Attitudes to Open Source Software in Bergen Kommune

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Contents

1 Introduction

This work is the Master thesis in Information Science from the University of Bergen. It is a qualitative and quantitative study of the attitudes to OSS within a department in the municipally of Bergen, Norway.

In recent years, Open Source Software (OSS) has seen a tremendous increase with regards to development, use and exposure. It is today widely accepted as a solution both for industry and home users. The widespread use of the Apache Web Server, the increased corporate interest in OSS (Stone, 2002), and the general user acceptance of OSS are strong indications that OSS is gaining popularity. An increasing number of systems are running OSS or free software today, some of which are the wide spread DNS server BIND9, the Apache Web Server and the operation system GNU/Linux [1].

In the beginning of the computer age, the academic mindset of sharing software was common, mainly because it was so hard to actually create a working piece of software. This sharing of ideas and software was a natural and efficient way of producing new technology (Feller and Fitzgerald, 2002). However as computer technology gradually was modernised it became more accessible to the industry who in turn created very advanced pieces of software for that time. From this grew licenses and software patents as the technology was industrialised. Software became a commodity that could be sold and bought like any other product.

The wide selection of OSS solutions that today are being distributed all over the Internet and being used daily by millions of people, was not a reality until companies such as Red Hat started making money selling services and support based on OSS. In doing so, the general public was made aware that it was possible to make money even though the business was based on OSS. Having vendors backing the solutions gave OSS access to a lot of new markets and areas, earlier limited to proprietary solutions and vendors. Businesses such as Red Hat moved OSS out of the background of highly specialized institutions and low end communication infrastructure such as mail servers or DNS servers, and into the marketplace, giving it the recognition and exposure of today.

1.1 Motivation for research

My first encounter with OSS was a coincidence, as all I knew was that Linux or BSD was what the cool geeks used and that if I wanted to be like the guys in the Hacker movies, I had to learn to master these operating system and their tools. I bought a book on Red Hat sometime around 1998, and I became hooked on Linux. However, after a period of hacking on old hardware and tampering with different systems, I found myself wanting to know why anyone would want to give away these systems, which from my point of view were fare superior to both Windows and OSX , instead of making money on them. The idea of sharing the source code of these systems with the world, free of charge, crashed with everything I though I knew about software and computers. This was when I started

[1] GNU is the tools and compilers, while Linux is the kernel that communicates with the hardware.

to read about Linus Benedict Torvalds, Richard Stallman and some of Eric Raymond work, especially (Raymond, 2000). What I found was far more interesting, and much smarter than anything I had imagined.

Having been interested in OSS for years, and especially OSS in business, I want to know where OSS stands today, from a business and organizational point of view. I want to know if OSS is being used, how people see OSS and why. To answer these question I have formulated a set of research questions to help improve my understanding.

1.2 Research questions

OSS is spreading, and is today a serious contender to the more classic proprietary solutions that have been dominating for about 40 years.

When working with attitudes, it is important to know if OSS is actually being used, to be able to measure the validity of the attitudes found and what causes this. Being able to show that OSS is in use, helps validate the attitudes within the department, and assess their validity.

In order to explain the attitudes towards OSS within this department, knowing which attitudes the employees of the department holds, becomes important. This, in combination with the cause of the attitudes, provides an opportunity to both explain the different attitudes, what causes these attitudes and in the end, look for interesting occurrences within the data.

1. How widespread is the use of OSS in the organisation?
2. Which attitudes can be found?
3. What causes these attitudes?

1.3 Case study: The municipally of Bergen

This case study was conducted within the Department of ICT of the municipally of Bergen. With the exception of one respondent, all the respondents were either employed at the department or external consultants.

1.4 The structure of this work

The structure has been designed to maintain a separation of theory and my own work. Therefore there is a Theory chapter and a Research Method chapter that holds most of the theory, while the rest of the work has very few references. However, in certain places, to maintain context, references have been given.

1.4.1 Structure

1. **Chapter 1 Introduction**

   Introduction chapter. Consists of a quick introduction to the problem area, motivation for research, research questions, the case of the research and this list.

2. **Chapter 2 Theory**

   Theory of OSS, this chapter explains some of they key points in OSS history and serves as the backdrop for the rest of the work. It is purely based on other peoples work.

3. **Chapter 3 Research Method**

   Explains research, the different research methods, case studies, quantitative and qualitative research methods and how to do interview and survey studies.

4. **Chapter 4 Research Design**

   This chapter explains the process and how the interviews and survey were designed for this research. It builds on the theory from the chapter on Research Methods.

5. **Chapter 5 Data collection**

   The process of data collection is explained here. From the start of the analysis of the data material, to the compiled data and how I went about compiling the data.

6. **Chapter 6 Analysis**

   Presentation of the findings, analyse of the survey data and representation of interviews.

7. **Chapter 7 Discussion**

   Discussing the findings from the analyse of the data. This chapter builds on theory from the Theory chapter. It discusses reliability and validity of the research, and a list of things that could have been done differently in the work.

8. **Chapter 8 Conclusion**

   Concluding the work. Conclusion and possible further research within the subject of attitudes to OSS.

1.4.2 The work

Theory was gathered and studied for both the Theory and Research Method chapter, a research design was then created as seen in the Research Design chapter based on the collected theory.

The designed survey was sent out to the respondents, compiled from a list created by the contact person within the department. After the survey had been completed, interviews were set up with those respondents who decided to participate further in this work.

The data of both the survey and the interviews were then analysed as explained in the Data collection chapter. The Analysis chapter was written while working with the research data, to be discussed in the Discussion chapter. The conclusion was then written, and thoughts of further research developed.

After most of the work was completed, the Discussion chapter was revised, adding a discussion on reliability and validity. At the very end, the Introduction chapter was written.

1.4.3 Findings

After having conducted my research, I have found that this department is actively using and developing (for and to) OSS. Most of the employees use OSS to solve tasks either for desktop use, development or services. Some even contribute to OSS projects. Most notably the real estate application used within the municipal.

I found several attitudes to OSS, that they were positive from most of the respondents. The main issue seems to be with business support (such as having a vendor behind the product). However, this appeared as less of a problem from a developers point of view than from a managers point of view.

The cause of attitudes are harder to uncover, but it generally seems to be connected to personal point of view, and the respondents experience with OSS. What seems most important is that the actual software is good and that it solves problems. The respondents are not affected by ongoing court cases against OSS software and organizations (especially in the United States of America). However, some attitudes may (and tend to be) based on wrong or misunderstood facts. Interaction with other people seemes to be an important part of creating attitudes, mainly from colleagues, not so much from friends and not at all from family.

2 Theory

In the early days of computer science research, many researchers made their work available to researchers from other companies, organizations or institutions. The work was usually distributed by source code. With the rise of commercial software, this practice decreased a lot as software became a commodity and commercially valuable. However,this culture of sharing was a natural part of being a programmer for the early pioneers, and it naturally became the de facto of software distribution prior to licenses and software patents (Feller and Fitzgerald, 2002).

Two groups can be said to have moved this approach to software into the mainstream, Richard Stallman and his idealistic Free Software Foundation(FSF), and the less idealistic, but more pragmatic approach of the Open Source Initiative(OSI).

2.1 History

Even though the main stream attention towards OSS is new, the origin of the basic behaviour is much older and can be traced back as far as the 1960s.

There has been a long tradition in software development of sharing and cooperation. Though this behaviour is not new, the widespread Internet has significatly increased both the scale and level of formalization in this field to the degree we can see today. When explaining the different eras I will use the three eras introduced by Lerner and Tirole (2005) in their article, which I find to be an informative and very good way of describing the different eras.

1960s to the early 1980s

During this era key aspects of operating systems and the Internet were created in academic settings at places such as MIT(Massachusetts Institute of Technology) and Berkeley(Berkeley, University of California), but contributions were also made by corporate research facilities such as Bell Labs and Xerox's Palo Alto Research Centre. In these early day, it was common for researchers to share source code. The most important cooperative work during the 1970s was on creating an operating system that would run on multiple architectures: Unix and the C language, used to create Unix applications, created at AT&T's Bell Laboratories. The software was available for free, or for a nominal charge. The result was further innovation from the people using these technologies which they shared with the rest of the "community". The idea of property rights or restricting use of software was alien to everyone involved and it was not until the early 1980s that AT&T begun enforcing intellectual property rights related to Unix (Lerner and Tirole, 2005).

Early 1980s to early 1990s Following AT&T's enforcing of intellectual property, work on formalization of the rules behind the cooperative software development process started to emerge. The FSF became a critical institution during this period, and Richard Stallman as the founder, lead the FSF in developing a wide variety of software, free of cost. They

introduced a formal licensing procedure, known as the General Public License. This licenses was created to make sure what AT&T had done to Unix would not happen again. The source code had to be available, and there could be no licensing restrictions imposed on others. All code related to the produced had to be licensed under the GPL as well (Lerner and Tirole, 2005).

The projects managed by this license, accepted contributors, but the official version of the software was often controlled by one person, or a board, making final decisions (Lerner and Tirole, 2005).

Early 1990s to today (2005) The spread of the Internet, created a dramatic increase and acceleration in OSS activity. The volume and diversity of contributors , resulted in an explosion of new OSS projects, most notably the Linux project, created by Linus Benedict Torvalds (Lerner and Tirole, 2005).

This period also saw changes in licensing, with the Debian Free Software Guidelines in 1995, allowing licensees greater flexibility in using the program, and even allowed bundling the OSS software with proprietary code (Lerner and Tirole, 2005).

These ideas and this culture were adopted by a number of individuals working in cooperative software development, in early 1997. These individuals later created the Open Source Defnition(OSD) (Lerner and Tirole, 2005).

2.1.1 Richard Stallman and the Free Software Foundation

According to Feller and Fitzgerald (2002), it was just a coincidence that lead Richard Stallman to believe that all software should be free. When working at the Artificial Intelligence Lab at MIT in 1979, they were the first to receive a new Xerox laser printer. This printer had a tendency to jam a lot, needing a human being to fix it. Richard Stallman requested the driver software from Xerox so that he could add an alarm to the software when ever this jam occurred, so that they were aware of the issue when ever it would arise. Xerox refused, and Richard Stallman, thinking that if you had bought a piece of software, you should also have the right to modify it, left his position at MIT to create a collection of software products that would be free, and the result was the GNU tools and applications.

In 1985 the FSF was founded by Richard Stallman (Feller and Fitzgerald, 2002). Even today, the creation of this foundation can be said to have been a huge milestone for OSS in general. The idealism it was created by is still strong today, if not stronger (Feller and Fitzgerald, 2002).

2.1.2 Important innovations during the mid 1980s and early 1990s

2.1.3 The Open Source Initiative

According to OSI (2011), the chain of events that were set in motion when Eric Raymond published his paper “The Cathedral and the Bazaar”(Raymond, 2000) in 1997, was very much the incentive to create the Open Source Initiative(OSI). The paper is also later said to have been an influence to Netscape when deciding to release the source code for its

browser[2] (Guliani and Woods, 2005). On February 3rd 1998, a meeting was held, and it was decided it was time to stop the moralising and confrontational attitude, which was the association people made towards "free software". It was time to be pragmatic, and sell it to the masses like Netscape did. The term "open source" was coined.

In late February 1998, Eric Raymond and Bruce Perens founded the OSI OSI (2011). The goal was an educational and advocacy organisation, but it was decided that within these bonds they would work to explain and protect the "open source" label. For this purpose they created the Open Source Definition(OSD). Since 2003, the OSI has been legally recognised as a non-profit organisation.

2.2 Free software and open source software - What's the difference?

Generally, both the FSF and the OSI try to achieve the same thing, when it comes to software:

> "*...the proliferation of quality software that can be freely obtained, copied, modified and redistributed...*"(Feller and Fitzgerald, 2002)

Their approach however, differs. While the FSF is concerned with the ethical aspect of freedom of software, the OSI takes the pragmatic route, focusing on superiority of software produced as open source software, compared to other types of development. The core of the differences are the terms they choose to use, free software for the FSF and open source software for the OSI.

Richard Stallman states that the FSF and OSI can work together on software, which are the practical issues, but that they disagree on the basic issues of philosophy. Eric Raymond has a different opinion on the matter, claiming that it's not because they disagree on the basics, but because how the FSF operates is less effective (Feller and Fitzgerald, 2002). He goes even further, explaining how the OSI tactics work, while the FSF do not. All this is summed up in a essay named "Shut up and give them the code", which in short means that the FSF talks too much, while the OSI wants to show people a working piece of software or code, in other words, the OSI wants to provide results (Feller and Fitzgerald, 2002). This idea of providing results or real world solutions, is the most important point for anyone who is not part of this sphere; real world application and not just words.

This is perhaps easier to explain by listing the organisations representing each term, as these organisations are the creators of the terms.

FSF: While not as well known in the main stream, it maintains a watchdog role over its own OSD-like Free Software Definition, which has been applied to many software licenses (Feller and Fitzgerald, 2002). They also publish a lot of essays, mainly written by Richard Stallman, on the subjects free software, copyright and patents. Their main operational goal can be said to be overseeing the GNU Software Project, which aims to create a free Unix-like system based solely on FSF software from the GNU project. It should also be said that the FSF has created a lot of important

[2]http://blog.lizardwrangler.com/2008/01/22/january-22-1998-the-beginning-of-mozilla/

tools used by OSS projects today, such as GCC, a compiler for code written in C, and system tools.

OSI: Maintains their own specification for software licensing, the OSD. As an organisation they have gone further than the FSF, by formalising their control over the specification and by legally registration and protection of the OSI Certified mark Feller and Fitzgerald (2002). They do however not create software by their own, but servers as an organisation for created software.

Together: They complement each other well, and the world of open source needs the FSF just as the world of free software needs the OSI, though FSF has had a more practical impact with tools such as GCC(the GNU Compiler Collection). While the FSF develosp software and is concerned with freedom , the OSI takes care of marketing free software and open source towards the mainstream business community (Feller and Fitzgerald, 2002).

Richard Stallman is famous for his quote that free in FSF is meant to be like free speech, not like free beer (Guliani and Woods, 2005) and copy left, not copy right.

2.2.1 What is Open Source Software

When talking about OSS, it helps having a standard to define it by. The OSD does exactly this. The OSD is not a license, but a specification to measure a software's "terms of use" against, to make sure it upholds the standard of the OSI. If a piece of software complies to the OSD, it can be said to be open source and it can apply to bear the mark of the the OSI as OSI Certified software. This certificate applies to the software, not the license the software is using. To achieve this, a piece of software has to comply to the nine criteria (OSI, 2011) of the OSD, it cannot comply to eight out of nine, it has to comply to all of them. They cover every aspect from distribution, derived works and authors code integrity. This guarantees that any certified software upholds all the standards, and servers as a mark for the industry that this software is serious and this leads to an easier path of acceptance and adoption in mainstream business. Specifically OSS is a piece of software where all the components of the software is available to the public.

OSS covers just about every aspect of information technology, from the basic libraries that runs the Internet today to the biggest and fastest super computers. OSS are operating systems, web servers, infrastructure and data - it can be found just about everywhere. Both as a business model and a development methodology OSS is very successful (Bonaccorsi and Rossi, 2003).

2.3 Open Source Software in ICT business and industry

OSS is becoming a serious player in the ICT industry, and it can no longer be ignored. OSS changes the idea of doing business in the ICT sector, moving the standard from selling software, to selling complete solutions put together by different OSS solutions or modules, and the revenue is created by integrators offering integrated solutions, licensing,

teaching, support and updates. The low entry cost of OSS means the entry cost for new integrators(vendors) on the marked is much smaller, and enables more vendors to enter the marked.

Software does not initially have to have been OSS. Companies will, from time to time, open source their solutions purely as a commercial strategy, or as a way to maintain their grip on a certain part of the industry. This enables companies to build their solutions beneath their OSS products and still maintain or even increase their customer base.

Riehle (2007) lists two main categories of OSS as being either community OSS or commercial OSS:

- In community OSS there is no single entity supervising the development and the participants and contributors of the community are the ones that make decisions. Communities have no need to profit financially from their work.

- Commercial OSS has a company maintaining licenses and deciding what makes it into the code base and what gets discarded. These commercial variants are usually in the game to make money. Making money on open source is a venture that can be split in two; (1) first level support and implementation and (2) second level support, training and development services (Riehle, 2007).

2.3.1 Use

OSS is used a lot today, but to succeed the OSS must be of high quality (Sohn and Mok, 2007). As examples of how successful quality OSS can be, both the Linux kernel and the Apache web server should be mentioned. Linux is running 28.7% of the total amount of servers world wide, and Apache (as of March 2009), is powering 66.65% of the one million busiest websites world wide (Lawton, 2009).

From a technical and practical point of view, there are also strong reasons why OSS is becoming so widely adopted. Sohn and Mok (2007) claims that as the source code is available for everyone, easy maintainability is possible with OSS and compared to proprietary software, it enjoys possible better quality and reliability due to more "walk through" of the code. Aberdour (2007) says bugs and faulty code is being caught so rapidly in OSS because of the peer review and testing, which in turn points to "walk through" of the code. This peer review can be said to be true as the bulk of testing is done by the user base (often also being made up by developers) (Aberdour, 2007).

Hauge et al. (2008) state that close to 50% of the Norwegian software industry is using or implementing OSS components in their solutions targeted at major organizations. So, not only does the industry use OSS, some companies are even known for contributing back to the communities and projects they find useful or if contributing back is part of their business model. Programmers are hired to work on or participate in different OSS projects because they are either heavy users of OSS-based IT or provides OSS-based IT solutions (Lakhani and Wolf, 2005). Big companies such as IBM, Sun Microsystems and even Microsoft are now working closely together with many OSS communities and even developing solutions for OSS and with OSS (Lamastra, 2009).

2.3.2 Economy

The modern hyper economics fast moving and competitive software industry is a challenging arena for competition and viability. Only the most cost efficient organizations, who are able to provide solutions at the lowest cost possible, while maintaining high quality and a spotless reputation, are likely to generate any sustaining revenue.

In this very environment the true value of OSS is most obvious. OSS provides better value to users and consumers, in turn increasing the value and revenue for the organization offering the solution (Sohn and Mok, 2007).

The marked created by the need of pre factored implementations of OSS has given birth to a new part of the industry, namely the integrator of OSS solutions (Riehle, 2007). Competition is fierce and only a few manage to succeed. For the ones who do succeed, this market offers potential for great revenues. Providing solutions such as these, the cost of software licenses is no longer an issue, and the integrator are able to save a lot of money on this. This is lucrative as the customers rarely care about small components of the solution, but rather the big picture, whilst saved licensing costs are not passed on to the customer and the integrator can maintain prices and increase his revenue (Riehle, 2007).

2.4 Myths on OSS

Like in most cases when different alternatives exists, opinions will develop as to whether a certain alternative is better or even superior to others. Issues like these are eagerly discussed and some opinions have gradually even become myths. Providing accurate information in regard to myths can be challenging, but this work will accept the populare myths circulating the Internet as myths on OSS. Probably the most well known myth, is how OSS is better than its proprietary counterpart. This view is being put to the test in a few texts, perhaps most notably in (Dedeke, 2009), and the results might surprise some. Two servers are being set up, by engineers from both Microsoft and Suse Linux. They then run for a year. He concludes that there are no hard evidence to support the claim that Linux is any safer than Windows and he even goes so far as to say that Linux in fact is more prone to serious security issues, compared to Linux.

Another work where OSS is put to the test, is in (Glass, 2005), where most aspects of OSS is being discussed. Ranging from the skills of developers and the security of OSS to the hype and economy surrounding OSS today. He also concludes that there are no hard evidence to support any of the claims that OSS is superior to its counterparts.

Other than this, there are obviously the "positive myths", though calling them myths is both unfair and misleading, since work such as (Bonaccorsi and Rossi, 2003) have been conducted in the same way as the more negative studies, while still providing actual results and evidence for the view that OSS is good. However, there are not, to my knowledge, any studies that defiantly can say that OSS are flat out better than its proprietary counterpart.

2.5 Attitudes

In psychology, attitudes are commonly defined as affect, behaviour and emotional. Further attitudes are often explained in terms of emotional and belief for explaining the information that attitudes are created from (Petty et al., 1997). This is a little out of the scope for this work, as it tends to focus more on observable attitudes that people holds towards OSS, and not on what an attitude is. However, some explanation and relation to OSS is in order.

For OSS the definition of attitudes can be attributed to various categories. Affect can be both experience and point of view. Behaviour and emotions can be linked to experience with vendors, software it self and problems concerning the environment of the product. While a lot of the refrences so far have been mostly positive, there are those who take the opposite view, or a more critical view on OSS, one being Glass (2005), even though having built his career opposing new buzzes in the industry, he does put forth some valid points that show a different side of the OSS attitudes which a lot of people in the industry have today. However, he fails to mention the importance of relevance. Is the software relevant at solving the task, or is it just OSS to be OSS? This is very important, and if answered wrongly, it will lead to attitudes that are either false, or based on the wrong experience.

There is also evidence of a change in attitude on a corporate level, as seen in Stone (2002), where he explains how emerging OSS vendors have made corporates turn to OSS, and how the general mainstream acceptance of OSS is growing.

2.6 Summary

Technology, business and development have changed a lot during the last 50 years. The ICT industry has evolved from sharing source code and research, and selling hardware with software bundled, to separating hardware and software, seeing software as a commodity that can be turned into revenue and the rise of two important organizations for FOSS (Free and Open Source Software). The FSF and OSI, different in some ways, similar in others. Introducing OSS in the ICT industry has changed a lot, created a new way of doing businesses, new models for development and new ways of thinking about freedom.

3 Research Method

What is research? Research generally refers to the search for new knowledge or new facts. There are two ways to classify research. When research is new to everyone it is referred to as primary research, while when research is new only to you as a person it is referred to as secondary research (Rugg and Petre, 2007). Secondary research is common in daily life, but this text understands research as primary research.

When researching, having a well thought set of research questions is very important. These research questions are formulated specifically to increase knowledge and they have to be given considerable thought and attention to achieve this goal.

Research methods are a central part of any research.These methods are put in place to enable the researcher to answer his or her research questions.

There are different methods for different research questions. Some methods deal with natural science using a quantitative method, while other methods deal with people and society often utilising a qualitative method (Frankfort-Nachmias and Nachmias, 1996). Each of the different approaches has their strength and weaknesses, but when put in their correct context they tend to be a better choice than their counterpart. It is worth noting that there is no definite rule as to where either can be applied, and that they should both be applied where they can help answering the research questions best.

3.1 Case study

A case study is a standard method of doing empirical studies within social sciences, and such are valuable because they are able to answer questions that other research strategies may not.

Usually conducted when doing research on a single entity or phenomenon. Detailed information is being collected on a single project, or on a single subject. During a case study, it is possible to utilise a variety of different methods to collect data, such as interviews and surveys (Wohlin et al., 2000).

As with any research, validity in case studies is important, and this is achieved by avoiding bias and making sure that the research has internal validity. This is discussed in more details in the the Discussion chapter.

When doing a case study, there are parts of a research method that are not necessary to follow, one being sampling for surveys. Still, I have added sampling to the survey part of this chapter, to explain it. A case does not necessary have to sample from a population, because the case is the population, and the case aims to explain the entire population.

3.2 Qualitative and quantitative methods

As mentioned, the two most common methods are the qualitative and quantitative method. One dealing with issues that are not measurable, the other with issues that are measurable in numbers and quantity. They both have their approaches that suits them best, but that does not mean that one cannot mix the them. In fact, in some cases this mixing of methods can lead to more accurate data and a broader understanding of the research

at hand. When doing research with two methods, it is possible to combine them in the same study, but each method will commonly address different research questions (Wohlin et al., 2000).

3.2.1 Quantitative method

Quantitative research is used to quantify the objects being researched, such as relationships or to compare data (Wohlin et al., 2000).

Measurement is essential to quantitative methods, connecting empirical data and observations with mathematical expressions and quantitative relationships.

Quantitative research come in many forms, but mainly it consists of numbers, statistics, quantities and other measurable units. A survey is a common quantitative research method. Quantitative research is commonly used when describing the number of people who holds a specific belief or behaviour. It can be applied to data collected by others, it can explain the way people act or it can predict how they will act, in the future. In social research, social phenomena can be systematically measured and scientifically assessed(Nardi, 2006).

Quantitative research deals with designing surveys, making quantifiable interviews, quantifying and counting responses and analyse data using statistics. Gathering this data for research, surveys serve as an ideal tool if in depth interviews or other forms of close interaction between research and population can be hard to achieve, as long as the population measured is able to read(Nardi, 2006).

3.2.2 Qualitative method

Qualitative research, as opposed to quantitative research, is not about measuring units or focusing on numbers and quantities. It is about interpretation and communication between researcher and respondent. An interview is a classic method of qualitative research.

Traditional qualitative research is a form of research where the connection between the researcher and the respondents tend to be closer than that of quantitative research. This is achieved by either interviewing or by exercising participating observation of the respondents, but qualitative research can be executed e.g. using free form surveys as well. However, this close connection is important, as qualitative methods should support the researcher in understanding social phenomena, data which can not be quantified or presented by frequency (Thagaard, 2004). Interviewing enables respondents to elaborate and ask questions. Depending on the mode of interview, these interviews enables discovery of knowledge which the researcher might not have anticipated when planning the research.

In qualitative research, describing how results were found is still very important, even though the immediate need to explain itself is not as central as it used to be (Wolcott, 2009). Explaining in details the foundation of the research, gives the results credibility. This makes it possible to explain how the different results were achieved (Thagaard, 2004) and to validate the results, by doing the study over again.

Compared to quantitative research where the data material is based on a statistically

viable selection of units, qualitative research can generate a lot of knowledge from a small selection of units.

When doing research in areas where very little research has been done before, a qualitative method is a viable choice, given that the researcher has a good amount of prior knowledge within the field being researched (Thagaard, 2004). This helps the researcher in discovering knowledge using prior knowledge on the subject, and is what Dalen (2004) refers to as theoretical sensitivity, meaning that the researcher gains insight and better understanding of the field.

Qualitative research is a valuable tool for research on people, rather than numbers. What is interesting is how things are and why they are this way, not how much they are or how often they occur. Using this method a researcher can gain a better understanding of how things relate to each other and why. In other words, a qualitative method is a good method for understanding what people think.

3.3 Understanding social science and research

The goal of social science and research is to produce reliable knowledge using a set of systematic tools to achieve this in a controlled manner. This knowledge enables us to explain, predict and understand our surroundings. In social science we often try to explain the "why" or "how" things are within a specific group of people, within the representative selection. We try to explain certain events and how they occur. This is supported by systematic and empirical analysis . Trying to explain, predict and understand is vital to this process (Frankfort-Nachmias and Nachmias, 1996). However, it is also common for social sciences to use a quantitative approach to certain areas where e.g. statistics and quantities can give a better explanation or understanding of the research question.

3.3.1 Explanations

In science there are generally two approaches to explanations. Deductive and probabilistic explanations (Frankfort-Nachmias and Nachmias, 1996).Deductive explanations are the universal generalisation that universal laws apply to everything and that the result of something will always be the same. This means that, without exception, as long as the variables remains the same, so will the result. There can never be any exception to this (Frankfort-Nachmias and Nachmias, 1996). Probabilistic explanations are a very important when dealing with such uncertain fields of research or variables. Not every scientific explanations can be based on universal laws or forms. Explanations sometimes has to come in the form of tendencies. So that if all the variables are the same, the result will tend to be the same.. Probabilistic explanation is limited in some cases, and the result can greatly be challenged by factors outside of the immediate area research (Frankfort-Nachmias and Nachmias, 1996).

- In general deductive explanations are most commonly found in natural sciences, while probabilistic explanations are more common in social sciences. However, there is no definite rule as to which explanation can be used where. It generally comes down the the specific research being done and in many cases deductive explanations

can suit social science in the same way as probabilistic explanations can suit natural science (Frankfort-Nachmias and Nachmias, 1996).

3.3.2 Predictions

Predictions are the reverse of explanations. We know that the result is based on knowledge of what is needed for the prediction to come true. This means that by combining knowledge, it is possible to predict the outcome or result of a certain action or the consequences of something. E.g. knowing that there has to be clouds for it to rain, we can predict that there will be no rain so long as there are no clouds in the skies. It is also possible to use past experience for a certain pattern of behaviour or chain of events to predict that the exact same can happen in the future.

3.3.3 Understanding

Understanding in social science is two sided as social science , humanistic and scientific, as social science touches both these fields. There are different ideas of what understand is and how to achieve it. Empathetic and predictive understanding (Frankfort-Nachmias and Nachmias, 1996). These two different approaches occur because social science can be both humanistic and scientific in nature.

- Empathetic understanding sees social and natural sciences as two entirely different bodies, and therefore the two can never use the same method (Frankfort-Nachmias and Nachmias, 1996). In stead they must both utilise different research methods specifically designed for their fields.

- Predictive understanding on the other hand, sees social science as something that can attain objective knowledge of both the natural and social world, meaning that social and natural science both can utilise the same methods. Empathetic understanding can be helpful in discovering things, but discoveries do need understanding, hence the need to attain objective knowledge (Frankfort-Nachmias and Nachmias, 1996).

3.4 Methodology in social science

"Science is not united by its subject matter but rather by its methodology." *(Frankfort-Nachmias and Nachmias, 1996)*

A methodology do not explain a specific method, but is more of a general approach explaining key processes that should be completed in any work of science or research. It is a system based on explicit rules and procedures that serves as the basis for research. It is not a definite rule, rather it is a self correcting and constantly changing way of doing research propelled by the constant discussions, critique and cooperation of scientists. This has created commonly accepted rules and procedures, each with their corresponding methods and techniques (Frankfort-Nachmias and Nachmias, 1996).

In social science, methodologies have been evolving rather slowly and seem to have been under constant criticism. All this criticism was turned to success though, as a lot

of effort were put into sharing ideas and information and rules and definitions with their methods and techniques, became common also for social sciences. According to Wolcott (2009), this acceptance enabled qualitative research to focus less on defending itself or to give detailed explanations of its "methods" as most researchers had felt obligated to do earlier.

3.4.1 Communication

A very important part of social science. Scientist can and should share common experiences, enabling replication and constructive criticism on conducted research. Replication is to conduct the research in the exact same way as before. Replication is either being conducted by the scientist doing the original work or a different scientist or group. This servers as a fault check on the work detecting the possibility of deception or unintentional errors in the research (Frankfort-Nachmias and Nachmias, 1996).

3.4.2 Reasoning

The process of ordering and relating empirical data and observations into systematic and logical structures. Everything builds on what came before, ensuring that the claims made or the end result is consistent. To perform reasoning the researcher must have complete competence in logical reasoning (Frankfort-Nachmias and Nachmias, 1996).

3.4.3 Inter subjectivity

Deals with the idea that empirical objectivity and the methods we use for verification are all products of the human mind, thus making inter-subjectivity a better name than objectivity. After all, truth is not an absolute measure (Frankfort-Nachmias and Nachmias, 1996).

3.5 Survey

Surveys are used in many contexts. Public opinions in newspapers and magazine articles, political surveys enabling political candidates to prepare and make the proper decisions during campaigns and market research discovering consumer preferences and interests (Floyd J Fowler, 2009). Using a survey, a larger part of a population is able to respond to the research, increasing the amount of actual respondents.

3.5.1 The sample frame

The sample is used to create a good representation of the population in being subjected to the survey. The sample contains a small subset from the population in interest. The subset should represent the greater population without having to involve everyone in the survey, but at the same time the subset should be designed so that everyone has an equal chance of being selected. This equal chance broadens the viability of the survey. The sample frame is the set of people that can be selected for the survey (Floyd J Fowler, 2009).

Evaluating the sample is very important, and so is the process of selections during this phase of the work.

Most cases of sampling can be broken down into three general classes:

1. Sampling from a complete list of the population studied .
2. Sampling those who happens to be at a specific place (e.g. patients emitted to an institution).
3. Selecting the sample based on something that is not the actual respondents. One way of doing this is to pick out certain classes at a given school to be included in the survey, before selecting the individuals in the selected classes.

Each sample is only representative for the sample frame it represents, that means only the people who actually had a chance of being selected in the first place are representative for the survey and the results it produces. In most cases some are excluded from the sample based on different variables. Therefore, when presenting the results, the researcher needs to know not only who were selected and who were not selected when presenting the results, but also why the different respondents were selected. This will help the researcher in understanding if the sample is representative for the sample frame, and who the sample represent.

It is also important to let the reader know why some respondents were excluded from the survey (Floyd J Fowler, 2009) possibly making validating the sample frame easier.

3.5.2 Survey methods

When doing surveys there are different approaches to gather data (Nardi, 2006):

1. Survey interviews
2. Self-administered questionnaires
3. Computer-assisted surveys
4. Web-based surveys
5. Telephone surveys

A survey method combining parts from all of the above is the online survey. Online surveys are self-administered, computer-assisted surveys based on the web platform, enabling quick distribution of the survey and accessible respondents. Having the option to skip questions without bothering the respondent based on earlier responses, makes the survey less likely to produce false data, maintains motivation to go on and improves the flow of the survey. While respondents are completing the survey, it is possible to run checks on their answers in the background to uncover any issues that might arise from their response, and have them correct this before the survey ends (Nardi, 2006). More common, however, is to use an on-screen warning such as red text or a red star telling the respondent that issues in their response have been detected and that these must be addressed before continuing.

Before doing an online survey it is important to decide on a software solution. Should one be bought or created for the specific survey?, or should any open source software survey solution be used? When deciding on an already existing solution it is important to review how the survey will be accepted by the respondents. Nardi (2006) explains that for each page all questions should fit on the screen and scrolling is to be kept to an absolute minimum. The navigation should be smooth and clearly notify the respondents where in the survey they are, and the survey should be able to automatically hide or drop questions based on conditions in the survey. E.g. when the respondent selects that he or she has no academic degree, there is no need to reveal the follow up question asking what degree the informant might hold.

3.5.3 Designing the survey

When designing a survey, the questions must be designed so that they provide the data the researcher needs. Surveys started as nothing more than extended journalism, much attention was paid to the way questions were asked. However, it became apparent that each respondent had to understand the questions completely or else the data would be prone to error (Floyd J Fowler, 2009).

When writing a research-based survey, the respondent must understand what the researcher meant by the question, and not be influenced by the researcher. Leading questions are often biased questions where the respondent answers what the researcher wants to hear, not what he or she thinks. Therefore data gathered from such questions are often flawed and do not represent the actual sample (Nardi, 2006).

When creating questions there are many variables to account for. Survey answers are evoked in an artificial situation where the scene is sat by the researcher, therefore they are not necessarily always correct measures. Creating good survey questions that can provide meaningful answers is about maximising the relationship between the answers recorded and what the researcher is trying to measure (Floyd J Fowler, 2009). Designing questions is a good way to avoid the issues that may occur in surveys where the design is flawed. Respondents should not under any circumstance have to guess. Some of the more important variables in creating good survey questions are:

- Survey questions that answer the research question. If they do not answer the research question they are not very useful to the researcher.

- Inadequate wording may lead to respondents filling in words they feel are missing to give a question some proper meaning, possibly making the answer worthless to the researcher. One word questions are inadequate, complete sentences with an actual questions is preferred (Floyd J Fowler, 2009).

- Poorly defined terms arises when terms that are not universally understood is being used in a question. This can occur if the researcher is using terms that are commonly found within his or her field of research or science, but not commonly found else where. Using day to day language and stay clear of terms and concepts which can have multiple meanings helps (Floyd J Fowler, 2009). A good approach is to write

questions that everyone can understand, without necessarily having the knowledge to actually answer them correctly.

- The "Don't Know" option is often regarded as the easy way out for respondents. However, it is possibility the respondent does not know, has no opinion or has too little knowledge on the subject to understand or answer the question. The solution to this is to use a screening question to check if the respondent has the knowledge to answer the question (Floyd J Fowler, 2009).

3.5.4 Evaluating the survey

Evaluating the survey before distribution is important and someone outside of the sample, but within the general population of the survey, are good candidates. Always go through the survey after creation, making sure it flows, has clear instructions, good and concise questions, and that the time it takes to complete is within reason.

Researchers should start by testing the survey on themselves. When the survey is ready, let more people test the it. Once a satisfactory amount of people have completed the survey, data from that survey should be reviewed too see if any questions might have been unclear, or if there are parts of the survey that is not working as intended (Nardi, 2006).

3.5.5 Errors

In surveys it is normal to generalise on a subset (the sample). A margin of error is present, but it should always be the goal of the researcher to make this margin as little as possible. As said in Floyd J Fowler (2009), if a coins is being flipped ten times, the result will not necessarily be five of each side. In some cases the result can be four and six, or three and seven. There are many ways in which errors can occur in a survey, and these may occur both in who answers the question, and in the answers themselves.

Errors due to who answers are generally in regards to the sample and how data is collected. For collection of data there are three steps that can produce errors in the process Floyd J Fowler (2009):

1. The sample-frame, those selected to participate. There are always some groups who are not invited to participate, e.g., due to the chosen medium for surveying.

2. Process of selection - sometimes the selected participants are not randomly chosen, but consist of volunteers.

3. Failure to collect answers from everyone in the sample, due to lack of responses, or not having the time or the willingness to respond.

Errors in the answers themselves, may be due to that the answers do not reflect the truth? Have the respondents misunderstood the question Floyd J Fowler (2009)?

3.5.6 Non-response

The failure of collecting data from a given number of respondents. Having a high number of non-responses is a major potential source of survey error. There are different ways to ensure that non-responses are kept to a minimum. These are usually either personal interviews, financial incentives, identifiable sponsors or repeated contact.

Internet surveys are a new method of collecting data, and experience in dealing with non-response using this media, is limited as opposed to the classic mail, telephone and interview survey methods. This is a weakness, and it is very easy to opt out of a survey, where the personal relations between researcher and respondent are being kept to a minimum, as they usually are in Internet based surveys.

3.5.7 Collecting data

Before performing a survey, the best medium for collecting the data should be selected. This medium should be adequate to satisfy the needs of all respondents in the sample for the survey. The survey should be accessible to everyone within the sample, as if not, the data collection will not be optimal. Are the respondents well educated, or is using computers or reading and writing a problem that effects the respondents ability to participate, understand and complete the survey? In case of a well educated sample of respondents, the burden of a self-administered survey is minimal, while for those not very well educated this can prove to be more of a challenge (Floyd J Fowler, 2009).

3.6 Interviews

Interviews are an important part of qualitative research and social science in general. Interviews are the perfect tool for in-depth knowledge and understanding of people and how they relate to their surroundings. Interviews are able to collect data that would otherwise be out of reach. While a static research method will only answer what the researcher already decided on, an interview can take turns and twists which the researcher was unaware of or had not considered prior to the interview.

There are a few different approaches to interviews. These approaches all have their strengths and weaknesses, but they all excel at their respective area of use. The most common ways to perform interviews for research are as follows:

- **Structured interviews**:

  Structured interviews are controlled by a list of questions and the order these are asked in, is fixed. This is a great tool for comparing answers, but it is not necessarily a great way of uncovering more complex knowledge.

- **Open-ended interviews:**

  An open-ended interview is not so much an interview as it is a conversation between the researcher and the informant. These interviews enable the researcher to go much deeper into the subjects brought up by the respondent than what would normally be expected from other more formal methods.

- **Semi-structured interviews:**

  Semi-structured interviews are based on a set of questions, but where the order of the questions is not important. This enables discovery of new knowledge and at the same time enables the respondent to talk more freely. Semi-structured interviews enables control over the direction of the interview and at the same time ensures there are no limitations on the freedom of the respondents to talk about subjects of their own choice. To better control the interview, an interview guide should be utilised, as explained in (Dalen, 2004). The guide should contain the main categories of topics, each having a series of more specialised questions following. There is no fixed order for the categories and they may therefore be decided during the interview (Thagaard, 2004).

  There is always room for the respondent to elaborate on subjects and matters they wish to enlighten or further explain. Probing for further explanations when necessary is possible, and should be used. Probes are positive feedback to the respondents, nods and short replies such as 'yes' and 'mhm' signal an interest in what the respondent says and encourages to further elaborate on the subject (Thagaard, 2004).

3.6.1 Preparing for the interview

It is important to always focus on the respondent while conducting an interview. The presence of a video recorder or a tape recorder and a microphone should not dominate or intimidate the respondent (Dalen, 2004). For this reason it is wise to explain to respondents prior to the interview the different tools present at the interview.

Before agreeing on an interview with the respondent, the respondent should be asked to agree or disagree to being recorded on tape. Respondents who do not agree to this should not be interviewed on tape. Instead, possible alternatives or solutions should be suggested to the respondent, such as hand notes during the interview. Although this might result in losing important information, it can be helpful in cases where there are few respondents and where all information is of importance.

In cases where the recorded interview is accepted, the focus is on creating an atmosphere where the respondent does not feel uncomfortable or put in an artificial position which in turn will hinder the outcome of the interview. Even though recorders and microphones have decreased in size they can still take focus away from the respondent. After settling any issues concerning the researchers tools, it is important to make the transition to the interview as natural and smooth as possible, starting off with "soft" questions to ease the atmosphere, take focus away from the interview situation and make the respondent talk freely.

3.6.2 The interview guide

When writing an interview guide the comfort of the respondents should always be taken into account. They should not feel intimidated or put of by any questions, as this can limit the data collection process having a negative impact on the overall research results.

The interview guide should cover questions that will hopefully result in answers that in turn will answer the research questions. Questions should be asked so that they invite the respondent to elaborate further on the given question and perhaps add more of their own experience, including areas the researcher might not have expected to talk about (Thagaard, 2004). The order of the questions are not fixed, but can be arranged during the course of the interview.

3.6.3 Selection of respondents

Respondents are the primary data source for a qualitative research. For this reason both an adequate number of respondents and a relevant selection of respondents should be asked to participate.

4 Research Design

This research seeks to answer the research questions set out in chapter 1. In chapter 3 the methods used to find answer to these questions have been accounted for. This chapter is written as something that is going to happen in the future, written as a guide for future work.

The research is based on both a quantitative and a qualitative method, in order to ensure that important information is not lost, and that the research does not relate to one method of research. Both a web survey and a semi-structured interview will be conducted, and in that order.

The application of two approaches is to ensure as much viable information as possible. The survey is intended as a tool for gathering quantitative data about the respondents, and to be used the invite to further participate in the interviews, by letting them accept or decline an invitation to the interviews at the end of the survey. At the end of the survey, each respondent can decide whether or not to be contacted sometime in the near future for a follow-up interview. This makes it possible to prepare in advance of an interview,and to get a much deeper understanding of the respondent and the data he or she presents. It also removes the need to probe the respondent of excessive background information .

Before collecting the data, the survey and interview had to be approved by Norsk Samfunnsvitenskapelig Datatjeneste, Personvernombudet for forskning.

It is based on the collection and analysis of data by performing qualitative scientific work in the field. The collection of data is made by surveys and interviews of employees at *The Municipality of Bergen.*

4.1 Case: The Municipality of Bergen

This research is based on employees in The Municipality of Bergen, Norway. Mainly within the Department of ICT, . except for a few external consultants working with the municipality and a few employees from different departments within the municipality. The reason for including these are of relevance to what the the Department of ICT does, and relevant competence and interest in OSS. The selection was suggested by a manager within the Department of ICT.

The Department of ICT has 30 employees spread across a lot of different areas of responsibility, but most of them share a common ICT relevant position and education. The department is also currently employing about 10 external consultants. The municipality identifies three categories of computer software:

- Business systems: e.g. Economy and salary systems.
- Office support systems, the tools used by all employees in the municipality, e.g. applications such as word processors, and web browsers. In other words, the common desktop applications.
- Systems for school and education, i.e. systems installed in schools and kindergartens within the municipality.

The Department of ICT is directly involved in both concern and office support systems. They help make decisions on business systems and office support system, and they further develop and support these systems. It is also at the Department of ICT the municipality centralises its ICT. While the city council has the final decision on the choices being made, the Department of ICT is there to advice and help on decision and practical issues. They also do a lot of the development on internal projects and maintenance on existing systems.

4.1.1 Selection of respondents

Respondents are selected by the contact person within the Department of ICT. Every employee including outside consultants were given the chance to participate, with the exception of employees the contact person felt unnecessary to include. These people either held administrative positions or positions otherwise irrelevant to ICT. An accurate number on the number of people excluded was never provided, but it was suggested to be fairly low.

4.2 The design of the survey

The survey used in this research is made up by different main categories which are then separated into more detailed questions concerning different aspects of computer use, knowledge and interest. The categories are made to be as independent as possible. The survey is meant to be accessible to ICT competence of all levels as long as the respondent has the competence needed to log on the web and has basic views on ICT in general.

4.2.1 Sampling

Being a case study, actual sampling in the sense of sampling a larger population down to a smaller one is not relevant for this study, as the target population is selected by a contact person within the municipally and because a case does not relay on a sample, in the sense that a population is not being sampled for a case. Therefore, the sample is the selected respondents from the organization.

4.2.2 Question form

The survey has been created as a self-administered survey, and as such respondents should be able to answer questions with just a few clicks (Floyd J Fowler, 2009). The survey does, however, contain a few short open questions. Most of these open questions are in the form of "if you care to explain". Having few open questions in the survey limits the possibility of irrelevant data (Floyd J Fowler, 2009). Making the survey available over the Internet provides possibilities not available with any other means of surveying. The ability to create rules for whether or not a question should even be shown, as explained in Floyd J Fowler (2009), removes the burden from the respondent of having to cope with instructions on which questions to answer next and which ones not to answer.

4.2.3 Response rate

The response rate is usually better when surveys are group-administered, and in job settings the response rate is often close to a 100% (Floyd J Fowler, 2009). It should, however, be noted that this survey is not handed out in a setting where all respondents are present, but be distributed by email. The contact person in the department sends out an email containing information about the coming survey and where it will be sent from. Then later I distribute the survey using the survey system to send out emails to all respondents. This survey also has the support of one of the employees in the organisation who will remind non-responders to respond and who will distribute details of the survey to the rest of the employees during meetings. This hopefully reduces the rate of non-response.

4.2.4 Error estimate

The survey has been created as not being to long and not to complex, in order to avoid loosing the attention of some or all of the respondents. This should, hopefully, be sufficient to ensure minimal occurrence of errors in the survey.

4.2.5 Data collection

The data will be collected from the survey database and will be coded by hand. Computer-assisted data collection will not be utilised for this research. There are limitations in computer-assisted data collection, that it cannot work with open question. Thus, limiting the amount of quantitative data gathered will help creating the groundwork for the interviews.

When collecting data from a self-administered survey such as this, it is important that all the participants are well educated, are able to read and write properly and have the computer skills necessary to complete the survey. With the sample limiting it self to employees generally working in the field of ICT it is fair to expect this to be true. There is no reason to believe that the collection of data will suffer from lack of understanding the technology used in the survey.

4.2.6 Designing the survey

The survey can be found in . This section will explain how I went about creating the survey, and why I have chosen the survey design I use for this work. The different sections of the survey and the item names will be translated from Norwegian to English. The survey was designed and handed out in Norwegian because the case it was based on, was a Norwegian organisation, and to avoid any confusion or linguistic barriers.

When I first started working on the survey, I was fairly new to survey as a research method, my only direct on experience was answering surveys or running small polls on internet community web sites. Therefore, I tested the survey on friends, family and students. I ran two tests on the survey, it have been adjusted and partly rewritten based on the feedback from both tests. All involved in helping me ran the survey both on

paper, taking notes as they went through the survey, and they also went through the survey online, in the form it would be distributed to the respondent. I did this to make sure the survey had consistency, clear questions and that it was not too time consuming. It also helped me understand the survey process better.

I will go through each section of the survey, and explain the questions I asked;

About you

This part is intended mainly to create demographic variables, but I also want to use it to compare it with results further into the survey to see if there is any clear evidence of these variables affecting other variables.

- "How old are you?"

  This is part of the demography, and I want to see if anything interesting can come out of comparing age to other variables.

- "What is your highest level of education?"

  Again, part of the demographic data, but I also want to see if there is any connection between level of education and the attitudes and understanding the respondents have towards OSS.

- "What is your position within the municipally?"

  Part of the demographic data.

- "How many years have you held your current position?"

  I want to use this data as a tool for checking when the respondents had their education.

- "Is IT part of your job assignment?"

  To see if the respondent is working with ICT or not. Since I know that all respondents for this survey do, this question is not important.

- "Do you make decisions regarding IT solutions? Ranges from architecture to choice of email client and web browser"

  I added this question at the end, hoping it may bring some interesting results. Do decision makers have other views on things compared to an ordinary employee?.

General

This section aims at getting a general impression of the respondents and their prior knowledge of OSS.

- "Had you heard of OSS prior to this survey?"

  Intended as a check, to see if the following two open answers should be shown or not.

  - Can you give an example on OSS?

  - Can you name one OSS license?

- "Do you connect any of the mentioned names with OSS? If you do not know, do not answer."

  - I want to check if the respondents know who is involved in OSS. It is intended as a control question.

Attitudes towards OSS

Here I want to reveal attitudes to OSS, and try to identify possible variables that affect their attitudes towards OSS.

- "Your attitudes towards OSS?"

  - Open answer, where I hope to get a feel for what the respondents generally think about OSS.

- "Has your education had any effect on how you see OSS?"

  - Again, I want to return to education. This time, however, I ask directly if it has had any effect.

- "Can you explain in greater detail how you think this has affected you?"

  - I choose not to hide this question, as negative answers might as well render valid data here.

- "Has your attitudes towards OSS been affected by the ones you interact with?"

  - The respondents will be asked to answer all the questions here, and I hope this will bring some interesting results, mainly if interaction has an effect on attitudes.

Experience with OSS

Experience with OSS can be an important factor in determining their attitudes towards OSS, use and history of use are important variables here.

- "Do you use OSS?"

  - It is possible that attitudes are affected by personal experience, so I want to know if the respondents actually use OSS.

- "Do you use any of the following operating systems?"

  - I want to see if the respondents use more than just basic OSS products. If they are using e.g. Linux, I can assume they use a lot of OSS products to complement it.

- "When was the first time you remember using OSS? If you can recall the year, that will be sufficient."
  - I want to create a table with the year the respondents started using OSS and check if anything worth noting happened that year.

Awareness concerning OSS

Being aware of OSS is important, and I want to test this, how aware are the respondents actually on OSS?

- "Do you believe that you interact with OSS during the day?"
  - I want to see how aware the respondents are about OSS in ICT technology.
- "Feel free to give some examples."
  - I want to see what they use, hopefully generate a list of common tasks OSS is being used to solve.
- "Do you believe there are OSS products that support your use of IT without them being obvious?"
  - Using OSS is one thing, but being aware that they work in the background as well gives a good indication on how aware respondents are to how widespread OSS actually is.
- "Do you think any of the following are such solutions? Multiple answers okay if necessary."
  - I want to give the respondents a chance to clarify or see how aware or unaware they are of OSS.

Interest in OSS

Interest is important, if the respondents lack interest in OSS as a viable solution for anything, their attitudes will reflect this as well.

- "Do you read any journals about OSS?"
  - Keeping up to date on OSS by reading available information and news can show if the respondents generally are interested in OSS. I hope this will revile such trends.
- "Do you read any of the following journals?"
  - Presenting a list can help the respondents, and this list is intended to provide useful information in regards to how "deeply" involved the respondents are in reading and keeping up to date on OSS.

- "Do you enjoy working with, or experimenting with, computers?"
  - It is no secret, OSS is generally used by people who have an interest in it, or who have experienced that it can provide a valuable asset to work flow or solutions needed. This question is intended to see if those who show interest in computers, also enjoy OSS more than those who do not.

Use of OSS

Using OSS and knowing OSS are in my view two different things. Therefore I find it interesting to see how the actual use of OSS is.

- "How often do you use OSS?"
  - I want to see how often the respondents use OSS to reveal if it is used on a daily basis, or just occasionally. It might explain if OSS is important to the respondent or not.
- "Do you use one or more of these web browsers, email clients or word processors?"
  - Do they use OSS for regular tasks, such as browsing the web, writing emails or creating documents? These are very basic office support tools, and as such they seem relevant to revealing whether or not the respondents use OSS for more than developing new solutions or products or maintaining systems and infrastructure.
- "Is any of the products you use OSS?"
  - This question is intended as a control question. If the informant answers no here, but yes on prior questions, they are not very aware on OSS and their attitudes might be based on wrong assumption or lack of knowledge.

4.2.7 Web based survey

The survey will take the form of a web based point and click survey. The invitations to the survey will be sent from a server located at the University of Bergen with a university email. Distributing the survey from this domain makes respondents more likely to accept the survey, than the survey coming from a unknown address.

For the survey the OSS based survey tool LimeSurvey[3] will be used and hosted on a UiB server. Every day, the survey database is backed up and sent to a backup server using a cron job on the survey server. This to ensure minimal loss of data, should anything go wrong. The survey will focus on establishing a general understanding of both the knowledge and attitudes of the respondent holds towards OSS.

The survey is also used to select respondents. Every respondent can agree to further participate in the research by filling in their contact information at the end of the survey. Anyone not filling in these will have their anonymity guaranteed. Note that the researcher

[3] An OSS survey tool, more info at limesurvey.org

is the only one who gets this data, so the only loss of anonymity from accepting an interview is towards the researcher.

Each respondent will have their unique survey key, or token, connected to their email address. The token and email address will be stored in two separate database tables, so there is no way of matching these and identifying the respondent. This unique key enables the survey system to send out reminders to non-respondents and it also enable the respondents to continue the survey at a later time. A reminder about this is given to the respondents at the end of the survey.

4.3 Semi-structured Interview

The interviews will be individual. This research is about the individual and as such, group interviews would not server the purpose. The semi-structured interview is explained in (Thagaard, 2004), which it is the approach chosen for these interviews.

There will be room for the respondent to elaborate on subjects and matters they wish to focus upon or further explain. Probing for further explanations when necessary is possible, and should be used(Thagaard, 2004). This ensures that there is nothing hindering discovery of new knowledge.

4.3.1 Selection of respondents

As mentioned earlier, the respondents are mostly employees with the Department of ICT, with some few hired in consultants from the private sector.

Participation is voluntary, and only respondents accepting to do so will participate in the interviews.

4.3.2 Interview guide

The interview guide should be designed to help achieve that the respondents talk about attitudes towards OSS in a way that answers my research questions, without feeling restrained by me as the interviewer.

When working with the interview guide, I had the same people who helped me with the survey, run through the interviews both with me as an interviewer, and on paper, to identify flaws or inconsistencies. I interviewed the same people again and again, until they agreed that the interview was ready to be used on my respondents for the real interviews.

The interviews will be commence with a short introduction going over the basic goal of the interview, and the issue of anonymity. The interview guide, like the survey, has been written in Norwegian, and the interviews will be conducted in said language. This interview guide is written for semi-structured interviews, which is why I will not explain my intention with each question. The questions are intended to keep the interview on track, should it go off topic. Each question is intended to be able to get interview back on the topic of its category.

I will explain the two categories in detail below.

There are two main categories in the interview guide.

1. What creates attitudes?

   Here I want the respondents to talk about what they believe create attitudes to OSS. The category opens with the main question, and follows up with questions intended to give me more valuable information, should the initial question not give me the information I try to find.

   Some of the questions correlates to questions asked in the survey. I find this to be in order, as it gives the respondents more time to elaborate on subjects they consider important, and it gives me more room for having them explain what I might feel needs clarification.

2. Which attitudes can be found?

   In this category, the respondents liberty to talk freely, is more limited, as they are only allowed to do so about the subject and in a controlled manner. I try to probe them for information, because I want to know which attitudes they possess and which attitudes can be found. Each question is asked trying to uncover as much information as possible about which attitudes that can be found, while yet leaving some room for interpretations and open ended answers. All in all, I want to challenge the respondents to talk about which attitudes they possess, and at the same time, try to uncover their attitudes to specific subjects which I find important in the OSS debate.

5 Data collection

Two subsequent approaches to data collection were used for this study; first a web based survey, and next an interview with respondents who had completed the web based survey.

5.1 Where was the data collected

The data for this research was gathered at the Municipally of Bergen in the Department of ICT. The communication between me and the department was facilitated through a contact person in the department. This department is responsible for office support (operating systems and desktop applications) and for shared systems(economy and salary systems). These systems are the standardized solutions used by every department in the municipally. They also assist the city council with making decisions regarding ICT, projects, architecture and development. Working in the department are developers, architects, consultants and a staff of managers.

5.2 Who generated data

The respondents were selected by the contact person working in the Department of ICT. Those not included held positions outside of the ICT scope and were not seen as relevant respondents by the contact person. They were mainly people with administrative or assisting positions such as managers or secretaries. The contact person was also excluded from the survey and interview due to his involvement in the project and his testing of the survey before it was given to the selected respondents. However, as the response rate to the interview was very low, he was included back into the interview process at a late stage. The invitation to the study was done by a initial survey sent to 31 respondents, 30 of these were working within the Department of ICT, some as consultants from the private sector, but still working in the department. One respondent was selected due to relevant experience, but this respondent worked for a different department and did not partake in the interview after the survey.

5.3 Web based survey

The web based survey was run for about three months, from the 10th of December 2010 to the 1st of March 2011. During this period the survey was constantly available, around the clock, to all the respondents. The information and invitation to the survey was sent from an email account at the University of Bergen to a list of possible respondents selected by the contact person. This email contained information on the survey, as well as details regarding the following interview and how to accept further inclusion in the process.

5.3.1 The survey process

When collecting data from the web based survey, very few problems were encountered. Having expected a few uncompleted responses, and some responses that seemed more eager to end the survey than to answer it properly, this problem was barely noticeable.

Out of 31 respondents, 16 answered in full, and one respondent did not complete the survey. The respondent had opted out at such an early stage, the data he generated was of no use. The rest of the possible respondents did not start the survey at all and never replied to emails. Most actual respondents provided good answers whenever they were asked to write a text, instead of clicking on pre-made categories.

5.3.2 Compiling the survey data

This was a time consuming process involving the use of spreadsheets, tables, graphs and printouts of the free text which the respondents had provided on open questions. To support this, the built-in features of the survey software (LimeSurvey) were used extensively and provided graphs, diagrams, schemes, numbers and a very simplified spread sheet of the entire survey with results. The data was organized in two different ways while I was working on it. The first schema held only general statistics in the form of percentages and numbers. The second schema held everything the first scheme did, but, it also included more details such as answers to open questions, and a reference to the data in the first schema, in case I needed to double check or to assist me in finding interesting data.

When the data was compiled into usable research material, it was done with the idea of it supplementing the interview and to be used as a base for the interview guide. The open questions were used as a qualitative data source, and to complement the interviews. The way this was done was by compiling a list where the respondents were sorted by level of education. This was then added to a matrix. The reason for doing this was to see if education was a factor in peoples attitudes towards OSS. This is explained in greater details in the Analysis chapter.

5.4 Interview

At the end of the survey, all respondent were asked if they would accept further participation in the form of an interview. They were requested to enter their email address into the survey(the last field of input), and informed that the time and date of an interview would be announced at a later time. Upon agreeing they also accepted that their response would not be anonymous any more, since it was linked to their personal email upon accepting. Of the six teen respondents that answered the survey, five respondents agreed to be interviewed. It is important to note that this loss of anonymity only applied to me, since I had to know which email address to contact for an interview. Other than this, their anonymity in the study was still maintained.

The interview process itself was most disappointing. Out of five respondents accepting further participation after completing the survey, only one respondent accepted the interview invitation even though the dates for the interviews were set to be at times decided by the respondents. This made the process of interviewing shorter, and far less important than planned. However, my contact person at the Department of ICT, originally excluded from the survey because of participation in the initial work on the web survey, accepted to help and gave an interview. This means that the interview part of the research con-

sisted of two respondents, instead of one. Still, considering there were expected to be five interviews, a total of only two was a major set back.

5.4.1 The interview process

Before each interview there was a few minutes of "chatting at the coffee machine" to break the ice and make both the respondent and researcher comfortable in the current role. These chats served useful during the interviews, as it was possible to relate things to topics brought up earlier before the interview had begun.

During the interviews, the collection of data was going as planned. A Dictaphone was used for recording audio during the interview. As a backup should the Dictaphone fail, a mobile phone was also recording the interview. The audio was complemented with notes, describing key points with their reactions, such as interest or lack of interest in a certain area or topic. This is useful for describing how the respondent reacted to different subjects and questions and to see if there is any connection between reaction and subject of dialogue.

5.4.2 Transcription

After listening to both interviews, I created a small piece of software that would produce a readable transcript that I could use while working with the interview data. The complete transcript could either be exported as a HTML file or a PDF file (to facilitate easy document inclusion).

Once I had the formatted transcripts, the process of gathering data from these were started. First, I created a code for each respondent, based on their position within the department. I then started by looking for categories that I could use, but decided that due to the shortness of the transcripts, the best option was to use the second and third research question as my two categories. After going over the transcripts it became clear that the transcripts from both respondents showed several similarities, but that two non-similar topics also stood out as important to each respondent. The most obvious way of splitting them was to categorise under each research question, similarities and differences within to the two categories.

The two categories used in the interview, were my research question, and they were the following;

1. "Which attitudes can be found?"

2. "What causes these attitudes?"

I ended up with a document that I could move into a matrix. To the left, I put the respondent code, and at the top I put the different categories I found while transcribing the interviews. Within each blank cell, I added the information relating to respondent code and category. The text I put into the table, was text from the interviews which I felt was most informative, but during the analysis I added more data from the interview.

It should be noted that the transcript does not include parts of the interview which were not relevant, e.g. parts that went off topic and entered different subjects not related to the research questions or the work in general.

6 Analysis

This chapter contains the analysis of the data gathered during the survey and interview process of this study. A total of 31 respondents were selected to partake in the survey, of which only 16 completed. Out of these 16, five respondents initially accepted to be part of the interview. Only one respondent was initially participating in the interview, but at a later point, my contact person in the organization agreed to take part in the interview, increasing the number of interviewees to two. The analysis is ordered based on the research questions, and not necessarily in the order of the answer from survey or interviews.

Given that every relevant employee in the department were able to join the survey, the representative selection for this survey was good. The overall response rate was 51.6%, which is better than normally expected from this survey medium, which sometimes can get as low as 20% (Floyd J Fowler, 2009).

The survey was analyzed both using the tools available in the LimeSurvey solution, and by using spreadsheets in LibreOffice Calc (equivalent to Microsoft Office Excel). Due to lack of experience in dealing with survey studies, the survey questions were not organized as they should have been, and to help solve this problem, most of the analyze was done by taking notes on paper and referring to different graphs and statistics in LimeSurvey and long or free text answers in the spreadsheet.

Some of the qualitative data gathered in the survey are used to complement the interviews based on the lack of respondents in these interviews and the good replies given by some of the respondents to the survey. This will give more data to work with when answering the qualitative part of the study.

When graphs or diagrams are presented, Norwegian words may occur, as the survey was given in Norwegian. However, where needed this text will be translated to English.

6.1 Q1: How widespread is the use of OSS in the organisation?

Following is the analyse of the data gathered from the survey.The survey was not optimally designed, but I have tried to address this as best as I can.

6.1.1 Demography

Most of the respondents in the survey are between 41 and 60 years of age and their most common level of education is some sort of higher education. 56.25% of the respondents have a Bachelor degree, while 31.25% holds a Master degree.

It was important for the study that the selected respondents had some understanding of ICT, and held an ICT related job. This strengthens the ability to answer the first research question as these respondents will have a much greater insight than someone using ICT for example solely to write and read emails.

Knowing that they did, and assuming that decision makers generally are in a position to make changes, what sort of responsibility did the respondents have? Judging by the answers to the survey, 56.25% of the respondents make decisions regarding architecture,

office support and software and framework for development. 43.75% do not make any decisions at all.

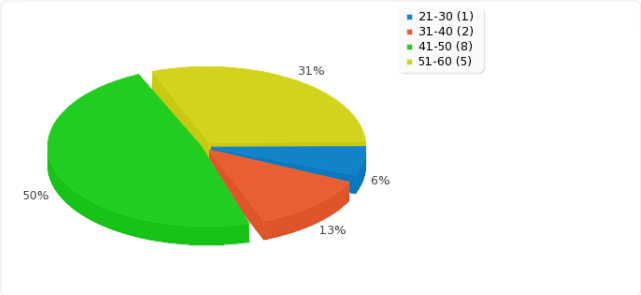

Figure 1: Age of the respondents.

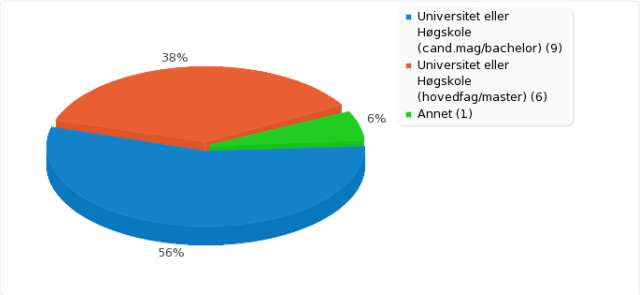

Figure 2: Education level of the respondents.

6.1.2 Experience and use of OSS

The level of experience with use of OSS varied among the respondents, but the overall picture was a positive one, which can be seen from the following sections. Familiarity with OSS and general knowledge of the subject is quite good. While some had been using OSS for almost two decades, (the specific OSS used was not asked for in the survey) some had, to their knowledge, only been using it for as little as a year. However, most of the respondents had a reflected and balanced view on OSS.

Familiarity with OSS 93.75% of the respondents had heard of OSS before this survey. When asked to name a piece of OSS, one respondent answered Adobe Reader, which is not a piece of OSS. Only one respondent responded "many", while the rest of the respondents responded with one or more examples of OSS. The most popular OSS products mentioned in the survey are listed in 6.1.3 (What OSS is in use).

Licenses After having given the name of one or more OSS products, the respondents were asked to give an example of an OSS license. A lot of licenses were mentioned, such as BSD (assuming the modified BSDL version), the Apache License and, not surprisingly, most of the respondents mentioned the GPL or GPL2 licenses. Arguably these are the most well known OSS licenses mentioned, but others mentioned are also used in a wide variety of projects. Two respondents mentioned licenses that are non-existing, OLA (which I assume is a reference to Oracle License Application) and cloud software, which is not a license, but a technology or software solution.

Control question As a control question, the respondents were given a list of some well known names in the ICT industry, and asked to identify the ones involved in some relation to OSS. None of the respondents selected any incorrect names, as shown in the figure below. However, it is possible that the respondents were all correct here because of how well known the these names are to respondents not particularly involved with OSS. Steve Jobs, Bill Gates and Steve Ballmer are all well known, but not for being involved in

OSS. Some of the names that were listed as OSS-names, such as Jon Hall, are however, not necessarily as publicly well known as OSS-names as the non-OSS names are.

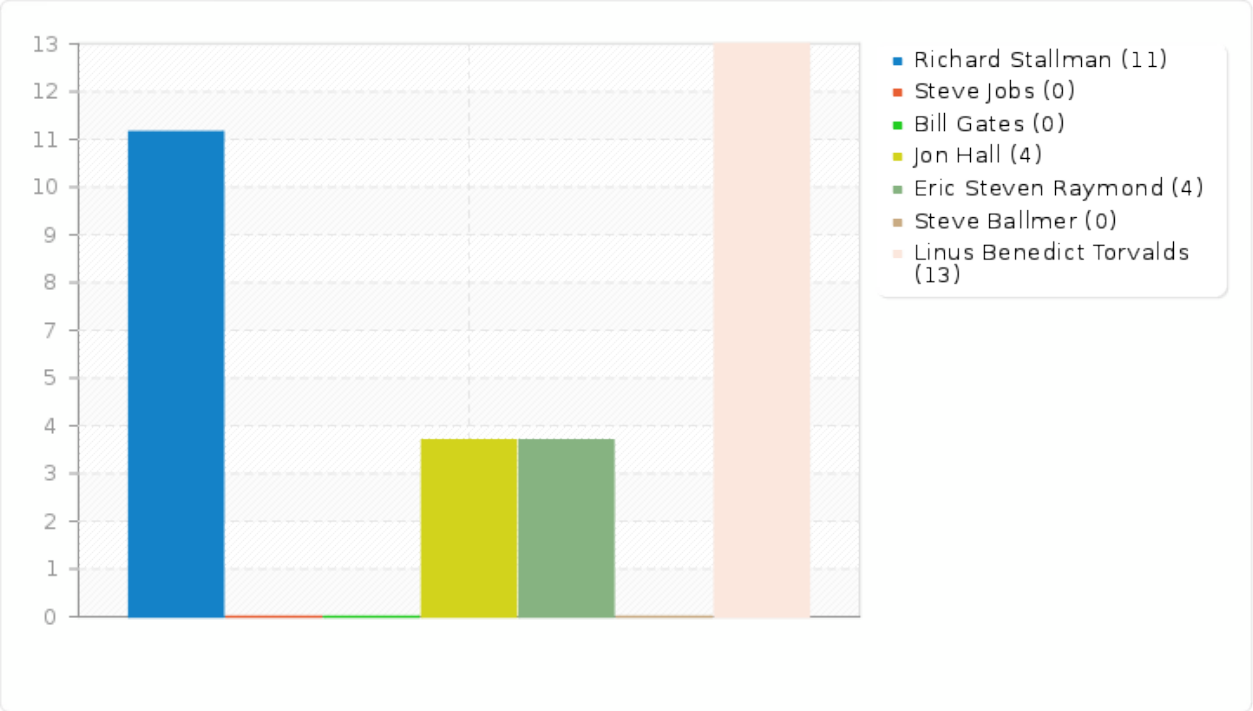

Figure 3: The results of asking the informants to identify names of people related to OSS.

We can see that most of the respondents knew Linus Benedict Torvalds and almost as many knew Richard Stallman, probably the most well known name within the mainstream open source and free software scene. Jon Hall and Eric Steven Raymond were recognised as well, both well known advocates of OSS.

Usage of OSS The informants where also asked about their habits of use in relation to OSS. A lot of them were using OSS, as much as 68.75% used OSS both at work and at home. 12.5% used OSS only at work, while 6.25% used OSS only at home. 12.5% of the respondents did not use OSS at all. None of the respondents were unsure if they used OSS or not.

In relation to this, I thought it would be interesting to know when the respondents first started using OSS, both on a regular basis and when they had their first encounter with using it. The answers ranged from 1991 and up to 2010, with a median at 2000. However, only two of the respondents started using OSS in 1991 and one in 1997, which arguably are the most important years for OSS in the 1991 to 2010 range. 1991 was the year when Linux was announced[4], though not widely known at the time, it was to become an important milestone for OSS. 1997 marks the release of the source code of Netscape which has been said to be the inspiration to the OSI, and the foundation for establishing the OSI was laid this year as well. The table represents the different years in which the informants used OSS for the first time. Note that some important events are not listed here, since this list is not related to OSS events, but what happened in the years the informants first used OSS.

[4]Linus announces Linux - http://groups.google.com/group/comp.os.minix/msg/2194d253268b0a1b?pli=1

Year	# respondents	Significant happenings
1991	2	The Linux project is announced on comp.os.minix by Linus Benedict Torvalds.
1993	2	The Wine project was started. First Slackware released. NetBSD and FreeBSD development started. Red Hat is founded.
1997	1	"The Cathedral and the Bazaar" is written by Raymond.
1999	2	OpenOffice.org is created based on the release by Sun Microsystems of their StarOffice source code.
2002	1	MediaWiki, which runs Wikipedia is released.
2004	1	Mozilla Firefox and Ubuntu is released.
2005	1	
2007	2	
2008	2	Sun releases OpenSolaris.
2010	2	

Table 1: Number of respondents first time using OSS based on the year.

The respondents were then asked to select the operating systems they used from a list of predefined alternatives, and multiple selections were possible. The answers in this list are interesting, and to no surprise eleven of the respondents used some version of Microsoft Windows, while different distributions of Linux had the second most users. The less known systems (Haiku, Syllable and Plan9) were not well represented, and OSX only had two users. Arguable this was the most surprisingly finding. Remembering that multiple selections were possible, we can read from the list that eight of the respondents used more than one OSS operating system, while two respondents did not use any OSS operating system or simply choose not to answer the question. Based on the statistics from distrowatch.com[5], this is somewhat similar to what we see in the general population of OSS users. Ubuntu and Open SUSE were high up on both lists while the survey ran. In the figure below the results can be seen in more detail.

[5]A ranking of the different Linux distributions, with complementary information and updated from the different distributions. More info can be found at http://distrowatch.com/dwres.php?resource=about

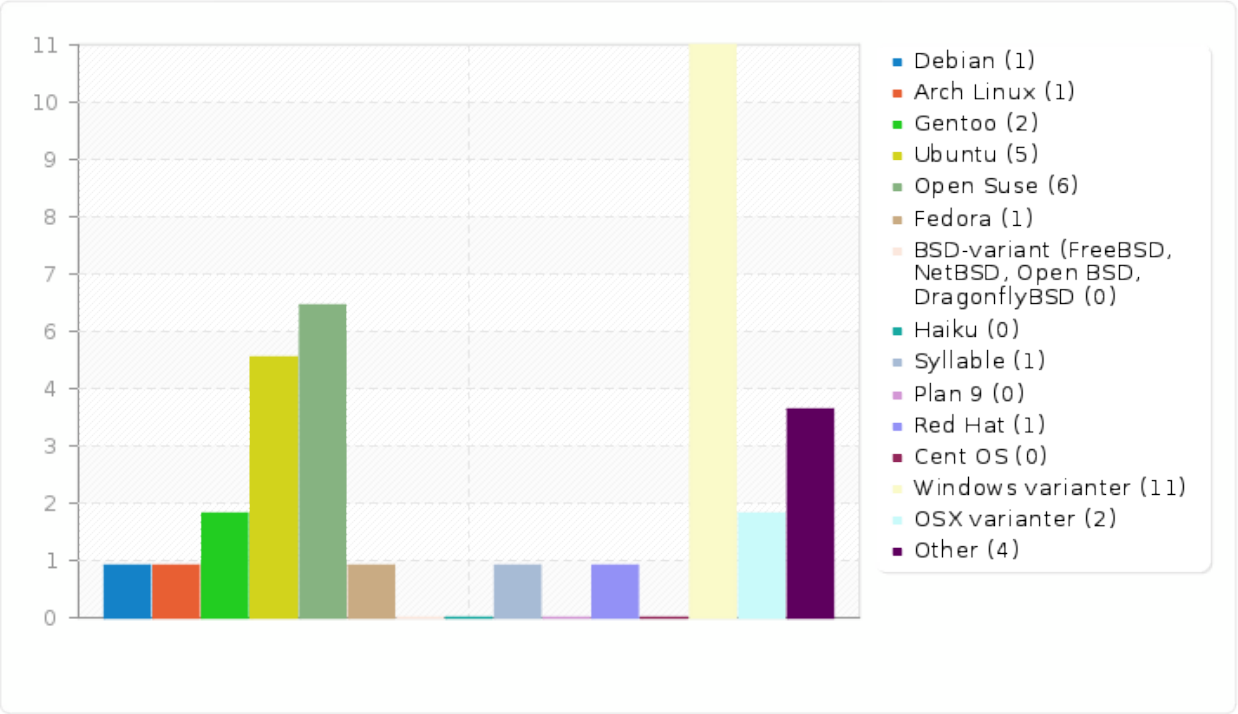

Figure 4: Operating systems used by the respondents. Variant is Norwegian and can be translated into flavor of, or type.

So how often is OSS being used? The table bellow gives an idea, it is separated into daily use, 1-3 days a week, 3-5 days a week or weekly use. The survey was created with only four alternatives because daily and 1-3 days a week and 1-5 days a week was expected to catch those who only use OSS at work, while daily include weekends as well.

Frequency	**% of respondents**
Daily	50
3-5 d/week	0
1-3 d/week	18.75
Weekly	31.25

Table 2: Frequency of OSS use by the respondents.

6.1.3 What OSS products are being used

During the survey, respondents were asked to name at least one OSS product they used as a tool in their work or which they developed for or with. This list does not include web browsers, email clients or word processors. These are addressed later.

- Apache Web Server[6], regularly used by four respondents, is a service designed to serve web pages and directories on a (web)server. It is currently one of the mostly used web servers in the world today.

- Mule ESB[7], used by three respondents, is an OSS Enterprise Service Bus. Even though the actual definition on this is not clear, it acts as a communication layer between different technologies.

[6]Widely used web server. More info at http://apache.org
[7]More info at http://mulesoft.org

- TrueCrypt[8], used by one respondent, is an on-the-fly disc encryption on data volumes. It is currently practically impossible to breach its security and gain access to any encrypted volumes without knowing the password. This is used for security in the municipally.

- Portico Estate[9], used by three respondents, is an OSS product which the municipally uses in their real estate management to keep track of their estates, what they own, what they let out and to whom. For any other necessary functionality the product supports the use of modules. One respondent take part in developing it, while two uses it as users only.

- Linux, used by five respondents. A kernel used in a lot of modern operating systems. Red Hat is specifically mentioned.

This indicates the broad specter of tasks OSS can support or assist in, be it as a developer, administrator (of computer systems) or as end users. Most of the tools presented here are specialized tools, with the exception of Linux, which the rest of the products can run on.

Web browsers The respondents were asked to select all the web browsers they use from a predefined list, and multiple selections were possible.

Web browser	**# of users**
Internet Explorer	16
Mozilla Firefox	11
Google Chrome	9
Opera	6
Safari	6
Konqueror	2
Netscape	2
Epiphany	1
Other	0

Table 3: Web browsers being used by the respondents.

There was an error in the survey, as Internet Explorer was listed twice, but this has been corrected and the total from both alternatives were more than sixteen, but it is likely to assume all the respondents use Internet Explorer in some way.

Email clients Again the respondents were asked to select which email clients they use from a predefined list, multiple selections possible.

[8]Security software. More info at http://truecrypt.org/
[9]More info at http://porticoestate.no

Email client	# of users
Outlook	14
Mozilla Thunderbird	6
Outlook Express	4
Mutt	2
Evolution	1
Other	1
Claws Mail	0
Sylpheed	0

Table 4: Email clients being used by the respondents.

The difference between Outlook and Outlook Express was not given in the survey, or by the respondents. I will assume that it is in fact the two different solutions the respondents are using, and that it is not a misconception towards the differences between the two pieces of software.

For the e-mail clients here, full support for Microsoft Exchange[10] as can be seen in Outlook (Exchange), does not exist.

Word processors	# of users
Microsoft Office	15
Open Office	10
Oracle Open Office	1
KOffice	0
Libre Office	0

Table 5: Word processors being used by the respondents.

Word processors Microsoft Office was the most used word processor, with Open Office as a good number two. Most of the respondents use both Microsoft Office and an OSS word processor. The question did not specify what they used at home and at work, but it is likely that the OSS word processors were used at home, due to the standardization on Microsoft in the municipally. Libre Office was a fairly new fork at the time of the survey, and that may be the reason why no one used it. It could also have been due to confusion as to whether it was Open Office or Libre Office the respondents Linux distribution upgraded to, when fetching updates, as both products have a very similar look and feel about them.

6.1.4 Awareness of OSS

Many OSS products, such as web servers, databases, infrastructure, etc., are providing services to end desktop users, silently working to support better known proprietary solutions. For that reason, measuring awareness of OSS is not as easy as just asking how aware users are, even competent users, and expecting them to know exactly what runs the infrastructure of the Internet which arguably supports a lot of the work we do today.

[10]http://www.microsoft.com/exchange/en-us/default.aspx

Daily contact with OSS products The first question was used to see if the respondents were aware of how much OSS they are likely to come in contact with or be served by on a normal day. This might serve as a control question, as it clearly shows the level of awareness the respondents have of OSS. This same question was also asked at another stage in the survey, but with a little twist and an option to answer "Unsure" instead of opting out of the question. However, it gave the exact same result.

Response	**% of respondents**
Yes	75
No	6.25
No answer	18.75

Table 6: Respondents assuming they are in contact with OSS on a day to day basis.

18.75% provided no answer. There are two reasons why this can occur; either they are unsure of the question or if they are in contact with OSS, without actually knowing it. The question may not be designed so that it gives the respondent all the information needed to make a decision. However, 75% of the respondents are aware of being in contact with OSS on a day to day basis. This is an overall acceptable level of awareness.

Daily used OSS products Every day use and the knowledge of which OSS products the respondents used can give a deeper understanding of how much awareness the respondents actually have. The following list shows the different tasks the respondents are using OSS to solve on a day to day basis at work. 75% of the respondents gave answers and examples, while the remaining 25% did not give an answer. Note that there is no statistics on the number of respondents, these are categories I have created based on the answers given to the open questions by the respondents. It was then put into different OSS solutions to show where OSS is being used the most. The tasks that the respondents most often tried to solve using OSS tools are on top, while the least are at the bottom. This is, however, not to say that security is what OSS is being used for the least, but that only one person in the survey works directly with security related OSS.

- Using products which presumably has OSS in their core
- OSS products to solve daily work tasks, such as Open Office and Eclipse.
- Project work on OSS products, such as Mule ESB and Portico Estate.
- Communication and development
- Operating systems and desktop applications
- Services and servers
- Communication
- Security

The last question under this section was about OSS supporting the user or the services the user uses, without their presence being obvious to the end user. Here, all of the respondents answered confirmatory, which probably was a result of the question being asked in a leading way, leaving no room for doubt that I meant the correct answer would be that they do support daily work.

6.1.5 Interest in OSS

The last questions try to measure how much interest the respondents have when it comes to OSS. This was done by asking the respondents if they were reading any OSS publications or magazines at all, then providing a list of the most well known OSS publications and magazines, asking the respondents to select one or more of the ones they regularly were reading. When asked if they read any OSS publications or magazines only 25% did so, while 75% did not.

The 25% who did, were then asked to select from a predefined list what they did read. Here follows a list of the items selected and the number of respondents who read them. Four respondents were reading OSS magazines. These will be given the identification "A", "B", "C" and "D". "A" read Linux Magazine, "B" read Linux Magazine and Linux Journal, "C" read Linux Format and "D" read Linux Journal. So only one respondent reads two magazines, the rest reads only one.

Magazine Name	**#of respondents**
Linux Magazine	2
Linux Format	1
Linux Journal	2

Table 7: The OSS publications or magazines the respondents were reading.

To see if interest in computers would show similar numbers, the respondents were asked if they enjoyed working with and experimenting with computers, as this has been associated with OSS and interest for OSS. Every respondent answered here, even though "No answer" was an option.

Response	**% of respondents**
Yes	62.5
No	37.5

Table 8: Respondents enjoying working with and experimenting with computers.

This shows that there is a fair amount of interest in computers within the department.

6.2 Q2: Which attitudes can be found

The analysis for this section is from the interviews with the two respondents. Respondent A is the administrative person in the municipally, while Respondent B is the developer. Respondent A is an employee in the municipally, while Respondent B is an external developer and consultant, working on projects for the municipally. However, his office and work place is at the municipally.

I started analysing the interview data trying to find some categories that both informants kept bringing up while answering the questions. The data material revealed three categories to me; economy, support and vendor. I will define these terms in more details:

- Economy: cost of operation, obtaining software and the importance of economy.
- Support: support agreements, expectations towards vendors in context of support, support in practice.
- Vendor: expectations towards vendors,

Respondent	Economy	Support	Vendor
Respondent A	Easy to focus only on a low entry cost, but operating expenses has to be part of the equation.	It can be challenging to maintain software modules when there is no vendor supporting the software modules and who owns it. Support agreements have to be made. In that case, someone has to be willing to accept responsibility for the entire solution, including all modules.	Effect and offers are often different for OSS compared to more traditional solutions.
	Operating environment and cost of implementation have to be taken into account when acquiring new software, otherwise it can result in economic challenges during the lifetime of the system.	For large systems, ownership and maintenance of large systems in an organisation can be challenging. Finding someone who can fix problems can be hard, and you end up having to do it yourself. It is easier to have a vendor supporting the system who can fix problems.	Strong requirements towards vendors in terms of security and life cycle.
	Price is not everything. Implementation and maintenance.	Commercial OSS vendors must deliver complete packages with implementation, training and service agreements for all the products.	When the municipally chose OSS, the vendor offered a complete package of components, assisting implementation, teaching and a framework on how to use the solution.
	Cheaper modules leave more room for training (users, maintainers and developers).	Having a service agreement with a vendor, provides safety	

	Economy	Support	Vendor
Respondent B	Economy is important, but quality is most important.	As a developer, support agreements are good to have, especially with proprietary source, when you depend on it.	Having a vendor is not necessarily a positive thing. A vendor is who knows the product, is always nice, but I do not have good experiences with support agreements on non-OSS products.
	Have no problem with paying millions(NOK) for a piece of software, so long as it help save time.	A support agreement can in many cases be an easy way to get help, but support agreements should be signed when needed, not before. It can be hard to get hold of support agreements, since getting access to them from the ones controlling them can be challenging at times.	OSS software does not need a vendor since you can see the source code and information is readily available online.
	Often bad decisions are being made on economic issues. Better decision could have saved the municipality money.	For proprietary software, finding solutions to problems can often be challenging, and the APIs that we develop on often holds a very low standard. They have no incentive to make good API's as the software has already been bought.	

The matrix lists the result of the transcript after it had been analysed to create the categories. Parts of the interview turned out to be of no relevant, or it got sidetracked to such a degree it would be meaningless to add it to the actual transcript.

Note that Respondent A is the administrative person, employee at the municipally, while Respondent B is the external developer and consultant working at the municipally.

Economy is important to both, but there seems to be an agreement also that quality

and access to solving a given problem are the most important aspects of software. While Respondent A is concerned with implementation cost and long term cost, Respondent B feels that even though management focus a great deal on cost and savings, the decisions being made are sometime of poor judgement and that better solutions or products could have been found. Respondent B is also of the opinion that cost should not be of the essence, as long as the software helps save time.

Support is a subject both respondents find important, but with a slightly different approach. While Respondent A feels that support is something that has to be present and that any serious software should have a support agreement, Respondent B is more concerned with immediate needs instead of preventive use of support agreements. Respondent B also feels that having a support agreement is not necessarily a guarantee for support as it can sometimes be hard to find the people who have access to these agreements. Respondent A points at safety as a reason for having support agreements, Respondent B feels that support agreements are mainly useful when working with closed source, where you depend on support.

Vendors seems more important to Respondent A. Respondent B does not talk much about vendors. This is where the biggest difference is, Respondent A is very concerned with vendors and what they can offer to the customer, for example support agreements. Respondent B on the other hand, feels that a vendor can be a bit of a double edged sword, and feels that having a vendor behind the product does not guarantee much of anything.

After working through this transcript, it appears that two categories which the respondents did not share stand out.. For Respondent A this was the different challenges within OSS and its relation to ICT could create, and in some cases did. Respondent B on the other hand, was much more concerned with practical use and development. The difference in these categories are interesting as it points at a fundamental difference in the view point for a manager and a developer. Where the manager sees a lot of problems and how to avoid them, the developer sees a way to make things work and use familiar tools and solutions which guarantees efficiency. Looking at these differences, they somewhat correlate with the previous matrix.
The following matrix deals with the unique views of Respondent A, the manager.

Respondent	Challenges
Respondent A	It looks as if it is challenging for OSS to adapt to a regulated marked in comparison to other commercial traders. Commercial solutions has a fair lead on OSS.
	OSS is often seen as tools for support and smaller modules of bigger applications.
	From a business perspective there are challenges connected to OSS. Mainly as to whether the solution is in fact free or how much the hidden costs may rise to.
	In the end, who acquire the software has to put forth the right specifications and demands.

This matrix deals with the unique views of Respondent B, the external developer and consultant.

Respondent	Use/development
Respondent B	As a developer, based on experience, commonly used OSS holds a higher degree of quality than proprietary software. Less problems, and if problems arise it is easier to find solutions than having to depend on a support agreement.
	There is rarely a need for OSS, as there is no specific need to see the source code, though this is a nice freedom to have with OSS.
	With OSS it is rarely necessary to hire outside help to help develop the solution.

Looking at the differences here, they somewhat correlate with the previous matrix. Respondent A focuses on the business point of view, while Respondent B is concerned with developing software and builds his attitudes on the actual process of developing software. While this can be said to represent a cause of attitudes, I feel it can just as well help highlight the differences in actual attitude to OSS.

Respondent A focuses on the business side and the bigger picture, while Respondent B is more concerned with, understandably, how to optimise his work flow and getting the help he needs, should the need arise.

6.2.1 Attitudes to OSS from the survey

This section presents parts of the data gathered from the survey, where the respondents were asked to describe their attitudes to OSS. The data is presented in a matrix, that shows positive and negative attitudes. Trying to find an interesting angel on the different attitudes , I decided to base them on the informants level of education . As stated, this was done to see if there is any difference in attitudes towards OSS based on the level of

education. I did this to see if these attitudes were random in the context of education, and based on other factors. I then added categories for both positive and negative attitudes. There are a few of the positive attitudes that could be attributed to negative attitudes as well, but given the context of these attitudes I would say they are generally positive, containing just minor reservations the given software has to fulfil. This will be explained in greater detail after the matrix. The reason for separating the respondents based on their level of education is explained in greater detail bellow the table, but I would like to clarify that this is not to stigmatise anyone with a lower education or to draw conclusions on whether or not a Bachelor or Master degree is better than the other. It is simply to see if there is a difference in attitudes.

Level of education	Positive attitudes	Negative attitudes
Cand. Mag/Bachelor	• Likes the idea of sharing, especially for the public sector where all municipalities share common needs	• Administration not necessary cheaper • Vulnerable and high demands of internal competence when there is no vendor
Cand. Mag/Bachelor	• Positive	
Cand. Mag/Bachelor	• The OSS development model means a new software can be produced faster than proprietary software due community efforts • Can be useful in non-critical systems	• For critical system support is necessary and OSS ends up being as expensive as proprietary software

Cand. Mag/Bachelor

- Open to OSS
- Ubuntu Linux is a stable version of Linux and is being used extensively in the developer community
- Low cost and high access to resources

Cand. Mag/Bachelor

- Positive to OSS, depending on the situation.
- Negative to OSS, depending on the situation.

Cand. Mag/Bachelor

- Positive, but one has to be wary when introducing OSS in large organisations, especially considering support and maintenance agreements

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Cand. Mag/Bachelor

- Positive, have introduced OSS in the organisation, but it has to be considered together with the alternatives

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Cand. Mag/Bachelor

- Mostly positive to OSS

Hovedfag/Master		
	• Generally positive to the term OSS	• OSS lack infrastructure and this hinders use • Commercial off-the-shelf products such as MS Office "unfortunately" exploits this hole.
Hovedfag/Master		
	• Active contributor to OSS in the field of real estate management	
Hovedfag/Master		
	• Supporter of good software, which usually is OSS	

Hovedfag/Master		
	• Generally positive to OSS. Quality has to come first. Positive, but reserved • Support systems where you pay for support, and I am very positive towards the model of EZ-Publish or Ubuntu • An active and good community can be sufficient, but it varies.	• Lots of bad software also within OSS. • Great software without backed support is hard to vouch for in critical systems
Hovedfag/Master		
	• Like it	
Other level of education		
	• Specified, nothing positive about OSS.	• OSS is not cheaper in use • OSS consultants cost more • OSS is no guarantee the license remains free

I'm trying to identify a possible correlation between education and overall attitudes to OSS. I found that of a total of fourteen respondents with a Cand.Mag or Bachelor degree who had indicated any attitudes, eleven expressed positive attitudes and three negative attitudes. For the respondents with a Master degree, there were seven positive and four negative attitudes in a total of eleven recorded attitudes. The respondent with a different education, had nothing positive to say on OSS, but did express three negative attitudes.

For the respondents with a Cand. Mag or a Bachelor degree, five respondents had

only positive attitudes towards OSS, while of the respondents with a Master degree three had only positive attitudes towards OSS. The respondent with other education had none.

Of all the respondents, only the respondent without a different education had only negative things to say about OSS. All the others else had only positive attitudes or a mix of positive and negative attitudes.

The respondents with a Master degree appear to be somewhat reserved towards OSS than those with a Cand.Mag or Bachelor degree. It is hard to be conclusive conclusive as to whether or not this is so, but the data, even though suffering from insufficiency in terms of volume, do indicate that education does play a role in peoples attitudes towards OSS. The fact that only the respondent with a different education had no positive attitudes towards OSS at all, supports this impression. Still, this is merely speculation, and it cannot be said to be plausible by the data material available.

Are the people we interact with affecting our attitudes?

The respondents were asked to answer if people they interact with might affect their attitudes towards OSS. There were three questions asked, but two of them were too similar, and produced identical results (interaction with people at work and colleagues). The third one was family, which no one were affected by at all, and is therefor not showed below. At work, and outside work are the ones which stood out.

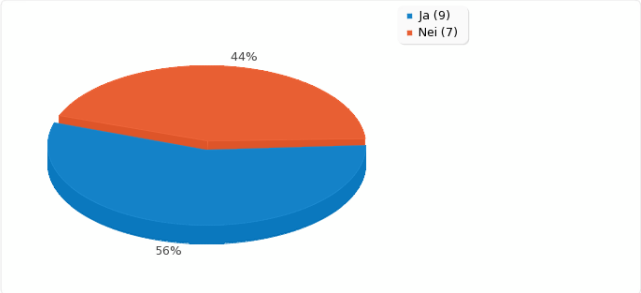

Figure 5: Respondents affected by interaction at work (colleagues).

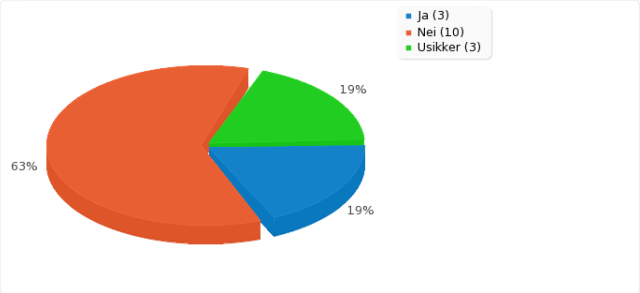

Figure 6: Respondents affected by interaction outside of work (friends and colleagues).

Here we see clear indications of which interaction affects the respondents the most. Interaction at work (and with colleagues) affects 56% of the respondents, while interaction outside of work affects only 19% of the respondents. However, it is interesting to observe that 19% of the respondents are uncertain as to whether they are being affected by interaction outside of work or not.

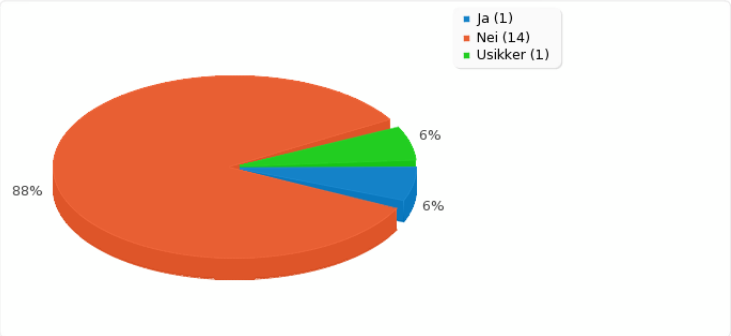

Figure 7: Respondents affected by interaction with friends.

Friends do not appear to have any decisive affect on attitudes to OSS. With 88% saying no, this is considered conclusive.

6.3 Q3: What causes these attitudes

In order to answer this research question, I used the second part of the interviews to ask the respondents a series of questions about different subjects related to OSS. Having established that there are attitudes, and that having looked at how interaction affects them the purpose of asking these questions was to discover what causes the different attitudes.

	Respondent A	**Respondent B**
If large corporations use, support and develop OSS?	As long as it is being done right. Implementation has to be done in a way that shows the good examples and the good solutions.	It helps the project when a number of large corporations are behind it, but it is not a factor when deciding to use the product or not, even though it is positive thing to account for.
Are attitudes changed by problems in the ICT industry when corporations take each other to court based on e.g. patent claims? Such as the patent court case between Oracle and Google on the DalvikVM used in Android?	Not familiar with the specific court case, but I don't think it does.	Not much, but there is an increased risk while the court case runs. However in the case of Google I believe they can find a good solutions. They cannot afford not to. Does not affect me, but people higher in the hierarchy with economic responsibilities might be affected by it.

Does such disputes weaken or create uncertainty to OSS?	Don't think so. The openness surrounding these cases today enables people to balance this on their own, there are so many sources of information available it helps highlight different sides of the case. Active users of the Internet today, which most of us are, pick up different information and draw conclusions based on this. I also discuss this with friends and colleagues, and conclude that in some cases one party is right, and in other cases the other party is right. The threshold to suing is also lower in the USA than in Europe.	Most people I know laugh at it, and does not take it very serious. There is no need to worry unless these court cases win in the Supreme Court of the United States.
Do the myths of OSS affect people who does not work in ICT compared to those who do?	The myths are changing, but they have been a reality.	Without doubt. People without experience often have attitudes based on wrong facts.
How about the myth that OSS is always good and Microsoft is always bad and that Microsoft are the bad guys while OSS is the good guys?	There are good things with both, that is how I see it.	No, I do not believe they are as hard hitting any more, most people are probably past that. These things often originate from facts, which are then added to.

Generally it seems that both respondents have knowledge of OSS, and that they do not focus on myths and are rarely affected by legal disputes or other uncertainties within the ICT industry. Both respondents share views on most of the questions asked in this part of the interview, even though they have different backgrounds or positions within the department.

They both seem to have a very open view on corporates using, supporting or developing

OSS. As long as the solution is good, it is good for OSS. They both agree that they are not affected by the court cases that run against OSS software and the different corporates that either support or create such solutions. Thanks to the openness of today, and the fact that most people talk about what goes on, neither believe that OSS and its reputation is being negatively affected by this. Respondent B points out that there is no need to worry unless one of these cases succeeds in the Supreme Court of the United States, while Respondent A is less worried about the problems "over there" and focuses more on what he believes makes the European ICT industry a safer industry compared to the one we see in the United States of America, with a higher threshold to sue in Europe compared to the United States of America.

The myths are changing, even though they have existed, claims Respondent A. Respondent B points out that with lack of experience comes attitudes based on wrong facts. They both agree on the myths about OSS and e.g. Microsoft, though they have different approaches to it. There are good things to both sides, but these myths are based on some sort of loose facts. These facts may, however, vary in quality.

Whether this is a correct or valid assessment of the legal position and the possible impact of American judgement in Europe, falls outside the scope of this work.

6.4 Summary

56.25% of the respondents hold a Cand. Mag / Bachelor degree, while 31.25% hold a Master degree. Of these 52.25% makes decisions on ICT, while 43.75% does not make decisions, but they still work with ICT every day.

93.75% had heard of OSS before the survey and interview. The overall picture was that most respondents knew OSS licenses, products and names in the OSS industry or advocates of OSS. None of the respondents picked names from the more classic propitiatory industry.

On use of OSS, 68.75% of the respondents use OSS both at work and at home, 12.5% does not use OSS at all, however, the low percentage of respondents using OSS may be traced back to misunderstanding the question, and believing that it meant active use, such as operating systems or web browsers. OSS is widely used in the organization, both for infrastructure, development and office support. Microsoft products are the ones used most, overall, but OSS alternatives are also widely used. Most of the respondents believe to be in contact with OSS on a daily basis, and OSS is being used for to support most tasks.

Only a minority of the respondents read OSS journals, I do however, not know if they read academic papers or ICT business journals.

The most important factors for attitude are economy, support and vendor(support). There seems to be no evidence of level of education within ICT affecting attitudes to OSS. Attitudes are more likely to be affected by interaction at work. Experience and point of view seems to be the dominant factors for creating attitudes.

Two different categories for each point of view stood out as important. While the manager focused on challenges with OSS, the developer focused on use and development

with OSS.

7 Discussion

The wide selection of OSS solutions that has spread to every corner oft he world, and is being used daily by millions of people, was not a reality until Red Hat, LinPro and others started making money selling services and solution based on OSS. They did this by selling Linux support and making the general public aware that there was indeed money to be made from both using and selling OSS. With that in mind, OSS was not yet widespread and the idea had not caught on outside of highly specialized institutions and in low end communication infrastructure such as mail servers or DNS servers. However, this is changing rapidly and a whole new industry is emerging from this new way of doing business. At the same time, there is generally a growing acceptance of OSS (Stone, 2002).

There are still a few misconceptions about OSS (Dedeke, 2009), even today, but these are slowly chaining and the debate is becoming a more balanced one, where the focus is being shifted from the fact that it is OSS to what it can do, both as a viable business plan Riehle (2007), and as a technical solution in organizations and businesses. It is no longer about being OSS; it is about solving the necessary problem.

With OSS implemented in big organizations such as the UK public sector Waring and Maddocks (2005) and with voluntarily work still going strong Bitzer and Geishecker (2009) (without regards to company interference and paid developers), the future is arguably bright for OSS as long as it is being used to solve the problems it was intended to solve, and not cherished as the savior of modern IT Bonaccorsi and Rossi (2003).

7.1 How widespread is the use of OSS in the organization

OSS in the organization is well used and well know, most every respondent has some sort of experience or familiarity with the concept. The survey showed that in certain areas OSS holds as much as a 50% of the common solutions it shares with Microsoft equivalents. Microsoft dominates on email in both service and client, but this is to be expected since according to my contact person, the municipally is standardized on Microsoft and using these solutions guarantees a better interoperability with shared resources and surrounding applications.

This part of the discussion will use the same headers as the analysis.

7.1.1 Experience and use of OSS

There is a lot of awareness on OSS in this department. Almost all the respondents had heard of OSS before the survey. Most of the respondents managed to name one or more OSS licenses, and the most common ones were the ones mentioned the most. There were some less known licenses being mentioned and there were a few licenses that are not OSS or not in existence or not actual licenses mentioned. The level of knowledge on OSS licenses indicates that the overall familiarity with OSS in the department is, in my opinion, good. There was no confusion when given a control question on well known people involved in OSS, no one fell for the big names in ICT that has nothing to do with OSS. Clearly most of the respondents pay a lot of attention to OSS.

Even though the municipally has standardized on Microsoft products for desktop and communication, more than half of the respondents are using OSS both at home and at work, which is arguably in line with the current trend (Stone, 2002), all tough this research is not new. A majority of the respondents started using OSS around and after 2000, which relates well to (Stone, 2002),

Windows is the clear winner on the operating systems, but Linux is well represented, as an established platform for development.

7.1.2 What OSS is in use

The use of OSS was not dominant on the end user part, but for development and administration (both of computer systems and resources) OSS was well used. The amount of web browsers being OSS was high, but Microsoft with Internet Explorer was the most common browser, however, arguably the fact that Internet Explorer is default for Microsoft Windows installations, the number of OSS web browser is high and proves that people know what they are looking for and that a lot of the respondents take the extra step to use OSS browsers. On email clients, Microsoft products were popular, but this has to do with the standardization on Microsoft in the department and the necessary for Microsoft Exchange support. Most OSS email clients do not fully support Microsoft Exchange.

Coming to a conclusion, OSS on the desktop is much used, and it is not far behind the proprietary solutions from Microsoft. Even though the question was intended to establish which OSS was in use, it provided insight of all products used. Examples of software being used for desktop related tasks, as well as for development and management of systems were mentioned.

7.1.3 Awareness on OSS

In order to answer this question, I had to ask a series of question to establish a general understanding of how aware the respondents were to OSS, both in regards to the OSS systems that may or may not support their use and the OSS the specifically used to solve problems or work related tasks.

75% of the respondents said yes to being in contact with or being served by OSS on a normal day. The respondents who answered no or decided to not answer at all are likely unaware of the amount of services running in the background of a modern infrastructure that in fact runs OSS.

Those respondents aware that they were using OSS on a daily basis, were asked to name the different tasks OSS was being used for. The list covers just about every aspect of an ICT related job. Ranging from products with OSS in their core, to operating systems and desktop application. When asked if they used OSS services that were not obvious (such as infrastructure), all respondents answered yes, but as pointed out in the analysis, this may be due to the leading question, and can not be taken into account without reservations.

Having 75% of the respondents being aware of OSS in this context is in my opinion acceptable, and supported by the variety of tasks that OSS was involved with every day

give a good indication. We can conclude that both the experience and use of OSS in the department is high.

7.1.4 Interest in OSS

This was the last part of the survey, and its goal was to see how the interest in OSS was within the department. Not many of the respondents read OSS publications, but more than half of them enjoy working with or experimenting with computers. This show that even though a lot of the respondents use OSS and are positive towards it, they generally see it as something related to work, and not something they explore further on their spare time.

7.2 Which attitudes can be found?

Based on both the interview and the data from the survey, there are a number of attitudes to find in regards to OSS. The most prominent ones as seen from the data collected from the two interviews are:

- **Economy**, which from a business perspective can be said to be the decisive force for selecting an OSS solution or going with a more classic proprietary solution. However, these attitudes differ somewhat bit depending on the background and the current position of the respondent. In general though, it seems to be important that the software does not pose the possibility of hidden cost down the road, but that the most important aspect is whether or not the software actually solves any problems. Working with the idea that software should solve problems, it is possible to argue that using a certain solution, the long time economic savings on that solution is more important than the actual cost of purchase. This is not necessary positive for OSS alone, as the hidden cost of OSS can be a surprise when the software itself is free. On the other hand, if an expensive proprietary solution is not solving the actual problem it is set to solve, it can be a rather expensive misfortune. A quote from respondent A enlightens the subject of economy, when considering development cost for OSS: “It is wrong to reinvent the wheel just because it is OSS”.

- **Support** is important to both respondents, but the approach differs. From a business perspective, support is something you want to have from the start, as it creates a feeling of safety for the given software. From a developers point of view, support is something that is important when needed. However, getting support when needed, can be both time consuming and frustrating long term.

- **Vendors** are most important from a business perspective, and not so much from a developers perspective. For the developer this can be said to correlate with the idea that support is something that should be acquired should the need arise. However, the business perspective clearly states that it is important to demand actual service from these vendors. So having a vendor is generally not a negative thing, but it does involve some strict agreements on what the vendor actually contributes and has to offer.

There were attitudes from both the business and developers side that could not be shown to have any significant correlation at all, and as such they had to be given their own categories. The two categories that stood out were the challenges with OSS from a business perspective and the use and development from a developer point of view.

- **Challenges - Manager point of view:**

  in regards to OSS are many, as with any technology, but the attitudes posed towards this form the business point of view are quite clear. Adopting OSS to a regulated marked controlled by rather complex laws where you need competence to actually create solutions that operate within the boundaries set by the environment where these solutions will be used, can be quite hard to achieve. Commercial solutions tend to have more resources available to afford the competence necessary to achieve this, and for this reason, commercial solutions have an advantage over OSS. Furthermore, OSS is seen as a tool for support and smaller modules of larger application. The business point of view is in regards to whether the OSS solution actually is free or, or in the case of hidden cost, how much it can be expected to be. The bottom line seems to be that it is up to who acquires the software to make the right decisions in regard to specifications and demands. The attitudes put forth here are important in general to ICT, and do not only affect OSS, but they do show some of the more classic OSS problems; cost and actual savings.

- **Use and development - Developer's point of view:**

  is what mainly concerns the developer, who basically uses the software to develop. The developer's attitude is that commonly used OSS generally holds a higher degree of quality compared to comparable proprietary software and that there are less problems. When problems do arise it tends to be easier to get help solving these problems on community web sites than having to rely on a support agreement and waiting for a support team to get up to speed on the problem and provide a solution. However, it is clear that there is rarely an actual need for OSS just because it is OSS, as there is no need to actually see the source code, though the freedom of being able to do so, is what is attractive about OSS. It seems that from a developer's point of view there is rarely any need to hire outside help to developer solutions based on OSS.This seems to be somewhat contrary to the business point of view and shows that there are in fact significant differences in the attitudes towards OSS if these attitudes are based on hands on experience from use only.

Attitudes to OSS as seen in the survey When using the survey to broaden the possible attitudes discovered on OSS, they seem to correlate to both the developer and business point of view. The freedom, usability and stability of OSS are all pointed out. OSS is generally seen as quality software by the respondents, even though as seen in some research that is not always the case. Whether this research is insufficient, or the department is unique, may be questioned. However, there do seem to be an overall positive attitude towards OSS in the department.

The negative attitudes correlate well with the business point of view, in that they all deal with the lack of infrastructure in OSS solutions (such as vendors, and proper software packages with for example support and implementation). Great software without backed support is hard to vouch for, which is obvious, considering that the business point of view finds the safety of support agreements to be an important part of acquiring software. However, the attitude that OSS can not be run in critical systems, is arguably wrong, when looking at the fact that companies such as Google Inc. are active users of OSS in their impressive system. This is probably one of the big problems for OSS today; the uncertainty of the product and the support behind it. However, as seen in the interviews, there is clearly a positive attitude towards OSS, also from a business perspective, as long as the premises are right.

The different attitudes towards OSS changed a lot when looking at the level of education the respondents held. For respondents with a bachelor there seemed to be a lot more positive attitudes than negative ones, compared to respondents who held a masters degree, where the amount of positive attitudes were closer to the amount of negative attitudes.

7.3 What causes these attitudes?

In general, attitudes can be said to be caused by the point of view and experience of the respondents. This does not necessarily mean that either one of them does not have any idea of the other's point of view, but simply that their own point of view is more important.

They both are open to the idea of corporate supported OSS, as long as the software is good. The fact that there are companies behind the software is not as important as the end result of using the software, so at least one cause of attitude is clear, quality of software.

The legal disputes regarding OSS do not seem to have much of an effect on either of the respondent. The openness of the world today, and the amount of available information might be enough to balance the picture. It is probably right that there is no need to worry, unless one of these cases against OSS win in he Supreme Court of the United States. It seems perfectly plausible that these legal disputes do not create or influence attitudes as long as they are just arguments with no real world consequences. With quality of software being the number one cause of attitudes towards OSS, it can be argued that as long as the software is good and solves the problems it was created or implemented to solve, that is the enough.

Based on the the developer's point of view, attitudes are often based on wrong facts. This also compares to earlier statements and data gathered from both interview and survey. There has been a focus on being honest towards OSS, which can easily be translated into importance of facts. It is therefor plausible that the second cause of attitudes is the facts or truth based on ones knowledge of OSS, whether these facts or truths are correct or not. This can be illustrated with a quote from Respondent B: "Usually it is non-OSS we curse most at.".

7.3.1 Interaction as a cause of attitude

This is based upon the survey data, and was not tested against the respondents during interviews. However, with 16 respondents answering this question, it is fair to assume this to be correct.

When working with the survey data on which interaction affected attitudes the most, there was a clear distinction between the three forms of interaction mentioned in the analysis, not including family, which had no respondents affected. Interaction at the work place seems to be the interaction that affects most of the respondents, and this arguably is natural, considering colleagues are often seen as ones peers by the respondents. They work at the same place, they may have the same work assignments and they work within the same field. Complementing this idea with the low rate of respondents being affected outside of work, it is safe to say that interaction at work is the primary source of attitude, at least when dealing with interaction as a separate issue.

7.3.2 Quality of software and knowledge

Quality of software, together with knowledge, seem to be the only real cause of attitudes towards OSS in this department. I find this plausible because both level of experience and the quality of the software has been brought up by almost everyone involved in the survey and by the two respondents from the interview.

7.4 Reliability and validity

For this discussion, I will use Thagaard (2004) when reflecting and discussing reliability and validity.

7.4.1 Reliability

This section tries to answer whether or not the research conducted in this work is reliable. Reliability is defined as critical evaluation of the work, to give an impression of the research as being conducted in a trusted and reliable way.

The chapter on Research Methods and Research Design tries to explain in detail theory behind the research methods and how I designed my research, to enable others to redo the research, and see if similar results may be found.

When using the survey, the gathering of data was really straight forward, with few obstacles and no room for interference from the researcher. Not including flaws in the survey, the setting for the survey was that each respondent should answer the survey without searching within answers from any third parties such as colleagues or Internet search engines such as Google.

During the two interviews, the respondents were given much room to talk freely on subject they wanted to elaborate on, and I did not interfere much, only asking questions from the interview guide when the interview needed to get back on track.

External reliability Would another researcher who conducts the same work end up with the same results as this work? In qualitative studies, this reliability can be hard to achieve.

In this case, the research was conducted in a department, with 31 relevant respondents, as a case study. If a new research were to be conducted within the same population, it is likely that the result would be the same.

Internal reliability Does the data gathered in this work correlate to research by others within the same field?

As this was a case on a single department within the municipal of Bergen, I believe that this will be assumptions, however, there are indications that some of the findings at least, correlates to what was found in FLOSSPOLS (2005). There are also certain papers, as seen in the Theory chapter, that support this work.

7.4.2 Validity

Validity is connected to data and the researcher's interpretations. Are the interpretations valid in context of the reality that has been studied.

Based on two interviews, I cannot claim that this work is valid based on the results or conclusions I draw, but I can say that I have tried to make it as transparent as possible, to ensure that it is possible to follow up on the work or to criticize it.

Exterior validity The results of a study may be transferred to, and be valid, in other contexts.

For this study, this is not likely, as this is a case study and based on one department in the municipal of Bergen only. However, if similar organizations and departments were to be subjected to a study similar to this, perhaps I can assume the results would be similar, but not in an entirely different context.

Internal validity How well causation are being supported within the study.

Transparency is important to achieve internal validity, and in this work I have focused a great deal on explaining the theory, how I gathered data and the process of analyzing the data. When presenting the analysis of the data, I tried to explain as much about the data as possible, without discussing it in too much detail, saving that for this chapter, Analysis. In the chapter Data collection, I explain how I gathered the data and what I did with the data after having gathered it. Transcripts from the interviews and the entire survey has also been added to the work as appendixes. I have, however, not been presenting alternative interpretations, even though this is helpful in supporting claims of validity. Much of this work was based on two interviews, and there was not much room for alternative interpretations, as the categories I used and the similarities and differences between the two respondents were clear, at least from my point of view.

My relation to the respondents was based on emails, and one meeting with one of the respondents for the interviews prior to the interview. In other words, I had not much of a relation to the respondents. When relating to the respondents, I could relate most to the

developer, based on my own experience with the things he brought up. I cannot say that my experience from this work had much of an impact on the conclusion I draw, but I do admit I probably am a bit biased towards OSS. However, I have tried to be as analytic as possibly, keeping my own view separate from the work.

7.5 Evaluation of the work

I believe that using both surveys and interviews was a good way of conducting this research, and I believe that if anyone were to do a similar research, a mixture of both would be rewarding. I only wish I had more interviews to work with.

7.5.1 What could have been done different

Few aspects of this work I would not have done different should I revise it with my current knowledge gained while working on this.

My chapter on research design, I should not have written it as something that would happen in the future, but rather used the same form as used in the rest of this work. However, at the time of writing, it was the correct form.

Survey While designing the survey, I had very little actual experience in survey design. I did a lot of reading, but I had no hands on experience. Running tests of the survey on friends and family hoping to improve it, this may not have been the best way, and certainly should not be the only way, of testing a survey.

On the actual survey, I should have focused more on the logical order of categories and questions. I had to do a lot of "cross analysis" when analyzing the survey data, because items that logically would belong together were spread apart. Should I redesign the survey, structure and logic would have been my main focus. Analyzing the survey data taught me that structure and logic is important.

One important question that was never defined was the difference between the Apache Foundation and its products and the Apache HTTP server, logical flaws such as this should have been discovered earlier in the survey design process, and not after the survey had completed its run.

Interview As with the survey, I had never designed an interview guide prior to this work. Here as well, I read up on the theory, without any hands on experience. I did test the interview on friends and family, but this often ended up being disconnected from the reality of an actual interview. What I would change follows:

- When I designed the interview guide, I should have asked questions more connected to each other.
- I should have performed the interviews closer to the survey end data, to minimize the number of respondents declining.
- I should have taken more control during interviews, and accepted less control from informants.

Besides this, and out of my control, the response from the respondents ended up being much lower than expected. Due to this, my data material ended up being much smaller than I had expected, and the overall work undoubtedly suffer from this.

7.5.2 Summary

In general, I would say my findings are being supported by different published papers and books. Both the positive and negative attitudes are heard of, and the importance of OSS are obvious. At least at the time of writing. However, there is a notable lack of negative information regarding OSS, that has not been supported by organizations who would benefit from putting OSS in a bad light. There also seem to be a lack of criticism towards OSS from the respondents, and the positive attitudes are often overwhelming.

It is challenging to judge validity, but based on how the interviews and the open answers on the survey correlate, I would say that they both support each other, and that they, together, support the discussion and my interpretations. At least for this given case.

8 Conclusion

As OSS acceptance grow both on the corporate level and the user level, OSS is quickly becoming a serious actor in the ICT industry. Backed by strong organizations using, developing and supporting OSS, it has created a whole new industry withing the ICT industry. It even has its own business models and advocates.

How widespread is the use of OSS

OSS is being used a lot in the department, and most of the respondents are familiar with both concepts, use and problems. Informants tended to be well informed and up to date on OSS and areas concerning it. When OSS use is as widespread as it is within this department, both for development and services, it it safe to assume that it supports the attitudes found, and the causes for these attitudes.

Which attitudes were found

There are three major categories when working with attitudes towards OSS. These are economy, support and vendors.

Economy deals with the economic aspect of acquiring software, using it and maintaining it. This does not favor either OSS or proprietary solutions, but it is concerned with software solving the problem it was intended to solve and how effective it is. Within the economic aspect comes quality of software. If the quality is low, the product will probably fail or not perform as expected, and there will be economic consequences.

Support is about how well vendors are able to support their product, how well support agreements work and the life cycle of the product as well as teaching users to use it and technical personnel to maintain it.

Vendors is about having someone supporting the products, as seen from the attitude towards support. Having some place to go when something goes wrong, or knowing that someone willing to develop and support the product are backing it with enough resources to actually make the product viable, are important factors. Having a vendor also battles one of the biggest problems with OSS, as seen in this work, the lack of infrastructure when buying a product. This incorporated both economy and support.

What creates these attitudes

As mentioned earlier, there are a few dominant factors for creating attitudes. These are point of view, quality of software, attitudes based on wrong facts and interaction with people at work.

Point of view deals with where the individual is within the organization, that is, what position he or she holds. The manager has a different view on OSS than the developer, but the bottom line is still very similar in most cases.

Quality of software is essential for economy and support is often carried a long way by quality software.

Attitudes based on wrong facts often occur both as positive attitudes and negative attitudes, and it is hard to find either one to be more obvious than the other. There

also seem to be a lot stronger attitudes and opinions coming from those who base their attitudes on wrong facts, than those basing them on actual facts.

Interaction do create attitudes, but mainly in a professional setting from colleagues. Friends and family did not have a noticeable effect on creating or altering attitudes.

There was no evidence that attitudes are being created, affected or altered by legal matters and lawsuits.

8.1 Further research

There is defiantly grounds for further research within this domain. Understanding the attitudes and what creates them is an important piece of the puzzle of understanding OSS as a whole, and further research should be conducted both in the field of Information Science and Psychology, perhaps together. To understand what drives OSS, it is important to understand the point of view of others.

Focus could be on quality of software and experience, as these seem to be among the most prominent factors for attitudes.

Even though similar, but far more extensive research has been done, such as FLOSSPOLS, there is still more room for this subject to be researched. For OSS to continue to grow (or stop growing), knowing what makes the users use it, is as important as researching how it works and what it does.

References

M Aberdour. Achieving quality in open source software. *IEEE Software*, 24:58–64., 2007.

Jürgen Bitzer and Ingo Geishecker. Who contributes voluntarily to oss? an investigation among german it employees. *ELSEVIER*, 2009.

Andrea Bonaccorsi and Cristina Rossi. Why open source software can succeed. *ELSEVIER*, pages 1243–1258, 2003.

Monica Dalen. *Intervju som forskningsmetode - en kvalitativ tilnærming*. Universitetsforlaget, 2004.

Adenekan Dedeke. Is linux better than windows software. *IEEE SOFTWARE*, pages 104–103, 2009.

Joseph Feller and Brian Fitzgerald. *Understanding open source software development*. Addison Wesley, 2002.

Joseph Feller, Brian Fitzgerald, Scott A. Hissam, and Karim R. Lakhani, editors. *Perspectives on Free and Open Source Software*. MIT Press, 2005.

FLOSSPOLS. Usage of and attitudes towards free / libre and open source software in european governments. (Deliverable) Maastricht, March 2005, 2005.

Jr Floyd J Fowler. *Survey Research Methods*. Sage, 2009.

Chava Frankfort-Nachmias and David Nachmias. *Research Methods in the Social Sciences*. St. Martin's Press, 1996.

Robert L. Glass. *Standing in Front of the Open Source Steamroller*, chapter 4, pages 81–92. In Feller et al. (2005), 2005.

Gautam Guliani and Dan Woods. *Open source for the enterprise - Managing risks reaping rewards*. O'Reilly Media Inc, 2005.

Øyvind Hauge, Carl-Fredrik Sørensen, and Reidar Conradi. Adoption of open source in the software industry. *IFIP Internation Federation for Information Processing*, 275; Open Source Development, Communities and Quality, 2008.

Karim R Lakhani and Robert G Wolf. Why hackers do what they do. *Perspectives on Free and Open Source Software*, The MIT Press., 2005.

Christina Lamastra. Software innovativeness. a comparison between proprietary and free/open source solutions offered by italian smes. *R&D Management*, 39:153–169., 2009.

G Lawton. The changing face of open source. *Technology News IEEE Computer Society*, pages 14–17, 2009.

Josh Lerner and Jean Tirole. *Economic Perspectives on Open Source*, chapter 3, pages 47–78. In Feller et al. (2005), 2005.

Peter M. Nardi. *Doing Survey Research, A Guide to Quantitative Methods*. Person Education Inc, 2006.

OSI. History of the osi, 08 2011. URL `http://opensource.org/history`.

Richard E. Petty, Duane T. Wegener, and Leandre R. Fabrigar. Attitudes and attitude change. *Annual Reviews Psychology*, 48:609–647, 1997.

Eric Steven Raymond. The cathedral and the bazaar. http://catb.org/esr/writings/homesteading/cathedral-bazaar/cathedral-bazaar.ps, 2000. Version 3.0.

Dirk Riehle. The economic motivation of open source software: Stakeholder perspectives. *IEEE Computer*, 4:25–32, 2007.

Gordon Rugg and Marian Petre. *A Gentle Guide to Research Methods*. Open University Press, 2007.

So Young Sohn and Min Seok Mok. A strategic analysis for successful open source software utilization based on a structural equation model. *Elsevier*, 2007.

Adam Stone. Open source acceptance grows. *IEEE SOFTWARE*, March/April:102, 2002.

Tove Thagaard. *Systematikk og innlevelse, En innføring i kvalitativ metode*. Fagbokforlaget, 2004.

Teresa Waring and Philip Maddocks. Open source software implementation in the uk public sector: Evidence from the field and implications for the future. *ELSEVIER*, pages 411–428, 2005.

Claes Wohlin, Per Runeson, Martin Höst, Magnus C. Ohlsson, Björn Regnell, and Anders Wesslén. *Experimentation in Software Engineering. An Introduction*. Kluwer Academic Publishers, 2000.

Harry F. Wolcott. *Writing Up Qualitative Research*. SAGE, 2009.

9 Appendices

9.1 Appendix A: Survey

Velkommen til en undersøkelse om holdninger til Fri Programvare.
Litt praktisk informasjon:

- Jeg er en masterstudent ved Universitetet i Bergen. Institutt for informasjons- og medievitenskap ved Det samfunnsvitenskapelige fakultet. Mitt navn er Dag Østgulen Heradstveit (Dag.Heradstveit@student.uib.no).
- Veilder er Solveig Bjørnestad (Solveig.Bjornestad@infomedia.uib.no).
- Vi tar sikte på å kartlegge bruk, kunnskap, erfaring og relevans i forhold til spørsmålet "Holdninger til Fri Programvare".
- Formålet med dette undersøkelsen er å skape et datamateriale for å supplere intervjudata (triangulering).
- Det er frivillig å delta og det er mulig å avbryte under veis eller å takke nei til å delta.
- Datamaterialet vil bli oppbevart i en database adskilt fra epost-adresser. Databasen eksisterer på en datamaskin i UiB sitt nettverk. Det er bare jeg og veileder som har tilgang på data gjennom survey-løsningen. Databasen er tilgjengelig for root-bruker (administrator) på den gitte maskinen.
- Ved endt arbeid slettes hele databasen, og alle sikkerhetskopier som måtte eksistere.

Vi ønsker å gjøre oppmerksom på at Fri programvare tilsvarer det engelske begrepet Open Source Software. Det er også viktig at det ikke søkes eller spørres etter svar mens en besvarer undersøkelsen.

Ved slutten av dette skjemaet vil du bli spurt om du ønsker å delta videre. Dersom det er aktuelt å delta videre blir du bedt om å oppgi epost adressen din. Dette er det eneste stedet din epost kobles sammen med dine svar. Ønsker du ikke å delta videre og å forbli anonym svarer du nei til å fortsette.

Innsamlingen av persondata avsluttes 25.02.11 dersom ingen andre opplysninger er gitt. Arbeidet pågår videre, men da i form av utskrivning av anonymisert materiale.

Det er 31 spørsmål i denne undersøkelsen.

Om deg

1 [bg1]Hvor gammel er du? *

Velg kun en av følgende:

- ○ < 20
- ○ 21-30
- ○ 31-40
- ○ 41-50
- ○ 51-60
- ○ 61-70
- ○ > 70

2 [bg2]Hva er din høyeste utdanning? *

Velg kun en av følgende:

- ○ Grunnskole
- ○ Videregående
- ○ Universitet eller Høgskole (cand.mag/bachelor)
- ○ Universitet eller Høgskole (hovedfag/master)
- ○ Høyere
- ○ Annet [ ]

3 [bg3]Hvilke stilling har du i Bergen Kommune? *

Vennligst skriv her:

[ ]

4 [bg4]Hvor mange år har du hatt din nåværende stilling? *

Velg kun en av følgende:

- ○ < 1 år
- ○ 1-5 år
- ○ 6-10
- ○ 11-15
- ○ 16-20
- ○ > 20 år

5 [bg5]Er IT en del av dine arbeidsoppgaver?

Velg kun en av følgende:

- ○ Ja
- ○ Nei

6 [bg6]Har du myndighet ved valg av IT-baserte løsninger? Dette kan være alt fra overordnet arkitektur til valg av epost- og nettleser. *

Vennligst velg alle som passer:

- ☐ Overordnet arkitektur
- ☐ Programvare for kontorstøtte
- ☐ Programvare/rammeverk for utvikling
- ☐ Ingen
- ☐ Vet ikke

Generelt

7 [gen1]Hadde du hørt om Fri Programvare før du hørte om denne surveyen? *

Velg kun en av følgende:

- ○ Ja
- ○ Nei

8 [gen2]Kan du gi et eksempel på Fri programvare? *

Svar kun på dette hvis følgende betingelser er oppfylt:
° Svaret var Y'Ja' i spørsmål '7 [gen1]' (Hadde du hørt om Fri Programvare før du hørte om denne surveyen?)

Vennligst skriv her:

9 [gen3]Kan du nevne en Fri programvare lisens? Det holder med et eksempel.

Svar kun på dette hvis følgende betingelser er oppfylt:
° Svaret var Y'Ja' i spørsmål '7 [gen1]' (Hadde du hørt om Fri Programvare før du hørte om denne surveyen?)

Vennligst skriv her:

10 [gen4]Forbinder du noen av navnene under med Fri programvare? Dersom du ikke vet lar du være å krysse av.

Vennligst velg alle som passer:

- ☐ Richard Stallman
- ☐ Steve Jobs
- ☐ Bill Gates
- ☐ Jon Hall
- ☐ Eric Steven Raymond
- ☐ Steve Ballmer
- ☐ Linus Benedict Torvalds

Holdninger til Fri programvare

11 [hold1]Dine holdninger til Fri programvare? Skriv noen ord dersom du kan peke på noen.

Vennligst skriv her:

12 [hold2]Har utdanningen din påvirker hvordan du ser Fri programvare? *

Velg kun en av følgende:

- ○ Ja
- ○ Nei
- ○ Vet ikke

13 [hold2.1]Kan du forklare litt nærmere hvordan du synes dette påvirker deg?

Vennligst skriv her:

14 [hold3]Er din holdning til Fri programvare blitt påvirket av dem du omgås? *

Vennligst velg passende svar til hvert element:

	Ja	Usikker	Nei
På arbeid	○	○	○
Utenfor arbeid	○	○	○
Kollegaer	○	○	○
Venner	○	○	○
Familie (f.eks barn)	○	○	○

Erfaringer med Fri programvare

15 [erf1]Bruker du Fri programvare selv? *

Velg kun en av følgende:

- ○ Jobb
- ○ Privat
- ○ Jobb og privat
- ○ Ingen av delene

16 [erf2]Bruker du noen av følgende operativsystem? *

Vennligst velg alle som passer:

- ☐ Debian
- ☐ Arch Linux
- ☐ Gentoo
- ☐ Ubuntu
- ☐ Open Suse
- ☐ Fedora
- ☐ BSD-variant (FreeBSD, NetBSD, Open BSD, DragonflyBSD
- ☐ Haiku
- ☐ Syllable
- ☐ Plan 9
- ☐ Red Hat
- ☐ Cent OS
- ☐ Windows varianter
- ☐ OSX varianter
- ☐ Annet: _____

17 [erf3]Når var første gang du kan huske å ha brukt Fri programvare? Det holder å oppgi året. *

Vennligst skriv her:

_____

Bevissthet vedrørende Fri programvare

18 [bev1]Er du i løpet av en dag i befatning med Fri programvare tror du?

Velg kun en av følgende:

- ○ Ja
- ○ Nei

19 [bev1.1]Kom gjerne med eksempler. Skill med linjeskift.

Svar kun på dette hvis følgende betingelser er oppfylt:
° Svaret var Y'Ja' i spørsmål '18 [bev1]' (Er du i løpet av en dag i befatning med Fri programvare tror du?)

Vennligst skriv her:

20 [bev2]Tror du det finnes Fri programvare som støtter ditt IT-bruk uten at det er åpenbart? *

Velg kun en av følgende:

- ○ Ja
- ○ Nei

21 [bev3]Du svarte nei, men tror du noen av disse være slike løsninger? Kryss av på flere om ønskelig. *

Svar kun på dette hvis følgende betingelser er oppfylt:
° Svaret var N'Nei' i spørsmål '20 [bev2]' (Tror du det finnes Fri programvare som støtter ditt IT-bruk uten at det er åpenbart?)

Vennligst velg alle som passer:

- ☐ Apache
- ☐ Sendmail
- ☐ Bind
- ☐ MySQL
- ☐ PHP
- ☐ Annet:

Interesse vedrørende Fri programvare

22 [int1]Følger du med i tidsskrifter som omhandler Fri programvare? *

Velg kun en av følgende:

- ○ Ja
- ○ Nei

23 [int2]Leser du noen av følgende tidsskrift?

Vennligst velg alle som passer:

- ☐ Linux Magazine
- ☐ Linux Format
- ☐ Linux Journal
- ☐ Linux User
- ☐ Linux Developer
- ☐ PHP Magazine
- ☐ Joomla Community Magazine
- ☐ o3: magazine
- ☐ Open source Magazine

24 [int4]

Liker du å jobbe med og eksperimentere med datamaskiner? *

Velg kun en av følgende:

- ○ Ja
- ○ Nei

Bruk av Fri programvare

25 [bruk3]Hvor ofte bruker du Fri programvare? *

Velg kun en av følgende:

- ○ Daglig
- ○ 1-3 dager i uken
- ○ 3-5 dager i uken
- ○ Ukentlig

26 [bruk1]Bruker du en eller flere av disse nettleserne? *

Vennligst velg alle som passer:

- ☐ Mozilla Firefox
- ☐ Konqueror
- ☐ Internet Explorer
- ☐ Epiphany
- ☐ Safari
- ☐ Google Chrome
- ☐ Netscape
- ☐ Opera
- ☐ Internet Explorer
- ☐ Annet: [ ]

27 [bruk2]Bruker du en eller flere av disse epost-klientene? *

Vennligst velg alle som passer:

- ☐ Mozilla Thunderbird
- ☐ Evolution
- ☐ Mutt
- ☐ Claws Mail
- ☐ Outlook Express
- ☐ Sylpheed
- ☐ Outlook
- ☐ Annet: [ ]

28 [bruk4]Bruker du en eller flere av disse dokumentbehandlings-applikasjonene?

Vennligst velg alle som passer:

- ☐ Microsoft Office
- ☐ KOffice
- ☐ Open Office
- ☐ Oracle Open Office
- ☐ Libre Office

29 [bruk5]Er noe av programvaren du bruker Fri programvare? *

Velg kun en av følgende:

- ○ Ja
- ○ Nei
- ○ Usikker

Ønsker du å delta videre

30 [vid1]
Ønsker du å melde din interesse dybdeintervju til en senere anledning?

Dette innebærer at du innkalles til et intervju med meg hvor vi skal diskutere holdninger til Fri programvare ytterligere.
Det vil bli gjort lydopptak av intervjuet, dette muliggjør å jobbe videre med intervjuet etter det er avsluttet.
Det er mulig å trekke seg under og etter intervjuet uten at dette trenger å begrunnes.
Ved avsluttet prosjekt tilintetgjøres lydopptak og transkripsjoner (notater fra lydbåndet).
Spørsmålene som blir stilt under intervjuet er utelukkende basert på Fri programvare og det blir ikke stilt personlige spørsmål.

Svarer du ja tillater du at jeg leser dine svar og bruker dem i et eventuelt dybdeintervju med deg. Alle data fra survey som presenteres vil være anonymisert, uavhengig av hvorvidt en velger å delta eller ikke. *

Velg kun en av følgende:

- ○ Ja
- ○ Nei

31 [vid2]Du ønsker å delta videre. Vennligst oppgi en epost-adresse jeg kan nå deg på. *

Svar kun på dette hvis følgende betingelser er oppfylt:
° Svaret var Y'Ja' i spørsmål '30 [vid1]' (Ønsker du å melde din interesse dybdeintervju til en senere anledning? Dette innebærer at du innkalles til et intervju med meg hvor vi skal diskutere holdninger til Fri programvare ytterligere. Det vil bli gjort lydopptak av intervjuet, dette muliggjør å jobbe videre med intervjuet etter det er avsluttet. Det er mulig å trekke seg under og etter intervjuet uten at dette trenger å begrunnes. Ved avsluttet prosjekt tilintetgjøres lydopptak og transkripsjoner (notater fra lydbåndet). Spørsmålene som blir stilt under intervjuet er utelukkende basert på Fri programvare og det blir ikke stilt personlige spørsmål. Svarer du ja tillater du at jeg leser dine svar og bruker dem i et eventuelt dybdeintervju med deg. Alle data fra survey som presenteres vil være anonymisert, uavhengig av hvorvidt en velger å delta eller ikke.)

Vennligst skriv her:

Takk for at du deltok.

Om du valgte å delta videre kontakter vi deg per epost på et senere tidspunkt for å avtale nærmere.

Mvh
Dag Østgulen Heradstveit
Masterstudent, Informasjonsvitenskap ved Universitetet i Bergen

01.01.1970 – 01:00

Send undersøkelse.
Takk for at du fullførte denne undersøkelsen.

9.2 Appendix B: Interview

Interview Guide

Vår 2011

Innledning

Hensikten med intervjuet er å samle data for å besvare sentrale spørsmål vedrørende hva som skaper holdninger og hvilke holdninger man finner.

Ønsker å vite mest mulig om hvordan du ser Fri programvare, hvilke erfaringer du har med det og hvilke holdninger man finner. Disse holdningene kan være alt fra helt positiv til helt negativ Det viktige er å kartlegge de forskjellige holdnigene som er å finne i organisasjonen.

Anonym

Alle intervju vil bli anonymisert, sitater vil ikke bli gjengitt på dialekt dersom de skulle bli brukt og det vil bli sendt forespørsel om hvorvidt det er ok å bruke sitatet. Det er et krav at ingen skal kunne peke ut deltagerne i ettertid ved å lese oppgaven.

1 Hva skaper holdninger

1. Hva tror du skaper holdninger til Fri programvare?
2. Bruker du Fri programvare ?
3. Hvordan er dine erfaringer med Fri programvare-løsninger?
   (a) Har du andre erfaringer vedrørende bruk av prop. løsninger? Gjerne tilsvarende løsninger.
4. Dersom du må ta stilling til valg av programvare, hvilke faktorer vil du da si er avgjørende for ditt valg?
   - Hvordan velger du dersom systemet er forretningkritisk?
   - Hva legger du i et forretningkritisk system?

- Hvordan synes du balanse i valg av forretningkritiske systemer stiller seg i forhold til valg av lisens?

5. Hvilke faktorer spiller inn når du skal velge en programvareløsning?
6. Hva tror du selv er grunnlaget for dine holdninger til Fri programvare?
7. Gitt frie økonomiske og tidsmessige rammer, hvordan ville ditt valg av løsninger forandret seg fra slik det arter seg nå?

    - Kan du i korte ord beskrive hvilke løsninger ville du valgt?

2 Hvilke holdninger finner man

1. Dersom du skulle beskrive Fri programvare til en person som aldri hadde brukt eller hørt om det før, hva ville du sagt?
2. Det finnes mange myter, både om Fri programvare og tilsvarende løsninger.

    - Tror dude fleste ser på disse mytene som sannheter?
    - Påvirker slike myter også IT-personell?
    - Dersom du er uenig i at disse mytene eksisterer, kan du forklare hvorfor?.

3. Hvordan påvirkes du av problemer i IT-industrien?

    (a) Oracles søksmål mot Google vedrørenda påstått Java-kode i Dalvik(Android)?

    (b) SCOs søksmål mot IBM og Linux vedrørende påstått Unix kode i Linux?

    - Skaper dette usikkerhet og svekker det tillitten til Fri programvare? Utdyp gjerne.

4. Hvor viktig er det å ha en leverandør bak et produkt?
5. Hvordan påvirkes holdningen til Fri programvare når du vet at flere store IT-selskaper er storbrukere av Fri programvare, og også ofte store bidragsytere til disse

    - Bidrar disse store selskapenes instats og støtte til å skape tillitt til slike produkter?

6. Bruker du andre systemer privat enn på jobb?

    - Hvorfor velger du å bruke en annen løsning privat?

7. Kan du beskrive ditt drømmesystem?

   (a) Hardware, eks PC eller Mac.

   (b) OS (Windows, OSX, Linux o.l), støtteprogrammer som dokumentbehandling og utviklingsverktøy.

8. Er det mer du ønsker å legge til om ditt forhold til Fri programvare?