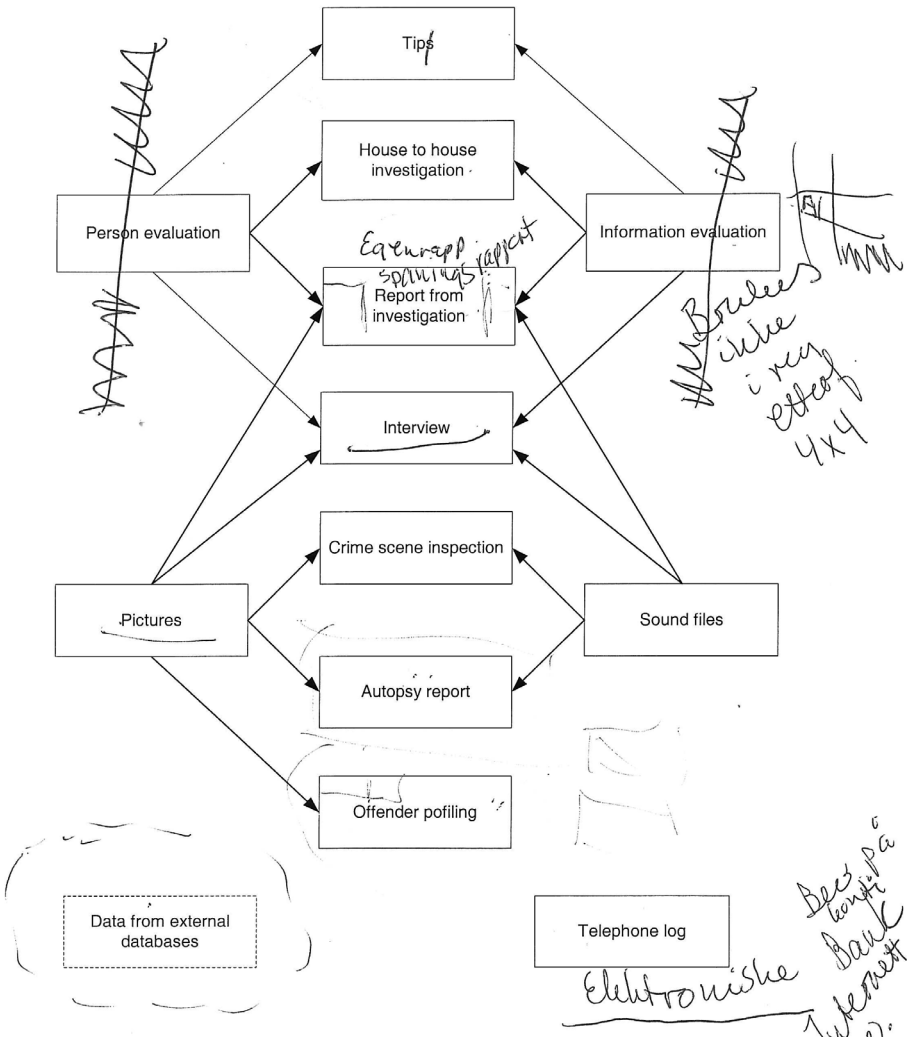
_____
Siri Stedje

Overall view of the process in
operational and strategic criminal intelligence work
20. November 2002
18:45 overview-e.vsd

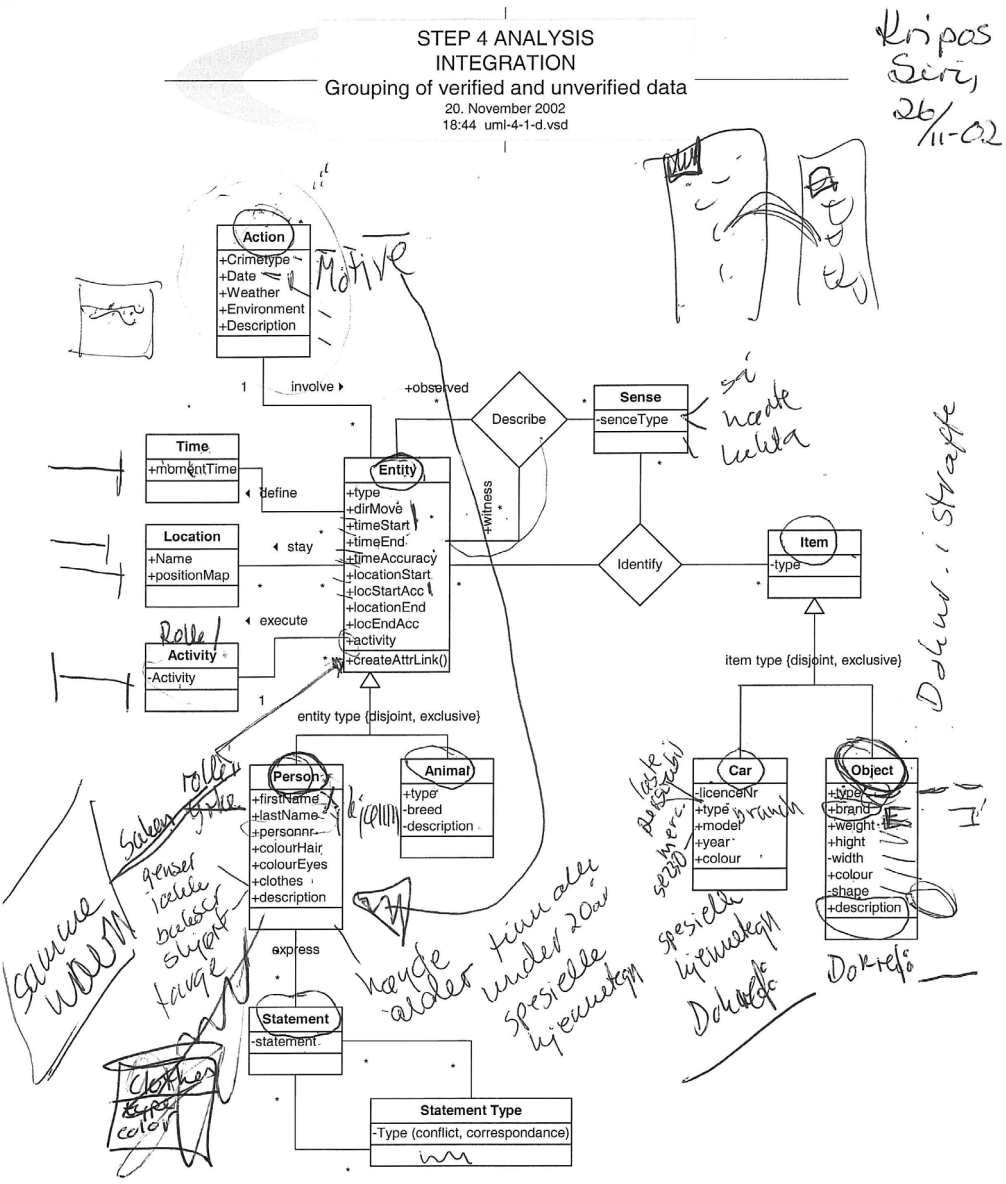


The overall categorisation will be based on events.
An event can
- include one or more action(s)
- be a crime already committed
- be information about planned illegal actions (crime control)
- be project based cases where several actions are related to each other through modus operandi and/or type of crime

The overall categorisation are intended to be the foundation of both operative and strategic criminal intelligence analysis, i.e. support the different types of analysis used within operative and strategic criminal intelligence analysis.



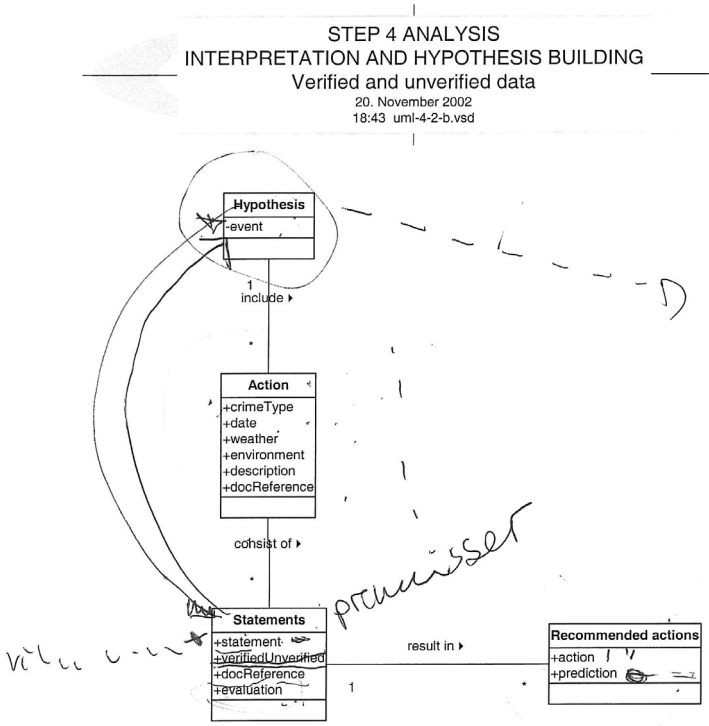
Information and person evaluation relates to the investigators work in classifying both categories with regard to relevance, truth value, understandibility, sufficiency, significance, timeliness.



One view for each analyst.
In this step the model is ment to reflect the analyst's view of the data from step 2 and 3 regarding

- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.



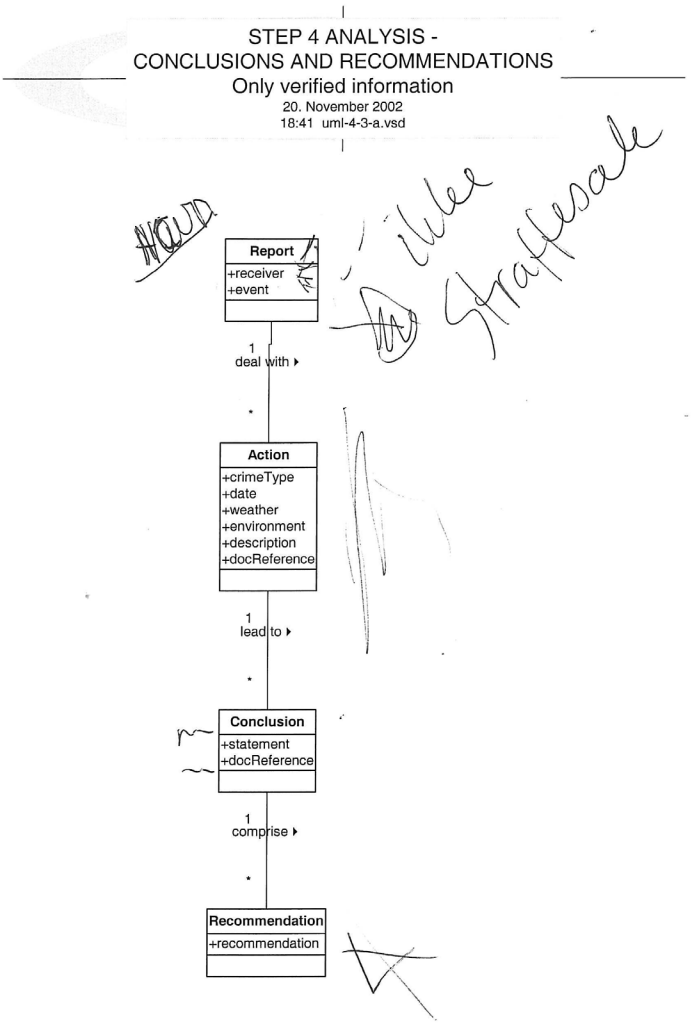
One view for each analyst and hypothesis
In this step the model is ment to reflect the analyst's interpretation (evaluation) of the data, and to reflect his or her own predictions about recommended actions regarding the important aspects

- Who	Key person(s)
- What	Criminal activities
- How	Modus operandi
- Where	Geographical perspective
- Why	Motive
- When	Time frame

and how they relate to each other.

Important questions during the work
- Are there any data that conflict with other data?
  What does the conflict consist of? Which data are most likely to be true?
- Are there any data that support other data?
  Why and/or how do the data support each other? Is it likely that these data are true?

Verified and unverified data, interpretations (evaluations) and predictions are combined in a hypothesis that focus on further data gathering.



In conclusion/recommandation all data should be verified. Data in the previous models can be verified or unverified. It is important in each step to mark the data as verified or unverified, and to change the status of the data when data are confirmed.

There may be several final reports dependent on area of use (prosecution, strategy, further investigation, or developing guidelines).

MØTE MED SIRI STEDJE 26. NOVEMBER 2002.

Sonja	Vi snakket om etterforskning og etterretning og det der er det de definisjonene som jeg så i Espens hovedfag.
Siri	Ja
Sonja	Og at begge to kunne ha verifiserte data og ikke-verifiserte data og i analyseverktøyet der kan dere bruke både etterretning og etterforskning, verifiserte og uverifiserte data. Men på rapporten når analysearbeidet er ferdig, det er bare verifiserte etterforskningsdata?
Siri	Ja, du kan si hypotesen vår vil jo kunne gå lenger enn kanskje premissene.
Sonja	Ja, men premissene som ligger i dataene, der bruker dere ikke uverifiserte data
Siri	Jo, eksempelvis psykologiske og sosiologiske teorier, eksempelvis da innen gjerningsmannsprofilering hvor du mener at vedkommende kanskje lider av Munchausen-syndromet og derfor har han forårsaket mange hendelser, tent på masse branner eksempelvis,
Sonja	OK
Siri	inngitt falske anmeldelser, og da kan du ha premisser som går på at vedkommende sannsynligvis har Munchausen og så kan du ta liksom teorier eller hypoteser for det da, altså stor søskenflokk, han er yngst av 5 søsken eksempelvis, han ble mobbet på skolen, hadde dårlige karakterer på skolen, han hevdet seg ikke i miljøet, han hevdet seg ikke sportslig. Den type ting som, noe av det kan vi si er bekreftet at han ikke hevdet seg i miljøet og sånn, men noe er også litt sånn synsing selvfølgelig.
Sonja	For akkurat det med de verifiserte og ikke-verifiserte dataene, altså analyserapporten går jo ikke med ut når dere er ferdig.
Siri	Nei
Sonja	Det er bare et internt verktøy. Så når dere holder på med disse, er det litt viktig at dere merker dataene om de skal være med i den siste rapporten eller ikke, sånn som jeg har lagt det opp nå, men vi kan komme litt tilbake til det når vi ser på modellene hvordan det skal gjøres. Og så var det det med kriminalanalyse og definering av det.
Siri	Jeg har skrevet Criminial intelligence analysis definisjonen her og der henviser jeg til Merry, 2000. Side 302.
Sonja	Vet du hva han heter til fornavn han fyren? Er det i den oppgaven du skrev nå sist?
Siri	Ja.
Sonja	Som jeg skal ha en kopi av?
Siri	Ja, så da finner du det der
Sonja	Ja, det gjør jeg
Siri	Dette er liksom også. Dette går jo på sosiologiske og psykologiske teorier. Gjerningsmannsprofilering.
Sonja	Ja, men det er jo en del av analysen?
Siri	Ja, for all del. Det er jo veldig viktig det. Den får du og så kan du jo få en Har du fått en konkret kopi av en analyserapport?
Sonja	Nei, det har jeg ikke, jeg har bare kikket på noen saker sist gang jeg var her
Siri	Ja
Sonja	og da bare tok jeg noen notater fra de Excel-regnearka, men ikke noen sånn analyse
Siri	Nei, men da kan du få det
Sonja	Jo, det gjorde jeg, jeg har fått det.
Siri	Konnerud-saken eller?

Sonja	Nå har jeg ikke de med meg nå, men jeg husker at du klipte ut navn og adresse holdt jeg på å si, og så skrev du premissene
Siri	Ja
Sonja	Og når jeg var på det metodekurset som Kripos har, fikk vi ikke utdelt, vi bare så de, for de tok alle de dokumentene inn igjen for det visst også saker som egentlig var virkelige da og som de hadde tatt utsnitt av. Når jeg har satt og modellert nå så har det dukket opp et problem. Problem og problem fru blom, men. Sånn som jeg har sett det for meg så har jeg sett at du begynner med det elektroniske systemet når Kripos blir kalt ut, og det som dere gjør etter da det blir lagt inn i ett system helt til slutten.
Siri	Mhm
Sonja	Men det må antageligvis som må det deles opp i moduler på en eller annen måte, for vi har etterforskningens rolle, så har du deres rolle, så har du teknikernes rolle.
Siri	Ja
Sonja	Så alle de vil få tilgang til sine deler av systemet, men det som blir det spesielle analyseverktøyet, skal det holde kildedata eller kan det legges inn i det som jeg vil kalle etterforskningsverktøyet for å si det sånn.
Siri	Kildedata?
Sonja	Ja, altså når dere samler inn dataene så har vel dere plikt på dere til å oppbevare de dataene dere har samlet inn?
Siri	Mhm
Sonja	Etter lov eller ett eller annet sånn.
Siri	Mhm
Sonja	Og hvis det blir liggende i det verktøyet som blir for innsamling av data
Siri	Mhm
Sonja	Så vil analyseverktøyet bli raskere.
Siri	Mmm
Sonja	Hvis en skal bygge analyse, sånn at disse dataene skal legges inn i analyseverktøyet, så vil det antageligvis bli veldig tregt.
Siri	Mmm
Sonja	For det vil bli veldig komplisert, men dere vil få det sånn at inne i analyseverktøyet vil det alltid ligge en link til hvor i dokumentene dere har funnet dataene, sånn at det etableres et sett med linker mellom de forskjellige nivåene i verktøyene
Siri	Mhm
Sonja	Men ikke at du drar med deg dataene til hvert nivå, for dere har jo mange
Siri	Mhm
Sonja	nivåer på etterretninga og etterforskninga og sånne ting. Hva synes du om de ideene?
Siri	Jo, det at du ja, for da blir det liksom at vi må inn Da blir det en stor database egentlig med all informasjon er det sånn å forstå?
Sonja	Ja
Siri	Som du da må hente ut når du konkretiserer hva du skal ha eksempelvis da når analytikeren skal inn så konkretiserer han hva, da når de nede på teknisk
Sonja	Så får de det de trenger
Siri	Ja
Sonja	Du kan tenke deg at sånn som, jeg har ikke kommet så langt til å lage skjermbildene enda, for det er en liten jobb det egentlig, sånn, så hvis du tenker deg at for eksempel en sånn, når dere har intervjua
Siri	Mhm
Sonja	Folk

Siri	Mhm
Sonja	Så vil den ligge her, så vil du ha en knapp, hvis du ser det fra ditt synspunkt nå som analytiker, så vi du ha en knapp som kanskje heter personer eller noe sånn og du vil få valg med definer ny og sånne ting nedover, du vil legge inn navnet og da vil der opprettes en link inn her sånn at når du får det fram så vil du alltid vite og kan få opp det dokumentet samtidig og så vil det vises her borte med navn, adresse osv. nedover
Siri	Ja
Sonja	Så fylles selve dataene inn her men så vil det bare ligge en link
Siri	Mhm
Sonja	Inn hit
Siri	Mhm
Sonja	I stedet for at de dataene alle de dataene skal hentes over, for da vil tror jeg analyseverktøyet veldig fort vil bli tungt
Siri	Mhm
Sonja	Og det vil ta tid og hente frem data
Siri	Ja
Sonja	Og det er utrolig hvor mye 2 sekunder betyr når du sitter og venter på ting og dere har vel ofte en stresset situasjon
Siri	Mhm, og da kan du selvfølgelig gå inn i denne databasen og hente ut personregister som vi kaller det da, hvor du da får alle personer og som ligger inne i databasen
Sonja	Ja, det vil du kunne få, alle som tilhører den saken vil du kunne få lista ut med navn og adresse, det skal vi se på litt etterpå hva jeg har lagt inn for personer og sånne ting
Siri	Mhm
Sonja	Så alle de personene, de objektene dere er interessert i det vil du kunne få lista og så ønsker jeg å lage da en, hvis jeg får det til, en sånn at dere kan ta de personene og lage automatiske forbindelsesdiagram og sånn med de personene som dere allerede har definert. Men jeg har foreløpig så har jeg konsentrert meg litt om den her biten her da siden jeg den som jeg oppfatter den vanskeligst å definere og lage, altså dette her ligger det mange data som er strukturert fra før sånn som telefonlogger og sånne ting altså de er strukturert så fra mitt synspunkt så er ikke det noe problem, det er bare å lage en database som det passer inn i og det er ikke noe problematisk, men å få til den biten her, den er litt vanskeligere.
Siri	Mhm
Sonja	På grunn av den måten dataene må sammenstilles på så derfor så har jeg forsøkt å konsentrere meg om det vanskeligste først og så tar vi det letteste etterpå. Jeg og Konrad diskuterte det med og fant vel ut at det kanskje ville være den beste løsningen og faktisk så er det en del, jeg har brukt et sånn analyseverktøy for samfunnsvitenskapelige forskere som har veldig mye med tekstdata å gjøre, og den er bygd opp etter noenlunde samme prinsippet
Siri	Spss
Sonja	Nei, det er statistikk, det er sånn numeriske data, men denne heter Atlas.ti så her definerer du et tekstfelt og så fyller du en kode i dette feltet her borte og så blir det opprettet en link og
Siri	Mhm
Sonja	Det fungerer, men til og med det går litt sent etter hvert, men antageligvis så er den implementert på en måte som kanskje kan endres på, for den går på linjebasis, men det blir veldig sånn teknisk da.
Siri	Mhm
Sonja	Så vi får se hvor mange koder og sånn og en kan jo kraftige maskiner etter hvert, men

	en kommer alltid til en viss grense der det begynner å gå tregt likevel synes jeg. Da tror jeg det var det generelle, så ha jeg begynt på modellene. Den første her det er bare hvordan jeg har tenkt å bygge opp hele systemet, der er det ikke brukt noen spesiell notasjon eller noe. Og den øverste kategoriseringen den har jeg tenkt å kalle for event. Det er altså for eksempel sånn som Baneheiasaken eller antikvitetsprosjektet eller hva det måtte være.
Siri	Mhm
Sonja	Og i en sånn sak så har du en datainnsamling, så har du evaluering og tilrettelegging av materialet og det har jeg oppfattet at det er etterforsker som gjør? Det er de som skriver inn når de har intervjua og ja så evaluerer informasjon og personer etter den her matrisa på 4 med
Siri	Nei, i rene etterforskningssaker så bruker ikke etterforskerne 4x4
Sonja	Bruker de noe i det hele tatt?
Siri	Nei, ikke noe system
Sonja	Legges det inn noe?
Siri	Det er svært sjelden at de skriver noe på rapportskrivers merknad. Hvis det er noe helt spesielt, så går de til etterforskningsleder og sier at han her lyver eller dette tror jeg ikke på eller noe sånt noe, så blir det veldig ofte opp til analytikeren om han skal, om han setter spørsmål ved det eller om analytikeren går og spør etterforsker.
Sonja	Men det blir ikke registrert noen plass, altså?
Siri	Nei, det gjør ikke det, men når en tenker rene etterforskingssaker,
Sonja	Nei
Siri	Neihei
Sonja	Antikvitetsprosjektet, er det en ren etterforskningssak?
Siri	Nei, der henter jeg mye av informasjonen i krimsys, og i krimsys der MÅ du bruke 4x4-systemet for å få lagra informasjon
Sonja	OK
Siri	Så der ligger 4x4-systemet
Sonja	Ja
Siri	Men det er etterretning og der har vi 4x4, men de som jobber med etterforskning har aldri hørt om 4x4
Sonja	Å, nei vel
Siri	Så etterforskning har ikke noe system sånn at
Sonja	Men bruker analyse de opplysningene som ligger der, de 4x4 som ligger i etterretning, bruker dere de noen gang videre i analysen, eller bryr dere dere ikke noe særlig om det?
Siri	Jo, det er klart at hvis jeg ser noe på krimsys og det står A1 så vet jo jeg at da er det informasjon ifra en polititjenestemann, og eksempelvis hvis at det er en observasjon ifra en polititjenestemann så vet jeg jo at da må jeg jo stole på den
Sonja	Ja
Siri	Men hvis det står X4 så er det anonymt vitne og det er klart at da vil jo ikke den merknaden
Sonja	Men legger du det inn noen plass i analysen din?
Siri	Nei, jeg gjør ikke det
Sonja	Så det behøver egentlig ikke inn i dette systemet i det hele tatt?
Siri	Nå må jeg tenke etter. Jeg tror egentlig ikke det.
Sonja	Nei
Siri	Det blir en sånn ja det er så få som etterforskerne kan det ikke
Sonja	Og hvis de ikke bruker det og du ser at jeg har satt stiplet linje rundt data fra eksterne

	databaser og det er bl.a. krimsys og sånne ting, altså de kommer ikke til å bli linka til dette systemet i det hele tatt
Siri	Nei, men det
Sonja	De vil være helt utenfor
Siri	Ja
Sonja	Og jeg mener hvis du henter informasjon herfra så kan en legge inn i det her systemet hvor informasjonen er hentet fra
Siri	Ja, det
Sonja	Og da kan du jo gå dit hvis det er noe du vil vite om at du har glemt, for den informasjonen vil alltid ligge der vil den ikke det, den blir aldri tatt vekk?
Siri	Den i krimsys?
Sonja	Ja
Siri	Den har vel en
Sonja	Er det den som har en foreldelsestid på 5 år?
Siri	Ja, det er vel, jeg tror det er 5 år
Sonja	Jeg syns han sa det han når vi var der nede sist og kikka på det da synes jeg han sa 5 år, hvis det ikke skjer noe nytt sa han blir det fjernet etter 5 år
Siri	Ja, og hvis han sa det så stoler vi på det
Sonja	Men hvis dere da har en sak som er gammel som dere tar opp igjen, da kan du risikere at de opplysningene er forsvunnet og at du har bare analyseinformasjonen?
Siri	Ja
Sonja	Hvis du kikker fremover nå
Siri	Ja, for dette vil du ha i papirformat, det som ligger på krimsys
Sonja	Det vil du ha i papirform?
Siri	Ja, analyserapport og sånn
Sonja	Men ikke de opplysningene som egentlig ligger her
Siri	Nei, det er sjelden du, eller du tar jo stort sett utskrift hvis det er noe du bruker i analyserapporten og legger ved som vedlegg i den konkrete saken.
Sonja	Ja,
Siri	Men
Sonja	Og du regner med at dere kommer til å bruke papir en stund fremover?
Siri	Ja, i den grad at du vil sikre deg at denne informasjonen har jeg faktisk funnet i krimsys så tar du utskrift av krimsys og legger ved i saken, men da kan du si at det er jo bare du som vet, så hvis det da skulle skje noe om sju år oppe i Trondheim så vil de jo aldri kunne klare å spore den informasjonen, for de vet ikke at jeg har tatt utskrift av den for 7 år siden.
Sonja	Nei, men hvis du holder på med en sak som ikke du får løst og om, hvis det er en sånn mordsak, så har den en foreldelsesfrist på et antall år, og hvis den skal åpnes igjen rett før den foreldelsesfristen går ut
Siri	Ja
Sonja	Da vil ikke de kunne spore tilbake alle opplysningene du har brukt?
Siri	Nei, ikke annet enn hvis jeg har det i papirform
Sonja	Sånn som jeg har lagt opp, vil du faktisk kunne spore tilbake alle opplysninger, bortsett fra hvordan personen ble evaluert omtrent, du vil få lagt inn alle de opplysningene du trenger da og med referanse til krimsys, men hvis vi tar vekk den evalueringa herfra så forsvinner de evalueringene, men hvis de ikke blir brukt i etterforskning, som jo dette er et verktøy for, egentlig
Siri	Vi bruker jo en form for evaluering, men de bruker ikke noen metode, de diskuterer

	etter avhør og sånn så blir det jo diskutert at liksom denne personen, nei han tror vi ikke noe på, og da blir ikke det registrert altså, og egentlig så synes jeg jo at det problemet du tar opp der. Vi hadde jo en sak, vi hadde jo Marianne-saken det var 19 år da ……
Sonja	Det blir litt vanskelig å finne fram
Siri	Det blir veldig vanskelig å finne fram, hva i all verden var det etterforskerne tenkte da
Sonja	Ja, så vi kan jo, altså selv om de ikke bruker denne 4x4-matrisen så kan jeg jo foreløpig beholde dette til vi skal presentere det for alle, både teknikere, etterforskere og alt sånn
Siri	Det syns jeg
Sonja	Så kan de si hva de mener om det på det tidspunktet og hvordan informasjonen der eventuelt skal se ut om de skal ha noe sånn om de bare skal ha et tekstfelt der de kan skrive hva de vil,
Siri	Ja
Sonja	eller om det skal være en metode for å gjøre det eller noe sånn.
Siri	Kan godt ha en tekstfil og så eventuelt vi som bruker 4x4 at vi eventuelt setter en kode der, sånn at det ikke må være slik at du må skrive en kode for
Sonja	Du kan lage to felt og så kan det ene være den A1 og eventuelt hvis de ikke kan det, kan de skrive ett eller annet i tekstfeltet som om hva de mener om det intervjuet de har hatt eller ett eller annet sånn
Siri	Ja, det hadde vært kjempefint
Sonja	Både om den personen og om den informasjonen. For det kan jo være at de tror at de lyver på noe, men ikke på alt liksom.
Siri	Ja
Sonja	Det var det steget, og da som det kan deles inn i er tips, hus-til-hus-undersøkelser, rapporter fra etterforskning, intervjuer, crime scene inspection, altså åstedsbefaring, autopsy, offender profiling. Men offender profiling, er det en del av rådata, eller en del av analysen?
Siri	Begge deler. Det kommer helt an på kunnskapen til analytikeren. Noen har kunnskaper fra offender profiling, andre har det ikke.
Sonja	Skal vi legge det inn som grunnlagsdata, hvis vi legger det inn som grunnlagsdata, kan en hvilken som helt analytiker hente det ut og bruke det i analysen.
Siri	Ja, kjempefint
Sonja	Så blir dette mer som en rapport med noen faste felt og noe skrevet.
Siri	Ja, det synes jeg at det helt klart må inn, det er viktig grunnlag i forhold til analysen.
Sonja	Har jeg glemt noe?
Siri	Tips, hus-til-hus
Sonja	Den der er rapporter som de måtte skrive som ikke har noen forbindelse med de forskjellige, hvis det var et eller annet som etterforskeren skriver rapport på og som ikke har forbindelse til noen av de andre. Jeg vet ikke om dere bruker det?
Siri	Du skriver jo tips og det blir jo veldig mye det, det blir jo kilde, for da tenker du kilde sånne tradisjonelle, hva tenker du egentlig på tips.
Sonja	Her, tips det er de som ringer inn om et eller annet, disse små gule lappene som dere bruker som dere sier, på en eller annen måte få strukturert det, sånn at de som tar de imot legger de inn i databasen i stedet for å ha gule lapper
Siri	Mhm
Sonja	Og ofte blir
Siri	Mhm
Sonja	Telefonlogger?

Siri	Bank, hvis du bytter ut telefonlogg med elektroniske spor, bankutskrifter, telefon,
Sonja	Men hvordan henter dere inn de bankgreiene og det, altså telefonlogg der får dere hele loggen fra telefonselskapet
Siri	Mhm
Sonja	Ettersom jeg har skjønt, men hvis det skal være et sånn bankspor eller et eller annet sånn hvordan hentes det inn?
Siri	Vi får det på fil også.
Sonja	Store filer?
Siri	Ja, vi får det vel sånn at vi kan bruke dem i Excel, vi gjorde ikke det før, men ja, nei, det er jo ikke så store som telefonen som regel, dem er mye større. Dette er jo ofte bevegelse på konti. Det er jo ikke så kjempestore fortegnelser.
Sonja	Nei, bank, telefon
Siri	Betaling eller kredittkort
Sonja	Jeg tror jeg vil beholde telefonloggen for seg selv og så kan jeg ta og bare lage en for internett og en for bank
Siri	Mhm, ja
Sonja	Og så få vi se hvordan formatet på dataene er etter hvert. Det er strukturerte data. Det er ikke noe problem. Det er bare å legge inn.
Siri	Ja
Sonja	Brukes det rapporter fra etterforskning?
Siri	Ja, eksempelvis etterforskning, jeg ville si en spaningsrapport eksempelvis at det ville jeg ville kalle det egenrapporter.
Sonja	Ja. Intervjuer det er med sikta og mistenkte og vitner.
Siri	Ja
Sonja	Crime scene det er teknikernes
Siri	Mhm
Sonja	Og så er det obduksjon og den psykologiske profilen. Er det noe mer?
Siri	Nei, det vi gjør av undersøkelser, den egenrapport vil dekke det aller meste.
Sonja	I hvert fall hvis det bare blir en rapport eller noe sånn, 2 eller 3 er det ikke nødvendig å lage en standard for den type rapport så hvis en kan finne her oppe en eller annen måte å lage en standard datalagringsformat i tillegg til at du får et felt der du kan skrive fritt så kan den dekke en del sånn småapportering som du ikke er helt sikker på kommer i alle saker og sånn.
Siri	Mhm
Sonja	Men disse vil jo komme, bortsett fra den, men den er jo, den vil jo ikke være med i alle saker, men når den først er med så er det jo ganske viktig og selv om den ligger her er det jo ikke dermed sagt at den behøver være med i alle saker likevel da bare lar du være å definere noe
Siri	Ja
Sonja	Inn under der
Siri	Ja, nei men
Sonja	Og så har jeg da laget mulighet for å lagre bilde og lydfiler hvis dere vil det
Siri	Ja
Sonja	I forbindelse med de forskjellige
Siri	Ja, men jeg får vel dette så skal jeg ta det opp med
Sonja	Ja
Siri	Og høre om det er noe vi har glemt, men jeg kan liksom ikke, der er bilde- og lydfiler, ja

Sonja	Vi vil jo gå gjennom dette mange ganger altså
Siri	Ja
Sonja	Regner jeg med
Siri	Ja
Sonja	Og når vi har gått gjennom det noen ganger jeg og du, for jeg regner med at det ikke er noen vits i å ta tida til masse mennesker sånn i innledende faser, men når vi har gått gjennom det en del ganger, og begynner å nærme oss, at vi tar det opp litt bredt sånn at en fra alle avdelinger er med, eller flere, det bestemmer jo de selv
Siri	Ja
Sonja	Hvor mange som vil være med og så får de kritisere det vi har gjort til da
Siri	Ja, men det høres greit ut
Sonja	Da begynner vi å nærme oss analysen
Siri	Ja
Sonja	Og den har jeg delt i tre steg, ble det til slutt, integrering er det første, forsøke å få integrert de dataene som ligger her,
Siri	Ja
Sonja	Og tolkning og hypotesebygging er neste steg
Siri	Mhm
Sonja	Som er grunnlaget for ny datainnsamling og så får du da, den skal være tilbake dit,
Siri	Mhm
Sonja	Ny datainn, ja ny datainnsamling, og så integrerer du det igjen og bygger nye hele vegen der og så går du ut med konklusjoner og anbefalinger som det siste steget
Siri	Konklusjon?
Sonja	Jeg vet ikke, det var dette med de engelske og norske orda.
Siri	Vi bruker hypoteser vi altså
Sonja	På det siste steget også
Siri	Mhm
Sonja	Jeg kikket litt på en sånn, på det formelle, eller på det kurset jeg var, da tror jeg han skrev slutninger, konklusjoner og hypoteser
Siri	OK, han gjorde det ja. Ja, men da hadde jeg nok brukt alle begrepa
Sonja	Alle 3
Siri	Det er helt klart at en del som ville reagere på konklusjon altså
Sonja	Mhm. Ja, men da bruker jeg, jeg har oversatt de fra norske altså så ta de med en litt klype salt enda, men akkurat konklusjon husker jeg han brukte på norsk
Siri	Ja
Sonja	Og hypoteser, men jeg kan kikke litt mer på de begrepene når jeg får den engelske ordboka.
Siri	Mhm
Sonja	Så vil du da ha muligheten til å presentere alle, ja den er vel kanskje ikke nødvendig å ha visuell… alle tre stega at du kan presentere de i relasjonsdiagram, eller forbindelsesdiagram, der var en del forskjellige typer diagrammer som ble brukt ifølge denne her og at en lager muligheter for å lage de forskjellige
Siri	Mhm
Sonja	Automatisk.
Siri	Har du den som jeg ga til deg?
Sonja	Yes
Siri	Jeg har beskrevet hva som kriminalanalytiker er også.
Sonja	Åja

Siri	Og der har jeg liksom, der har du forskeren/analytikeren
Sonja	Mhm
Siri	Og så har du mer den standardanalytikeren. Her er det hva som ligger i de da.
Sonja	Ja, det var litt flere enn det jeg fikk oppgitt sist, for der tror jeg det var 4 eller 5 forskjellige
Siri	Ja, dette er jo tatt ifra Murder Investigation Manual
Sonja	Ja, for her var det forbindelsesdiagram, produktflyt, hendelser og aktiviteter
Siri	Ja. Det er det analytikerne i Norge blir lært
Sonja	OK
Siri	På det kurset. Men her er det liksom oppramsing av hva som
Sonja	Bør være med
Siri	Ja
Sonja	Greit. Det blir større og større.
Siri	For det vi faktisk gjør aller mest i drapssaker det er jo mapping. Mapping of the scene. Mapping of the routes. Identify mapping of possible search zones Det er jo noe av det vi, det ble du jo ikke lært på det kurset på Starum?
Sonja	Nei
Siri	Nei
Sonja	Det Wilma som dere har utarbeidet nå, kommer dere til å bruke det til den type mapping?
Siri	Ja, problemet er jo at det er veldig ressurskrevende med den GIS
Sonja	Ja, for du må
Siri	Du må kode GIS-kodinga
Sonja	Ja, og så må du ut med GPS må du ikke det?
Siri	Ja, det må du. Så når du har god tid på deg, kanskje. I hvert fall har du det i bakhodet at det er en mulighet til å bruke det
Sonja	Men det er ikke det dere vil gjøre i første omgang når dere sitter og sammenligner
Siri	Nei
Sonja	Data og sånn
Siri	Nei, har ikke tid. Da har du mer enn nok med å skrive alle rapportene eller avhørene som kommer inn, eller tipsene som kommer inn. Som regel da. Det er først etter en måneds tid at du begynner å få oversikten og at du da
Sonja	Så dette skal egentlig være et litt enklere verktøy kan du si enn den Wilma sånn at du bare kan få en oversikt over de dataene som ligger der på et kartgrunnlag.
Siri	Ja, den Wilmaen er altfor ressurskrevende i en startfase
Sonja	Ja, så her hvis du får lagt inn et kart og så får du og at du da automatisk eller får plottet inn hvor de forskjellige folka var til enhver tid, som de har sagt at de har vært.
Siri	Mhm
Sonja	Ja
Siri	Den og den scene …….. Det blir mye sånn hva vi velger å kalle gjerningsmannsprofilering, men det er analytikerens jobb men grunnen til at ikke vi har hatt eller grunnen til at analytikeren ikke har hatt de oppgavene her, det er jo at vi i Norge ikke er lært til det. Det er jo den eneste grunnen.
Sonja	Ja
Siri	Men jeg tror at mer og mer at vi blir
Sonja	Er det det dere kaller åsteds eller offender profiling
Siri	Ja, på en måte kan du si det sånn. Det er liksom hva som er motivet her. Og da må du jo litt inn på sånn psykologi.

Sonja	Mhm
Siri	Og så er det økonomi, er det et seksuelt overgrep eller er det, ja?
Sonja	Vi kan gå litt mer inn på den også etter hvert som jeg kanskje får lest den, at vi kan ta den litt neste gang også.
Siri	Ja
Sonja	Her er en del ting som overlapper med det som dere har forklart før også.
Siri	Ja
Sonja	Og så er det noe som kommer i tillegg.
Siri	Ja, det er jo helt klart
Sonja	Og så den siste fasen det er distribusjon. Det er jo bare å få sendt det ut da. Så det berører jo ikke, for så vidt dette informasjonssystemet. Her har jeg glemt noen ting. Jeg kommer til å skrive oppgaven på engelsk for det er det greieste når jeg tenker på sensorer og sånn etter hvert, det blir så begrenset når en skriver det på norsk. Så her ser du da egentlig et ER-diagram
Siri	Dette er et ER
Sonja	Ja, det er laget med en objektorientert metode, men det er egentlig, så langt som jeg er kommet nå så er det ikke mer enn et entity relationship diagram, sånn skal du lage da. Forhåpentligvis så få du sånne som det. De er litt enklere. Men altså dette er jo veldig mye av det som går på vår utdannelse som er grunnstammen i vår utdannelse da, så det skal du ikke ta så tungt.
Siri	Akkurat
Sonja	Jeg har da forsøkt å definere opp det dere har sagt at dere er interessert i. Det var personer og biler og ande objekter som er mest interessante for dere i en sak.
Siri	Ja, og tid og sted.
Sonja	Ja, og jeg har delt, jeg har laget en klassifisering som heter entity som omfatter ting som kan bevege seg, personer og dyr. Så har jeg laget en entitet som heter item som der jeg har definert biler som egen klasse for jeg fant ut at der er det en del informasjon dere må vite som dere nødvendigvis ikke må vite om andre objekter. At den var litt spesiell.
Siri	Ja.
Sonja	Og så hadde jeg definert en klasse for våpen, men er den så spesiell at den behøver å ha en egen klasse. Hva lagrer dere om våpen i samme sak i selve analysen?
Siri	Det er klart at hvis det er ran så er jo våpen viktig.
Sonja	Men hvordan er det viktig, holder det med å skrive type, merke
Siri	Ja, det vil dem jo stort sett aldri kunne si, men vitner etter ran har jeg nesten aldri opplevd at de klarer å si
Sonja	Om det er en kniv eller
Siri	Jo, selvfølgelig
Sonja	En kniv eller en pistol eller revolver, skytevåpen da
Siri	Ja
Sonja	Jeg ser jo ikke forskjell på det, og hvis det er et skytevåpen, at det er en, jeg vet ikke hva de heter for noe engang.
Siri	Maskingevær
Sonja	Ja, eller et eller annet sånn, eller hvilket merke det, eller sånne ting har jeg tenkt forklart inn der. Hvis det er andre objekter så for eksempel i det antikvitetsprosjektet ditt, så kan du ha forskjellige andre beskrivelser der du får vekt, høyde, bredde, farge, hvilken form den har
Siri	Ja
Sonja	Og så en egen kolonne for beskrivelse.

Siri	Ja
Sonja	Hvis det er noe av dette som ikke skulle passe, har du i hvert fall en mulighet for en sånn, bare en vanlig beskrivelse.
Siri	Mhm. Sånn som det antikvitetsgreiene, er det da mulig eksempelvis og så da legge inn ei kolonne for, henge på vegg, stå på gulv, eller
Sonja	Det kan du få inn her
Siri	Det kan du få inn her ja, og det kan du søke frem.
Sonja	Ja. For jeg så at er bare en av kategoriene dine på det antikvitetsprosjektet. Og så på bil så få du da nummerskilt, type, om det er, her må vi kanskje ha en ekstra en, for type da hadde jeg tenkt sånn, Mercedes eller Folkevogn eller, men må du ha en sånn. Om det var en lastebil og sånn bil
Siri	Ja, det er veldig viktig.
Sonja	Ja, og så går vi ned på Mercedes og hva det ellers måtte være og hvilken modell det er, jeg vet ikke hva det heter de bokstavene etterpå, er det ikke noe som heter SE230 eller noe sånn for Mercedes?
Siri	Jo, sikkert
Sonja	Og hvilken modell, årsmodell, farge, trenger du noe annet på bil?
Siri	Ei kolonne med spesielle kjennetegn altså. Fartsstriper og litt sånn forskjellig
Sonja	Bulker og litt sånn også. Det hender vel. Men da kan våpen egentlig bli lagt inn i den som heter objekt så da deler vi den bare i biler og objekt for det er helt umulig å lage klasser for alle de typer objekter dere kan være interessert i
Siri	Ja
Sonja	Da blir det en sånn liste at dere kommer aldri til å gidde å lete i den
Siri	Nei
Sonja	For dere vil aldri finne frem, tror jeg
Siri	Nei, nei den var veldig
Sonja	Og så sånn som vi snakket om. Her vil det ved hvert av disse så vil det legges inn en link som dere ikke vil se, den vil ligge bak i systemet til hvor i dokumentet dere vil finne den, men i tillegg så må dere kanskje ha noe sånn dokumentnummer eller noe sånn som skal brukes formelt senere.
Siri	Mhm
Sonja	Når dere skriver rapporter og sånn. Må dere ha det med fra nå?
Siri	Nå tenker du at vi eksempelvis går inn og søker på sykkel
Sonja	Mhm
Siri	Så får vi opp alle dokumenter med sykkel og da må vi ha en referanse
Sonja	Den referansen jeg tenker på i første omgang, den vil bare være en sånn intern for maskinen, så når du søker så får du opp den lista med alle de som har med syklene, og så hvis du peker på den så vil det dokumentet som har den komme opp.
Siri	Ja
Sonja	Men det er internt i maskinen. Men dere må vel ha en sånn dokumentreferanse som sier noe for dere når dere skal presentere det eller sende det videre.
Siri	Ja, vi refererer bestandig til dokument
Sonja	Ja, for hver ene lille attributt her?
Siri	Ja
Sonja	Eller for selve objektet?
Siri	Objektet, for de står jo i en rapport som regel da.
Sonja	Som regel så står det i en rapport.
Siri	Ja, eller det gjør jo ikke det da hvis det er observasjoner av sykler da, menn på sykkel.

	Så si det at 10 observasjoner av menn på sykkel, så vil jo vi bruke det dokumentnummeret som er i straffesaken og ikke det dokumentnummeret som maskinen har. Vi må jo bruke det dokumentnummeret som straffesaken har ellers ville vi ikke klare å finne tilbake i straffesaken.
Sonja	Nei, men er, skjer det på nivået her, eller skjer det på nivået objekt? For hvis det skjer på nivået objekt så kan jeg bare legge inn en som heter dokumentreferanse for dere. Og der legger dere inn nummeret på dokumentet i straffesaken. Men hvis det skjer for altså at hvis det blir sånn at dere plukker litt fra hver rapport så må det legges inn for hvert enkelt av de. Hvis dere skal henvise til ett objekt, så mest sannsynlig så er det vel en person som har beskrevet det objektet i en rapport?
Siri	Ja, jeg kan liksom ikke se hvordan, jeg ser liksom noen andre muligheter enn at det må refereres til noen som sier det.
Sonja	Og det er vanligvis sagt i ett intervju eller en rapport eller et eller annet sånn.
Siri	Ja
Sonja	Og hvis du da får en ny observasjon, så vil du registrere det på nytt og da vil du få et nytt objekt av objektet for å si det sånn. For her kan du jo ha mange forskjellige sykler eller mange biler og hvem som har sett de og sånne ting.
Siri	Mhm
Sonja	Greit, og da blir det det samme her. Da får det en sånn dokument referanse her for hver som dere kan bruke fornuftig ut til folk.
Siri	Mhm
Sonja	Sånn at de skjønner det. Og det andre her det går bare inni maskinen sånn at den holder rede på hvor det er.
Siri	Ja, du vil jo få mange som kan, sier at de så en bil og at han hadde muligens den og den farge.
Sonja	Mhm
Siri	Og så kunne vi ikke si noe mer om det andre, ikke sant?
Sonja	Mhm
Siri	Da, når du da klikker på den ene som sier eller med bare farge, så vil du jo få dokreferanse i forhold til vedkommende som sa det i intervjuet eller?
Sonja	Ja, det vil du
Siri	Jeg bare tenkte på muligheten for å bli begrenset her. Hvis du går inn på bil da, og så søker du på alle blå biler
Sonja	Mhm. Så vil du få opp ei liste over alle de som har nevnt en blå bil.
Siri	Ja
Sonja	Og så vil, sånn som jeg har tenkt det nå, etter hvert som du klikker på de blå ned igjennom i den lista, så vil maskinen automatisk ta opp det dokumentet, det kommer frem, hvis ikke systemet blir for tungt, men det er sånn jeg har tenkt meg det nå. Og så vil du ha, her står jo en eller annen slags dokumentreferanse her oppe i forståelig norsk, og det vil være den som vil ligge her. Men mellom det stadiet der og det stadiet her
Siri	Mhm
Sonja	Så blir det en del manuell tildeling. Blant annet sånn med tid og sted og aktivitet så har jeg tenkt det slik at når dere begynner på saken, så definerer dere inn de tidsenhetene som er interessante, hvilke steder og posisjoner på kart eventuelt og hvilke aktiviteter dere vil ha saken delt inn i. Og så etter hvert som dere begynner å lete gjennom rapportene så er det de verdiene som dere har definert her som kommer inn her med en link ut til dokumentene hvor dere fant det, men ikke nødvendigvis den teksten som står der.

Siri	Mhm
Sonja	Hvis dere skal bruke den teksten som ligger her, så vil det legge utrolig strenge retningslinjer for de som er intervjuere når de skriver rapporten.
Siri	Mhm
Sonja	Da må de skrive det etter et bestemt format og sånne ting.
Siri	Mhm
Sonja	Så det blir en del definering og skriving, men det altså jeg har ikke så veldig tro på all den automatikken der og den sikkerheten derfor så blir det mellom de to stegene der så blir det veldig mye menneskelig innsats altså.
Siri	Ja, men jeg tror ikke det er ikke til å unngå, eller jeg tror den menneskelige innsatsen er bedre.
Sonja	Ja
Siri	Det blir en for stor usikkerhet.
Sonja	Ja, for du kan få en falsk trygghet altså hvis du har en maskin til å identifisere enheter her og du ikke går igjennom det selv, så må du være 100% sikker på at de har brukt den malen de skal og i en stressa situasjon så kan det være vanskelig.
Siri	Ja
Sonja	Men hvis du har definert de på forhånd her, og må tildele. Da vet du at formatet, de vil finne alle formatene her.
Siri	Ja
Sonja	Som vil ligge inne her og hvis du har gjort en feil, så kan du gå hit for å sjekke om formatet er feil i stedet for å gå til alle intervjuene så går du rett og slett til de 12-14 tidsenhetene du har definert her og se at det er noen feil, og endrer du den her, så blir den endra her.
Siri	Mhm
Sonja	Men det blir litt lettere for dere å se når dere får det sånn, når jeg tegner skjermbildene og forklarer hvordan det virker da og hver sak eller hver event den kan ha mange actions som jeg har kalt det, altså hendelser. Ja. For eksempel hvis du skal ha antikvitetsprosjektet ditt så vil antikvitetsprosjektet blir event og alle de forskjellige hendelsene der noe er blitt stjålet de vil bli definert inn her med om det er drap om det er ran eller hva det måtte være, hvilken dag, hvilken type være, omgivelsene og en beskrivelse og motiv blir vel også lagt inn her. Det er vel her det naturlig hører hjemme.
Siri	Ja, det synes jeg er greit å ha med der.
Sonja	Ja
Siri	Om det er økonomisk, eller hevn eller. Nå kan det jo ikke bestandig definere det da
Sonja	Nei, men etter hvert som du går ut i saken så blir det kanskje lettere å definere det.
Siri	Ja, det bør det.
Sonja	Ja, eller om motivet skal knyttes til person. Men altså du kan jo kanskje finne et motiv før du finner en person?
Siri	Men activity, men liksom hva kommer
Sonja	Ja, vi skal ta den enkelte her, men her vil du få de enkelte personene. Type det er bare om det er bare om det er person eller dyr, hvilken retning hver enkelt person både vitne, alle de som har vært innkalt til avhør, eller hatt tips, hvilken retning de beveget seg i, tidspunkt for når de var på stedet til de gikk fra stedet og en sånn tidsramme eller time accuracy om det 30% riktig, 60% riktig eller hva det måtte være. Og hvor de starta før de beveget seg hvor de slutta og hvor riktig det kan være. Og så hva de bedrev på stedet. Ikke nødvendigvis at det var de som hadde den kriminelle handlingen, men jeg gikk bare forbi eller var innom kiosken, sånn som du hadde

	skrevet i den smuglersaken. Noen var på veg til Sverige, tilbake fra Sverige, solgte sprit og sånne ting.
Siri	Mhm
Sonja	Men her oppe vil det være stjålet sprit på den og den datoen.
Siri	Mhm
Sonja	Så selv om det er en handling så kan det involvere masse personer, for ett mord vil ha mange vitner som er personer. I noen tilfeller så vil den action og event være den samme sånn som mordene i Baneheia, for der er det bare en enkelt handling, men så lenge du vil bruke det til sånn som antikvitetsprosjektet, ting som går over lengre tid, så må du ha en måte å dele de to på.
Siri	Ja, ja.
Sonja	Men jeg tenkte at i de enkelttilfellene så er det ikke farlig om den og den blir det samme, blir beskrevet på samme måten. Det er bedre å åpne for den muligheten at du kan dele det.
Siri	Ja
Sonja	Og ha mange handlinger innenfor ett event.
Siri	Ja, ta for eksempel den spritsaken nå da, metanolsaken som går
Sonja	Ja, så vil du ha fått metanolsaken her, så vil du ha fått de enkelte salg og alt sånn her og hvem som har solgt til hva det vil være de personene som ligger her.
Siri	Mhm
Sonja	Og der vil det etter hvert komme ut hvem som er vitner, hvem som er tiltalt og eller ikke tiltalt da, ja det vil det jo også etter hvert da.
Siri	Mhm
Sonja	Hvem som er skyldig. Så her går det mer på hvordan det var selve den dagen den handlingen fant sted.
Siri	Ja, ja.
Sonja	Så motiv bør kanskje flyttes. Det er jeg ikke helt sikker på. Jeg har ikke blitt helt enig med meg selv. Jeg diskuterer med meg selv enda hvor det helst bør ligge da.
Siri	Når jeg tenker motiv, kan hende jeg tenker snevert. Da tenker jeg motiv er det et økonomisk motiv for denne saken eller er det hevnmotiv for denne saken, eller er det sex som er motiv for denne saken.
Sonja	Men det kan være flere motiv kan det ikke det, eller?
Siri	Eller psykologisk motiv da
Sonja	Men jeg mener hvis det er mange personer innblandet så kan hver person ha sitt motiv.
Siri	Ha sitt motiv
Sonja	Ja, da hører den til her nede. For da må du kunne definere en for hver person, og ikke bare en for hver handling.
Siri	Mhm
Sonja	For hvis dere har tre mistenkte som har hvert sitt motiv, så må den kunne knyttes opp til person og ikke til selve handlingen.
Siri	Ja
Sonja	For her vil du bare få en.
Siri	For da kan jeg gå inn og så søke, finn alle trailersjøfører?
Sonja	Ja
Siri	Ta spritsaken da.
Sonja	Mhm
Siri	Masse trailersjåfører.

Sonja	Så du vil ha med yrke
Siri	Ja, eller hvilke rolle vedkommende har i saken.
Sonja	Mhm. Det er vel kanskje det jeg tenker på som aktivitet.
Siri	Ja, akkurat den ja.
Sonja	Jeg vet ikke.
Siri	Jo, den er fin. Hvilken rolle han har ja.
Sonja	Ja.
Siri	Yes, ja, veldig bra for da kan jeg få opp alle som, sånn som Baneheia da, alle som jogga i Baneheia.
Sonja	Ja, hvis du definerer det inn som en aktivitet her, så kan du få det eller om han var lastebilsjåfør eller hva han ville.
Siri	Ja, det er bra.
Sonja	Person blir beskrevet med, fornavn, etternavn, personnummer, etter hvert så vil dere jo finne de opplysningene på de fleste.
Siri	Mhm
Sonja	Her kan det godt være at det i første omgang blir person x eller person y eller at dere ikke har noe navn, dere har bare sett en person og sånne ting, men det vil jo endre seg underveis.
Siri	Ja
Sonja	Så det skal det bli, det er en måte for å registrere det på hele tida da. Farge på hår, øyne, så har jeg skrevet clothes, eller klær, må dere spesifisere det?
Siri	Ja, det blir jo liksom,
Sonja	Bukse, jakke,
Siri	Ja
Sonja	Og så med farge?
Siri	Ja
Sonja	Og så må en ha høyde på person
Siri	Ja
Sonja	Alder
Siri	Det er veldig viktig for personnummer det er nå en ting, men den gir oss ingen ting når vi søker etter unge menn.
Sonja	Nei. Er det nødvendig å ha personnummer?
Siri	Jeg pleier ikke bruke det.
Sonja	Nei. Det er ingen vits i å legge inn informasjon hvis dere aldri bruker det.
Siri	Men
Sonja	For det er jo kanskje opplysninger dere ikke vil vite med en gang.
Siri	Det er det at når du avhører vitner så er det jo faktisk folk som har samme navn. Det blir ofte store saker.
Sonja	Ja, men da kan det jo ligge sånn at det kan skjelnes.
Siri	Ja, vi vil jo alltid skrive det i rapporten da.
Sonja	Ja, og derfor kan det kanskje like gjerne ligge her så har du opplysningene med en gang.
Siri	Ja
Sonja	Eller om at dere går og finner det når dere skal skrive rapporten.
Siri	Men det er veldig viktig når vi skal søke at en finn alle menn under 20 år, eksempelvis.
Sonja	Mhm
Siri	At du da, eller alder mellom 16 og 22. Ja

Sonja	Ja, det har jeg jo glemt å skrive, kjønn.
Siri	Ja
Sonja	Ja, det er vel kanskje greit.
Siri	Det er veldig greit.
Sonja	Er det noe mer dere gjerne vil vite om personer? Spesielle kjennetegn der også? Om de
Siri	Ja, det er jo det da. Om de er lutrygget eller ja, spesielle kjennetegn. Det går på observasjon av person, et vitne som observerer så vil han da kunne vitnet selvfølgelig si at han observerte en som jogga.
Sonja	Den blir ivaretatt gjennom her. Her får du en beskrivelse av hva et vitne så med, eller så eller hørte eller alle de her sansene som du har, så, hørte, lukta
Siri	Mhm
Sonja	Og så vil du da få, men de vil bli laga i samme formatet, hva vitnet sier og hva den så. Men den som ble observert første gang vil jo bli vitne neste gang, så da vil jo den bli, ha en forklaring av seg selv, og hva den så og da vil dere hele tiden kunne sammenstille opplysninger om vitnet med opplysninger om hva de så eller hørte.
Siri	Mhm
Sonja	Sånn at hvis han sier at han var høyere enn meg så kan du gå inn og se hvor høy vitnet har beskrevet at han har og da vil du vite at han er over den høyden.
Siri	Ja
Sonja	Det samme vil du jo se her at det er en forbindelse fra person og over til hvilke type til objekter og biler, at de så en bil og hvordan de har beskrevet den bilen.
Siri	Og så en annen ting her ja. Det vi gjør eller gjorde i hvert fall i Baneheia, vi tok foto av vedkommende vitne.
Sonja	Ja, og det vil ligge på pictures.
Siri	Ja.
Sonja	Og som vil bli koblet opp mot intervjuer og da vil dere kunne gå derifrra og dit og så til dit for å se på bildet, for det er ikke nødvendig å ta med det bildet inn her synes jeg. Da blir det veldig tungt system.
Siri	Ja
Sonja	Men dere får tilgang dit.
Siri	Ja, knallbra.
Sonja	Det var det, og så da får du en person eller et vitne eller hva som da beskriver dyr de har sett med om det er en hund eller en katt eller hvilken rase det er og en beskrivelse av den hunden.
Siri	Mhm
Sonja	Jeg vet ikke om det er nødvendig å ha
Siri	Nei, det er ikke så ofte
Sonja	Nei, jeg tenkte på den hunden som beit i hjel noen
Siri	Jada
Sonja	Men det er jo ikke så ofte
Siri	Nei, men det er veldig greit å ha med
Sonja	Ja
Siri	Som i Baneheia så ble det liksom, da hadde vi en 100% identifisering for folk kjente igjen bikkjer ikke sant?
Sonja	Javel
Siri	Ja, det er mye lettere å beskrive bikkjer enn folk.
Sonja	Men må du ha noe mer å beskrive bikkjene med?

Siri	Nei, der også har du vel ei kolonne hvor du eventuelt kan skrive rosa band hvis at bikkja gikk i rosa band
Sonja	Ja, det har du, men ville du hatt sånn som farge eller, men hvis det er en fortausmix, så må den jo beskrives uansett liksom.
Siri	Ja.
Sonja	At den er en blanding av det og det
Siri	Ja, folk er veldig flinke til å beskrive bikkjer.
Sonja	Javel. Er de flinkere til det enn folk?
Siri	Åja, ja. De kan si at det er en Rottweiler ikke sant og da er det jo ikke så mange, sånn som Baneieheia, så var det veldig lett å knytte, ok ja hun gikk tur med en Rottweiler da og da.
Sonja	Du knytter de via bikkjene ja.
Siri	Ja, det er ikke det min venninne har en hund som jeg av og til går tur med. Og da kjenner jo folk igjen bikkja for de kjenner jo ikke igjen meg.
Sonja	Ja, det er klart at du kan knytte det på den måten også.
Siri	Ja.
Sonja	Det var de faste og så har jeg laget en entitet som det kalles da for statement, eller uttrykk, altså hvis det er noen uttrykk eller ord, eller et eller annet i materialet som ikke kan knyttes direkte til noe av dette, så at det legges inn her
Siri	Ja
Sonja	Og at en da kan kjøre det opp mot andre uttalelser og så registrerer du her om at det er konflikt eller overensstemmelse mellom de uttalelsene.
Siri	Ja
Sonja	Og her oppe vil dere jo også, men her blir det jo mer en identifisering av dere om hvilke personer som kan være
Siri	Mhm
Sonja	Omtalt på forskjellige tidspunkt. Og er det den personen og er det en personen og stemmer det?
Siri	Mhm
Sonja	Men trenger dere noen plass til å registrere det her? At dere har verifisert det på en måte?
Siri	Ja, det er jo viktig for når du eksempelvis søker ut personer at du da får bekrefta der at han ble observert av den og den i det og det dokumentet.
Sonja	Ja, men trenger du noe utover det? Jeg tenker på sånn som hvis du har et vitne eller hvis du har 4 vitner som har beskrevet at de har sett en person eller 2 personer og etter hvert så eller fra begynnelsen så høres det ut som om det er forskjellige personer. Men så snevrer det egentlig inn til en person. Må du ha noen dokumentasjon på det i dataene. Jeg har tenkt å lage en logg for hver sak om hvilken etterforsker og hvilken informasjon altså hva de har funnet ut og hva de har tolket inn i dataene.
Siri	Mhm
Sonja	I dette steget så er det mest bare å sette sammen alle dataene som ligger og så da gå over til neste steg som er hypotesene, for det er der dere begynner med å finne ut av er det ikke det om det er det ene eller det andre, om det kan stemme det de har forklart eller ikke har forklart og sånne ting.
Siri	Ja
Sonja	Ja, så hendelse, altså det er jo plass til mange hypoteser så hendelsen blir den som blir det øverste.
Siri	Mhm
Sonja	Eller den enkelte hypotese, og for hver hypotese så er det knyttet handlinger som er

	definert det samme som her, og da hver hendelse har, de aksjonene som består av de uttalelse som er både verifiserte og ikke verifiserte og så har du anbefalte handlinger. Her blir det deres egne ord for det vil jo alltid en hypotese bestå av.
Siri	Ja
Sonja	Den vil ikke bestå av dataene. Her kan du si at vitnet det og det så det og det.
Siri	Ja
Sonja	Derfor så tror dere at det stemmer?
Siri	Mhm
Sonja	Så har jeg lagt inn en verifisert og ikke-verifisert.
Siri	Mhm
Sonja	Er det nødvendig? Fordi at på det kurset ble vi litt innprenta at her bruker dere verifisert og ikke verifiserte data, men når vi kommer til neste steg på konklusjoner og anbefalinger, så skal det bare være verifiserte data.
Siri	Ja, du kan si at konklusjon skal jo representere premissene.
Sonja	Ja, men kan dere ta med alle premissene.
Siri	Premissene, de er jo faste, de skal du ikke tulle med, det er jo dokumentreferanser, men det er jo både verifisert og uverifisert informasjon. Det kan jo være informasjon fra Krimsys og selv om du finner den på Krimsys så er det ikke dermed sagt at denne er riktig.
Sonja	Nei
Siri	Jeg er egentlig litt usikker på hva dem mener med verifisert og ikke verifisert fordi at
Sonja	Når vi var her sist så hadde dere noen dokumenter som ikke skal vedlegges straffesak og noen som skal vedlegges straffesak.
Siri	Hypotesen, vårt produkt skal ikke legges frem i straffesak.
Sonja	Nei, men denne skal.
Siri	Snakker du da om analyserapporten?
Sonja	Ja.
Siri	Nei.
Sonja	OK. Da spiller det jo egentlig ingen rolle?
Siri	Nei, jeg ser liksom ikke
Sonja	For det endelige produktet deres er jo analyserapporten.
Siri	Ja, og skal ikke vedlegges straffesak
Sonja	Nei, og da spiller det jo egentlig ingen rolle om det er verifiserte eller ikke verifiserte eller hva det er for noe. Det må i så fall neste ledd eller statsadvokaten eller hvem det er finne ut hvilken informasjon han kan bruke?
Siri	Ja, egentlig
Sonja	Men skal det ligge med fra deres side, eller er det han som skal gå og finne det?
Siri	Her kan du si at premissene våre da, de bli jo at du har funnet i Krimsys at Peder Ås smugler heroin inn i landet og så dokreferanse Krimsys og dato.
Sonja	Mhm
Siri	Og så neste premisset
Sonja	Du har funnet ut at noen så han
Siri	X4-vitne som er et anonymt vitne
Sonja	Mhm
Siri	Sier at Peder Ås smugler sigaretter inn i landet. Og du bruker jo den type informasjon i premissene dine da.
Sonja	Ja
Siri	Og der er jo konkret informasjon som du har funnet i Krimsys. Men det er jo både

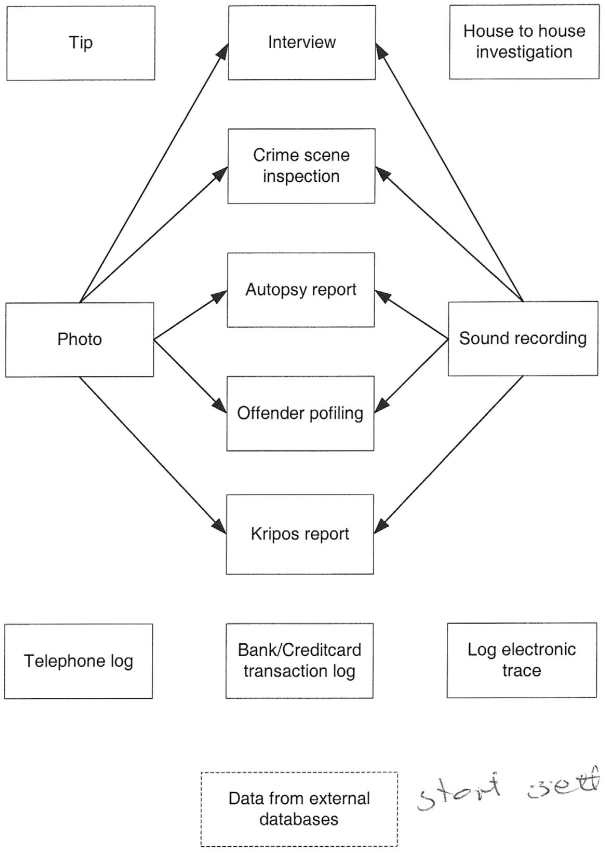
	observasjoner fra tjenestemenn du kan legge der og det kan være anonyme vitner altså. Så men at det er viktig at du har en dokreferanse sånn at det er ingen tvil om at du har faktisk funnet dette her i et. Det er ikke tatt i fra din hjerne, det er ikke du som nå sitter og skriver at du tror at han, ergo så sitter du å lager premisser ut fra egen hjerne. Det, nei, det kan hende at det er noe sånt noe de tenker på.
Sonja	Ja
Siri	Å ja, så vil jo denne her bli en sånn og ut fra disse premissene så vil du jo kunne og der har du lov til å trekker tråden lenger. Da kan du jo si at Peder Ås er den største heroinsmugleren på Østlandet eksempelvis uten at du har lest det noe sted. Men ut fra alle de premissene som du har funnet så er det din hypotese, din tolkning at han her er den største på Østlandet, og jeg vil jo ikke kalle det en verifisert hypotese, eller
Sonja	At den bygger på verifiserte data, nei den gjør jo ikke det
Siri	Jeg vil ikke ha sagt det, hvis en bygger på verifiserte data som jeg vil si da er det jo faktisk kriminalbevis det bygger på da.
Sonja	Ja, sånn som at dere har tatt ut penger i den og den minibanken den og den dato på det og det kortet. Det er verifiserte data.
Siri	Det er verifiserte data.
Sonja	Ja, men at en eller annen har sagt at han har sett meg der og der den og den dato på det og det klokkeslettet, det er for så vidt uverifiserte data inntil du kan få 10 stykker som kan bekrefte det og da er det på veg mot verifiserte data?
Siri	Ja
Sonja	Men både, begge de to typene skal være med i både hypotesebygginga
Siri	Ja
Sonja	Og i konklusjonen.
Siri	Ja
Sonja	Men da er det ikke nødvendig å skille mellom verifiserte og uverifiserte data.
Siri	Nei, i hvert fall ikke slik jeg ser det
Sonja	Nei, men da kutter vi det ut i første omgang.
Siri	Men, men det kan jo hende at det er noen andre som tenker på noe annet altså. At
Sonja	Jeg kan ikke huske hvor jeg leste det heller, jeg har lest en del sånn i det siste, men
Siri	Ja
Sonja	I så fall hvis jeg kommer på noe annet enn det vi har snakket om nå så ringer jeg deg igjen
Siri	Ja, jeg vil si at du bruker den type informasjon du har, om det er fra anonyme kilder som absolutt ikke er verifiserte eller om det er fra polititjenestefolk så bruker du jo informasjonen.
Sonja	Ja. Så for en enkelt hendelse, alstå en event så har
Siri	Ja
Sonja	Du de og de handlingene som ble gjort i det der antikvitetsprosjektet så har du stjålet her og der og der og der, så det er bare det som er lagra her for hver hypotese, men den kan du egentlig bare knytte opp mot den andre. Og så har du det som du kaller for premiss, de har jeg kalt statement her, verified og unverified går vekk, dokumentreferansen er viktig.
Siri	Ja
Sonja	Evalueringa det er det sånn som du sier at ut ifra dette premisset så kan en anta at. Det vil bli lagt inn her på evaluering og på den og den bakgrunn forsøk å intervjue det vitnet om igjen
Siri	Ja, her er liksom hypotesen vår kan du si da, er det det du tenker på? Evaluation det er det er liksom hypotesen at Peder Ås født da og da, bor der og der er den største

	heroinsmugleren på Østlandet punktum.
Sonja	Ja, det er din evaluering. Og hypotesen, jeg var litt sånn, vi kan kanskje få den ned sånn på en måte og forsøke å kalle det her oppe noe annet. Jeg skal kikke litte grann på det hvordan jeg kan navnsette disse forskjellige tinga, men vi mener det samme altså.
Siri	Mhm
Sonja	Og så har du den og den anbefalinga at på bakgrunn av det jeg har sagt her og de dataene jeg har funnet så er det vil jeg at dere skal gjøre det og det.
Siri	Mhm
Sonja	Og at du kanskje kan si noe om hva de antageligvis vil finne.
Siri	Mhm. Ja
Sonja	Holder det for en sånn hypotese?
Siri	Ja
Sonja	Men da kan du selvfølgelig ha flere hypoteser for hver. Ikke sant
Siri	Ja da.
Sonja	Med sine premisser og hva det måtte være.
Siri	Mhm
Sonja	Og så blir det den endelige rapporten. Den skal sendes til, eller det kan være mange endelige rapporter som sendes til forskjellige?
Siri	Ja, den hypoteserapporten,
Sonja	Ja, her blir det hvem som har fått den, om det er Statsadvokaten eller hvem det måtte være, hvilken hendelse det gjelder og alt det her formelle med hvilke handlinger som er begått og sånne ting. Og da premisser, doumentreferanser og recommended action.
Siri	Ja.
Sonja	Så de er nesten de samme, men altså her vil du ha et sånn utviklings- ikke sant, du vil stadig utvikle nye hypoteser som ender opp i den siste. Så denne er til internt bruk for dere kan du si og det vil være den som går ut av avdelingen.
Siri	Ja, ja.
Sonja	Det er forskjellen.
Siri	Mhm
Sonja	Og så skal jeg tenke litt på hvordan jeg kan navnsette dette her sånn at dere skjønner det bedre. Så her er det jo det der som er viktigst å finne ut når dere bygger hypotesene. Om det er data som er i konflikt med hverandre eller støtter hverandre. Så skal det lages en logg for alt det dere gjør. Den har jeg ikke begynt å tenke på enda og det er også et ganske stort arbeid.
Siri	Mhm
Sonja	Jeg forsøker å ta litt av gangen for sånn som jeg ser det så må jo på en eller annen måte navnet til den som har foretatt de her forskjellige vurderingene, det må inkluderes både i hypotesene og hvordan du har satt sammen informasjonen og alt sånn
Siri	Mhm
Sonja	Sånn at når du jobber på en sak så får du det resultatet og hvis dere snur bunka og en annen skal gjøre det så kan han ha sitt resultat og så må dere kunne spore det hele vegen.
Siri	Ja, ja det er jo sånn management også at du kan gå inn og søke å få opp alle rapporter som Peder Hansen har skrevet.
Sonja	Mhm. Men også deres jobb. Hvordan du har satt sammen dataene.
Siri	Ja
Sonja	Og hvordan du har tenkt. Hvis det ikke er noen som har så mye imot det, men jeg

	forstod det sist gang at det var ikke noen som hadde liksom noe
Siri	Nei, for det
Sonja	Nei, for altså den gangen hvordan du gjorde og hvilke handlinger som ble foretatt på bakgrunn av hvilken informasjon kan kanskje være veldig viktig på et litt senere tidspunkt når dere begynner å gå tilbake igjen sånn at dere slipper å gjøre de samme tinga 2 ganger.
Siri	Ja, helt klart
Sonja	For det er jo klart at dere har et enormt tidspress, så kort tid og når dere skal sette dere ned og roe dere er det ikke alltid like lett å huske hva som skjedde
Siri	Nei, det er det ikke. Skal vi ta lunsj?
Sonja	Ja, da tror jeg at jeg var stort sett ferdig med det jeg ville, hvis ikke. Nå i første omgang da.

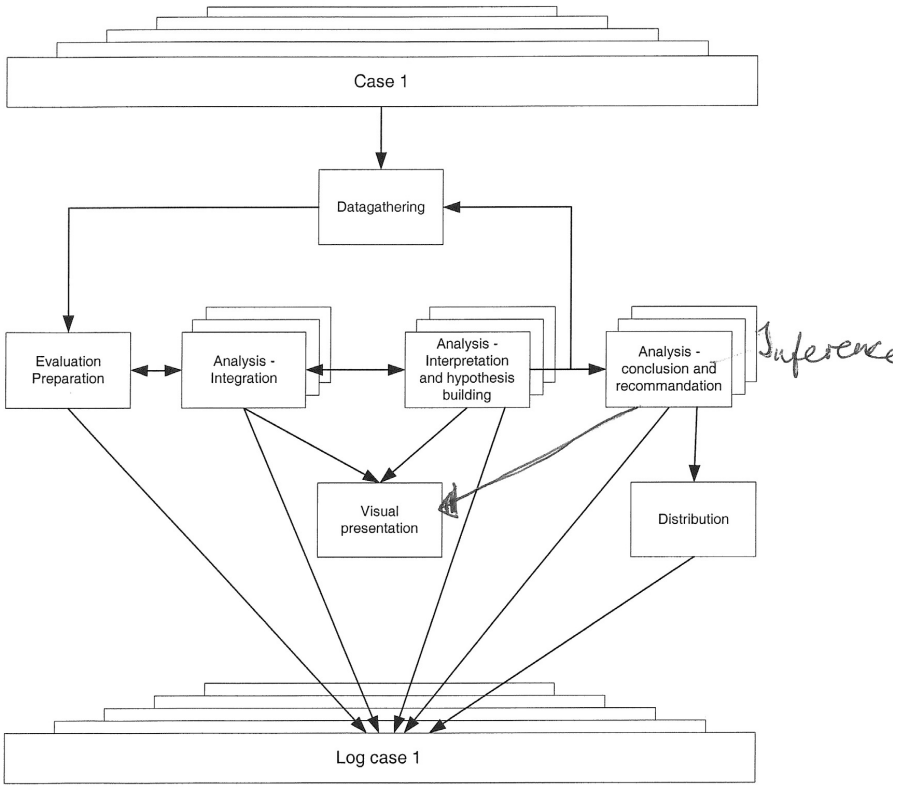
Sin
21/2-03

STEP 1 DATAGATHERING
20. February 2003 13:04 step1-a.vsd
Sonja Wilhelmsen, UIB



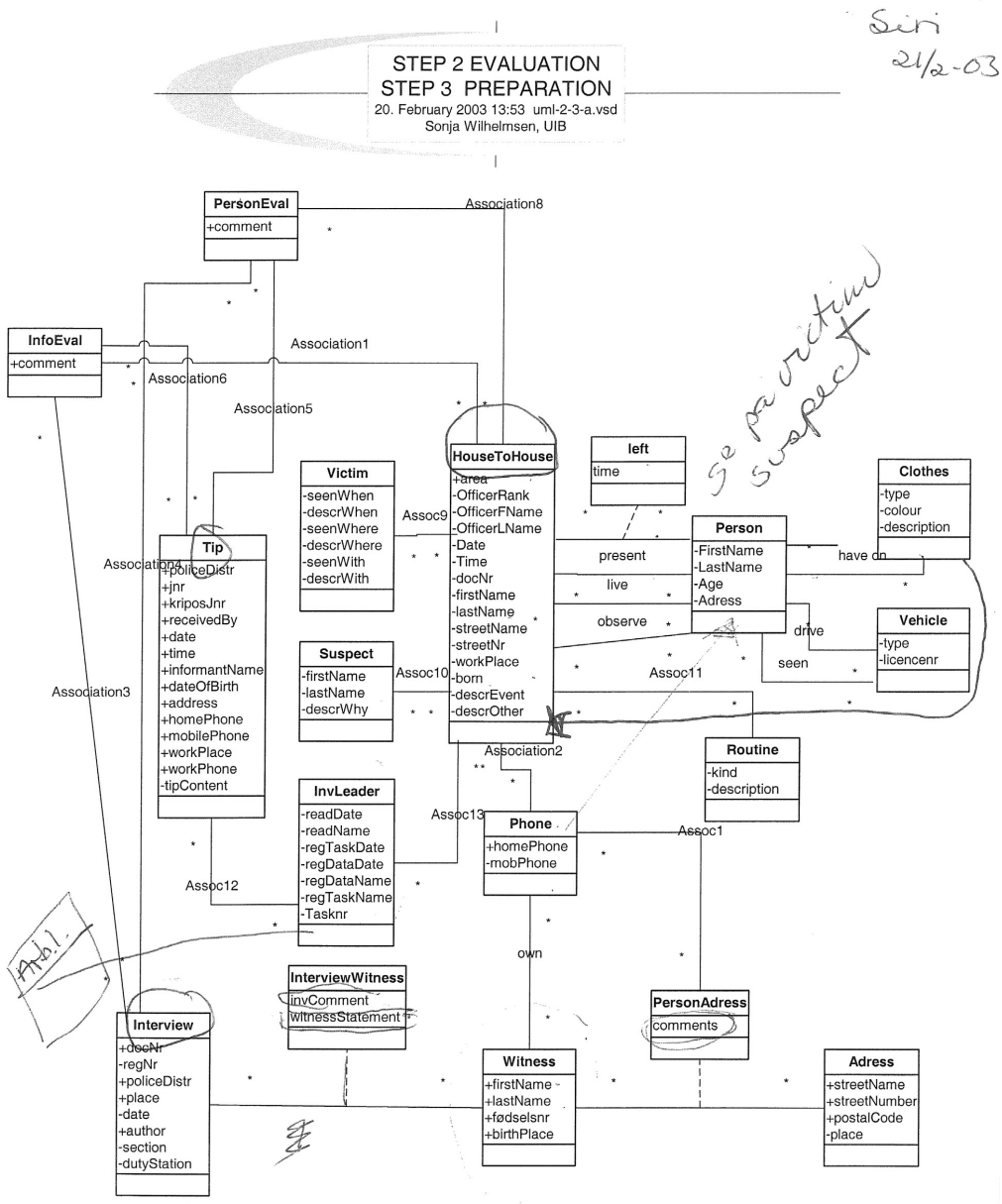
The data will originate from different sources and in different forms. This information system will not be electronically linked to other information systems. As a result, interesting and relevant data from these systems (here labelled 'Data from external databases') will be recorded in this system by the analyst during the analysis phase.

Sire 21/2-03

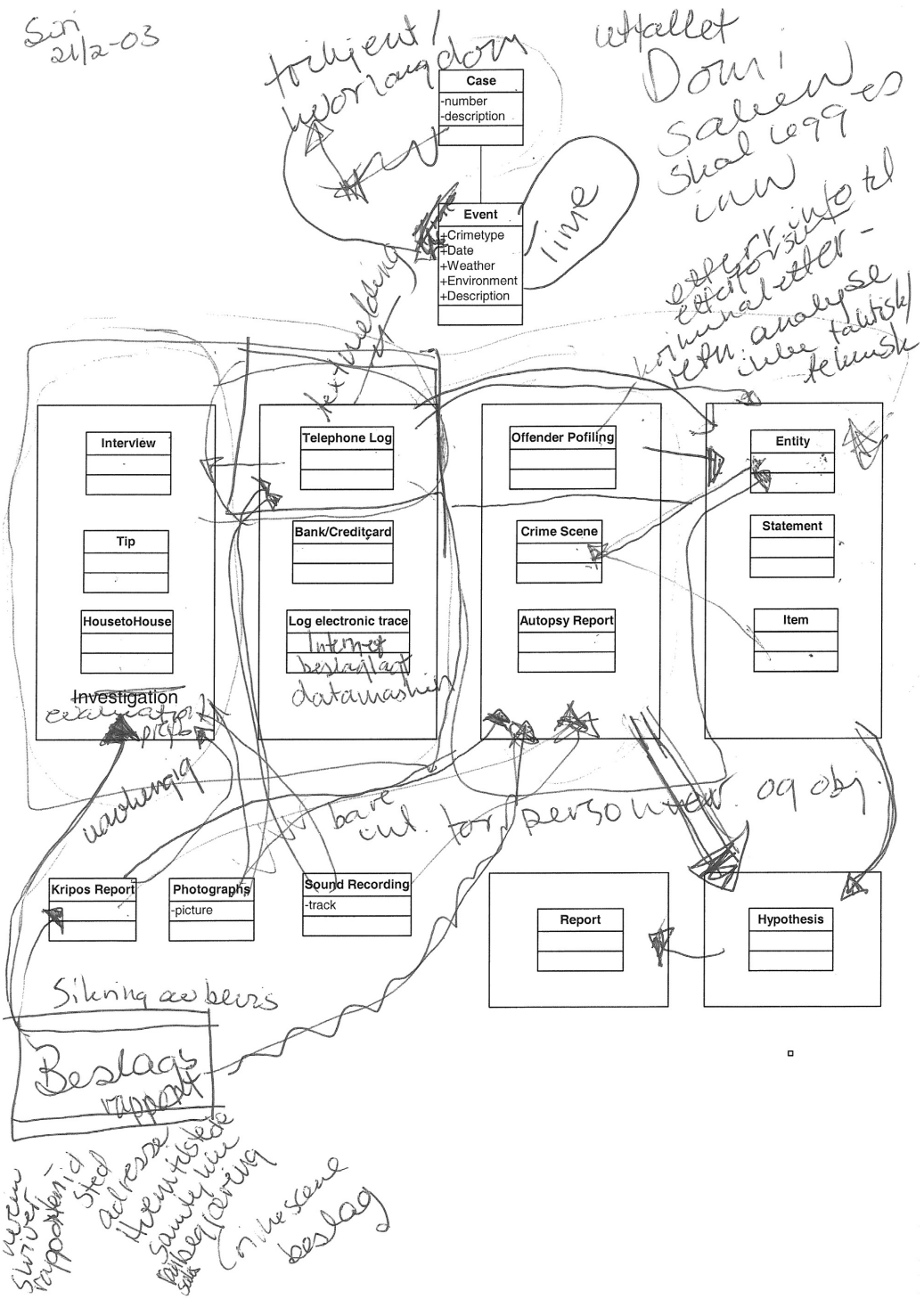


A case can include one or more event(s) that deal with
- a crime already committed
- information about planned illegal actions (crime control)
- investigation projects based on crimes related to each other through modus operandi and/or type of crime

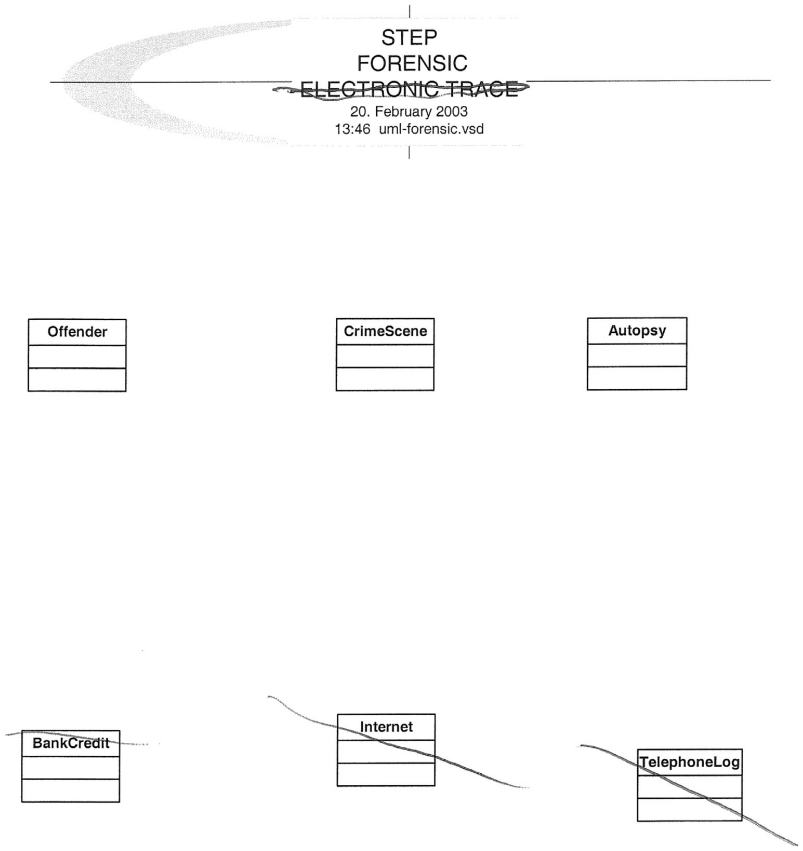
The model are intended for both operative and strategic criminal intelligence analysis, i.e. support the different types of analysis used within operative and strategic criminal intelligence analysis.



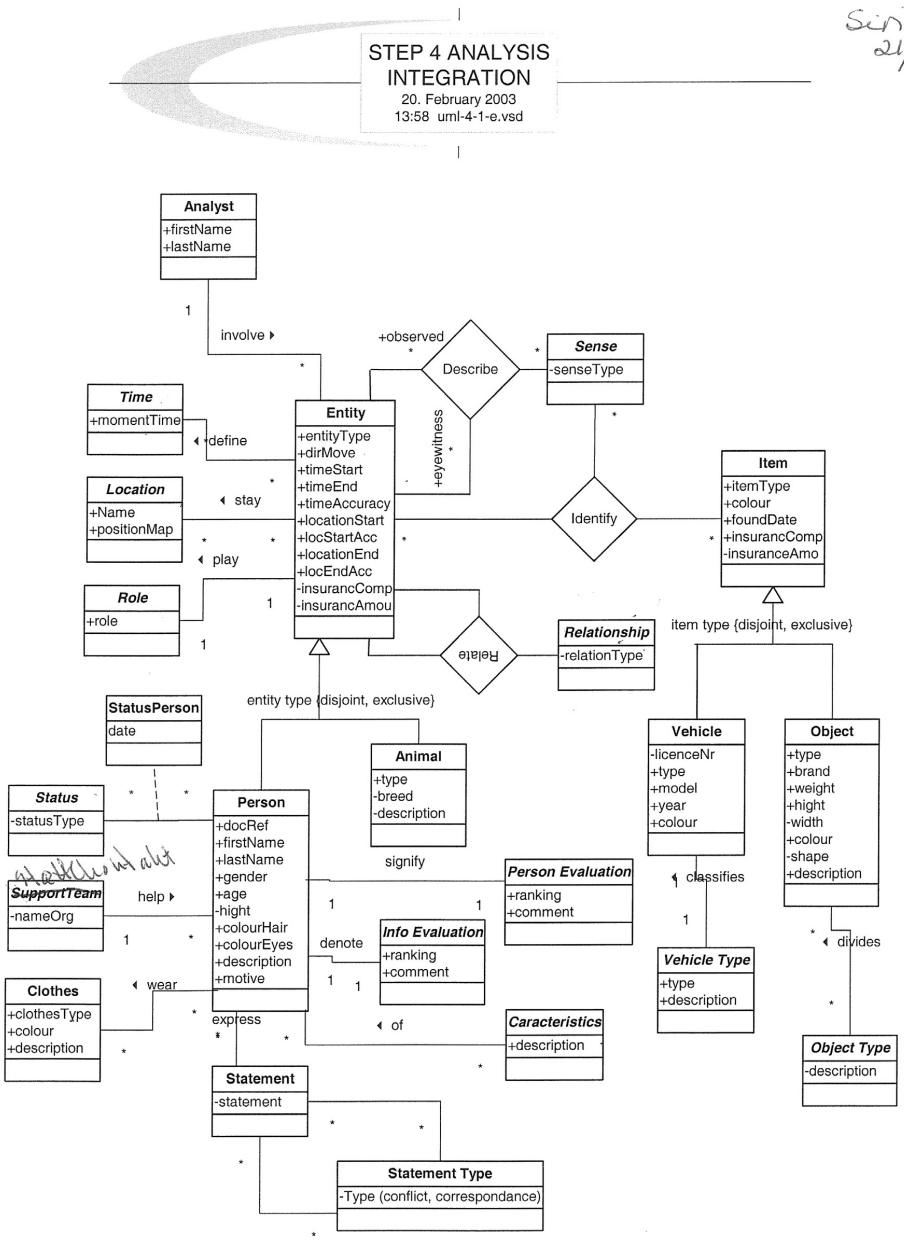
Information and person evaluation relates to the investigators work in classifying both categories with regard to relevance, truth value, understandibility, sufficiency, significance, timeliness.


Case
-number
-description
Event
+Crimetype
+Date
+Weather
+Environment
+Description
Interview
Tip
HousetoHouse
Investigation
Telephone Log
Bank/Creditcard
Log electronic trace
Offender Pofiling
Crime Scene
Autopsy Report
Entity
Statement
Item
Kripos Report
Photographs
-picture
Sound Recording
-track
Report
Hypothesis

Siri
21/2-03


STEP
FORENSIC
ELECTRONIC TRACE
20. February 2003
13:46 uml-forensic.vsd
Offender
CrimeScene
Autopsy
BankCredit
Internet
TelephoneLog

Sin 21/2-03

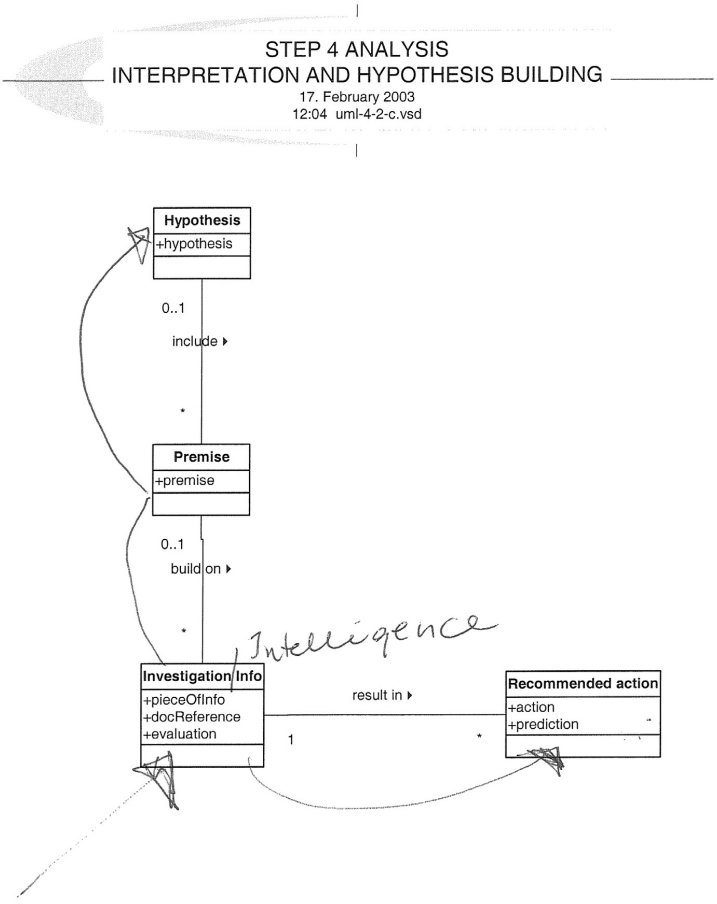


One view for each analyst.
In this step the model is ment to reflect the analyst's view of the data from step 2 and 3 regarding

- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.

Siri
21/2-03



One view for each analyst and hypothesis
In this step the model is ment to reflect the analyst's interpretation (evaluation) of the data, and to reflect his or her own predictions about recommended actions regarding the important aspects

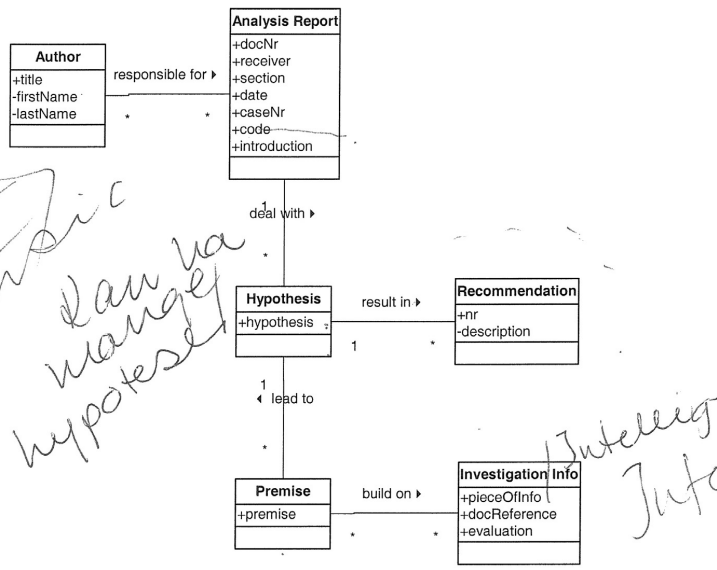
- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.

Important questions during the work

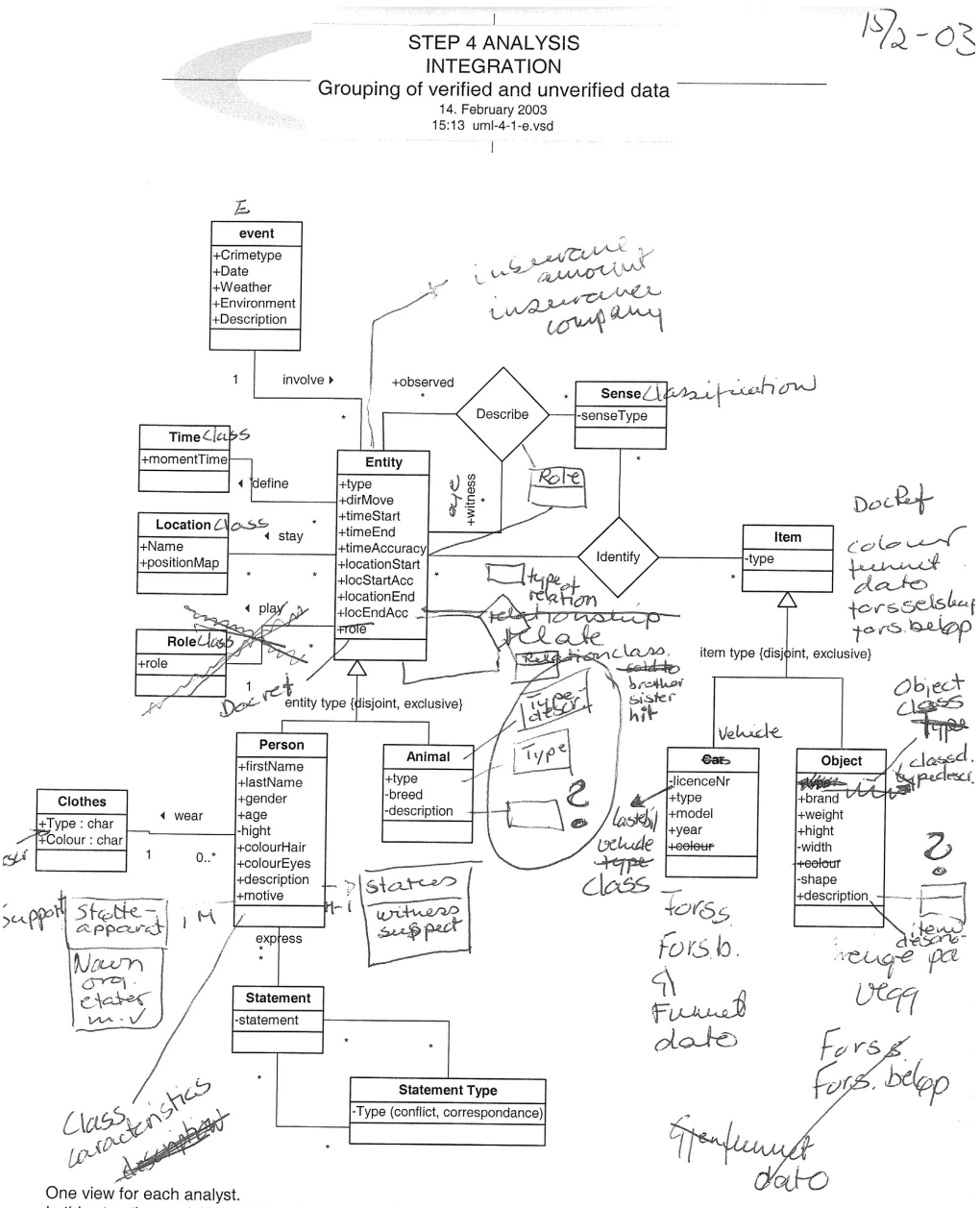
- Are there any data that conflict with other data?
  What does the conflict consist of? Which data are most likely to be true?
- Are there any data that support other data?
  Why and/or how do the data support each other? Is it likely that these data are true?

Verified and unverified data, interpretations (evaluations) and predictions are combined in a hypothesis that focus on further data gathering.



In conclusion/recommandation all data should be verified. Data in the previous models can be verified or unverified. It is important in each step to mark the data as verified or unverified, and to change the status of the data when data are confirmed.

There may be several final reports dependent on area of use (prosecution, strategy, further investigation, or developing guidelines).



One view for each analyst.
In this step the model is ment to reflect the analyst's view of the data from step 2 and 3 regarding

- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.

MØTE MED SIRI STEDJE 21. FEBRUAR 2003.

Oversikten.	
Sonja	Hvis vi begynner på den oversikten så har jeg ikke endret noe særlig på den. Bortsett fra at vi ble enige om at den datainnsamlingen den skulle gå fra, når du holder på med interpretation og hypotesebygging så får du noen actions som kan ende opp i datainnsamling og så går du evaluering og dette om igjen.
Siri	Mhm
Sonja	Så den har jeg tegnet inn og visuell presentasjon går på integreringa og på hypotesebygginga. Trenger dere den på det siste steget der dere lager rapporten? Lar jeg den være knyttet opp mot visuell presentasjon.
Siri	Den analyse
Sonja	rapporten
Siri	Ja
Sonja	Bør dere kunne knytte den opp mot en visuell presentasjon?
Siri	Ja.
Sonja	Mhm, da tegner vi inn en pil der. Jeg fikk en sånn analyserapport av deg sist.
Siri	Ja.
Sonja	Som der var skrevet en innledning, en hypotese, premissene og det.
Siri	Ja
Sonja	Skal det kunne vises i en visuell presentasjon med nettverk?
Siri	Ja, for sånn som det er nå i dag da så skriver vi en, eller i hvert fall gjør jeg det, så skriver jeg en analyserapport i Word som legges ved sak og som er litt mer utfyllende med innledning og sånn og så skriver jeg en analyserapport i Powerpoint som jeg da presenterer. Men du kan si at premissene og hypotesen er jo det samme da så det er jo bare at jeg kopierer det over i Powerpoint, men det tar jo tid det også.
Sonja	Ja, men det skal dere vise den med sånn nettverk f.eks. hvem som har hatt kontakt med hvem og sånne ting.
Siri	Ja, det pleier vi ofte, det viser vi på presentasjonen ja.
Sonja	Da skal det være en kobling der også. Har du noen andre kommentarer til den oversikten der. Den er stort sett som den andre var.
Siri	Ja, nei.
Datainnsamling.	
Sonja	Det steget er egentlig bare en oversikt over de dataene som jeg mener kommer til å komme inn. Det jeg lurer på på dette steget. Data fra eksterne databaser hender det etterforskerne henter inn data f.eks. Krimsys?
Siri	Ja. At de henter inn informasjon. Det er helt klart, eller det stort sett analytikeren som gjør det da. Og det hender, men mer og mer nå så blir det at analytikeren gir arbeidsoppgaver til disse som sitter på Krimsys daglig. For vi sitter ikke på Krimsys til daglig lenger.
Sonja	Nei.
Siri	Jeg pleide å gjøre det og var da veldig god på Krimsys, nå har jeg vært inne på Krimsys 2 ganger på 2 år og da er det klart at da mister du, du glemmer koder og du glemmer spørreord og
Sonja	Men stort sett så blir de dataene som hentes derfra, de blir lagt inn på analysesteget og ikke på etterforskningssteget hvis du kan si det sånn?
Siri	Analysesteget det er jo bare en form for å strukturere informasjonen så det er jo inne

	på analyse det like mye som etteforskning.
Sonja	Ja, for jeg lurte på om de som etterforsker, hvis de har intervjuet noen,
Siri	Mhm
Sonja	og det er noen opplysninger de ikke har eller ett eller annet. Kan det hende at de går til Krimsys eller andre registre?
Siri	Akkurat etterforskerne, det er nok svært sjelden.
Sonja	Ja
Siri	Jeg tror ikke noen særlig av dem er autorisert faktisk
Sonja	Nei, så da måtte jeg ta hensyn til når jeg laget modellen for det steget, men så lenge de ikke gjør det så er det heller ikke nødvendig å ta høyde for det.
Siri	Nei, jeg, noen er autorisert, men det er et fåtall.
Sonja	Ja. Så har jeg skrevet her at informasjonssystemet ikke vil ha koblinger elektronisk til de andre og at de dataene som hentes ut derfra først vil komme inn på analysesteget.
Siri	Mhm
Sonja	Og det er jo heller ingen ting i veien for at en etterforsker kan legge inn informasjon på det som kalles for analysesteget da.
Siri	Nei.
Sonja	Altså det blir jo en sånn organisasjonsmessig del som dere må bestemme hvem som skal bruke det.
Siri	Ja
Evaluation and preparation.	
Sonja	Den neste tegnet jeg ganske raskt i går etter at jeg hadde begynt å tegne skjermbildene og da fant jeg egentlig ut at jeg var ikke helt sikker på hva som var hva. Som jeg sa sist at overordnet hadde jeg kalt event, men nå kaller jeg det for case med nummer og beskrivelse og så får du hvert event innenfor den saken hvis du skal bruke de til sånn forskjellige
Siri	Ja
Sonja	Og så har jeg kalt det som har med intervju, tips og hus-til-hus-undersøkelser for etterforskning, er du enig i det?
Siri	Det var vanskelig, offender profiling det er jo en form for kriminaletterretningsanalyse.
Sonja	Den blir gjort av andre enn de som sitter på etterforskningsavdelingen?
Siri	Mhm. I min terminologi da som kanskje fraviker i forhold til Kripos for nå bruker jeg terminologien som jeg bruker i Manchester så er offender profiling går det inn under kriminalanalyse, kriminaletterretningsanalyse. Ikke, det er da ikke taktiske eller tekniske godkjente bevis for å kalle det sånn.
Sonja	Nei
Siri	En etterretningsinformasjon til etterforskning.
Sonja	Crime scene investigation og autopsy report det er teknisk eller taktisk eller det de kaller for forensic evidence, eller forensic.
Siri	Ja, crime scene det er jo både den og ja, det er
Sonja	Egentlig går det et skille sånn
Siri	Ja, det gjør det
Sonja	Mellom offender profiling og crime scene og da vil du ha den egentlig over i analysedelen.
Siri	Offender profiling er en analyse, etterretningsinformasjon for å si det sånn. Og ikke godkjent som bevis i retten da.
Sonja	Nei

Siri	Når jeg snakker om bevis og ikke bevis så tenker jeg på hva som er godkjent i retten og offender profiling så er ikke det bruk i norsk rett.
Sonja	Nei. For hvis den skal være med i det som heter analyse så må det tas hensyn til. Da må jeg antageligvis lage noen andre entiteter enn entity, statement og item. For offender profiling vil vel mest sannsynlig ikke passe inn der i de datastrukturene som jeg allerede har laget?
Siri	Mhm
Sonja	Det gjør ikke noe.
Siri	Du har sett
Sonja	Altså offender profiling, crime scene og autopsy report, de har jeg ikke sett rapportene av, så det må jeg få før jeg kan utforme hvordan de skal se ut. Telefonlogg der har jeg ganske mye. Bank- og kredittkort og det som jeg kaller electronic trace, er det bare internettadresser eller kan det være andre ting?
Siri	Beslaglagte datamaskiner, men å få dem inn i noe sånt system, det annet enn internett og beslagte datamaskiner. Ja
Sonja	Men jeg ville gjerne hatt et eller annet sånn som dere har brukt på bank- og kredittkort og elektroniske spor og de tre der. Der har jeg ikke sett noen ting.
Siri	Bank- og kreditt,
Sonja	Ja
Siri	spørs om vi har da, crime scene det har vi i hvert fall, det er sånt som du må få når du kommer opp dit da.
Sonja	Ja
Siri	Internett
Sonja	Ja. Deres analyse den retter seg veldig mye mot den intervju, tip og house-to-house investigation, ikke sant?
Siri	Begge deler, du kan si for øyeblikket så er det ekstremt mye på telefon da
Sonja	Ja, så derfor så får jeg litt sånn, det som gjøres med telefon
Siri	Mhm
Sonja	Når du først har fått den inn i en struktur i databasen
Siri	Ja
Sonja	Så er det ikke nødvendig å lage noen ny,
Siri	Nei
Sonja	Da bruker dere den strukturen som dere har i databasen og analyserer ut fra det
Siri	Ja
Sonja	Og lager sånne nettverk og sånne ting så derfor mener jeg det er ikke nødvendig å ta alle de dataene og linke inn hit til analyse
Siri	Hvordan tenkte du da at, sånn som det er for øyeblikket for telefon da så har vi ikke noen egen database hvor du putter alle telefonene inn i så hver enkelt analytiker har sin egen
Sonja	sitt egen regneark eller hva det er
Siri	sitt system
Sonja	ja
Siri	og med veldig liten mulighet til liksom å kontrollere eller sjekke om telefonnummer går igjen i andre saker eller sånn for det ligger heller ikke på nett, dette ligger hos hver enkelt, men og da hvordan du eventuelt tenker å få det over på itemene det
Sonja	Det vil jo egentlig bare ha, kunne ha forbindelse med person her, det vil jo ikke, ja kanskje ved en stjålen telefon eller et eller annet hvis den, men altså
Siri	Men det er jo interessant det altså
Sonja	Mhm

Siri	og linke telefon og person, det er jo liksom det analysen vår stort sett, eller telefonanalyse det er jo å linke tid, sted og person
Sonja	Ja
Siri	Og hvis du ser i media nå, så er det jo veldig sånn, ja både den dama på Notodden og han Hells Angels som ikke er blitt sett siden januar og sånn. Det første vi da stort sett gjør er å gå inn på telefon og se på bevegelser der. Det er liksom i etterforskningssaker og så har du disse etterretningssakene hvor telefon er nærmest alfa og omega.
Sonja	Ja
Siri	Folk hos oss som nærmest bare sitter med telefon for tida.
Sonja	Så jeg var litt sånn i tvil om jeg skulle legge telefonlogg, altså det blir jo ganske mange data, alle data er ikke like interessante.
Siri	Nei
Sonja	Så da blir det kanskje på et sånn datainnsamlingssted, at en slår isammen de to og får det til datainnsamling uansett bortsett fra den, ja alle de, og så eventuelt lager en mulighet for å koble telefonen opp mot disse, sånn at du bare legge over de dataene som er interessante for de personene og de objektene som du etterforsker.
Siri	Mhm
Sonja	Ja.
Siri	Det
Sonja	Hvis ikke vil det bli forferdelig mye data
Siri	Mhm
Sonja	å laste inn i det analyseverktøyet som kanskje ikke er interessant. Crime scene og autopsy report og offender profiling, er det noe som skal knyttes opp mot personer og statement og item her?
Siri	Nei.
Sonja	Derfor skilte jeg de litt ut for jeg
Siri	ja
Sonja	følte at det var en litt annen type arbeidsprosess, en annen type data enn det dere jobber mot når det gjelder telefonlogg og alt dette.
Siri	Ja, det er også det, så det at det blir skilt ut sånn det
Sonja	Offender profiling, fordi at selv om dataene for så vidt ligger her så kan jeg jo godt lage en link inn mot person der du kan ta noe inn i beskrivelse eller et eller annet sånn.
Siri	Ja
Sonja	eller at den blir linket til et bestemt, hvis de har funnet en kniv eller ett eller annet sånn at du da har en forbindelse fra kniven her og til at den er funnet på åstedet og sånne ting.
Siri	Ja, mhm
Sonja	Men jeg følte også at det var en annen, at det er andre som jobber med og derfor at de kan ha det som sitt område og så kan dere hente inn den informasjonen som trengs
Siri	Ja, det er
Sonja	men så føler jeg at det på den annen side er annerledes enn intervjuer og den type ting så derfor så tror jeg at jeg skilte ut dette, men da blir det en boks sånn som jeg hadde og så blir det en boks for seg selv og så blir entity og så skal det da være linker mellom her.
Siri	Mhm
Sonja	Men jeg går ut fra at disse crime scene og autopsy report de har ikke noe behov for

	å linkes til dette?
Siri	Nei
Sonja	Jeg kan ikke tenke meg at de skal ha behov for det.
Siri	Nei, jeg
Sonja	og legge det inn der noen veg.
Siri	Jeg ser heller ikke det.
Sonja	Nei
Siri	Ikke annet enn at det er en informasjonsflyt for å si det sånn at det går an å gå inn og se på dem.
Sonja	Ja, selvfølgelig, men det er noe annet enn å kunne laste dataene over fra det ene nivået til det andre.
Siri	Ja
Sonja	Men hvem som skal ha tilgang til hva av dette, det blir jo en sånn organisasjonsmessig beslutning hos dere.
Siri	Ja, det eneste er den der crime scene der har de jo det med de der beslag, der det gjelder også på etterforskning, jeg lurer på om du skal ha hatt en egen på beslag.
Sonja	OK, i forbindelse med steder og personer.
Siri	Ja. Det er jo sikring av bevis, beslag
Sonja	Mhm
Siri	og jeg bare tenker på de store katalogsakene som vi hadde for noen år siden, og
Sonja	katalogsaker?
Siri	Ja, sånne fiktive
Sonja	Åja, sånne som sa de solgte noe og så solgte de ikke noe?
Siri	Ja, sendte endringer og utga seg for å være Telenor gule sider og dette her.
Sonja	Åja, de ja.
Siri	Hvor vi hadde noe ekstremt med beslag og hvor da vi mistet oversikten rett og slett. Men dette er mange år siden. Men da satt alle og førte sine egne beslagsrapporter som det ikke gikk an å, ja. Så det lurte jeg på om i en enkelt sak om det gikk an å ha en egen boks for beslag hvor du fort kunne se hvilke beslag du hadde i saken og slippe å gå inn på hver enkel rapport.
Sonja	Mhm
Siri	Idag må vi jo gå inn på hver enkelt rapport og så OK her er det 12 beslag og så må du inn på neste rapport, her er det gjort 20 beslag og så må du
Sonja	Så det vil antageligvis komme inn her på de som etterforsker, for det er vel de som driver med beslag, de og så de som er ute på, så egentlig så vil den ha en sånn forbindelse både her og her.
Siri	Ja, du kan si at dette er jo en åstedsrapport, jeg må bare tenke, det er en åstedsrapport når du er ute bare at du kaller det bare beslagsrapport eller ransakingsrapport. Så det er ikke det at det er så viktig å linke de to opp mot hverandre.
Sonja	OK
Siri	Det er det ikke.
Sonja	Så får vi en beslag her.
Siri	Men det er viktig å ha en egen beslag sånn at du i hver enkelt sak kan gå inn og se hva slags beslag er gjort i denne saken her og at du da får en umiddelbar oversikt over beslag som er gjort.
Sonja	Men hvem vil det være naturlig skulle føre den beslagsrapporten eller hva du vil kalle det?
Siri	Det må være etterforsker som skriver rapporten.

Sonja	Ja. Da vil den når de skriver rapporten sier du, vil det si at det ikke er rapporter fra intervju og tips og sånne ting, men fra den som vi kalte for Kripos rapport f.eks. eller egenrapportering.
Siri	Det er en egenrapport ja.
Sonja	Beslag er en egenrapport og den vil bli skrevet uavhengig av intervju, tips og hus-til-hus?
Siri	Ja, det gjør den. Et annet eksempel, hvis du husker .....saken. Det er mange år siden nå, i 1993, da hadde vi 50 adresser som vi ransaket på og på hvert sted så fant du jo i gjennomsnittlig 20 og 30 gjenstander. Dette her ble det vanskelig å holde oversikt over etter hvert når rapporter ikke var linket opp og annet enn at en hadde det i papirformat da.
Sonja	Mhm
Siri	Ja, det ville vært veldig greit og raskt å kunne gå inn og se hva som er gjort av beslag i denne saken.
Sonja	Ja.
Siri	Og, ja det kommer jo frem på telefonlogg, hvor mange telefoner eksempelvis som det er tatt utskrift av vil det ikke det?
Sonja	Hva mener du nå?
Siri	Det vil komme frem på telefonloggen hvor mange telefoner er det vi har gjort beslag i i denne saken?
Sonja	Ja, det vil komme fra teleselskapet
Siri	Ja,
Sonja	så kommer den lista med nummer som du har fått fra de og så kommer neste teleselskap og sånne ting.
Siri	Ja
Sonja	Som jeg har tenkt nå da. Er det andre sånne egenrapporteringer som er spesielle i oppbygginga og som er veldig viktige?
Siri	Ikke som jeg ser nå
Sonja	Nei
Siri	Åstedsrapport, det vil jo stort sett være veldig begrenset med åstedsrapporter da i en sak.
Sonja	Ja, det behøver ikke være noen?
Siri	Nei, det gjør det heller ikke. Det må jo heller ikke være beslag i en sak.
Sonja	Neida, men det er jo det en må ta høyde for
Siri	Men det kan jo i noen tilfeller bli veldig veldig mye, eksempelvis sånn som den der internettsaken med pedofile eller som vi hadde her ikke sant hvor 120 stykker ble pågrepet og sånn
Sonja	Ja
Siri	Hvor at du du har jo ikke nubbetjangs til å finne ut hva er det som er gjort av beslag annet enn at du må gå inn og se på hver enkelt sak.
Sonja	Ja, og det blir litt mye.
Siri	Det gjør det.
Sonja	Men da vil jo hvis etterforsker har en sånn beslagsentitet eller hva du vil kalle det så får han jo sjanse til å gå inn og registrere det med en gang han lager rapporten og han lager en egen beslagsrapport?
Siri	Ja, den heter beslagsrapport.
Sonja	OK Men da er det jo like greit å få det inn med en gang.
Siri	Tid og sted og ja, hvem som var til stede ved ransakingen og adresse, samtykke eller og det var ved begjæring, altså ransakingsbegjæring eller samtykke.

Sonja	Ja, men det var fint at vi fikk fant ut av det. Og så den der Kripos rapport eller egenrapport har jeg da tenkt å knytte opp mot både det som jeg kaller investigation her og opp mot den boksen som jeg har kalt offender profiling og sånne ting, for de har kanskje andre rapporter, jeg vet ikke, men jeg har bare gjort det foreløpig så har vi en sånn mulighet når vi presenterer det også til å huske på at det kanskje er andre ting.
Siri	Mhm
Sonja	Og fotografier og lydfiler
Siri	Mhm
Sonja	vil både gå opp mot intervjuer og alt dette og
Siri	og ja på telefon
Sonja	på telefon?
Siri	Ja
Sonja	Ja, utskrift av samtaler, eller lydfiler av samtaler, ja
Siri	For det som har skjedd nå det siste er jo at analytikere hos oss sitter og lytter på telefon og liksom og analyserer ja,
Sonja	Ja, det var blant annet den tekstmeldinga med hun som er forsvunnet nå som de fant i går
Siri	Ja
Sonja	da, så jeg også det stod i avisa at de holdt på å analysere om det var hennes måte å skrive mailer på eller meldinger på alt sånn
Siri	OK, ja
Sonja	så det har jeg egentlig ikke tenkt på, men der bør det vel være et annet som heter tekstmelding eller, for da vil du jo kunne får utskrift av det sammen med telefonloggen hvis du er interessert
Siri	Mhm
Sonja	Men det går jeg ut fra at du må be om spesielt?
Siri	Ja, du må be om spesielt de der tekstmeldingene
Sonja	Ja, det er det jeg mener, de vil jo kanskje bli færre enn antall telefoner
Siri	Enn antall telefoner, ja, å ja, ja
Sonja	Men likevel så bør du ha en måte å lagre det på
Siri	Ja, for det i noen saker er det jo betydelig og liksom det siste nå er jo at det er analytikere som sitter og lytter på telefon, det var det ikke før, da var det egne folk på kommunikasjonskontrollen, men nå er det egne analytikere som sitter og lytter på telefon og som liksom har hele analysen, litt komplisert, men og der er det jo lydfiler selvfølgelig.
Sonja	Ja
Siri	Mhm
Hypotesebygging og analyserapport.	
Sonja	Så var det da steget som heter hypotesebygging. Det bygger selvfølgelig på analysen
Siri	Ja
Sonja	og det som heter rapporten det bygger på hypotesen igjen.
Siri	Mhm
Sonja	jeg vil jo tro at hypotesen, at der vil du komme inn med ting fra, ifra ..... crime scene investigation og autopsy report
Siri	Ja hypotesen vil jo liksom trekke fra alt den
Sonja	Ja, den vil det. Men jeg går altså den vil jo trekke fra intervjuer, tips og hus-til-hus-undersøkelser via det du har bygd opp med entiteter og personer og sånne ting og

	det bygger jo på det som ligger her og det som er valgt ut å være relevant
Siri	Mhm
Sonja	Så. Det her har en sånn mellomstilling for å si det sånn, der må det lages en link direkte opp til hypotesen og så når du kommer så langt så kan du si at du som analytiker vil bruke både den som grunnlag og den som grunnlag og de to her går inn i det grunnlaget her.
Siri	Ja
Sonja	så da vil du få all ting opp
Siri	Ja
Sonja	så da går de opp mot åsted og alt sånn selvfølgelig.
Siri	For her date, tenker du også time ikke sant.
Sonja	Ja, selvfølgelig.
Siri	Men
Sonja	Det er det jo ikke alltid du vet
Siri	Nei,
Sonja	Det vil jo komme frem her, på entitet så ligger jo tid her som et analyse klassifisering
Siri	Mhm
Sonja	Jeg lurer på om vi skal ta det vekk
Siri	Javel. Ligger dag også her da på entity
Sonja	Nei, der ligger bare tid.
Siri	OK
Sonja	Sånn at du innenfor det tidsrommet, eller innenfor den dagen så kan du operere med forskjellige tidsbegreper og se hva som kan stemme.
Siri	Mhm
Sonja	Den kan godt ligge der og så kan vi se etter hvert om den skal være der eller ikke. Den bør kanskje være der sånn at du kan få lagt den inn i ettertid for å hente ut for når dere skriver den analyserapporten så skriver dere den og den dagen på det og det tidspunktet?
Siri	Ja. Ja, og så bare tenkte jeg på sånn hvis at du skal bruke dette litt sånn strategisk i forhold til hvilke dager er det vi har drap, er det lørdager eller er det onsdager
Sonja	Ja
Siri	Hvilke klokkeslett, liksom sånn. Hvis en liksom tenker så langt da
Sonja	Ja. Men da legger vi den der. Det er ja. Når det gjelder strategisk så er det lettere å lete der enn å lete ned igjennom i strukturen
Siri	Mhm. Lurer også på det skjønner du om du skal kunne ha muligheten til under tidspunkt da å gå inn og legge relationship eller hvis det er drap da hvilke forbindelser det var mellom offer og gjerningsmann, altså for senere når saken er oppklart da også på et senere stadie og kunne gå inn her og legge hva som ble utfallet av saken.
Sonja	Du mener dommen?
Siri	Mhm. Høres det problematisk ut eller?
Sonja	At dommen i saken skal legges inn nei.
Siri	Ja
Sonja	Nei, absolutt ikke
Siri	Nei for jeg liksom ser for meg når at du da hvis du får laget en stor database på dette og hvert år så må vi sende sånn oversikter til riksadvokaten vedrørende drapssakene da og da går det på hvilke forbindelser var det mellom offer og gjerningsmann og så er det utfallet av saken og dette er problematisk det for vi må gå inn i hver enkelt

	sak og manuelt dra frem saken for det står jo ikke på nettet heller som regel.
Sonja	Nei, når det gjelder dommen hva, vil du lagre hele dommen?
Siri	Nei, bare utfallet

Opptakeren stoppet, men samtalen var nær slutten.

PRESENTATION AT KRIPOS
10. NOVEMBER 2003

DATA MODELS

— Forberedelse 8.11.03
— Kripos 10.11.03
— Konrad 17.11.03

Sonja Wilhelmsen, University of Bergen
05.11.2003

GENERAL COMMENTS TO THE DATA MODELS.

Entities drawn with a dotted line are shown in more than one model.

Categorisation of the data.

In evaluation and preparation the data are divided into four main categories	
Other databases	Data gathered from external databases and registers (both within the police and outside)
Informants	Data gathered from witnesses, suspects and accused.
Evidence	Physical evidence gathered by forensic technicians with lab rapports and autopsy reports, confiscation of equipment, and electronic traces obtained by the sexual assault group.
Electronic traces	Transcripts from telephone companies, banks and credit card companies
In the integration phase of analysis the data are divided into six main categories	
Entity	Entities that can move (person, dog) and that are interesting either as witnesses, suspects or accused
Item	Physical entities (car, gun) that have a connection to the investigation
Statement	Statements made by informants and statements found in confiscated equipment
Internet use?	Addresses visited found in confiscated equipment and by the sexual assault group
Telephone	Phone calls and SMS/MMS messages exchanged by persons under investigation
Account	Payments between/to/from persons under investigation

COMMENTS TO THE DIFFERENT MODELS.

Evaluation/preparation and finalisation. Overview of entities.

A case can include one or more event(s) that deal with
- a crime already committed
- information about planned illegal actions (crime control) str.?
- investigation projects based on crimes related to each other through str.? str.?

modus operandi and/or type of crime.

Evaluations and preparation. Informants and other databases.

Evaluation relates to classifying both information and source with regard to truth value.

Analysis – Integration of data from informants and evidence.

One view for each analyst.
This part og the analysis model is meant to reflect the analyst's view of the data from evaluation and preparation regarding

- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.

Analysis – Integration of electronic traces – Telephone.

In this step the model is meant to reflect which telephone numbers that have been connected at which point, either by conversation or SMS, or MMS.

The attribute 'type' in 'Own' is ment to reflect if the phone is at home, at work, a mobile phone or a IMSI-nr.

Analysis - Interpretation... inn her

Se neste side

Analysis – Inferences, conclusions, and recommendations.

In conclusion/recommendation all data should be verified. Data in the previous models can be verified or unverified. It is important in each step to mark the data as verified or unverified, and to change the status of the data when they are confirmed.

There may be several final reports dependeing on area of use (prosecution, strategy, further investigation, or developing guidelines).

Verified/unverified data.
Er det en enkelt, eller flere, som karakterisere en verdi som ikke verifisert? Hvis ikke, manuelt avgjøre.
Ikke verifisert vises i ~~rødt~~ lilla farge. Mulighet for å endre underveis?
Spørsmål ved lagring av verdi?
En standardverdi?

Analysis – Interpretation and hypothesis building.

and to reflect his or her own predictions about recommended actions regarding the important aspects

- Who Key person(s)
- What Criminal activities
- How Modus operandi
- Where Geographical perspective
- Why Motive
- When Time frame

and how they relate to each other.

Important questions during the work

- Are there any data that conflict with other data?
  What does the conflict consist of? Which data are most likely to be true?
- Are there any data that support other data?
  Why and/or how do the data support each other? Is it likely that these data are true?

Verified and unverified data, interpretations (evaluations) and predictions are combined in a hypothesis that focus on further data gathering.

Analysis. Profiling.

The model shall support writing of the profiling report(s). The profiling will not be elaborated in more detail in connection ~~in~~ with my phd.

DESCRIPTION OF LINKS BETWEEN THE DIFFERENT DATA MODELS.

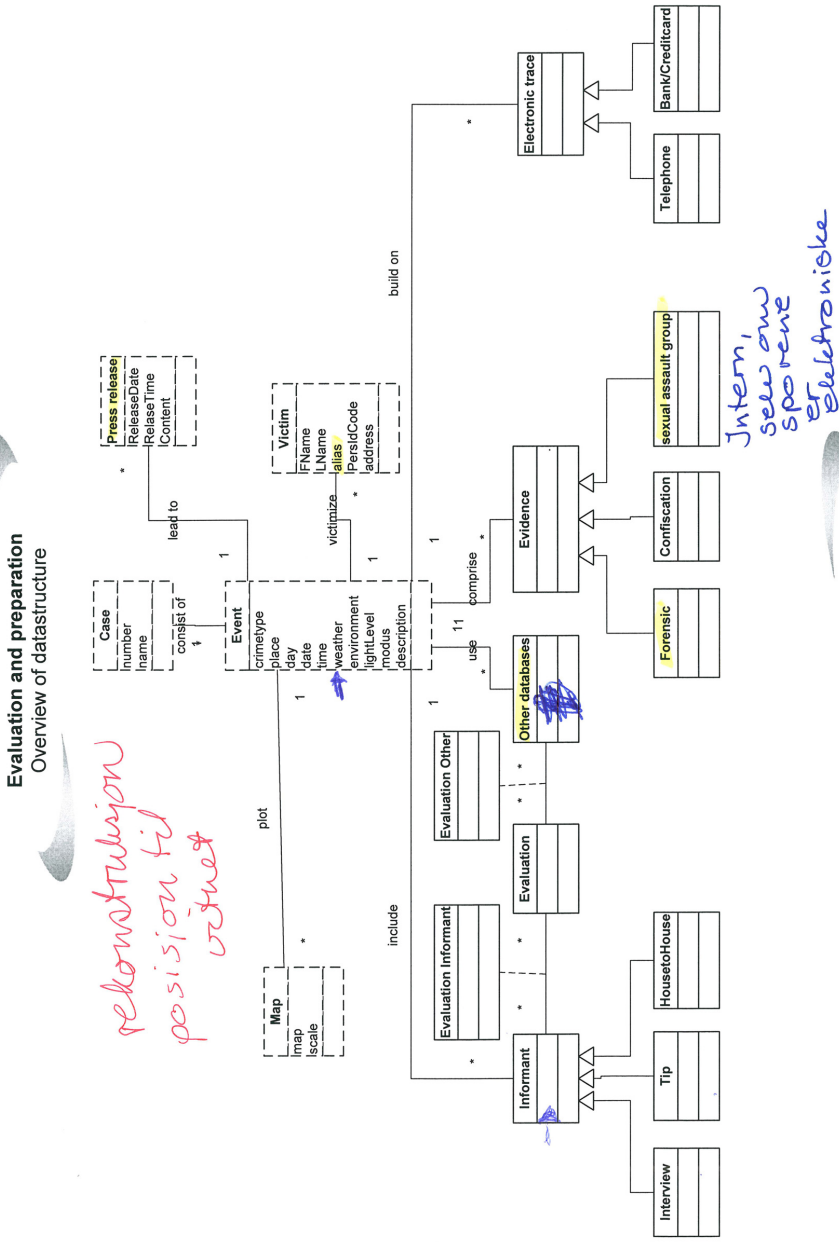
Electronic links shall be established between the different phases. A link that originates in an attribute that is represented with a text field shall be connected to the interesting text within the attribute, not only to the attribute itself. The interesting text should also be highlighted (e.g. coloured yellow) to show that there has been established a link to another attribute.

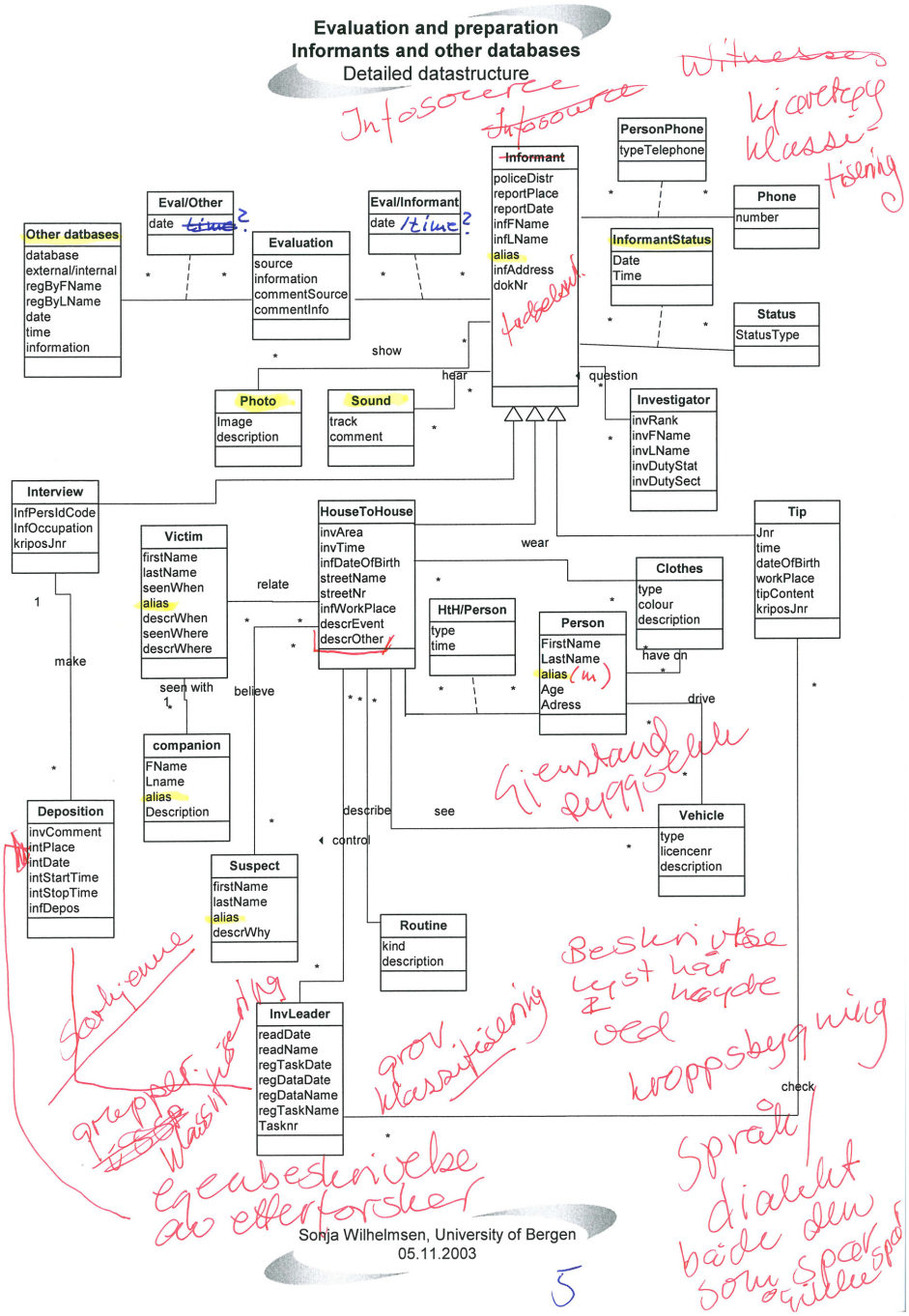
All phases will always be linked to the entities shown with a dotted line in the models.

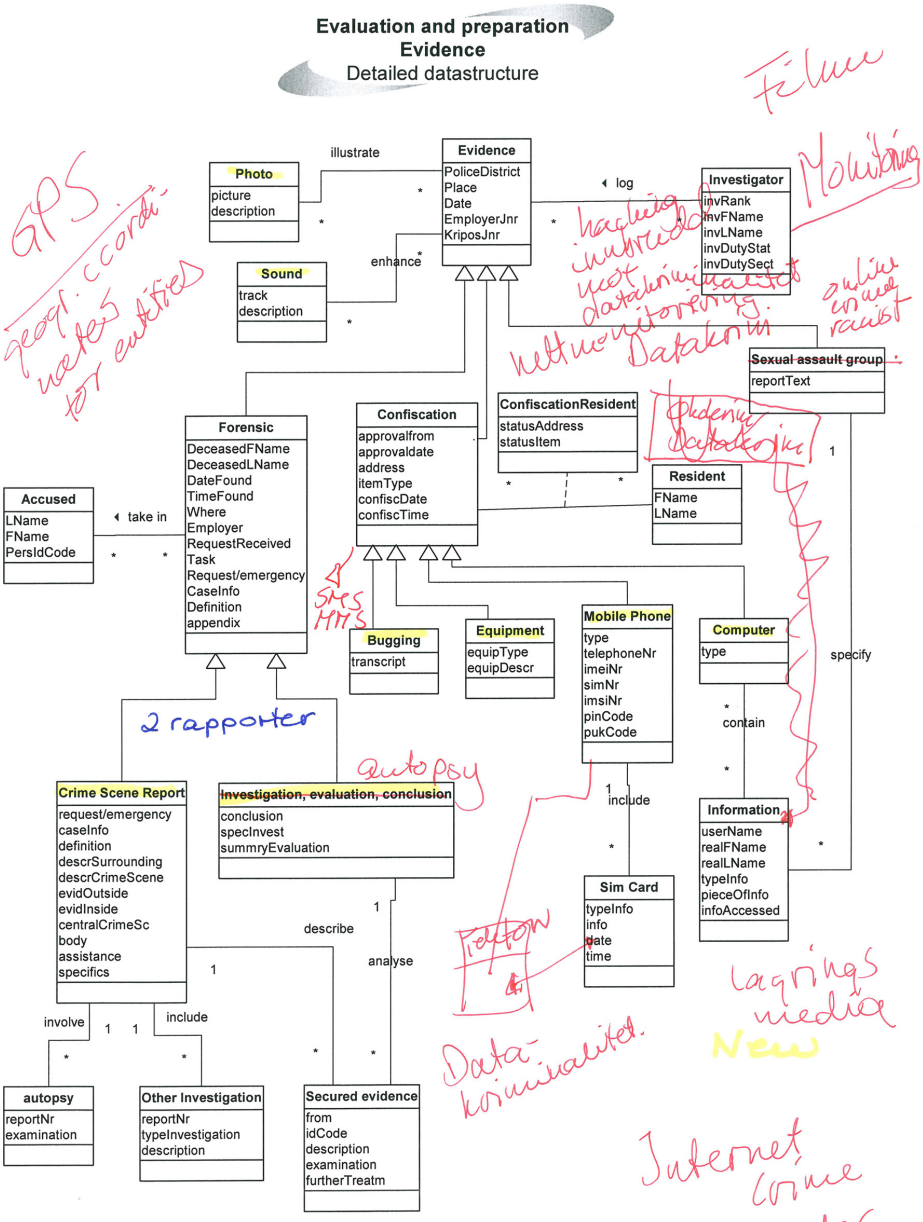
If links not shall be established to all entities in a phase, the name of the entities are written on the link together with the direction.

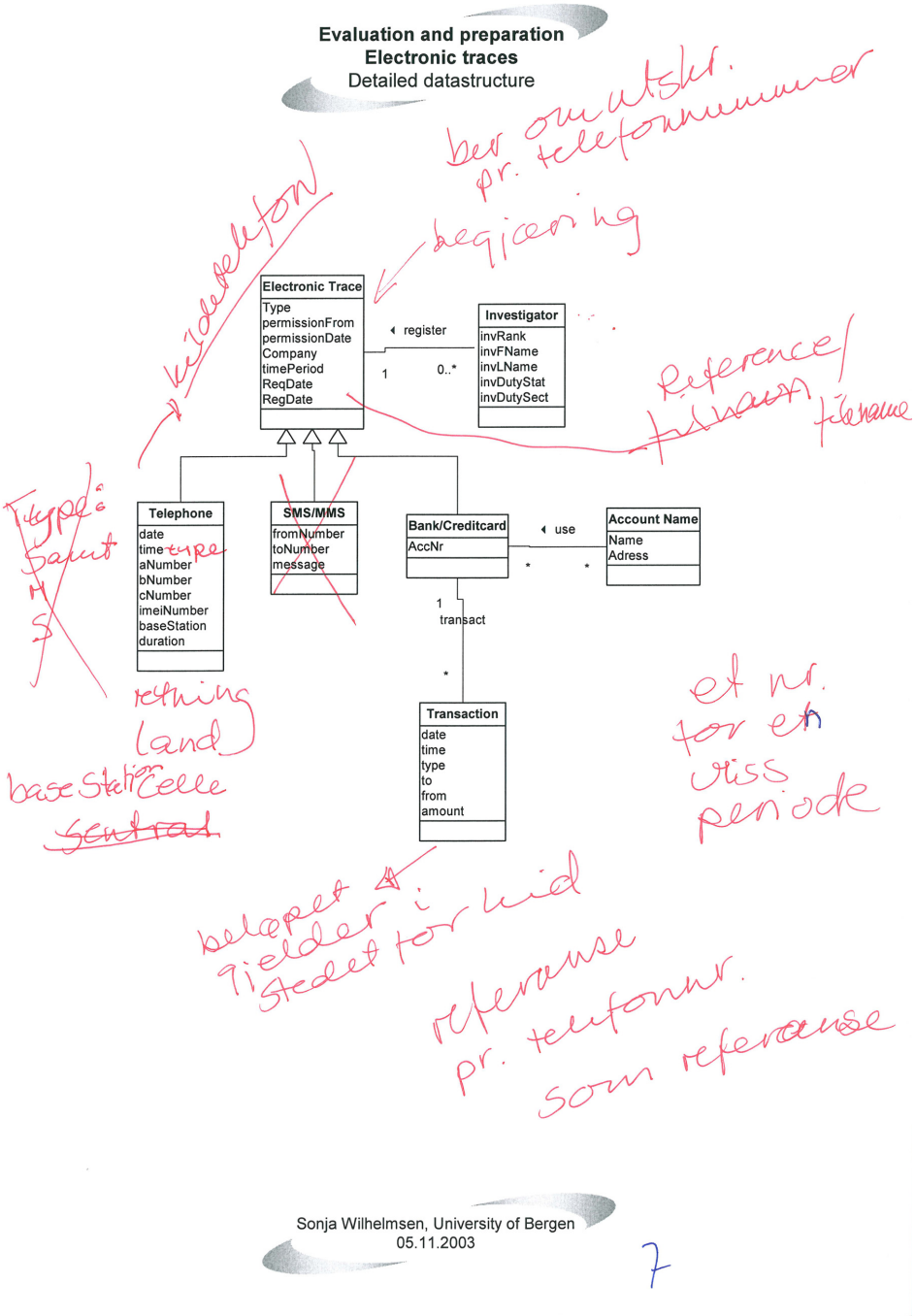
Kontakt. Slutninger fælles begreb

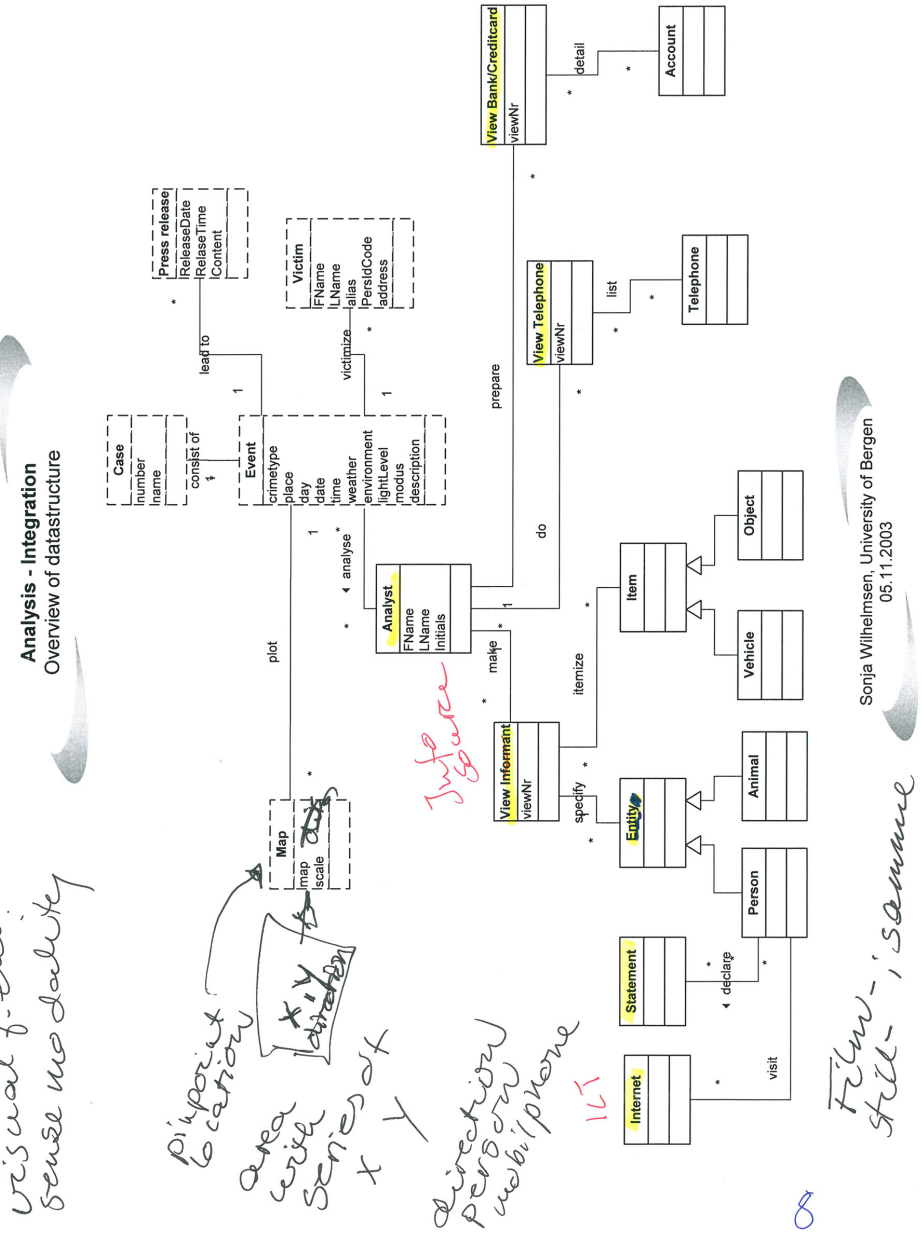
3

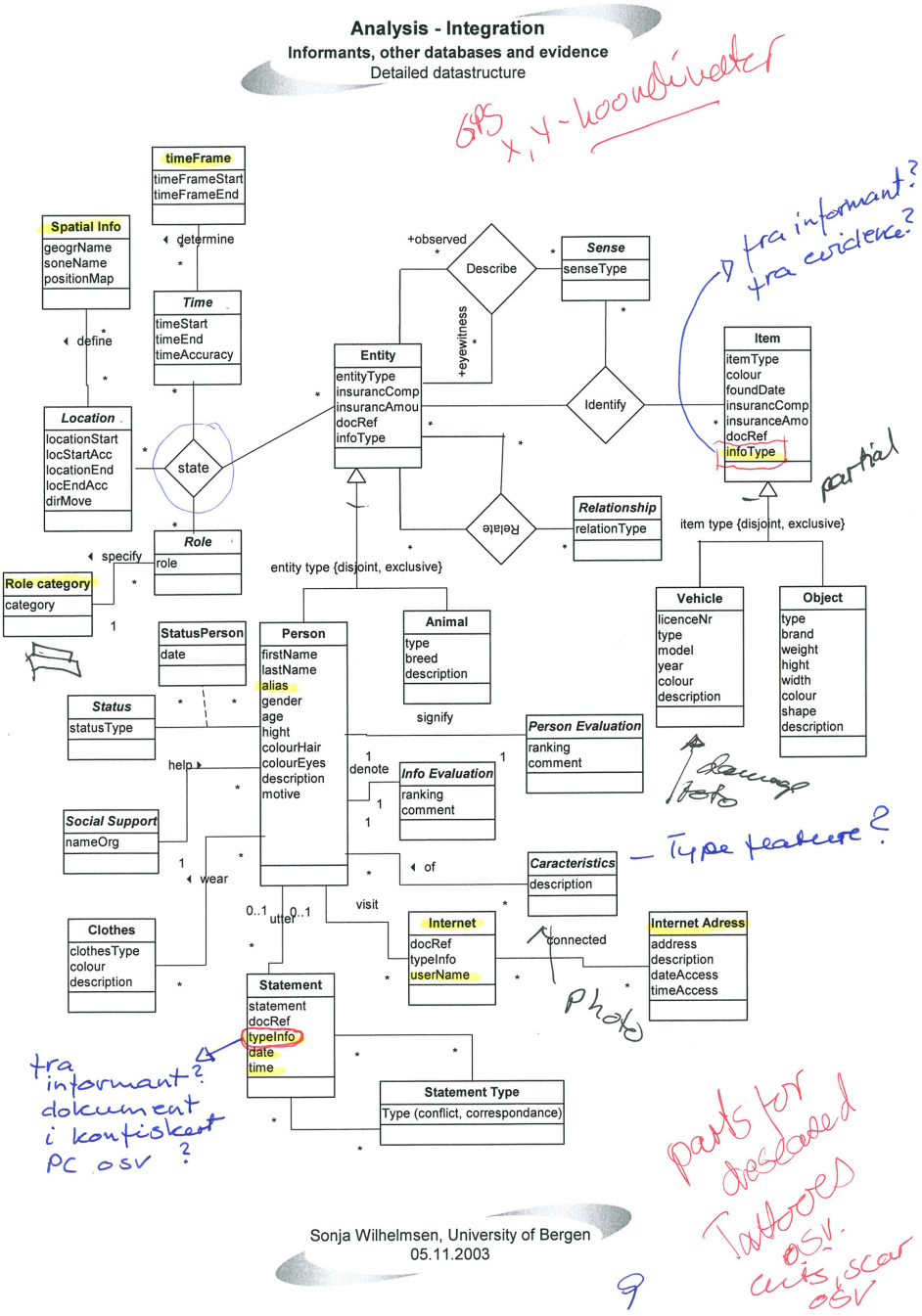

Evaluation and preparation
Overview of datastructure
Sonja Wilhelmsen, University of Bergen
05.11.2003
Case
Inumber
Iname
Press release
IReleaseDate
IReleaseTime
IContent
lead to
consist of
Event
crimetype
place
day
date
time
weather
environment
lightLevel
modus
description
Victim
IFName
ILName
alias
IPersIdCode
Iaddress
victimize
build on
Map
Imap
Iscale
plot
include
use
comprise
Evaluation Informant
Evaluation Other
Evaluation
Other databases
Evidence
Informant
Tip
Interview
HousetoHouse
Forensic
Confiscation
sexual assault group
Electronic trace
Telephone
Bank/Creditcard


Evaluation and preparation
Informants and other databases
Detailed datastructure
Other datbases
database
external/internal
regByFName
regByLName
date
time
information
Eval/Other
date
Evaluation
source
information
commentSource
commentInfo
Eval/Informant
date
Informant
policeDistr
reportPlace
reportDate
infFName
infLName
alias
infAddress
dokNr
PersonPhone
typeTelephone
Phone
number
InformantStatus
Date
Time
Status
StatusType
show
hear
question
Photo
Image
description
Sound
track
comment
Investigator
invRank
invFName
invLName
invDutyStat
invDutySect
Interview
InfPersIdCode
InfOccupation
kriposJnr
Victim
firstName
lastName
seenWhen
alias
descrWhen
seenWhere
descrWhere
relate
HouseToHouse
invArea
invTime
infDateOfBirth
streetName
streetNr
infWorkPlace
descrEvent
descrOther
wear
Tip
Jnr
time
dateOfBirth
workPlace
tipContent
kriposJnr
Clothes
type
colour
description
have on
HtH/Person
type
time
Person
FirstName
LastName
alias
Age
Adress
drive
make
seen with
believe
companion
FName
Lname
alias
Description
Deposition
invComment
intPlace
intDate
intStartTime
intStopTime
infDepos
describe
see
control
Vehicle
type
licencenr
description
Suspect
firstName
lastName
alias
descrWhy
Routine
kind
description
InvLeader
readDate
readName
regTaskDate
regDataDate
regDataName
regTaskName
Tasknr
check
Sonja Wilhelmsen, University of Bergen
05.11.2003

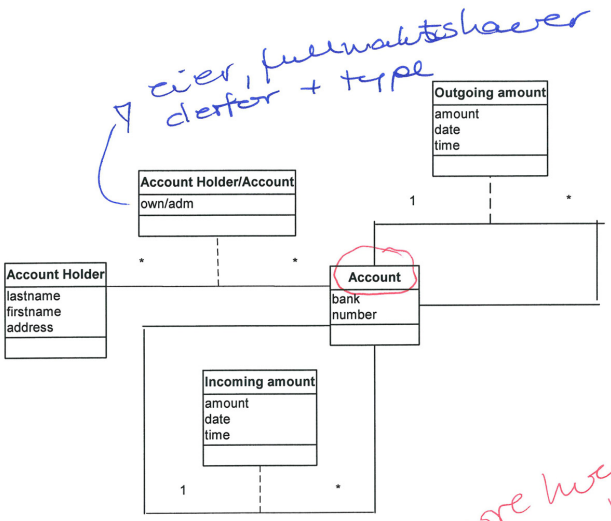

Evaluation and preparation
Evidence
Detailed datastructure
Photo
picture
description
illustrate
Evidence
PoliceDistrict
Place
Date
EmployerJnr
KriposJnr
log
Investigator
invRank
invFName
invLName
invDutyStat
invDutySect
Sound
track
description
enhance
Sexual assault group
reportText
Forensic
DeceasedFName
DeceasedLName
DateFound
TimeFound
Where
Employer
RequestReceived
Task
Request/emergency
CaseInfo
Definition
appendix
Confiscation
approvalfrom
approvaldate
address
itemType
confiscDate
confiscTime
ConfiscationResident
statusAddress
statusItem
Resident
FName
LName
Accused
LName
FName
PersIdCode
take in
Bugging
transcript
Equipment
equipType
equipDescr
Mobile Phone
type
telephoneNr
imeiNr
simNr
imsiNr
pinCode
pukCode
Computer
type
specify
contain
include
Information
userName
realFName
realLName
typeInfo
pieceOfInfo
infoAccessed
Sim Card
typeInfo
info
date
time
Crime Scene Report
request/emergency
caseInfo
definition
descrSurrounding
descrCrimeScene
evidOutside
evidInside
centralCrimeSc
body
assistance
specifics
Investigation, evaluation, conclusion
conclusion
specInvest
summryEvaluation
describe
analyse
involve
include
autopsy
reportNr
examination
Other Investigation
reportNr
typeInvestigation
description
Secured evidence
from
idCode
description
examination
furtherTreatm
Sonja Wilhelmsen, University of Bergen
05.11.2003


Evaluation and preparation
Electronic traces
Detailed datastructure
Electronic Trace
Type
permissionFrom
permissionDate
Company
timePeriod
ReqDate
RegDate
register
1
0..*
Investigator
invRank
invFName
invLName
invDutyStat
invDutySect
Telephone
date
time
aNumber
bNumber
cNumber
imeiNumber
baseStation
duration
SMS/MMS
fromNumber
toNumber
message
Bank/Creditcard
AccNr
use
Account Name
Name
Adress
1
transact
*
Transaction
date
time
type
to
from
amount
Sonja Wilhelmsen, University of Bergen
05.11.2003

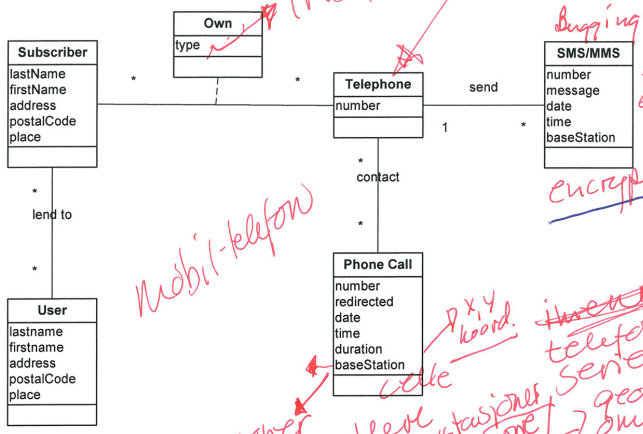

Analysis - Integration
Overview of datastructure
Case
lnumber
lname
consist of
Event
crimetype
place
day
date
time
weather
environment
lightLevel
modus
description
lead to
Press release
lReleaseDate
lRelaseTime
lContent
Victim
lFName
lLName
lalias
lPersIdCode
laddress
victimize
plot
analyse
Analyst
FName
LName
Initials
prepare
do
make
Map
map
lscale
View Bank/Creditcard
viewNr
detail
Account
View Telephone
viewNr
list
Telephone
View Informant
viewNr
specify
itemize
Item
Object
Vehicle
Entity
Animal
Person
Statement
declare
Internet
visit
Sonja Wilhelmsen, University of Bergen
05.11.2003


Analysis - Integration
Informants, other databases and evidence
Detailed datastructure
timeFrame
timeFrameStart
timeFrameEnd
determine
Spatial Info
geogrName
soneName
positionMap
define
Time
timeStart
timeEnd
timeAccuracy
Location
locationStart
locStartAcc
locationEnd
locEndAcc
dirMove
state
Role
role
specify
Role category
category
+observed
Describe
Sense
senseType
+eyewitness
Entity
entityType
insurancComp
insurancAmou
docRef
infoType
Identify
Item
itemType
colour
foundDate
insurancComp
insuranceAmo
docRef
infoType
Relate
Relationship
relationType
entity type {disjoint, exclusive}
item type {disjoint, exclusive}
Vehicle
licenceNr
type
model
year
colour
description
Object
type
brand
weight
hight
width
colour
shape
description
Animal
type
breed
description
StatusPerson
date
Person
firstName
lastName
alias
gender
age
hight
colourHair
colourEyes
description
motive
Status
statusType
help
signify
Person Evaluation
ranking
comment
denote
Info Evaluation
ranking
comment
Social Support
nameOrg
wear
of
Caracteristics
description
Clothes
clothesType
colour
description
utter
visit
Internet
docRef
typeInfo
userName
connected
Internet Adress
address
description
dateAccess
timeAccess
Statement
statement
docRef
typeInfo
date
time
Statement Type
Type (conflict, correspondance)
Sonja Wilhelmsen, University of Bergen
05.11.2003

Analysis - Integration
Electronic traces - Bank/Creditcard
Detailed datastructure



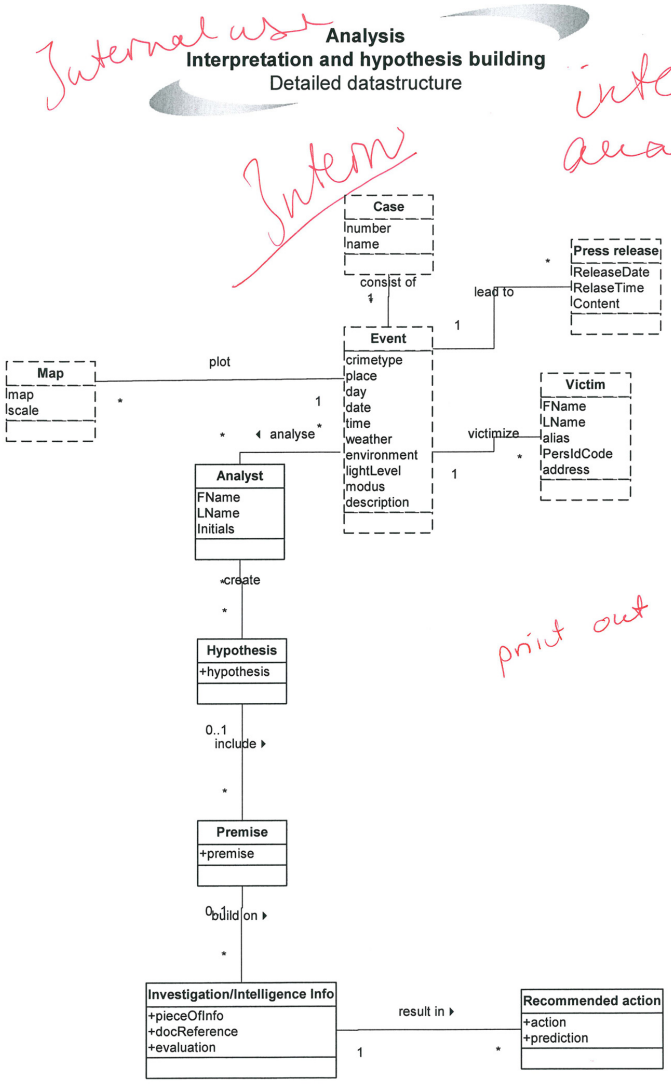
Analysis - Integration
Electronic traces - Telepone
Detailed datastructure

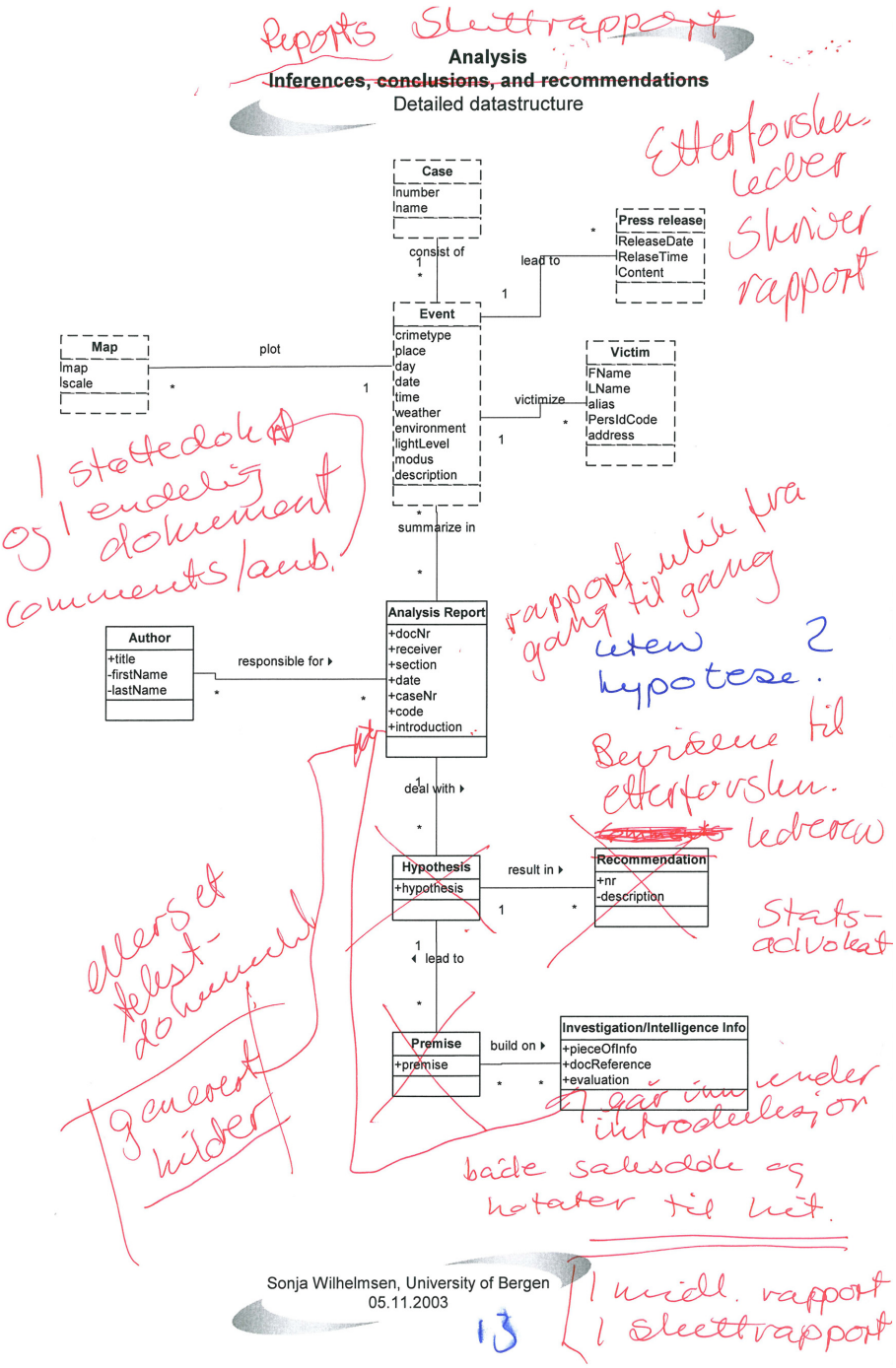


'Own' er ment å reflektere om telefonen er hjemme, på jobb, mobiltelefon eller et IMSI-nr.

Annet
- bompasseringer
- videokamera
- bensinstasjoner

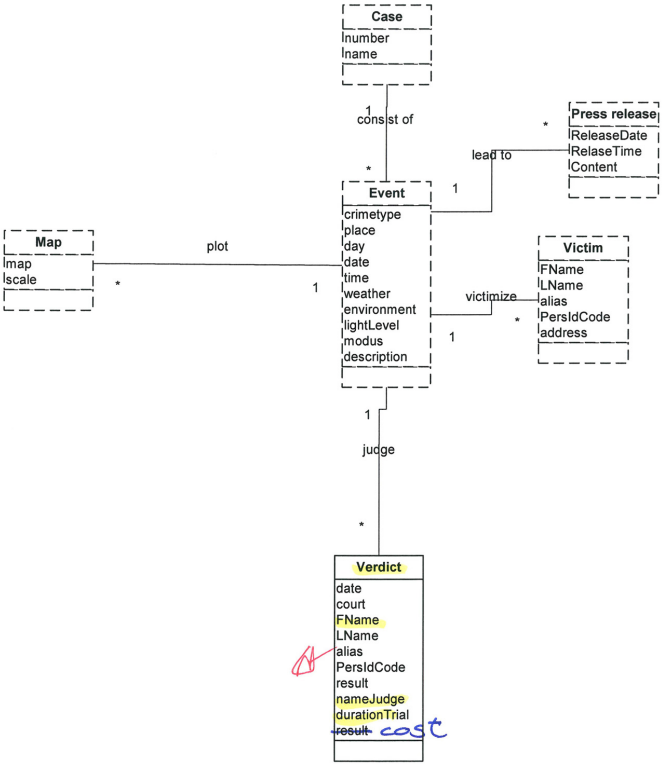
Sonja Wilhelmsen, University of Bergen
05.11.2003
a-electr-tlf-b.vsd
02.11.2003 13:26


Analysis
Interpretation and hypothesis building
Detailed datastructure
Case
number
name
consist of
lead to
Press release
ReleaseDate
RelaseTime
Content
Event
crimetype
place
day
date
time
weather
environment
lightLevel
modus
description
plot
Map
Imap
Iscale
analyse
victimize
Victim
FName
LName
alias
PersIdCode
address
Analyst
FName
LName
Initials
create
Hypothesis
+hypothesis
include
Premise
+premise
build on
Investigation/Intelligence Info
+pieceOfInfo
+docReference
+evaluation
result in
Recommended action
+action
+prediction
Sonja Wilhelmsen, University of Bergen
05.11.2003


Analysis
Inferences, conclusions, and recommendations
Detailed datastructure
Case
Inumber
Iname
consist of
lead to
Press release
IReleaseDate
IRelaseTime
IContent
Event
crimetype
place
day
date
time
weather
environment
lightLevel
modus
description
Map
Imap
Iscale
plot
Victim
FName
LName
alias
IPersIdCode
address
victimize
summarize in
Analysis Report
+docNr
+receiver
+section
+date
+caseNr
+code
+introduction
Author
+title
-firstName
-lastName
responsible for
deal with
Hypothesis
+hypothesis
result in
Recommendation
+nr
-description
lead to
Premise
+premise
build on
Investigation/Intelligence Info
+pieceOfInfo
+docReference
+evaluation
Sonja Wilhelmsen, University of Bergen
05.11.2003
13

~~Finalisation~~ Concluding comments

Detailed datastructure



New

14

LOG FUNCTIONS FOR DATA AND RELATIONSHIPS.

Evaluation and preparation.

For each attribute value created
log 'user-id' and date and time

For each attribute value changed
log 'user-id' and date and time

For each attribute value accessed
log 'user-id' and date and time

If any attribute value is accessed more than 10 times and less than 30 times
then display attribute value in blue colour
if any attribute value is accessed between 30 and 40 times
then display attribute value in green colour
if any attribute value is accessed more than 40 times
then display attribute value in red colour

Analysis – Integration.

If 'View informant' is created
then log view nr and initials and time and date

For each attribute value created
log view nr and date and time

For each relationship value created for 'state'
For each relationship value created for 'specify'
log view nr and date and time

For each relationship value created 'define'
log view nr and date and time

For each relationship value created for 'determine'
log view nr and date and time

If 'View Telephone' is created
then log view nr and initials and time and date

For each attribute value created
log view nr and date and time

For each relationship value created for 'send'
log view nr and date and time

For each relationship value created for 'contact'
log view nr and date and time

15

If 'View Bank/Creditcard' is created
then log view nr. and date and time

For each attribute value created
log view nr and date and time

For each relationship value created for 'Outgoing Amount'
log 'view nr' and date and time

For each relationship value created for 'Incoming Amount'
log 'view nr' and date and time

Analysis – Interpretation and hypothesis building.

For each attribute value created
log 'Analyst Initials' and date and time

For each relationship value created for 'create'
log 'Analyst Initials' and date and time

For each relationship value created for 'include'
log 'Analyst Initials' and date and time

For each relationship value created for 'build on'
log 'Analyst Initials' and date and time

For each relationship value created for 'result in'
log 'Analyst Initials' and date and time

Analysis – Inferences, conclusions, and recommendations

For each attribute value created
log 'user id' and date and time

Analysis – Profiling

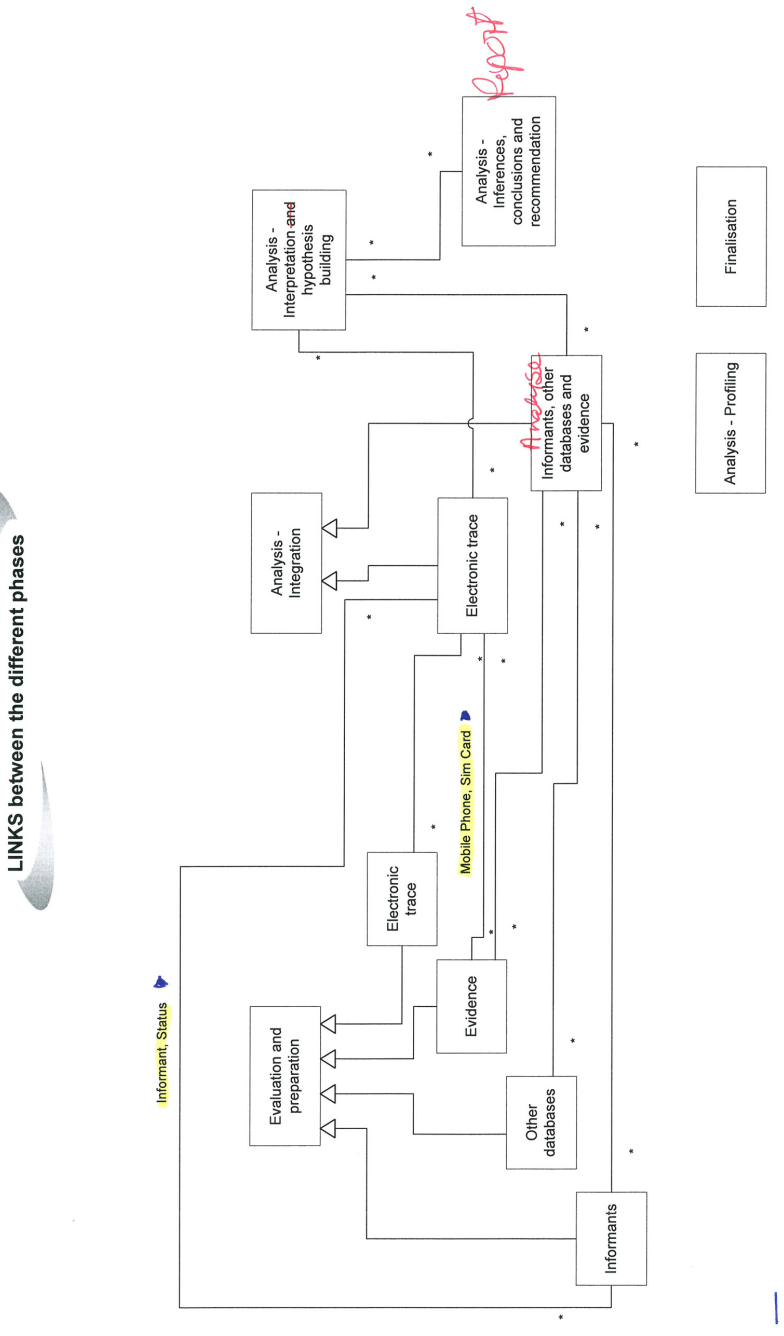
For each attribute value created
log 'user id' and date and time

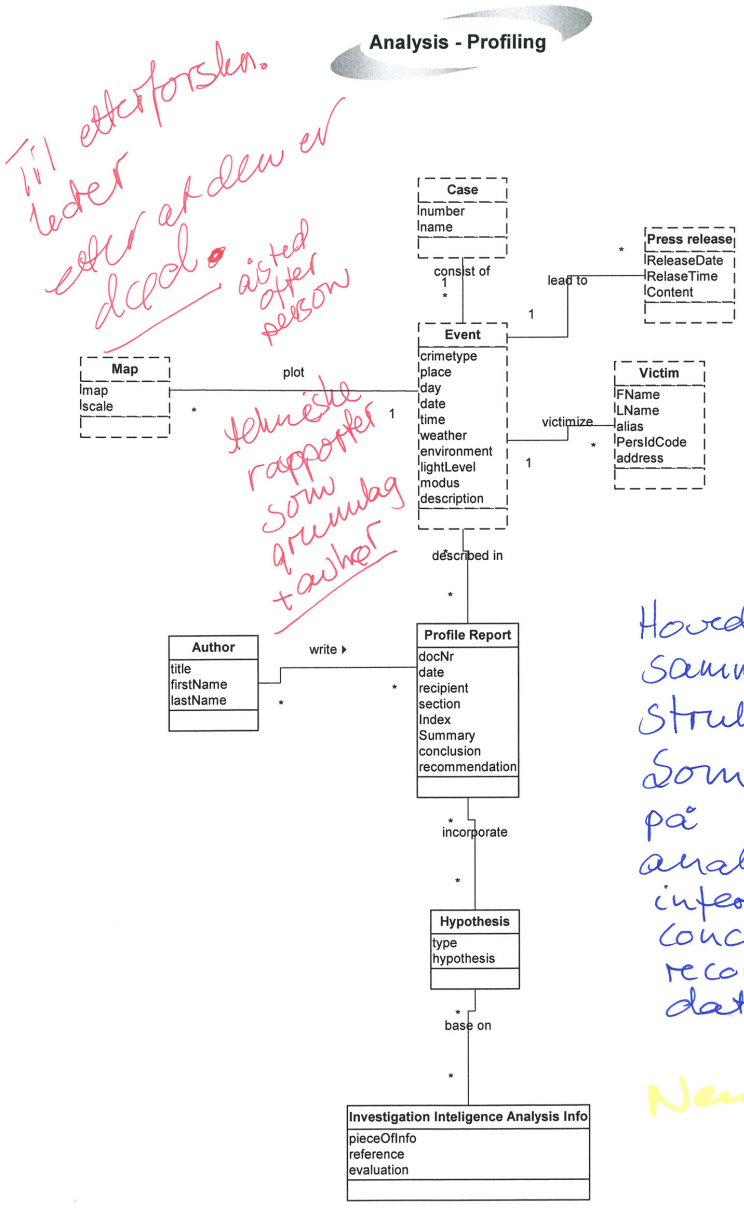
For each relationship value created for 'base on'
log 'user id' and date and time

Finalisation

For each attribute value created
log 'user id' and date and time

16


LINKS between the different phases
Informant, Status
Evaluation and preparation
Electronic trace
Evidence
Other databases
Informants
Mobile Phone, Sim Card
Analysis - Integration
Electronic trace
Analysis - Interpretation and hypothesis building
Analysis - Inferences, conclusions and recommendation
Informants, other databases and evidence
Finalisation
Analysis - Profiling
Sonja Wilhelmsen, University of Bergen
05.11.2003

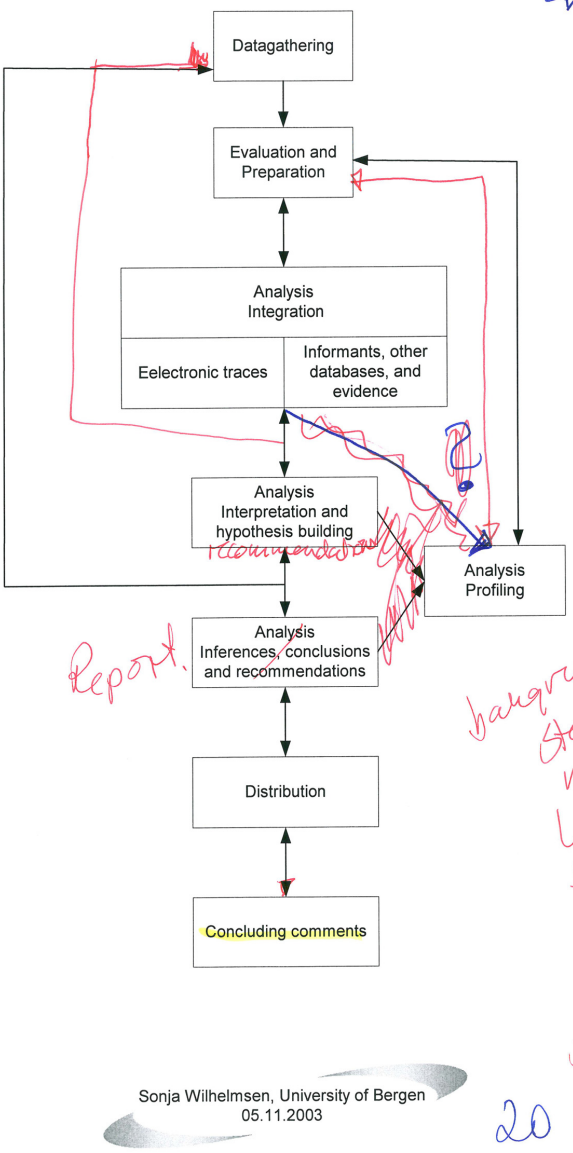

Analysis - Profiling
Case
number
name
consist of
1
*
lead to
*
1
Press release
ReleaseDate
RelaseTime
Content
Event
crimetype
place
day
date
time
weather
environment
lightLevel
modus
description
Map
map
scale
plot
*
1
victimize
1
*
Victim
FName
LName
alias
PersIdCode
address
described in
*
Author
title
firstName
lastName
write
*
*
Profile Report
docNr
date
recipient
section
Index
Summary
conclusion
recommendation
*
incorporate
*
Hypothesis
type
hypothesis
*
base on
*
Investigation Inteligence Analysis Info
pieceOfInfo
reference
evaluation
Sonja Wilhelmsen, University of Bergen
05.11.2003
18

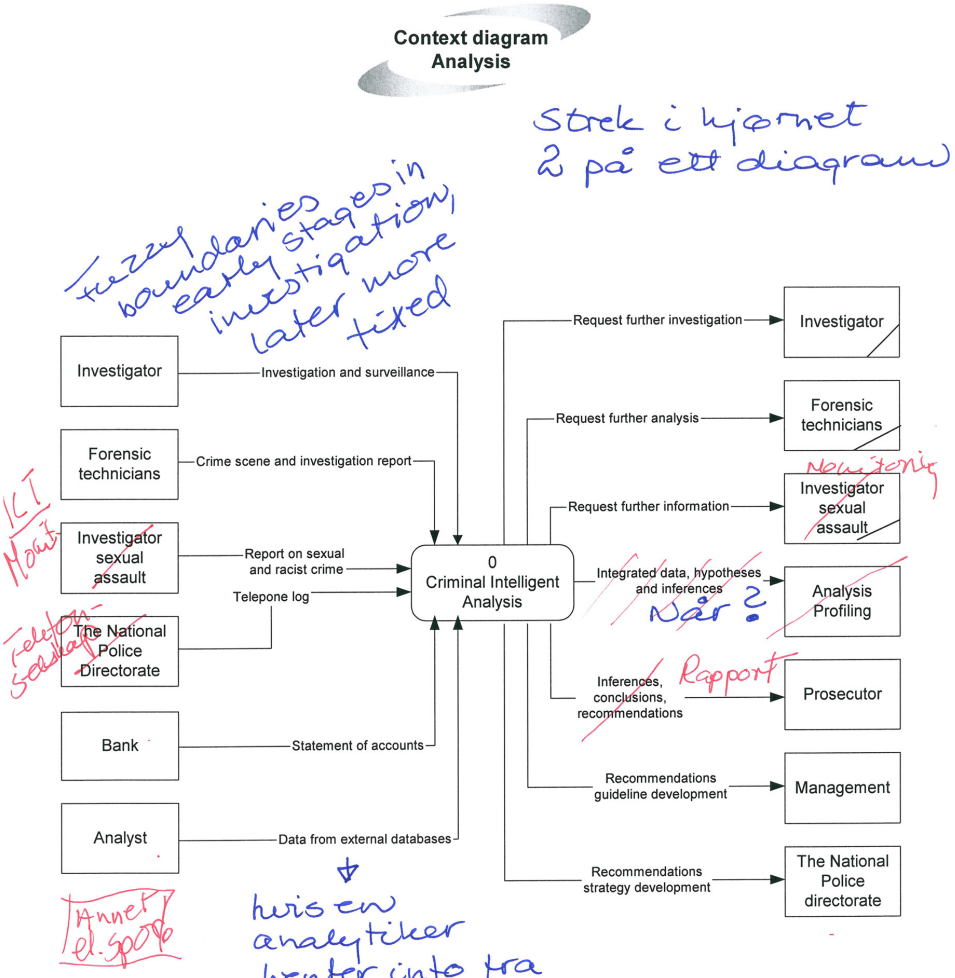
PRESENTATION AT KRIPOS
10. NOVEMBER 2003

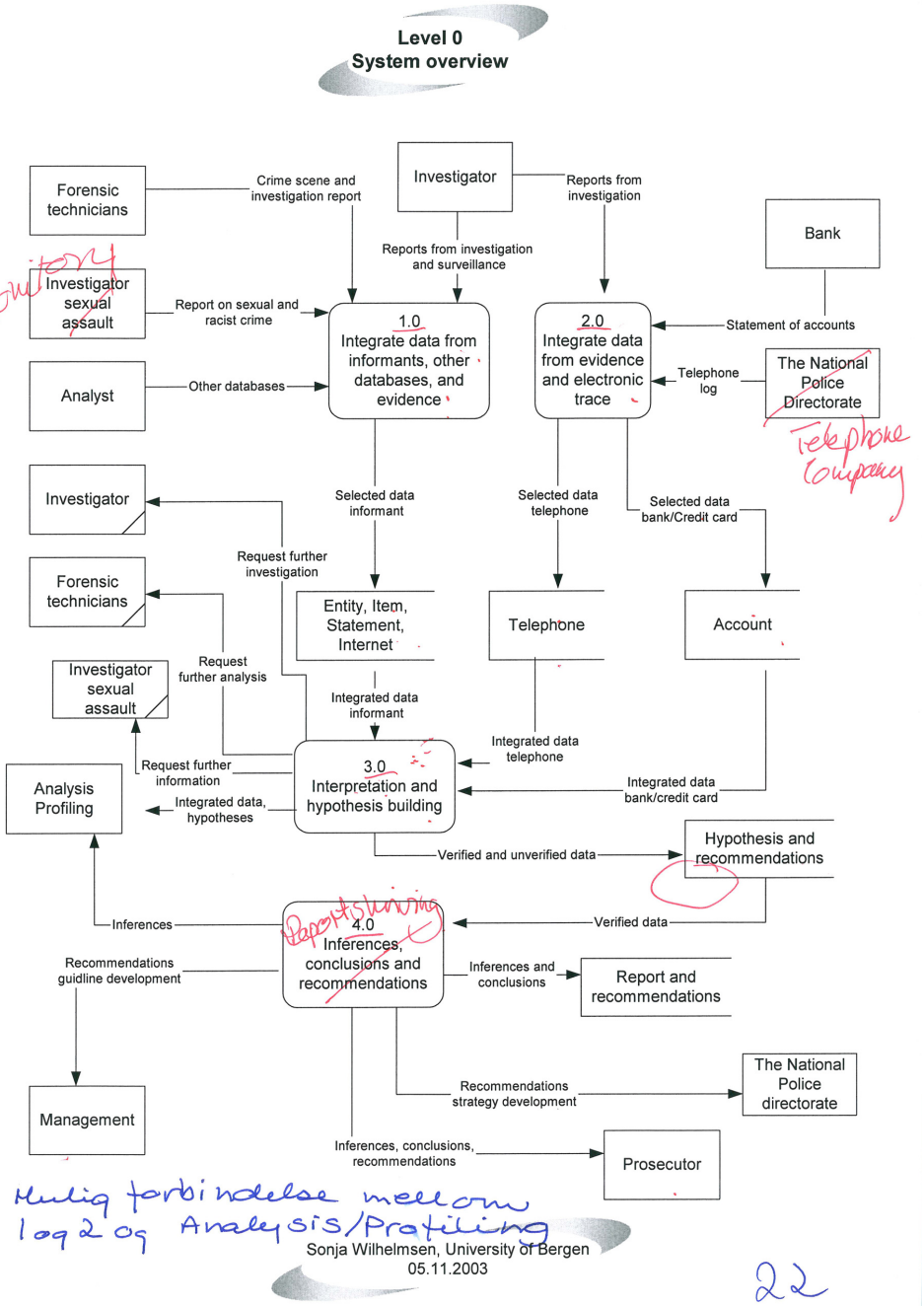
DATA FLOW MODELS

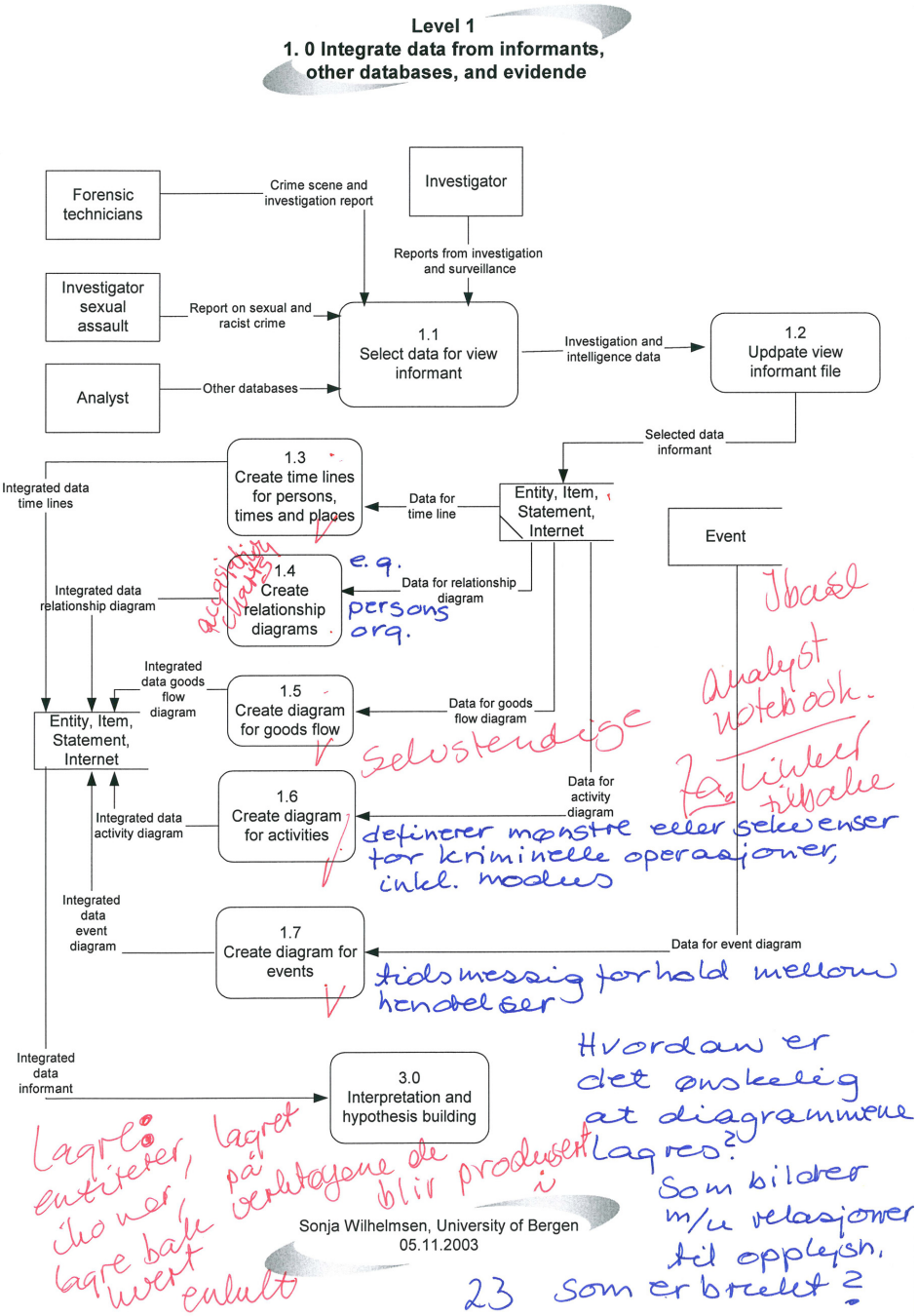
Sonja Wilhelmsen, University of Bergen
05.11.2003

19

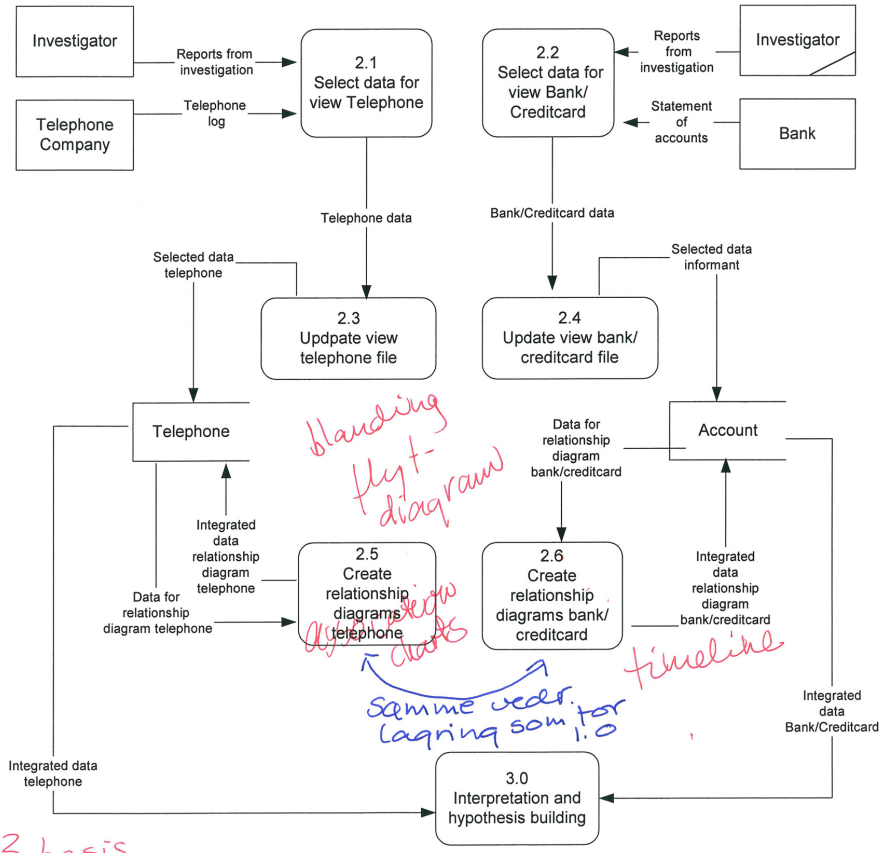

Overview of the process in criminal intelligence work
Datagathering
Evaluation and Preparation
Analysis Integration
Eelectronic traces
Informants, other databases, and evidence
Analysis Interpretation and hypothesis building
Analysis Profiling
Analysis Inferences, conclusions and recommendations
Distribution
Concluding comments
Sonja Wilhelmsen, University of Bergen
05.11.2003


Context diagram
Analysis
Investigator
Forensic technicians
Investigator sexual assault
The National Police Directorate
Bank
Analyst
Investigation and surveillance
Crime scene and investigation report
Report on sexual and racist crime
Telepone log
Statement of accounts
Data from external databases
0
Criminal Intelligent Analysis
Request further investigation
Request further analysis
Request further information
Integrated data, hypotheses and inferences
Inferences, conclusions, recommendations
Recommendations guideline development
Recommendations strategy development
Investigator
Forensic technicians
Investigator sexual assault
Analysis Profiling
Prosecutor
Management
The National Police directorate
Sonja Wilhelmsen, University of Bergen
05.11.2003


Level 0
System overview
Forensic technicians
Crime scene and investigation report
Investigator
Reports from investigation
Reports from investigation and surveillance
Bank
Investigator sexual assault
Report on sexual and racist crime
1.0
Integrate data from informants, other databases, and evidence
2.0
Integrate data from evidence and electronic trace
Statement of accounts
Analyst
Other databases
Telephone log
The National Police Directorate
Investigator
Selected data informant
Selected data telephone
Selected data bank/Credit card
Request further investigation
Forensic technicians
Entity, Item, Statement, Internet
Telephone
Account
Investigator sexual assault
Request further analysis
Integrated data informant
Integrated data telephone
Request further information
3.0
Interpretation and hypothesis building
Integrated data bank/credit card
Analysis Profiling
Integrated data, hypotheses
Verified and unverified data
Hypothesis and recommendations
Inferences
4.0
Inferences, conclusions and recommendations
Verified data
Recommendations guidline development
Inferences and conclusions
Report and recommendations
Management
Recommendations strategy development
The National Police directorate
Inferences, conclusions, recommendations
Prosecutor
Sonja Wilhelmsen, University of Bergen
05.11.2003

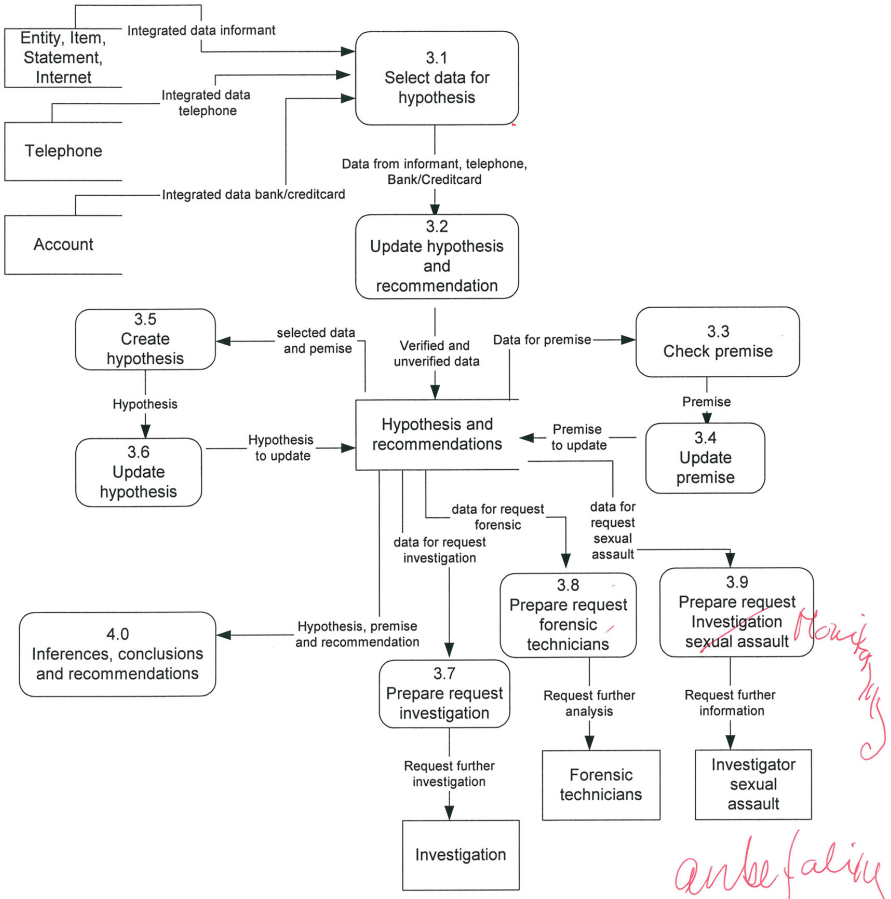

Level 1
1. 0 Integrate data from informants, other databases, and evidende
Forensic technicians
Crime scene and investigation report
Investigator
Reports from investigation and surveillance
Investigator sexual assault
Report on sexual and racist crime
1.1 Select data for view informant
Investigation and intelligence data
1.2 Updpate view informant file
Analyst
Other databases
Selected data informant
1.3 Create time lines for persons, times and places
Integrated data time lines
Data for time line
Entity, Item, Statement, Internet
Event
1.4 Create relationship diagrams
Integrated data relationship diagram
Data for relationship diagram
1.5 Create diagram for goods flow
Integrated data goods flow diagram
Data for goods flow diagram
Entity, Item, Statement, Internet
1.6 Create diagram for activities
Integrated data activity diagram
Data for activity diagram
1.7 Create diagram for events
Integrated data event diagram
Data for event diagram
Integrated data informant
3.0 Interpretation and hypothesis building
Sonja Wilhelmsen, University of Bergen
05.11.2003

Level 1
2. 0 Integrate data form evidence and electronic trace

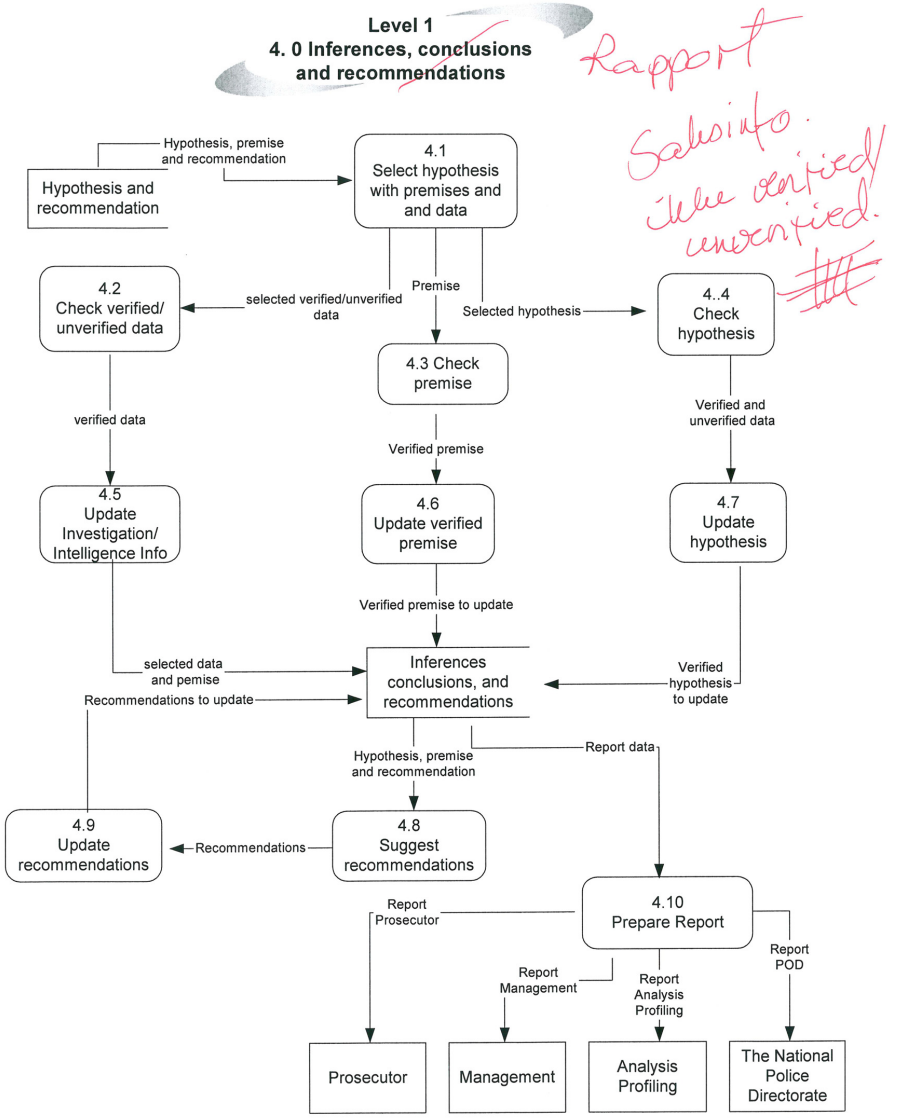


Sonja Wilhelmsen, University of Bergen
05.11.2003

Level 1
3. 0 Interpretation and hypothesis building



Sonja Wilhelmsen, University of Bergen
08.11.2003


Level 1
4. 0 Inferences, conclusions and recommendations
Hypothesis, premise and recommendation
Hypothesis and recommendation
4.1 Select hypothesis with premises and and data
4.2 Check verified/ unverified data
selected verified/unverified data
Premise
Selected hypothesis
4..4 Check hypothesis
4.3 Check premise
verified data
Verified premise
Verified and unverified data
4.5 Update Investigation/ Intelligence Info
4.6 Update verified premise
4.7 Update hypothesis
Verified premise to update
selected data and pemise
Recommendations to update
Inferences conclusions, and recommendations
Verified hypothesis to update
Hypothesis, premise and recommendation
Report data
4.9 Update recommendations
Recommendations
4.8 Suggest recommendations
Report Prosecutor
4.10 Prepare Report
Report Management
Report Analysis Profiling
Report POD
Prosecutor
Management
Analysis Profiling
The National Police Directorate
Sonja Wilhelmsen, University of Bergen
08.11.2003

D: TRANSCRIPTS FROM STRUCTURED INTERVIEWS 20.01.2005

D

INTERVJUVEILEDNING FOR INTERVJUER PÅ NYE KRIPOS 20.04.05.

Intervjuet vil fokusere på to hovedkategorier:

- Planleggings- og beslutningstakingsprosessen som utføres før implementering av et nytt informasjonssystem.
- Hvilke informasjonssystemer som blir brukt i operativ kriminalanalyse i dag (både datamaskinbaserte og ikke-datamaskinbaserte systemer) og utvekslingen av informasjon mellom dem.

Jeg har planlagt følgende spørsmål for å få kunnskap om de to kategoriene. Dersom du har relevant informasjon som ikke omfattes av spørsmålene, setter jeg pris på å få utfyllende kommentarer.

Planleggings- og beslutningstakingsprosessen:

1. Kan du beskrive en typisk planleggings- og beslutningstakingsprosess for innføring av et informasjonssystem?

2. Er det trekk ved planleggings- og beslutningstakingsprosessen som er karakteristiske for politisystemer?

Informasjonssystemer:

3. Hvilke informasjonssystemer brukes for operativ kriminalanalyse på KRIPOS i dag?

4. Er alle informasjonssystemene tilgjengelige for etterforskeren eller er etterforskeren avhengig av andre for å fremskaffe informasjonen som er nødvendig?

5. Hvordan utveksles informasjon mellom KRIPOS og politiet?

6. Hvordan utveksles informasjon mellom KRIPOS og rettssystemet?

7. Kan du fremheve problemer og suksesser dere har hatt i forbindelse med nye systemer?

INTERVJUERS KONTAKTINFORMASJON.

Universitetslektor Sonja Wilhelmsen
Institutt for informasjons- og medievitenskap, Universitetet i Bergen

E-mail	sonja.wilhelmsen@infomedia.uib.no
Telefon arbeid	55 58 41 27
Mobiltelefon	90 58 97 34
Adresse	Postboks 7800
	5020 Bergen

INTERVIEW GUIDE.

This interview will focus on two main categories:

- The planning- and decision-making process carried out before implementing a new information system.
- Which information systems being used in operational investigation today (both computer based and non-computer based systems) and the exchange of information between them.

I have planned the following questions to acquire knowledge of the two categories. However if you have relevant information not covered by the questions, your comments are appreciated.

Planning- and decision-making process

1. Can you describe a typical planning- and decision making process for introducing an information system?

2. Are there characteristic features associated with the planning- and decision-making process for police systems?

Information systems:

3. Which information systems are used in operational analysis at KRIPOS today?

4. Are all systems available to the investigator or do the investigator have to rely on other persons to obtain the information they need?

5. How is information exchanged between KRIPOS and the police?

6. How is information exchanged between KRIPOS and the judicial system?

7. Can you highlight problems and successes in new systems?

CONTACT INFORMATION FOR THE INTERVIEWER.

University lecturer Sonja Wilhelmsen
Department of Information Science and Media Studies, University of Bergen

E-mail	sonja.wilhelmsen@infomedia.uib.no
Telephone work	55 58 41 27
Mobile telephone	90 58 97 34
Address	Postboks 7800
	5020 Bergen

Bergen, 9. juli 2005

UTSKRIFT AV INTERVJUER.

Vedlagt oversendes utskrift av intervjuet 20. april. Utskriftene er anonymisert. Det har jeg gjort fordi jeg ønsker å offentliggjøre intervjuene i forbindelse med avhandlingen.

Dersom du har noen kommentarer ber jeg deg om å skrive det på papirkopien som ligger vedlagt og returnere den slik at jeg kan få rettet det opp. Det var enkelte ord jeg ikke kunne høre og da har jeg bare brukt en _____. Dersom det finnes slike streker i intervjuet med deg vil det være fint om du kunne fylle ut det som mangler.

Dersom du ikke har kommentarer til intervjuet, kan du bare sende meg en e-post: Sonja.Wilhelmsen@infomedia.uib.no.

Etter at jeg har fått tilbakemelding, vil jeg rette opp utskriftene og sende deg en kopi av det endelige resultatet sammen med en erklæring om at intervjuene kan offentliggjøres i avhandlingen.

Med vennlig hilsen

Sonja Wilhelmsen

Doctorate study - Sonja Wilhelmsen

As we agreed during my data collection, I recorded the interview/meeting with you. I would like to use the transcripts as part of my doctoral thesis and for that reason I ask you to sign the permission below.

Permission agreement

I give permission of this material to be used in the thesis.

Place _____

Date _____

Name _____

Address_____

Signature _____

Intervju med NN2 20.04.05.

Wilhelmsen:	Du har kikket litt igjennom intervjuguiden du fikk i går, så kanskje vi kan gå rett på spørsmål 1 om du kan beskrive en typisk planleggings- og beslutningstakingsprosess ved innføring av et informasjonssystem?
NN2:	Ja, nå er det vel i utgangspunktet ikke enkelt å besvare det for, etter å ha tenkt litt på det, så er det ingen enhetlig måte dette har vært gjort på. Hvis jeg ser tilbake har utviklingen av datasystemer vært slik at noen har oppstått som et behov nedenfra og andre har kommet som en politisk beslutning ovenfra. Det er Politiets data- og materielltjeneste (PdMt) som er den instansen i Politietaten som i utgangspunktet står ansvarlig for utvikling og drift av datasystemer i norsk politi. De systemene som har kommet ovenfra har i veldig stor grad vært systemer som har vært knyttet opp i en eller annen hendelse hvor en forutsetning for å kunne gjøre en god jobb er et datasystem. Oppgaven med å utvikle systemet har da vært sendt Politiets data- og materielltjeneste som har måttet prioritere saken slik at det ikke har blitt anledning til å se hvordan dette burde henge sammen med andre systemer i hele strafferettskjeden. Resultatet har blitt etablering av et autonomt system som har alt i seg for å utføre den spesielle oppgaven, med oppdatering, sletting og retting. Utviklingen skjer ved at PdMt setter ned en prosjektgruppe og en styringsgruppe med deltakere ifra de involverte parter og kjører dette som et vanlig prosjekt med delprosjekt og hovedprosjekt. Du får et innføringsløp som, litt avhengig av hvor komplisert løsningen er, involverer for eksempel politihøgskolen. Man velger å lære opp lærere som går ut i distriktene hvis det dreier seg om en veldig omfattende oppgave, eller man lærer opp de som skal bruke det hvis det er snakk om få brukere. Jeg kan ta eksempler på system som har kommet opp som en politisk beslutning veldig raskt. For noen år siden, jeg tror en må tilbake helt til begynnelsen av 80-tallet, så var det teknologi på markedet for å få automatisk behandling av fingeravtrykk (AFIS) slik at du slapp å sitte og bestemme koder manuelt og forholde seg til et kortregister hvor man var avhengig av at fingeravtrykk hadde en viss kvalitet for å kunne søke i registeret. Utstyret var imidlertid kostbart og det var ikke på det tidspunktet noen forståelse for at man burde investere i et såpass spesialisert system i motsetning til andre løsninger for straffesakskjeden. En dag satt en person og tok et bilde av seg i en fotoautomat på Østbanen da det smalt en bombe i en oppbevaringsboks like ved og vedkommende ble drept. Det gikk lang tid før de fikk tak i gjerningsmannen basert på fingeravtrykk. Avdelingslederen for fingeravtrykksavdelingen havnet på første side i VG på grunn av dette og kom tilfeldigvis til å si at hvis vi hadde hatt et automatisk fingeravtrykkssystem (AFIS), som jo var tilgjengelig, så ville denne saken fått en rask oppklaring. Da dette ble kjent ble det politisk bestemt, nesten over dagen, at et slikt system skulle anskaffes, og slik ble et norsk AFIS etablert.
Wilhelmsen:	Så det er de som kommer ovenfra.
NN2:	Det er de som kommer ovenfra. Vi hadde en tilsvarende situasjon i forbindelse med asylproblematikken hvor det på et tidspunkt ble en stor influks av asylsøkere som krevde et datasystem for at man skulle kunne håndtere situasjonen. Så er det disse som kommer nedenfra hvor man sitter og føler at behov for systemer presser på og opplever at når disse krav kommer oppover i systemet så, det har i hvert fall hittil vært slik, har PdMt

	hatt hendene fulle med de store, tunge oppgavene som de har blitt pålagt politisk. Men samtidig så har institusjoner som bl.a. Nye Kripos og Oslo Politidistrikt hatt et så stort behov for nye løsninger at det er blitt en utvikling lokalt parallelt med at en har hatt en utvikling sentralt. Den sentrale utviklingen har da, i hvert fall frem til nå, ført til veldig mange slike nærmest autonome systemer med egne rutiner og prosesser. Men det har blitt slik at de forskjellige oppgavene i prosessen, både innenfor og på tvers av etater, må gjøres ved at data må registreres i ett system og så må de tas ut i rapporter og sendes videre for registrering i et nytt system for så å ta ut nye rapporter hvorfra data legges inn i et tredje system osv. Slik går det hele strafferetts-kjeden igjennom. At man da i tillegg fikk en del lokal utvikling har ikke hjulpet på dette med å se helheten. Etter hvert så har man laget løsninger som gjør at disse systemene på en måte klarer å få en form for direkte, men svært ineffektiv, kommunikasjon mellom noen av de mest sentrale systemene. Så det store problemet når man snakker om innføring av disse systemene, er at det aldri har blitt fattet beslutning om etablering av en infrastruktur. Det er først nå det seneste året at det er blitt prioritert å gjennomføre et slikt prosjekt. Et nytt infrastruktur- og arkitekturprosjekt i regi av Justisdepartementet, er i gang for neste generasjons systemer for politi, påtalemyndighet, domstolene og fengselsvesen. Integrerte systemer vil da føre til at man forholder seg til prosesser og ikke til systemer. Nytten man i dag har av datasystemer i politiet er i stor grad avhengig av at den enkelte kjenner systemene og vet hva som ligger i de slik at du kan slå opp i det ene, andre, tredje, fjerde eller femte systemet. I stedet for at, hvis du satt med etterlysninger, så forholdt man seg til en etterlysningsfunksjon som tilbød alt du trengte i forbindelse med etterlysningen. Men i dag må du inn i ett system hvis du skal etterlyse i Interpol, du må i et annet hvis du skal etterlyse i Schengen, du må inn i et tredje hvis du skal sende fingeravtrykk til Eurodac, du må inn i et fjerde hvis du skal etterlyse lokalt i Norge. Basert på det jeg har skissert så langt er det på en måte veldig problematisk å skulle vise til et typisk innføringsløp for systemer i Norge.
Wilhelmsen:	Vi kan på en måte si at du har 2 forskjellige løp, de som kommer ovenfra og de som kommer nedenfra.
NN2:	Ja
Wilhelmsen:	Arkitekturprosjektet som du snakket om. Er det ferdig nå, eller er det fremdeles under arbeid?
NN2:	Nei, det jobbes det med. Det betyr at det nå er blitt veldig fokus på at alle nye systemer som er planlagt, er i gang, eller som ligger på beddingen, de må forholde seg til den fremtidige arkitekturen. Slik at når man utvikler disse så blir de laget på en måte som passer inn i en helhet. Dette innebærer et stort løft i riktig retning for effektiv informasjonsbehandling i justissektoren. Enkeltsystemer vil ikke kunne bli lønnsomme hvis de skal belastes infrastruktur som alt annet skal forholde seg til også.
Wilhelmsen:	Nei.
NN2:	Som sagt det har vært litt problematisk å få til de helt gode og effektive systemer, men det er veldig mange, isolert sett, gode systemer. Man hadde jo ikke hatt mulighet til å drive ordentlig politiarbeid hvis man ikke hadde hatt disse systemene. Men som sagt det er systemer som krever mye av brukerne for å finne frem til all relevant informasjon.
Wilhelmsen:	Da har du vel nesten tatt både spørsmål 1 og 2 sammen.

NN2:	Ja.
Wilhelmsen:	Da går vi over på informasjonssystemer. Hvilke informasjonssystemer som brukes for operativ kriminalanalyse på Kripos i dag?
NN2:	Det er et utall av systemer i drift som inneholder den informasjonen som potensielt er interessant for analyse. Den sentrale delen i kriminalanalysen er et system som går under betegnelsen Analyst Notebook og dette vil du få vite mer om når du snakker med NN5. NN5 er avsnittsleder på analyseavsnittet ved orgkrim-avdelingen og det er han som administrerer det systemet. Jeg har ikke nok kompetanse til å si akkurat hvordan systemet brukes, men det er flere relevante politisystemer som har interface mot Analyst Notebook. Jeg vet at i regi av Oslo Politidistrikt har det vært utviklet et system som heter Smartsys som er litt etterretning og litt sakssystem og det systemet har et rimelig godt interface mot dette analysesystemet slik at en kan hente inn data direkte til analysen. Men i tillegg er man avhengig av å ta ut filer og trekke ut data fra flere systemer for å få utført ønsket analyse. På etterretningssiden bruker politiet et system som heter Krimsys som pr. i dag er det eneste offisielle kriminaletterretningssystemet forvaltet av Kripos.
Wilhelmsen:	Når du sier etaten, mener du både politiet og
NN2:	Når jeg sier etaten så er det politietaten. Du kan ta saksdata ganske raskt inn fra Smartsys, men det er et Oslosystem. Videre benyttes det sentrale straffe- og politiopplysningsregister hvor hele historikken på kriminelle er lagret. Etaten bruker i dag BL-systemet som et førsteregistreringssystem ved alle politidistrikter der enhver straffesak starter. Derifra sendes det inn i et sentralt straffesakssystem, Strasak, hvor du kan hente ut rapporter. Tilsvarende får politiet tilgang til loggene på telefon og telefonnummer fra teleoperatørene som også kjøres inn i analysesystemet. Dette siste gjøres for å kunne analysere tusen på titusener av samtaler, og få satt opp relevante forbindelser på en oversiktig måte.
Wilhelmsen:	BL, blir det brukt av Kripos?
NN2.	Ja, fra 1.1. i år. Og grunnen til at det ikke har vært brukt før, er at gamle Kripos var et rent bistandsorgan. Vi hadde ikke påtalekompetanse så vi førte ikke egne saker. Fra 1.1., da vi ble Nye Kripos, fikk vi påtalekompetanse og kan etterforske egne saker. Da må vi inn i BL, for alle offisielle straffesaker i Norge må starte med registrering i BL.
Wilhelmsen:	Da har du egentlig vært innom veldig mange av de spørsmålene som jeg ville
NN2:	Roter jeg til kronologien for deg?
Wilhelmsen:	Nei, ikke i det hele tatt, det var bare for å få satt opp de punktene jeg var interessert i. Du har vært innom Kripos og politiet, etterforskerne er jo da avhengig av andre egentlig for å skaffe en del informasjon.
NN2:	Ja, de er avhengige av tilgang til en rekke systemer. Noen av disse systemene er rimelig greie da tilgangen er regulert ut ifra den funksjonen vedkommende har. Det er ikke slik at du får tilgang til strafferegisteret og til BL og til Strasak og til Krimsys fra sak til sak. Du har en tilgang og den bruker du som for eksempel etterforsker, enten det er på den ene eller andre saken. Det er selvfølgelig helt spesielle saker der man er avhengig av uverifisert informasjon som finnes i etterretningssystemene. Da kan det hende at det er nødvendig å få tildelt en høyere klarering i en konkret sammenheng. Noen av systemene er organisert slik at det er lett å søke frem den rapporten eller sette opp de søkekriteriene som skal til for å få trukket ut ønsket informasjon.

	Andre er basert på så gammeldags teknologi at man faktisk er avhengig av at rapporter må programmeres individuelt eller finnes ferdig tilgjengelig.
Wilhelmsen:	Ja vel. Hvis rapportene er lagt inn så kan etterforskeren selv finne informasjonen?
NN2:	Ja
Wilhelmsen:	Da behøver en ikke være avhengig av folk som driver systemet til vanlig og bruker systemet til vanlig.
NN2:	Nei. I veldig stor grad så kan du gå ut og hente disse selv, men som sagt det er veldig mye knyttet opp mot den kompetansen du selv har til å gjøre dette. Det kan hende at du som etterforsker ikke behersker en teknikk som gjør at du kan få ut infoen, mens en kollega har kompetanse og kan være behjelpelig. Det eksisterer ikke noen enhetlig kompetanse opp mot bruk av datasystemene hvis man går inn på et sjikt i organisasjonen. Selv om du sitter og er etterforsker på for eksempel taktisk etterforskningsavdeling er det ikke sikkert du har like god kompetanse på alle systemene. Rett og slett fordi det har vært veldig tilfeldig hvilke systemer du har brukt tidligere.
Wilhelmsen:	Ja, og det er vel ikke alle systemene du har bruk for i enhver sak så det kan gå lang tid mellom hver gang du bruker det og da forsvinner jo gjerne kunnskapen etter en stund.
NN2:	Ja. En del systemer er meget spesielle og krever høy spesialkompetanse slik som det tidligere nevnte analysesystemet. Det samme er tilfelle med bruken av det digitale fingeravtrykkssystemet som søker avtrykk og gir deg en liste over de mest sannsynlige kandidater og så må en spesialist sette seg ned og ta fram det avtrykket du søkte på og det som maskinen foreslår, si ja eller nei, om det er en ”hit”. Så til syvende og sist er det et menneske som er nødt til å gjøre en vurdering ut fra sin spesialkompetanse. Dette er eksempler på systemer for spesialister og ikke for den generelle etterforsker.
Wilhelmsen:	Ja, hvis du vanligvis driver med taktisk etterforskning så vil du være avhengig av tekniske spesialister både på fingeravtrykk og DNA-spor og
NN2:	DNA-spor og spor knyttet opp mot hylser og patroner og kuler. Det er også spesielle systemer. Nye Kripos som skal bistå i etterforskning i politidistriktene til enhver tid må ha kompetanse på spesialsystemer som er etablert her for at vi skal kunne fremstå som spesialister på en rekke fagområder. For med den raske teknologiske utviklingen er jo nærmest dagens spesialist morgendagens generalist.
Wilhelmsen:	Ja
NN2:	Det er slik at det som i går, i gåseøyne, var en spesialitet ivaretatt av Nye Kripos i dag kan ivaretas av distriktene selv p.g.a. den teknologiske utvikling. Men så dukker det stadig opp nye spesialområder og da er det at Nye Kripos igjen skal gripe tak i saken. Dette gjelder spesialområder som det kreves stor kompetanse, stor innsats og store ressurser for å kunne beherske. Skaffe teknologien som er knytta til nettopp dette spesialområde og drive det inntil teknologien igjen har gjort området tilgjengelig for en rimelig penge og mindre spesialkompetanse.
Wilhelmsen:	Så det er Nye Kripos som til enhver tid egentlig sitter på spisskompetanse innenfor politiet?
NN2:	På spesielle områder, ja. Hvis du skal være spesialist og kunne håndtere disse systemene, så må man ha et visst antall saker. La oss ta en sakstype som drap. Vi er jo med og bistår i drapsetterforskning. Ved en del store politidistrikter som for eksempel Oslo politidistrikt, så er ikke drap nødvendig en sjelden

	foreteelse, slik at de kan opprettholde kompetanse. Men hvis du går til et mindre politidistrikt i Norge som kanskje har et drap hvert tredje år eller sjeldnere de ikke klarer å bli eksperter på den type etterforskning. Så det er hele tiden slik at på disse spesialområdene må du ha et visst antall saker for å kunne opprettholde høy kompetanse.
Wilhelmsen:	Rettssystemer. Utveksling av informasjon mellom Kripos og rettssystemet? Men nå har vel ikke dere hatt påtalemyndighet tidligere?
NN2:	Nei
Wilhelmsen:	Så det har ikke vært så mye utveksling mellom Kripos og rettssystemet kanskje. Det har gått via et politidistrikt.
NN2:	Ja, for det har jo vært politidistriktet som har vært oppdragsgiver. Vi har bistått så da har det vært påtalekompetansen i distriktet som har hatt et forhold til statsadvokaten.
Wilhelmsen:	Ja. Jeg tror den modellen og alt det jeg har laget det har jeg jo gjort for et års tid siden når det var Kripos så jeg tror ikke jeg vil gå så veldig på Nye Kripos for å si det sånn.
NN2:	Nei.
Wilhelmsen:	For da må jeg begynne å tegne alt om igjen sånn at det passer inn i den nye organisasjonen nå og det tror jeg egentlig ikke har noen hensikt i hvert fall ikke for min oppgave da.
NN2:	Nei.
Wilhelmsen:	Veldig mye av det vil være det samme, men flyten rundt vil kanskje være at den går til rettssystemet i stedet for til politiet.
NN2:	Ja, for nå kan vi ha egne saker. Egne saker med egen påtalekompetanse så det blir jo påtalejuristen her som kan snakke med statsadvokaten.
Wilhelmsen:	Ja, så da vil dere få en påtalejurist som går direkte. Men da vil det alltid gå via påtalejuristen og så inn til rettssystemet.
NN2:	Ja, nå er jeg litt på gyngende grunn, det er jo påtalejuristen som setter opp siktelser. I hvor stor grad statsadvokaten også har direkte kontakt med etterforskning, det kan du få sjekket opp både med NN4 og med NN5 som har operativ politibakgrunn.
Wilhelmsen:	Ja, da har vi kommet til om du kan fremheve noen problemer og suksesser dere har hatt i forbindelse med nye systemer.
NN2:	Ja, ett system som startet litt problematisk, men som har utviklet seg til å bli en suksess er DNA-systemet. På et tidspunkt ble det bestemt at man kunne registrere DNA-profiler til personer som hadde blitt dømt for helt spesielle straffbare handlinger, dvs. i henhold til visse paragrafer i straffeloven. Derved kunne man fra åsteder hvor det sikres biologisk materiale søke i DNA-registeret. Det var imidlertid lagt ganske restriktive regler på hvordan du kunne bruke systemet. I utgangspunktet skulle en ta blodprøve som gikk til analyse for å få fram profilen. Det var ikke alltid så lett, for hvis du skal ta blodprøve så må du ha helsepersonell til å gjøre det. Det hendte at disse reserverte seg for å foreta prøvetaking i fengsler. Dette førte til en utvikling hvor man i stedet kunne bruke en liten Q-tip og ta væske fra munnhulen og da ble det en prosess som enhver kunne gjøre. Videre så oppdaget man etter hvert at reglene for bruk var veldig stringente. Blant annet hvis du hadde en mistenkt i en sak, så hadde du anledning til å ta hans profil og sammenligne den mot det materialet du hadde i den konkrete saken, men du fikk ikke lov til å søke hans profil opp mot alle de uoppklarte voldtektssakene som lå inne i

	DNA-registeret med mindre han samtykket skriftlig. Og det gjør man ikke.
Wilhelmsen:	Nei, det gjør en vel ikke ofte.
NN2:	Helt til for et par år siden en gjorde det.
Wilhelmsen:	Ja vel.
NN2:	Jeg vet ikke hvorfor, men han gjorde det. Så vi søkte på profilen og fikk treff på en annen voldtektssak. Dette ble slått stort opp i pressen og nå er denne restriksjonen slettet. Etter dette ble det mer populært å sende inn prøver. Ulempen var imidlertid at dette kostet penger. Dette la en tydelig demper på aktiviteten. I et par år var det ikke så veldig mye som skjedde. Men så kom det en del pålegg som førte til at man fikk et løft i antall registrerte saker samtidig som bruken ble litt utvidet. Fra i år er det gratis for politidistriktene å sende prøver på dømte personer, så nå er den beskrankningen borte også. Åstedsprøvene må distriktene fremdeles betale for. Men man fikk den effekten at etter hvert som det ble lagt inn personer i registeret så hadde man en tilsvarende økning i antall hit. Så hit-antallet, det fulgte på en måte antall registreringer. Vi publiserte månedlige statistikker på hvordan dette gikk på intranettet for politiet. Nå har det eksplodert. De siste årene har det faktisk nærmest vært en dobling hvert eneste år på både registreringene og hitene som vi får i dette. Så DNA er, fra å være noe som ikke ble noe særlig brukt av flere grunner, plutselig blitt veldig effektivt. Et system som også har vært virkelig effektivt er et internasjonalt asylkontrollprosjekt vi er med på. EU fikk etablert et system for å håndtere Dublinkonvensjonen; Asylsøkere som driver og hopper fra land til land etter hvert som de får avslag skal sendes tilbake til det første landet som jo presumptivt vet hvor de kom fra og kan få sendt dem tilbake. Det ble etablert en fingeravtrykksdatabase, Eurodac. Vi fikk koblet vårt anlegg med fingeravtrykk automatisk opp mot dette slik at asylsøkere som kommer til Norge og som det blir tatt fingeravtrykk av blir automatisk sendt for søk til Eurodac. Vi får tilbake beskjed om vedkommende har vært registrert i et annet EU-land og det har da gjort at man har oppdaget veldig mange asylhoppere og falske identiteter så det er et system som virkelig har gjort det mye enklere å ta den første håndteringen av asylsøkere.
Wilhelmsen:	Eurodac?
NN2:	Ja, for det er dactyloscopy det står for.
Wilhelmsen:	Har du noe å tilføye utover det?
NN2:	Nå har jeg snakket om to systemer som i hvert fall har endt opp som suksess og som lenge var et problem. Et eksempel som ikke har vært det helt store er etterretningssiden. På et tidspunkt ble det etablert et nasjonalt Krimsys-system samtidig med etableringen av et narkotikasystem (Narksys) ved Oslo politidistrikt. Det ble så fattet en beslutning om at narkotikarelaterte saker skulle registreres i Narksys og all annen kriminalitet skulle i Krimsys. Dette fungerte ikke bra, for det var ikke slik at organisert kriminalitet drev med en ting, det var tvert imot slik at de kunne drive med spritsmugling og investere pengene i nark og prostitusjon. Etter hvert ble det slik at i Krimsys lå det narksaker og i Narksys lå det andre saker. Etter hvert var det ikke noe helhetlig oversikt lenger. Man visste ikke hvor ting lå. Det har vært jobbet veldig lenge for å få et nytt system og nå er det bestemt at et slikt skal utvikles. Et resultat var at det ble etablert nye lokale registre som igjen forsterket problemene. Nå skal det som sagt utvikles et nytt felles etterretningssystem. Så akkurat på etterretningssida har det ikke vært noen stor suksess med datasystemene.

Wilhelmsen:	Nei, hvis du hadde slått sammen begge i utgangspunktet, eller
NN2:	Hvis du hadde slått sammen systemene i utgangspunktet og sagt det at her fikk vi ikke etablere systemer ut ifra type kriminalitet hadde saken vært en annen.
Wilhelmsen:	Ja, noe mer å tilføye?
NN2:	Nei, ikke sånn uten at du spør meg om noe.
Wilhelmsen:	Nei, jeg tror jeg i grunnen har fått en god oversikt over det jeg ville. Så du skal ha takk.

Intervju med NN4 20.04.05.

Wilhelmsen:	Da begynner vi med planleggings- og beslutningstakingsprosessen.
NN4:	Hvis vi da tar tak i det som kalles et kriminaletterretningssystem i politiet så begynner jo egentlig planleggingsfasen med at man registrerer et behov for et slikt verktøy. Det dreier seg altså om at man ikke har et verktøy for å gjøre den jobben i dag eller at det verktøyet man har er rett og slett gått ut på dato, altså den teknologiske utviklingen har passert den eller at kriminaliteten har fått en annen form som gjør at vi må få andre verktøy, få andre løsninger for å systematisere informasjon. Det er det første man legger til grunn. Slik man har gjort det for eksempel innenfor kriminaletterretning. Det gjør jo at man begynner å se på hva kriminaletterretning egentlig består i. Hva er det man trenger å vite for å kunne drive kriminaletterretning? Man kartlegger den type informasjon, hva kriminaletterretning produserer, hva man trenger. Da har man kjørt gjennom en ganske bred kartleggingsfase hvor alle behov egentlig er dratt frem og så begynner man etter hvert å finne ut løsninger. Hvordan man skal levere denne varen, dette produktet. Det er planleggingsfasen, beslutningsprosessen er for så vidt enkel. På dette nivå beslutter jo Politidirektoratet at det skal innføres et nasjonalt system og nedsetter en arbeidsgruppe som da består av ekspertisen innenfor IKT som befinner seg på PDMT, ekspertene, de som bruker det ved politidistriktene, ved særorganene og også da en eller to personer fra Politidirektoratet for å ha ledende funksjoner i selve prosjektet. Det var vel litt kort om planleggingsfasen. Var det noe mer du ville vite?
Wilhelmsen:	Nei.
NN4:	Hvis vi da tar et litt mindre system, for eksempel journalsystemet, vi bruker Lotus Notes for å journalføre alle våre saker, hvor etterforskningsskritt blir ført og forespørsler blir journalført så er det klart at der begynner man igjen med at det er et behov for kontroll, et behov for å ha en kontinuitet i dokumentene, et behov for å ha oversikt på tvers av avdelingene. Hvem som jobber med hvilke saker og hvilke personer. Før man utreder så har man da hatt et behov for å komme sammen fra de enkelte avdelingene og skissere de behov man har for særegenheter, det være seg en spesiell type informasjon og hvordan man bearbeider saker osv. Og så viser det seg at man ofte kan komme ned til en ganske ensartet informasjonsflyt og så lager man da et system på det. Beslutningsprosessen her blir jo da vurdert av avdelingsledelsen eller ledelsen ved Kripos som bestemmer og gjennomfører utviklingen av sånne prosjekt på informasjonssystemene.
Wilhelmsen:	Når det oppstår et behov, blir det i vurderinga i planleggingsprosessen ofte tatt hensyn til de andre systemene som ligger til Kripos?
NN4:	Ja, det har vel egentlig ført til hvordan man kan benytte de systemene man allerede har i gang. For vi har nok systemer. Det er nok en overordna oppfatning at det er nok systemer, det er nok løsninger, det er nok ikoner å trykke på så man skal helst ha færre systemer enn det man egentlig har i dag. Man skal ikke ha noen flere i hvert fall. Man ser veldig mye på det man har før man kan begynne å lage noe nytt.
Wilhelmsen:	Så når dere lager nye elektroniske systemer blir det diskutert hvilke plattformer de andre systemene har sånn at det kan skje en elektronisk uteksling, eller blir det mest fokusert på den oppgaven en skal løse?
NN4:	Plattformen er i utgangspunktet lagt av PDMT altså hvor man har såkalte NT-

	mastere og XP-mastere som ligger i bunn og som legger plattformen. Å komme med noen annen plattform enn det ville være veldig vanskelig for da må man gjennom en lang, lang prosess for å få godkjent den plattformen som en slags masterløsning i politiet og jeg tror til nå så har vel egentlig PDMT bare godkjent 2 masterløsninger i løpet av en 5 – 6 år. Jeg tror ikke det er noen problematikk egentlig. Man må forholde seg til den plattformen som ligger der i infrastrukturen.
Wilhelmsen:	Så er det trekk som er karakteristiske for informasjonssystemer.
NN4:	Ja, hvis man for eksempel tar et regnskapssystem så er det jo ofte at regnskapssystemer er standardiserte for rørleggerbedrifter og elektrikerbedrifter og snekkerbedrifter og det går rimelig greit. Men politiet som etat er et nisjeprodukt i samfunnet, i særdeleshet i det norske samfunnet, og der er det en del ting man må se hen til. Man driver jo ofte på samme måte som en del andre bedrifter, men settingen er at det er en del spesielle ting, altså dette med at man skal tenke på at man skal ha dokumentasjon for bevisføring, man skal ha en notoritet, man skal ha politibegrepene, man skal ha en relasjon til straffesakskjeden som man ikke ser i noen andre bedrifter. Det er ingen bedrifter som jeg kommer på sånn automatisk utenom tollvesenet og kanskje en del advokatfirmaer som er så relatert opp til straffesakskjeden for produksjonen sin. Så hensynet til straffesakskjeden, det tror jeg at jeg vil si er karakteristisk for politisystemet. Så er det jo også det at en del politibegreper og polititermer er ikke noe mer spesielle enn det et laboratorium har som spesial-, hva skal vi si, spesialspråk og stammespråk internt, så det er ikke mye spesielt egentlig å se til for politiet. Det tror jeg ikke.
Wilhelmsen:	Da går vi over på informasjonssystemene og hvilke informasjonssystemer for operativ kriminalanalyse det er på Kripos i dag. Og når jeg sier i dag så tenker jeg på Kripos før nye Kripos. Hvis det er noen endringer da?
NN4:	Jeg tror ikke det er så veldig mye endringer. De er jo veldig saksavhengig egentlig. En operativ kriminalanalyse kan gjøres i mange forskjellige saker og selvfølgelig i sin natur avvike alt etter hva slags straffesak man snakker om. Snakker man om en økonomisk etterforskning så vil det nok være noe annerledes enn det vil være i en drapssak kontra det i en internasjonal etterforskning. De informasjonssystemer i det alt vesentligste som er brukt i dag er jo de sentrale systemene som du har tilgang til fra din egen pc. Strafferegisteret, SSP, folkeregisteret, DUF, altså register over utledninger og andre av annen herkomst som bor i Norge. Man har telefonkatalogen, man har kriminaletterretningssystemene, BL og PO. Det er egentlig alle de politisystemene man har tilgang til. I tillegg så bruker man da informasjon fra teletilbydere, bank, post, Brønnøysundregistrene, firmaopplysninger, Tollvesenet osv. Men i det alt vesentligste det man bruker er BL, PO og de sentrale systemene.
Wilhelmsen:	PO det står for?
NN4:	Politiets operative, det er vaktloggene som man bruker ute i politidistriktene. Man fører oppdrag inn i vaktjournaler osv. For det er klart at politiet kommer i kontakt med veldig mange personer og det er klart at mye av denne informasjonen vet man ikke hva man skal bruke til på det tidspunkt som man er i en kontrollsituasjon. Men i ettertid kan det være av vesentlig betydning for oppklaring av straffbare forhold som man ikke visste om på det tidspunktet kontrollen foregikk. For eksempel ferietyverier. Man har sett saker nede på Oslo S og man stopper folk rundt omkring i forkant og skriver ned dette og det

	er klart at denne informasjonen er vesentlig for å drive analyse når man i ettertid ser hva som skjedde. Ellers er det stort sett å gå inn på de sentrale systemer og gå gjennom dem. Det er Strasak, SSP, kriminaletterretnings-systemene altså Krimsys, Usys, Interpol sine inn- og utdragerbaser som ligger med telegrammer inn og ut, saksregisteret er jo alltid interessant for dagen og gå tilbake igjen til passkontorene og se på innleverte pass, reiser osv. I internasjonale saker kan det hende at man må innom Nsys for å se i hvilken grad det kan være omhandlet som internasjonalt etterlyste eller om det finnes noe informasjon liggende der. Folkeregisteret er jo egentlig det som ligger i bunnen av alt. Folkeregisteret kan du bruke til å identifisere folk ut ifra 11 siffer. Navn blir ofte litt dårlig. Ellers går det selvfølgelig på om en person har vært etterlyst, hvem han har vært etterlyst sammen med osv. DUF er som sagt utlendingsregisteret, hvem de er relatert til de når kommer, hvilke saker de har hatt osv. Økosys for hvilke kjøretøyer de har hatt. Et nennsomt utvalg av de mest anvendbare, selvfølgelig varierer det fra dag til dag. Skal vi da gå videre på nettet eller?
Wilhelmsen:	Ja, da vil vel etterforskeren ha tilgang til
NN4:	Alle registre ja. Altså selvfølgelig ting som telefonlister som kommer fra teletilbyder vil man jo ikke ha tilgang til. Panteopplysninger, transaksjonsdata på kontoer vil man selvfølgelig ikke ha tilgang til. Det samme gjelder jo for skatteetat, ligningsetat, aksjer osv, dem vil man heller ikke ha tilgang til. Tollvesenets systemer vil man heller ikke ha tilgang til.
Wilhelmsen:	For å få ut informasjon fra disse registrene, da må du ha spesiell tillatelse?
NN4:	Ja, det er registre som ikke ligger under politiet. Aller typisk er jo f.ek.s fra banker der man ber om en utlevering på grunnlag av en rettslig kjennelse eller en begjæring, eller at man rett og slett går inn og ransaker og tar beslag. Det er forskjellige måter å få ut denne informasjonen på. Vi har selvfølgelig ikke online tilgang til dette.
Wilhelmsen:	Nei, men de fleste systemene som er politiet eller Kripos sine, der vil etterforskeren kunne gå inn og hente ut informasjon selv.
NN4:	Ja.
Wilhelmsen:	Da er de i veldig liten grad avhengig av andre?
NN4:	Ja, han er avhengig av opplæring. Altså den tekniske duppeditten er til stede. Infrastrukturen er på plass slik at man kan hente data fra de forskjellige databasene rundt omkring, men det krever jo da at brukeren er opplært og har et visst kompetansenivå. Det er klart at hvis det er noen systemer her som man veldig, veldig sjelden bruker, så kan det være at man må få andre til å ekstrahere de dataene som man trenger og så kan man da selv jobbe videre med det.
Wilhelmsen:	Men det vil vanligvis ikke være noe problem å få hjelp til sånne ting?
NN4:	Nei. Det som kanskje er utfordringen er jo at det gjør brukerne bevisst på hva de kan og hva de ikke kan. Problemet oppstår i det tilfellet du tror at du kjenner et system så godt at du får ut alt det du trenger, så viser det seg at din egen oppfatning av ditt eget kompetansenivå er feil. Da har du et problem.
Wilhelmsen:	Og at du da vurderer dataene du har fått feil.
NN4:	Ja, at du også kan tolke de feil. Det kan skje. En annen ting er at hvis du ikke vet at du kan ta ut relasjoner mellom foreldre og barn på folkeregisteret så får du det ikke ut. Hvis du da tror at du må ta kontakt med ligningsvesenet så er det noe feil. Hvis du da ikke vet hva en gitt kode egentlig betyr i et system så får du en feiltolkning. Det er den menneskelige faktor, å være sikre på at

	operatøren har et høyt nok kunnskapsnivå og ikke overvurderer sin egen kompetanse. Det var vel det om pkt. 4 om alle informasjonssystemene er tilgjengelig, der vil jeg svare ja med de begrensninger som gjelder.
Wilhelmsen:	Ja.
NN4:	Hvordan utveksles informasjon mellom Kripos og politiet? Altså, det er jo veldig mange måter å gjøre det på egentlig. Du kan jo si at i de tilfellene hvor vi får en skriftlig forespørsel inn hit, så svarer vi i utgangspunktet skriftlig, og det er jo for så vidt greit. Når man ringer får man et muntlig svar og når man sender en telefaks så får man svar. Når man sender en e-post får man svar osv. Det som er mer interessant er jo i de tilfellene hvor vi ønsker å legge ut informasjon hvor vi ikke vet hvilket politidistrikt dette kan være relevant for. Det er litt interessant og der har man i hvert fall to godt fungerende system, ved at kriminal- og etterretningssystemet som i dag er i Krimsys hvor man registrerer hendelser, personer og organisasjoner som kan være aktuelle for politidistriktene ute. Politidistriktene søker og får tilgang til den informasjonen som Kripos har. Så har vi Politiforum, som er en sak som ligger på Intranett, som egentlig er et ukeblad for politifolk som går på etterlyste personer, modus, hvem som er tatt for hva, vitner som etterlyses, tyvegods som er funnet her og der osv. Her kan man gå inn og oppatere seg selv og se hva som har skjedd den siste uka. Det er klart at her blir det bare lagt ut informasjon uten at man egentlig vet hvem mottaker er. Så mottakeren må faktisk gå inn å lese og se på dette.
Wilhelmsen:	Men når da etterforskning pågår i en sak og Kripos er involvert. Kan da Kripos bruke de samme systemene som politiet bruker, eller har du en elektronisk utveksling? Eller er det slik at du tar ut av et system og legger det inn i det andre systemet?
NN4:	Til en viss grad så er det utveksling. Man jobber nå med at BL skal bli slik at man skal kunne sitte inne og logge seg på en BL-sak i Mosjøen eller i Bergen eller hvor det måtte være. Slik som det er i dag så har man identiske kopier av BL-basen rundt omkring. Så det vil si at man i Haugesund produserer avhør i en sak og produserer det i BL, men man sender elektronisk til Bergen slik at de tar det inn i sin BL-base. Altså, det produseres i samme format og kan tas inn. Alle avhør som blir produsert nasjonalt blir automatisk nasjonalt tilgjengelig. Det er kun tilgjengelig i det enkelte politidistrikt i det øyeblikket du gjør en jobb for et annet politidistrikt. Du møter, du gjennomfører avhøret, sender det til neste politidistrikt som skal ha det og tar det inn i din løsning, da blir det som et dokument som er produsert.
Wilhelmsen:	Hvert politidistrikt har ansvar for at sin del av BL er oppdatert?
NN4:	Ja.
Wilhelmsen:	Og så kan andre lese det?
NN4:	Alle kan gå inn og lese og søke i BL hvis de har tilgang selvfølgelig. Det er jo igjen tilbake til spørsmål om tilgang. Infrastrukturen er der. Man vil også, så vidt jeg har forstått det, legge til rette for en felles nasjonal dokumentserver slik at man kan slippe å søke på hvert enkelt politidistrikt, man kan søke på et nasjonalt nivå. Alle dokumenter som blir produsert.
Wilhelmsen:	Nå må du søke pr. politidistrikt pr. sak?
NN4:	Nå må du søke pr. distrikt, ikke pr. sak. Litt avhengig av hva vi skal hente ut, men vi søker først på et nasjonalt nivå, for eksempel etter en person og den personen har en straffesak i Stavanger, så går jeg inn i Stavanger og henter ut det. Men så er det jo en person som har hatt 40 saker i Stavanger, 40 saker i

	Kristiansand, 40 saker i Bergen og 40 saker i Trondheim. Da blir det en veldig stor mengde informasjon du må gjennom. Da får du delt den opp i sekvenser etter politidistrikt. Så man har tilgang til det, men når det gjelder sånne, jeg holdt på å si mobile kriminelle, som flytter veldig mye mellom distriktene så må du logge deg på og av de forskjellige BL-basene. Du har tilgang, men det tar litt tid. Det ville det jo for så vidt gjort uansett om det ligger på en felles dokumentserver eller ligger på forskjellige servere.
Wilhelmsen:	Ja.
NN4:	Når det gjelder utveksling av informasjon mellom Kripos og rettssystemet, nå kjenner jeg ikke til Lovisa og hvordan dette fungerer, men i det alt vesenligste så er det i papirformat slik jeg kjenner til det.
Wilhelmsen:	Ja, og det har vel ikke vært så veldig stor utveksling mellom Kripos og rettssystemet heller før dere fikk påtalemyndigheten?
NN4:	Nei, hvis du referer til Kripos, så kan jeg jo si at før Nye Kripos fikk påtalemyndighet så var det politidistriktene man jobba for som sendte dette til retten og som stod for rettsforhandlinger osv. Så hvis man sier Kripos og rettssystemet så blir det jo garantert papir. Og også den andre veien, tilbake igjen da. Dommen kommer i papirformat og kjennelsene kommer i papirformat.
Wilhelmsen:	For de fikk dere fra rettssystemet slik at dere kunne oppdatere sakene her hos dere?
NN4:	Ja, så ble det da også desentralisert slik at hvert politidistriktet har ansvar for sine. Når en person får en dom som er rettskraftig så er det politidistriktet som har ansvar for å avslutte saken i BL, gjøre opp beslag og gjøre saken ferdig, så det er der informasjonen er nasjonalt tilgjengelig.
Wilhelmsen:	Så det var ikke Kripos?
NN4:	For lenge siden var det det.
Wilhelmsen:	Men de siste 4 – 5 åra?
NN4.	Nei, da har man faset ut dette med føring av dommer og det ligger til retts- og påtalefunksjonen og det er politidistriktene som er naturlig. Det vil bli ganske unaturlig at i det øyeblikket vi får en avgjørelse i straffesaken så skal den sendes inn hit for oppdatering, så det er mye bedre at de har ansvaret for det selv og da ser de også mye mer helheten i straffesakskjeden og behovet for å registrere og gjenbruke informasjonen.
Wilhelmsen:	Ja. Så det siste da om du kan fremheve det du opplever som problemer eller suksesser med nye systemer som dere har innført?
NN4:	Hvis vi går tilbake i tid så var det et problem at det ble nye systemer. Altså, det var faktisk problemet at man ikke så nok hen til helheten, men at man produserte nye systemer, frittstående, enkeltstående løsninger. Typisk er journalsystemet i Kripos som ikke er elektronisk samkjørt med de andre dataløsningene som gjør at man har et system man bare må putte data inn i og som ikke er nasjonalt tilgjengelig. Det var et problem, nå kan jeg si at det egentlig er snudd til en suksess for nå ser man nettopp dette at fordelen, eller fordel og fordel, poengene med å innføre nye systemer er å prøve å slå sammen eksisterende løsninger. Typisk er en bil, altså du ser en bil som er stjålet. Den ligger i ELYS, den ligger i Autosys og den ligger også i det lokale BL. Det er altså en trippelregistrering. Nå har man fått til en integrering mellom dette. Når en bil blir stjålet nå blir det sendt melding automatisk fra BL til ELYS og Autosys og også til Interpol og Schengenlandene. Nå er det en automatikk og en kontinuitet i dette så suksessen er jo det at man har sett

	helheten og fått ting til å fungere mer i helhet, at man har fått en felles plattform å stå på. At man har fått et felles straffesakssystem og et felles politioperativsystem og at man ikke har 27 forskjellige formater på alt man har rundt omkring, at man ikke har 27 forskjellige måter å ta avhør på rundt omkring, men ensartet og strukturert. Dokumenter fra et politidistrikt kan automatisk tas inn i en database hvor som helst, i et hvilket som helst annet politidistrikt uten at en trenger å gjøre noe med det. Alt er laget over samme lest, det er kopier av databasens struktur og alt sånt er det samme. Er det noen flere suksesser vi har hatt?
Wilhelmsen:	Bare et lite spørsmål først. Du sa at Kripos hadde et journalsystem som ikke snakket med de andre. Hva het det?
NN4:	Omnis7, et Omnis databasesystem.
Wilhelmsen:	Men når du snakker om journalsystem nå, var det et system der du førte inn all informasjon som kom inn i en sak?
NN4:	Ja, det var et journalsystem som bare ble brukt ved 2 eller 3 avdelinger ved Kripos som man nå er på veg til å fase ut. Man bruker kanskje Omnis enda ved laboratorieavdelingen hvor man tar materialet til undersøkelse og man kjører dette igjennom en prosess ved en laboratorieavdeling og så kommer det en rapport ut som sendes tilbake igjen.
Wilhelmsen:	Og den rapporten blir lagt inn i det journalsystemet?
NN4:	Den er produsert der, men den ble sendt tilbake til oppdragsgiver som gjorde den tilgjengelig gjennom BL-systemet. Men settingen er at BL er ikke lagt for laboratorieoppgaver. Altså oppgavene på en laboratorieavdeling er så spesielle at der trenger man en del hyllevarer, for så vidt, for laboratorietjenester, men laboratorietjenester avviker såpass mye i sin natur fra etterforskning at man kan kanskje få et gigantverktøy for både laboratorietjenester og etterforskning, men det blir helt feil. Så det man gjorde da var at man satt ute og produserte en anmodning i et system. Sendte den inn her sammen med de objektene som skulle undersøkes. Det ble puncha på nytt igjen og så gikk det da den løypa det skulle og så kom det et resultat ut i andre enden som da ble sendt tilbake til operativ. Så det var egentlig systemet. Og det at man hadde et journalsystem på e-avdelingen og et journalsystem på laboratorieavdelingen og et på en tredje avdeling gjør det ganske innfløkt. Så man jobber seg nå mot et felles journalsystem og det tror jeg vil bli veldig, veldig mye bedre. Da snur man egentlig et problem til en suksess.
NN4:	Det var stort sett det. Har vi hatt noen flere suksesser da. Det tror jeg egentlig ikke. Det vi har hatt suksess med faktisk det kan man se i implementeringen av NSYS. Altså, hvor Norge ble medlem av Schengensamarbeidet og besluttet seg for at all informasjon som kom inn til NSYS skulle gjøres nasjonalt tilgjengelig. Det vil si at man tok det inn i politiets masterløsning og derfra gjorde det tilgjengelig for politienhetene ute. Uten noen form for punching eller noen ting. Det foregår en viss kvalitetskontroll for å sjekke kriminalitetsparametre, om dette er straffbart etter norsk lov osv. Og så blir dette gjort nasjonalt tilgjengelig. Dette er en suksess når vi da har en infrastruktur som går over hele landet som gjør at informasjon som blir gjort internasjonalt tilgjengelig er tilgjengelig for hele politiet i Norge umiddelbart. Dette uten at man trenger å skrive noe nytt og legge til noe. Det er en suksess, absolutt.
Wilhelmsen:	Hadde du noe mer å tilføye som jeg ikke har tenkt på?
NN4:	Det er ikke så godt å si. Nei, altså jeg tror egentlig ikke det. Jeg tror vi har fått

	en ganske grei gjennomgang. Hvis jeg bare skal si noe om det er noen trekk ved planleggings- og beslutningsprosessen som er karakteristisk for politisystemer, så er det kanskje det at vi har vel ikke fokus på profitt. Vi har mer fokus på effektivitet og gjenbruk enn det man kanskje har ved en del andre plasser. Vi er ikke en virksomhet som tjener penger, vi er en virksomhet som forvalter ressurser og da er det jo mer fokus på dette med effektiv gjenbruk og effektiv forvaltning. Man har en veldig god gjennomgang på de temaene som går rundt det. Stikkordet er gjenbruk av informasjon. Det tror jeg kan være viktig å få frem. Ellers så er resten greit.
Wilhelmsen:	Ja, da skal du ha takk.

Intervju med NN5 20.04.05.

Wilhelmsen:	Vi kan begynne med planleggings- og beslutningstakingsprosessen, kan du beskrive en typisk planleggings- og beslutningstakingsprosess for innføring av et informasjonssystem her ved Kripos?
NN5:	Ja, hvis jeg for lov, så kan jeg tenke meg å starte litt i forkant.
Wilhelmsen:	Ja, gjerne.
NN5:	Min erfaring med det er jo at nå og da blir det født en ide eller så er det noen som kommer over et system som de anser for å være formålstjenlig å ta inn i organisasjonen. Da kan det være at man har dette liggende på et veldig lavt nivå hvor man tester dette litt ut, kanskje uoffisielt, bare for å se om dette kan være noe. Er dette noe å gå videre med osv. Så kjører man dette opp, formaliserer det. Det er jo en veldig hierarkisk organisasjon vi befinner oss i, så det blir løftet gradvis oppover i organisasjonen og på et gitt tidspunkt blir det fattet en beslutning om at vi skal se nærmere på dette. Da tar vi utgangspunkt i at dette er et system som allerede er ferdig utviklet og ønsker da for eksempel bare å implementere det i organisasjonen. Vi får da en demo av dette og så går vi tilbake i tenkeboksen og ser på hvem som har behov for dette systemet, på hvilken måte kan vi utnytte det. Og så lager vi da kanskje en plan i forhold til dette. Den planen går da på økonomibiten, vi må ha midler til å finansiere dette, den inneholder en opplæringspakke, og den vil inneholde en implementeringsbit, rent teknisk. Det er den måten jeg er vant til at vi kjører det på. Jeg skal øyeblikkelig i gang med en slik prosess selv. Det har på en måte kommet så langt i forhold til denne spesifikke biten at vi skal ha et møte hvor jeg kommer til å samle de aktørene i organisasjonen som har beslutningsmyndighet og slik at vi kan gå tilbake i tenkeboksen eventuelt si at vi går for dette, eventuelt at vi kutter det ut. Hvis vi går for det så er det snakk om hvordan vi kan avsette midler til dette, la oss si i 2006. Vi må begynne å planlegge slik at vi kan få det inn i virksomhetsplanen og som et resultatmål og selvfølgelig da avsette midler til det. Da lager vi en kortsiktig plan for hvordan vi skal gjøre dette, veldig enkelt sagt. Det er jo en del skjær i sjøen dersom du skal fokusere på opplæringen. Jeg har jo allerede sagt litt om hvordan vi tenker når det gjelder økonomibiten. Når det gjelder opplæringsbiten så er kanskje det den biten jeg vil si det svikter mest. Hvis du skal ta den tekniske biten så vil jeg si at vi har såpass profesjonelle folk at det klarer man alltid å få til. Det er noe som jeg i liten eller ingen grad involverer meg i. Når det gjelder opplæringen så er det slik at totalt sett når det gjelder IKT-verktøy så utnytter man jo bare noen få prosent av det. Jo, du får en kort innføring og opplæring. Du får kanskje et helt nytt dataverktøy og så skal du selvfølgelig begynne å bruke dette fra dag en etter at du har blitt gitt opplæringen, men så er det mange andre gjøremål og så glemmer man det. Slik at i forhold til veldig mange dataverktøy som vi bruker, så bruker vi bare en del andel av mulighetene som ligger i verktøyet. Den totale utnyttelse av IKT som er tilgjengelig i politiet, den er lav. Følger du resonnementet mitt?
Wilhelmsen:	Ja.
NN5:	Det er kanskje ikke enestående for denne institusjonen eller politiet, håper jeg.
Wilhelmsen:	Nei, det tror jeg ikke.
NN5:	Jeg vet ikke om det var svar på det du ønsker i forhold til planleggings- og beslutningstakingsprosessen?
Wilhelmsen:	Når det dukker opp et system som dere kunne tenke dere å innføre, vil dere i

	vurderingsprosessen tenke på de andre systemene dere har og hvordan det eventuelt kan inkorporeres med andre systemer? Eller blir det sett på som en isolert bit fordi det er en oppgave som trenger det?
NN5:	Nei, vi prøver alltid å tenke enhetlig. Hvordan kan vi anvende dette i kombinasjon med andre systemer. Hvis vi tar det helt ned på det daglige nivå på mitt avsnitt som er Analyst Notebook, og I2, det produktet.
Wilhelmsen:	Analyst Notebook er et produkt fra I2?
NN5:	Ja, det er klart at dette er et produkt som vi har hatt stor suksess med og er veldig godt fornøyd med og nå kommer de med en ny løsning som heter IXV. Den ligger på beddingen og jeg må ta et initiativ og se på hvordan kan vi utnytte denne i vår organisasjon. Vi har ikke kommet så langt at vi har tatt en beslutning, men det verktøyet er jo i samme familien som Analyst Notebook så de to verktøyene kommuniserer veldig god sammen selvfølgelig. Det blir som Word/Excel innenfor Microsoft. Det er det samme brukergrensesnitt, begrepene er de samme osv., som vi i dag er veldig godt kjent med slik at vi håper vel da på at vi skal spare inn en del i forhold til opplæring. Vi prøver alltid å tenke helhetlig, men det er jo det at behovene i en del tilfeller er så spesielle at det ikke er, pr. i dag, teknisk mulig å få alle systemer til å kommunisere sammen. Det var jo et veldig enkelt eksempel. Det er jo innenfor Kripos du ønsker å få svar på dette?
Wilhelmsen:	Ja, de andre har også snakket noe om at Politiets data- og materielltjeneste av og til er inne når det gjelder innføring av informasjonssystemer? Når du har sett på det nye verktøyet, har PDMT vært med å vurdere det, eller er det noe som kommer nedenfra og opp?
NN5:	I forhold til det konkrete verktøyet så har jeg tenkt å involvere PDMT, invitere de, nettopp fordi jeg ønsker at de skal få et innblikk i hvilke dataverktøy som finnes ute på markedet. Vi inviterte de med på et samarbeid for en tid tilbake. Men da virket det som de ikke var noe spesielt interessert. Nå vil jeg si det så enkelt at det kan man kanskje også sette på kontoen manglende kapasitet. Vi kan ikke bare legge det på manglende vilje. Men vi opplevde det i alle fall slik at de uteble i den prosessen som vi da ønsket. Hvis vi skal tilbake til dette med opplæring. DocuLive er et journalsystem som vi anvender i vår organisasjon og der er det klart at det på et tidspunkt ble gitt opplæring. Du får en dags opplæring og du skal ut og bruke dette. Når du da kommer tilbake til arbeidsplassen så er det så mye annet som skal tas at for mitt vedkommende så gikk det mange uker før jeg fikk tid til å gå inn igjen i DocuLive og det er klart at da er det nærmeste som å si ”Rykk tilbake til start”.
Wilhelmsen:	Ja.
NN5:	Ett av inntjeningspotensialene vi kunne hatt, det var å kjøre repeterende kurs. Når du har jobbet litt med det, er det klart at du er bedre i stand til å absorbere detaljene i et system enn det du er når du starter på en grunnopplæring.
Wilhelmsen:	Du har litt flere knagger å henge det på.
NN5:	Ja.
Wilhelmsen:	Dere har en del informasjonssystemer og en del er kanskje veldig forskjellige så du må ha mye kunnskap for hvert enkelt system. Du kan ikke dra så veldig mye nytte av den kunnskapen du har fra andre systemer?
NN5:	Nei, det er veldig lite. Men det er klart at veldig mange av politiet sine systemer, de kommuniserer overhodet ikke sammen. Det er et kjempeproblem for oss politi. Da jeg jobbet på IKT så hadde jeg en del

	presentasjoner, og da snakker jeg om cirka 40 systemer som politiet hadde tilgang til. Da var det slik at jeg var regnet som en spesialist, men likevel så kunne jeg ikke alle systemene. Og sånn må det nødvendigvis bli. For den som da jobber med systemene bare delvis fordi hovedoppgaven går ut på å ta avhør, har ikke mulighet til å bli gode i alle disse systemene. Han vil jo selvfølgelig bli god i noen av systemene, men han vil ikke bli god i bruken av systemene samlet sett, nei.
Wilhelmsen:	Men vil han ha adgang til systemene?
NN5:	Han vil normalt ha tilgang til de fleste systemene. Det er jo faste rutiner når det gjelder å gi tilgang og det er ut i fra behov. Selv politietterforskere får tilgang til et gitt sett med systemer i kraft av å være etterforsker. Sivilt tilsatte som for eksempel på IKT vil få en høyere tilgang til disse systemene, mens en som jobber for eksempel i resepsjonen ikke har tilgang til noen av disse systemene. Hvis vi snakker om de rent politioperative systemene.
Wilhelmsen:	Ja, de er jo det som er hovedfokus for meg da.
NN5:	Man får tilgang etter type funksjon, og dette er det faste rutiner på.
Wilhelmsen:	Ja. Er det noen spesielle trekk ved planleggings- og beslutningstakingsprosessen?
NN5:	Hos oss?
Wilhelmsen:	Ja, eller som er karakteristiske for politisystemer.
NN5:	Jeg vil si det er lite helhetlig tenkning hvis du skal si noe om dette. Det er nok et helt stykke veg å gå. Det har kommet seg nå de siste årene, men det som har preget politisystemene er lite helhetlig tenkning. Det oppstår et behov, det behovet må dekkes og så lager man en løsning som dekker akkurat det behovet. De dagene det brenner såpass sterkt er man bare nødt til å dekke behovet uten å stoppe opp og tenke hvordan kan vi tenke helhetlig. Så det fører da til at det blir selvstendige systemer. Det preger hele denne prosessen på godt og vondt.
Wilhelmsen:	Har du noe mer å tilføye til planleggings og beslutningstakingsprosessen.
NN5:	Nei.
Wilhelmsen:	Da går vi over til informasjonssystemer. Hvilke systemer anvendes i dag?
NN5:	Hvis du ser på datasystemer så anvender jo vi i det daglige Excel og Analyst Notebook. Det er de to dataprogrammene som vi bruker mest. Det er klart at Excel har en begrensning på rundt 65.000 rader og med den informasjons-mengden som i dag brukes blir dette veldig tidlig for lite. Så da gikk vi over på Access som dataløsning og som supplement til Excel. Det vil igjen kreves en del opplæring for at den enkelte skal være i stand til å bruke dette, men de som har behov for det har laget løsninger som dekker det behovet slik at sånn sett så går dette bra. Og så er det Analyst Notebook på motsatt side. De to er på en måte hovedverktøyene som vi i dag bruker. Excel og Analyst Notebook.
Wilhelmsen:	Det nye som I2 nå hadde utviklet, IXV, hvordan er det i forhold til det med Excel og Access?
NN5:	Det er et supplement til Analyst Notebook. Det som Analyst Notebook inneholder, det er veldig sterke analysefunksjoner. Se koblinger på tvers osv. Problemet er jo bare det at etterspørselen i forhold til visualisering av hendelser er såpass stor at mange bruker Analyst Notebook bare for å visualisere hendelser, situasjoner osv. Da bruker du jo 0,1 % av mulighetene og kapasiteten i selve datavaren. IXV var da mye mer tilrettelagt for visualisering på bekostning av analysefunksjonene. Pluss at dette blir en langt

	billigere løsning. Ja, det er en del funksjoner i dette verktøyet som ville være formålstjenlig. I tillegg så var prisen på dette noe lavere som følge av at man hadde skåret ned på analysemotoren i denne datavaren. Og dette er jo noe av det som er veldig viktig. Det er en stor, kompleks informasjonsmengde. Hvordan skal en for eksempel kunne presentere dette på en enkel måte når det skal fremlegges for domstolene. Dommerne er dus med mye av disse begrepene, men en jury vil jo ikke være kjent med alt det vi jobber med til dagen. Basestasjon, forklar det for en jury, det er hva det innebærer. Da er det veldig enkelt å kjøre en del gode visualiseringer av hvordan dette teknisk er bygget opp og da får juryen en saklig innføring i dette. Da vil de på en måte få noenlunde samme plattform hvis du skal gå videre. Da behøver du ikke bruke Analyst Notebook. Men det er her IXV kommer inn som et veldig sterkt visualiseringsverktøy.
Wilhelmsen:	Men vil da Notebook bli skiftet ut til fordel for IXV?
NN5:	Nei, vi er nødt til å ha den, for de som går inn og for eksempel kjører en telefonanalyse. De er helt avhengige av å ha Analyst Notebook. Men da kan en frigjøre litt kapasitet her slik at de som har enkle visualiseringsoppgaver som du for så vidt kunne gjort med penn for å spissformulere meg veldig. Det kan man da bruke dette dataprogrammet til og så kan du legge til informasjon i bakkant. Slik at hvis det på et gitt tidspunkt i visualiseringa er behov for å jobbe videre med dette, så kan man importere dette i Analyst Notebook og så har man et startpunkt å jobbe ut fra. Slik får du en viss gjenbruk av dataene. Men det er bare tanker hos meg foreløpig. Det er litt mer tankearbeid bak og så en gradvis innføring internt i organisasjonen og det kan være at vi skal kjøre et møte med I2 i mai/juni for å se på om vi skal gå videre med dette. Men da må vi som sagt ha på plass en del aktører. Helmer Haukaas på IKT bl.a. Han må være med på møtet og påse hvordan vi skal implementere dette i den totale IKT-strategien som er i organisasjonen, budsjett osv. Så som sagt i forhold til datavarer så bruker vi det. Hvis vi da går inn på ikke-maskinbaserte systemer. Hva tenker du da på?
Wilhelmsen:	Jeg tenkte på om det er system som er for eksempel papirbasert, at det er informasjonsflyt som er basert på papir, ikke elektroniske data.
NN5:	Papir, det verserer jo veldig mye dokumenter, men vi bearbeider alltid dokumentene slik at vi får det inn i et eller annet system.
Wilhelmsen:	Ja, men kan du ha utveksling fra det ene systemet til det andre, internt i Kripos, fra politiet, fra rettsvesenet?
NN5:	Ja.
Wilhelmsen:	Er det noen av de dataene som må tas ut i papir og legges inn i andre system?
NN5:	Det meste.
Wilhelmsen:	Ja vel, så det er ikke elektronisk overføring mellom de forskjellige systemene?
NN5:	Nei, da må vi bare differensiere dette. Hvis vi ser på politisystemene som vi bruker i etaten så har man selvfølgelig elektronisk utveksling av informasjon mellom noen av systemene. Det foregår elektronisk overføring mellom BL, Basisløsninger, som er saksbehandlingsløsningen som politiet bruker i etterforskningssaker, Strasak, som er straffesaksjournal, og Edis, som er registeret over etterlyste kjøretøy og personer. Så har vi båtmoter og litt småting til veldig enkelt sagt. Der er det elektronisk overføring, men for eksempel er det ingen kommunikasjon opp mot det sentrale straffe- og politiopplysningsregister SSP. Ingen kommunikasjon mellom de slik at der sitter man altså og trekker ut dommene, fordeler dokumentene, sågar kopi av

	rettsboken for kvaliteten på BL-dokumentet er ofte ikke god nok til at de uten videre kan tas inn i SSP. SSP kan vi ikke ha feil i for det får fatale konsekvenser. Som en del av kvalitetssikringsrutinen så får man dette inn i papirformat, store bunker hver eneste dag og så sitter man da på nytt og fører inn i SSP, bare som et banalt eksempel. Hvis du tar analysejobben som jeg er satt til å utføre, så har man altså BL-dokumentene. Der får man alltid plukke ut informasjonselementene av dette, laste dette inn etter et gitt mønster i for eksempel et Excel-ark og så må man da importere dette fra Excel og inn i Analyst Notebook for å jobbe videre med det. Men basispunchingen går fra papirdokumentene med manuell punching inn i et Excel-ark og så har man på en måte bygget plattformen for å importere dette i Analyst Notebook.
Wilhelmsen:	Så du tar det ut på papir fra BL og så punches det inn i Excel og så kan det tas videre?
NN5:	Ja, så hvis du tar NOKAS-saken i Rogaland som består av enormt mange permer, jeg vet ikke, vi snakker sikkert om noen hundre ringpermer. Den som har sittet med dette ansvaret har jo også måttet sitte der med disse ringpermene, lese gjennom saksdokumentene, ta ut det som er viktig informasjon og manuelt punche dette inn i et Excel-ark, eller de har en Access-base der siden informasjonsmengden er så enormt stor, og så jobber man videre med det ut i fra de punktene.
Wilhelmsen:	Men BL kan ikke brukes som et analyseverktøy da. Det er bare et registreringsverktøy?
NN5:	Det er et saksehandlingsverktøy som skal gi støtte til den enkelte etterforsker slik at han utfører etterforskningen på en mest mulig korrekt måte. La meg ta et banalt eksempel. Hvis du skal inngi en anmeldelse så plikter jeg før du inngir anmeldelsen å gjøre deg kjent med noe som heter anmelder- og vitneansvar. Det er jo at du skal opplyses om at det er straffbart å inngi falsk anmeldelse, eller uriktig forklaring for politiet. Det er klart at da plikter vi å gjøre dette og da vil vi automatisk gå inn i en hjelpetekst som minner deg på at nå må du huske på å gjøre kjent anmelder- og vitneansvaret. Følger du meg i resonnementet?
Wilhelmsen:	Ja.
NN5:	Så her finner man en rekke rutinetrekk som gjør at du som etterforsker ikke skal glemme å minne den enkelte på hvilke rettigheter og plikter han har når han møter hos politiet. Så det er på en måte det som er den sterkeste styrken til BL.
Wilhelmsen:	Men hvis du foretar et intervju med en kriminell eller et vitne blir det da lagt inn i BL?
NN5:	Ja, det er et elektronisk dokument og dokumentet består av 2 kategorier informasjon, den ene typen informasjon ligger i ulike felter som er sterkt standardisert og den andre typen informasjon ligger i tekstfelt som inneholder selve forklaringen. I de standardiserte feltene der er selve informasjonen om Peder Ås som vitne. Det vil selvfølgelig være definert som et etternavnsfelt, som et fornavnsfelt, som et fødselsnummerfelt osv og den informasjonen har man jo selvfølgelig elektronisk trukket ut. Selv om det pr. i dag ikke er så helt enkelt. Men forklaringen kommer inn som en del av friteksten. Og den biten må jo da leses. Det står da for eksempel at Peder Ås til tid og sted var sammen med Ole Olsen og Nils Nilsen. Hadde Ole Olsen gått inn i et felt så ville vi kunne trekke den informasjonen ut elektronisk. Hvis du da skal jobbe med den type informasjon så må du systematisere slik at også Ole Olsen og

	Nils Nilsen går inn i gitte felter. For det bruker vi da Excel eller Access når informasjonsmengden blir for stor.
Wilhelmsen:	Ja, men da har dere tatt ut manuelt hva som skal inn i Excel-arket.
NN5:	Ja. Nå skal ikke jeg si at de jobber etter samme mønster i dag, men jeg hadde et innarbeidet mønster for meg selv, hvor jeg for eksempel merket navn med gult, kjøretøy med grønt osv. Senere når du kommer tilbake til dokumentet igjen, og dette er nr. 2048 og det var et navn du skulle se etter så kunne du bare se etter de gule feltene. Var det opplysninger som jeg måtte få undersøkt nærmere så jeg bare kjapt nedover og da hadde du det med en gang. Jeg vet ikke om andre jobber etter samme mønster fordi det var min arbeidsrytme som jeg vente med til over noe tid.
Wilhelmsen:	Ja, men jeg vil tro at de fleste har en eller annen form for system for å skille.
NN5:	Ja, vi har jo forsøkt å videreføre dette selv om jeg antar at noen bruker samme fargemønster uten at jeg skal påstå det.
Wilhelmsen:	Ja, det ville jo være lettere å overta andes saker.
NN5:	Absolutt. Men det er ikke nødvendig å pålegge visse farger. Dersom det bare er et mønster i en sak så vet jeg hvilken farge jeg skal se etter. Når vi er ute på bistand, for å si litt om galskapen i dette, for å etterforske en stor sak så anvendte vi tidligere et system som heter R-base. Du kjenner systemet?
Wilhelmsen:	Ja, jeg har hørt om det.
NN5:	Det systemet var et system som bare vi hadde tilgang til, så da vi kom ut brukte vi dette, etablerte veldig gode rutiner og vi var der som oftest til saken var løst. Men vi klarer ikke løse alle saker, Geirangersaken, som et enkelt eksempel. Når vi da reiste igjen tok vi med oss R-base databasen og følgelig står politiet lokalt igjen litt på bar bakke. Det er en åpenbar svakhet i dette med informasjonsutveksling mellom vår organisasjon og politiet lokalt. Dette har da ført til at vi har gått mer over til standardverktøyene som Excel med de minuser og plusser som det måtte ha.
Wilhelmsen:	R-base var et analyseverktøy?
NN5:	Nei, database. En database som ga oss oversikt over navn, kjøretøy, den håndterte arbeidsoppgaver osv. Du kjenner til det.
Wilhelmsen:	Nå husker jeg det igjen, men det var så mange forskjellige system, så av og til er det litt vanskelig å skille dem.
NN5:	Ja, det skjønner jeg veldig godt. Vi prøver her i dag å etablere en ny datamodell som skal erstatte R-base for R-base har falt helt ut.
Wilhelmsen:	Dere bruker det ikke lenger?
NN5:	Ikke nå fordi det ble for store, ikke konflikter, men interessemotsetninger i forbindelse med at vi tar med oss hele databasen og reiser igjen. Og hva hadde de igjen lokalt? Så det er på en måte å prøve å tette litt av det tomrommet og etablere noe som man kan beholde lokalt når vi reiser igjen.
Wilhelmsen:	Ja, og som de kan operere?
NN5:	Ja, ikke minst det. Tilbake i 1997 så hadde vi oppe med PDMT, den gangen PD, at vi måtte få på plass det de kalte storsak i BL. Utarbeiding av navnelister, kjøretøylister, arbeidsoppgaver var en modul i BL. Men det har det altså ikke vært økonomi til å gjennomføre enda.
Wilhelmsen:	Nei vel, så det ligger ikke inne enda?
NN5:	Nei, og nå er vi i 2005. Vi tar det opp igjen med jevne mellomrom, vi får se. Det er det at uka er for kort til å vente på PDMT. Jeg vet ikke om dette er svar på det du spør om?

Wilhelmsen:	Jo, absolutt.
NN5:	Om du på en måte danner deg et bilde av hvordan ting er.
Wilhelmsen:	Jo, det gjør jeg.
NN5:	Jeg sitter ikke med fasiten, men der er mitt bilde av situasjonen.
Wilhelmsen:	Men det er ikke fasiten jeg skal ha. Derfor har jeg hatt intervjuer med ansatte fra forskjellige avdelinger, både innen IT og analyse. Det er greit å få forskjellige synspunkter på hvordan folk opplever det. Ettersom jeg har forstått så har dere ikke hatt så veldig mye utveksling av dokumenter eller informasjon med rettssystemet tidligere da dere ikke hadde påtalemyndighet. Det meste gikk via politiet. Har jeg forstått det riktig?
NN5:	Ja, det er riktig.
Wilhelmsen:	Men hadde dere noe samarbeid med rettssystemet og noe utveksling av informasjon?
NN5:	Med domstoler. Det kunne for eksempel være at de skulle ha oversendt straffeattest for å ta et eksempel. Og da henter vi dette ut fra SSP og sender det over til domstolene.
Wilhelmsen:	Da går det på papir.
NN5:	Ja, det går alltid på papir. Hvis du spør om det så er det jo galskap. Domstolene, hvis de har behov for en ajourført straffeattest for en tiltalt med spørsmål om den betingede dommen som han fikk for 4 måneder siden og den ikke var kommet med, eventuelt at man er kommet til kunnskap om at han fikk en betinget dom, så har jo dette stor betydning i forhold til straffeutmålingen. Da bør det være slik at domstolene enkelt selv kunne hente ut dette, men det kan man altså ikke.
Wilhelmsen:	Da må de ta kontakt med dere?
NN5:	Ja, en telefon hit og så er det vi som sender dette over. Det er jo som oftest aktor i saken som ringer hit og da står han kanskje i retten og skulle hatt dette i går.
Wilhelmsen:	All den type informasjon må innom dere? Hvis domstolene skal ha ut informasjon fra registrene som for eksempel Krimsys så må de henvende seg hit og få en utskrift?
NN5:	Ja, det kan jo hende at det er lokalt, men vi får veldig mye henvendelser på det.
Wilhelmsen:	Kan du fremheve problemer og suksesser dere har hatt i forbindelse med nye systemer?
NN5:	Ja, suksesser, vi har jo hatt suksesser med nye systemer. En type suksess er Analyst Notebook. Vi vet jo at det er veldig enkelt å håndtere informasjon hvis verden var statisk. Men de store informasjonsmengdene som kommer hit er alltid i bevegelse i forhold til at det kommer og går informasjonselement. Informasjon som foreligger og som ikke er verifisert blir kanskje verifisert og da for å håndtere dette så må du ha et litt robust verktøy og det er en typisk bit som har vært en suksess. På et litt lavere detaljeringsnivå, hvis du går inn på en telefonanalyse så vet vi jo også det at håndtering av 1:1 relasjoner og 1:M relasjoner er enkelt å håndtere. Problemet oppstår når du skal håndtere mange til mange, da blir verden plutselig utrolig kompleks. Excel håndterer 1:M eller M:1 veldig enkelt, men den håndterer ikke M:M. Det kan Analyst Notebook som definitivt er en suksess i norsk politi. Så jeg synes det på en måte er en skikkelig suksess. Med trafikkdata får du svar på bare noen få sekunder dersom du ønsker å se om 5, 6, 7, 8 personer har hatt jevnlig kontakt innbyrdes. Dersom du hadde gjort dette i Excel så måtte du ha tatt en og en

	og sett gjennom. Når det gjelder problemer, så er det jo dette med manglende kommunikasjon på tvers av de ulike datasystemene. Det er et hovedproblem for oss politi at de ulike datasystemene ikke kommuniserer sammen slik som de burde. Vi sitter og dobbeltfører alt mellom himmel og jord. For å starte i utgangspunktet så avsier altså domstolene en dom og det kan være Peder Ås som dømmes til 5 års ubetinget fengsel. Så sendes denne dommen som et dokument over til politiet som da sitter manuelt og fører dette dokumentet inn i BL. Da tenker jeg på domsslutningen hvor det står for eksempel at Peder Ås dømmes for overtredelse av straffelovens § 162, 2. ledd til fengsel i 5 år. Da må altså de i BL sitte å plukke ut 5 år sette det inn i et gitt felt, deretter må han sette inn hvilken lov det gjelder, hvilken bestemmelse det gjelder osv. Så skal man sende dette inn til oss. Som følge av at det pågår denne dobbeltføringen, at den foreliggende rettsboken sendes i papirformat til politiet så er det alltid en risiko for at man puncher feil. Dermed krever vi rettsboken når vi skal føre rett inn i SSP, som også skjer manuelt, så da får vi oversendt rettsboken som et Word-dokument i papirutgave da. Vi får BL-dokumentet som et fastlagt skjema med felter navn, personalia osv og så sitter vi i siste instans og fører dette inn. Grunnen til at vi som sagt har rettsboken er jo nettopp for å kvalitetssikre for det gjøres en god del feil. Og det er nokså naturlig når det skal gjøres manuelt gang på gang på gang. Men vi har jo såpass mange kvalitetssikringsrutiner at feilmarginen er helt marginal. Men vi gjør også feil så vi oppdaterer ut fra spesialrapporter. Dette er tilbake til min tid på IKT, men jeg har på en måte tatt det med meg hit. Så jeg kjører av og til spesialrapporter fra SSP for å fange opp eventuelle feil. Veldig mye av det som føres i SSP er jo koder. Straffeloven for eksempel er lov 001, bare for å gi et litt banalt eksempel, mens 100 er en helt annen lov og 010 en annen. Det er klart at når du da sitter for eksempel å puncher veldig mange 001, 001 så kan det være at det står 010 i stedet for 001. Og da er det klart at du må ha en rutine som gjør at du kan fange opp dette. Det har vi veldig godt innarbeidede rutiner for slik at det står det de faktisk er domfelt for, overtredelse av straffeloven og ikke vegtrafikkloven for eksempel som er en klassiker. Det er ikke så farlig hvis det er den veien. Problemet er hvis det er motsatt.
Wilhelmsen:	For å sette det på spissen så kan det ende opp med 3 resultater, en i domsboka, en i BL og en i SSP?
NN5:	Ja, og da kan det være at dette blir fanget opp i forhold til spesialrapporter vi kjører ut, men vi klarer ikke fange opp alle. Men feilprosenten er helt marginal i dag. Det er enormt gode rutiner på det, men det er klart at det skal ikke være sånn at det føres inn i 3 ulike systemer. Det går på datakvalitet, og det går på gjenbruk og ressurser. Jeg vet ikke om det gir et innblikk i forhold til fremheving av problemer?
Wilhelmsen:	Det gir et veldig godt innblikk.
NN5:	Dette er jo stort sett bare det enkle eksemplet. Når vi kommer ut på en konkret sak og skal yte bistand, da foreligger BL-dokumentet. Det er klart at hvis rutinene gjøres manuelt dess flere feil får en.
Wilhelmsen:	Ja, absolutt, og det tar jo en del arbeidstid i tillegg.
NN5:	Ja. Jeg kan gi veldig mange eksempler på dette med manglende kommunikasjon på tvers av systemer. Hvis du skal se på suksesser, så har vi blitt flinkere til å velge systemer som kommuniserer. Microsoft sine produkter brukes veldig hyppig og det kombinert med I2 sine produkter har på en måte vært en suksess oppi dette. Den tekniske biten kan jeg for lite om

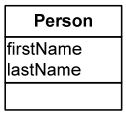
	fordi jeg sluttet på IKT for tidlig. Men dette med FitWeb og elektronisk overføring av fingeravtrykk osv som på en måte er en helt annen side som har kommet inn i politiet de siste åra. Kommunikasjon mellom FitWeb og Eurodac. Jeg regner med at NN2 var innom noe av dette.
Wilhelmsen:	Ja, NN2 var inne på det med Eurodac, og NN2 sa at de overfører elektroniske fingeravtrykk i Europa og at Kripos hadde tatt del i utviklingen av det arbeidet. Men jeg har jo inntrykk av at de systemene det er best kommunikasjon på er nettopp de som går på teknisk etterforskning og ikke på taktisk. Har jeg oppfattet det riktig da?
NN5:	Ja, det er helt riktig. Jeg kan nevne andre problemer på et enda høyere nivå som er tatt opp. Vi kommer jo alltid i kontakt med en del utenlandske borgere og det medfører at vi må gi de såkalt fiktive personnummer. Dette personnummeret startet på 99 i utgangspunktet. Men det er klart at etter hvert så slapp man opp for personnummer på 99, 98 og nedover og så kom man ned på 80-tallet. På et gitt tidspunkt fant også Skattedirektoratet ut at de måtte legge om sine rutiner for de var også i ferd med å slippe opp for en del personnummer. Det var nærmest tilfeldighetene som rådde da man klarte å fange opp at de var i ferd med å komme i konflikt med tildelingen av våre fiktive personnummer innen justissektoren og Skattedirektoratet, eller Sentralkontoret for folkeregistrering som har ansvaret for dette på sin side. Det er klart at da beveger vi oss på en knivsegg hvis en uskyldig person får tildelt det samme personnummer som en straffedømt. De var i ferd med å møtes så måtte man legge om på rutinene i forhold til dette og det ble jobbet på høytrykk, men det forteller litt om ideen og de problemstillingene som man kan komme i konflikt med. For å gi et lite innblikk i kompleksiteten så har vi såkalte D-nummer i folkeregisteret som styres av Skattedirektoratet. Et D-nummer er for eksempel en utenlandsk borger. For å ta den klassiske, for eksempel en svenske som jobber i Norge. Hans arbeidsgiver må selvfølgelig betale arbeidsgiveravgift på hans inntekt, betale skatt osv men så er han bosatt i Sverige. Da får han tildelt et såkalt D-nummer, det vil si at vi legger 40 til hans fødselsdato. Hvis for eksempel du var født den 10. blir det da valgt 50 som fødselsdato. Dette er en måte å løse det på. Det er bare valgt i folkeregisteret i forhold til en del utenlandske borgere. Dette identifiseres som D-nummer innenfor folkeregisteret og folkeregisteret har ikke vi noe ansvar for. Dette ligger noe tilbake, men så har vi en del utenlandske borgere som søker om asyl og som får opphold. Følgelig får de tildelt et personnummer og det var i forhold til dem denne konflikten oppstod. Og så måtte vi foreta noen i grep i forhold til dette. Da har man altså valgt ulike måter å gjøre dette på innenfor de ulike systemene. Vi har enda ikke noen ensartet måte å føre dette på. Hvis du da ikke følger med på utviklinga og leser alt som kommer av informasjon, og det er nærmest umulig i dag, så glipper det i forhold til dette. I ett system valgte man altså å legge 20 til måneden, så for mitt vedkommende som er født i 09 så ville jeg da fått måned 29. I et annet system legger de 40 til fødselsdagen. Bare for å gi et lite eksempel på kompleksiteten i dette. Hvis vi skal snakke om informasjonsutveksling på tvers av ulike systemer og kommunikasjon da er en tilbake til at en må en tenke mer helhetlig. Men da har vi løftet det litt ut av politiet og opp mot samfunnet forøvrig. Det er klart at vi må enes om dette. Ta for eksempel en nederlender som blir pågrepet på Gardermoen i besittelse av 4 kilo hasj. Han har jo ikke hatt noe med folkeregisteret å gjøre så det er

	klart at vi må ha muligheten til å tildele vedkommende et personnummer slik at vi får en unik identitet på ham. Men igjen, her er det nødvendigvis ikke samme identitet i BL for de har sin måte å tildele dette på i Strasak som vi har i SSP. Hvis han da blir sittende på soning i x antall år og han eventuelt skulle få tildelt et fødselsnummer gjennom det offentlige, altså utenfor politiet så får han tildelt enda et. Bare for å gi et lite innblikk i hvor kompleks denne verden er, altså hvor lite helhetlig de tenker.
Wilhelmsen:	Det hadde jeg aldri tenkt på muligheten for at det ble tildelt forskjellige personnummer alt etter hvilket register.
NN5:	Hvis vi går tilbake bare et par år, så hadde vi en måte å tildele personnummer på i Krimsys, en i Usys osv. Vi hadde en måte å tildele på i BL som da ble videreført i Strasak, og en tredje måte å tildele på i SSP slik at samme person kunne i realiteten, bare innenfor politisystemene være ført opp med 3 ulike personnummer. Rutinene går jo på at den enkelte skal sjekke dette. Men det er jo basert på manuelle rutiner slik at kvaliteten var uten tvil høyest i SSP for det stilles veldig strenge krav til de som sitter og fører dette registeret i forhold til kvalitetssikring, i etterfølgende kvalitetssikringsrutiner. Enhver som blir tilført et personnummer kommer ut på egne lister neste dag som en rapport. Den skal gås gjennom og her gis det ganske omfattende opplæring i forhold til hvilke kvalitetssikringsrutiner den lista skal undergis slik at man skal unngå å få en dobbeltføring av en person. Korreksjoner blir foretatt umiddelbart. Man hadde et lite antall personer med 3 ulike personnummer, og hvis jeg satt meg ned og arbeidet med det i dag så skulle jeg klare å skaffe det i dag også. Helt sikkert.
Wilhelmsen:	Da blir det jo vanskelig å utveksle informasjon.
NN5:	Ja, det er jo unike felt. I alle fall når jeg kobler filer så kobler jeg på fødselsnummer. Alle systemene ligger ikke inne med enten 11 eller 13 siffer heller. Hvis vi kutter ut de to første tallene i årstallet blir det 11 siffer, tar du de med blir det 13. Slike ting gjenspeiles i forhold til problemene. De fleste politisystemene bruker 13 siffer. Problemet er bare at dette ikke er gjennomført i alle systemene slik at du har noen på 11 og noen på 13. Dette går som sagt relativt bra enda, men på ett eller annet tidspunkt så vil du komme i konflikt. Hvilke skal du legge til 19 på og hvilke skal du legge til 20 på? Jeg kan gi flere eksempler på manglende kommunikasjon i forhold til systemer, men tilbake til suksess. De tekniske systemene har kommet langt. Og så vil jeg fremheve de systemene vi bruker på analysesida i forhold til M:M relasjoner.
Wilhelmsen:	Takk skal du ha.

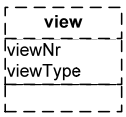
E: NOTATIONS

Notation for EER-diagrams.

Entity and attribute.



An entity called ‘Person’ with the attributes ‘firstName’ and ‘lastName’.
Identifiers are not used in the EER-models. For each entity the identifier will be a computer generated attribute. The entities will in many cases consists of data that is “incomplete”. E.g. the identity of a person can be difficult to establish, and an investigator or analyst must have the opportunity to record data about a person without knowing the persons social security number or even name.



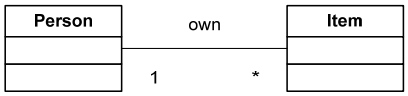
An entity that has a broken line is represented in more than one model.

Multi valued attributes is represented by (*).

Cardinality of a relationship.

1 denotes one, and exactly one.
* (or 0…*) denotes minimum none, maximum many.
0…1 denotes minimum none, maximum 1.
1…* denotes minimum one, maximum many.

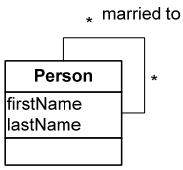
Binary relationship.



The relationship read as follows:
One person can own none or many items.

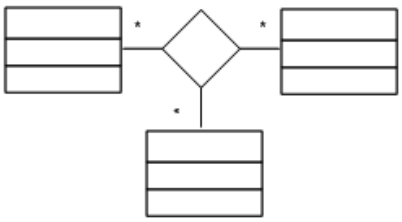
One item can be own exactly one person..

Recursive relationship.



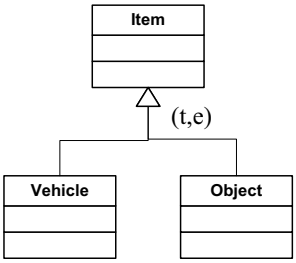
A recursive relationship means in this case that one person can be married to multiple other persons (over time).

N-ary relationship:



An n-ary relationship connects three or more entities (at the same time).

Generalisation.



'Item' is a generic entity.
'Vehicle' and 'Object' are subset entities.

A generalisation hierarchy can have the following properties:

Total or partial coverage and partial or overlapping coverage:

Total (t): Each element of a generic class is mapped to at least one element of the subset class

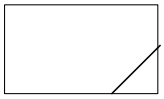
Partial (p): An element of a generic class can exist without being mapped to any element of the subclasses.

Exclusive (e): When each element of the generic class is mapped to at most one element in the subset classes.

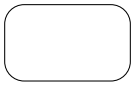
Overlapping (o): An element of a generic class can be mapped to two or more different subset classes.

Notation for DFD-diagrams.

Source/Sink or external entity.



Source/sink (or external entity) repeated one or more times in one DFD-diagram.



Process.

Data store (or file).

Data flow.