University of Bergen

Department of linguistic, literary and aesthetic studies

DIKULT350

Master's thesis in Digital Culture

Autumn 2021

How technological elevation impact our body, mind, and societies.

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Abstract (English)

This thesis aims to uncover the reasons, consequences, and implications of applying technology to human conditions and display these elements through an essayistic review of examples and a theoretical framework. Through analyzing the dynamic and fleeting computational technologies, it is vital to uncover what this means for us as not only consumers—but as humans. By encoding human aspects in technology, we externalize various computational processes of the biological human— such as for example calculation or memory—and we experience a change in what it means to be human. Through this it becomes possible to uncover how technological elements can alter the biological boundaries of human potential capability. Though this implementation of technology is often-most praised as a valuable tool to effectivize certain processes, this thesis aims to uncover the unseen consequences of implementing something allegedly as 'simple' as a light bulb- and criticizes the use of technological remedies that alter the biological aspects of body, mind, and society.

The baseline of the thesis is rooted in the exploration of the interchangeable evolution of human and machine—i.e., *artificial and real*—and draws inspiration from the theories of Bernard Stiegler's hypothesis of a shared organology between the biological and the technological. There is a prevalent focus on how technological externalization of cognition is detrimental to the assemblage of human nature and how technological elevation of capability impact this domain both individually and collective—for good or bad. Furthermore, it is vital to state that the thesis asserts a technological deterministic viewpoint—that technology and human has an equal exchange in a socio-cultural development—and that the focus will be on computational technologies, and not all technology uniformly.

With computational technology being such a pivotal force in impacting socio-cultural evolution, there is a necessity to uncover what the tools we use are doing *to* us, instead of just looking at what they do *for* us. We need to understand *why* our tools are being made, *what* they are made for, *who* they are made for and *when* they are being used. Furthermore, considering the representation of technological tools in modern times—it is important to uncover how the representation of technology scales towards what technology actually *is* and actually *do*, within the context of impacting body, mind, and society.

Abstract (Norwegian):

Denne oppgaven tar sikte på å avdekke årsaker, konsekvenser og implikasjoner av å anvende teknologi inn i menneskelig kognisjon og fremstiller disse elementene gjennom bruk av en essayistisk gjennomgang av eksempler og et teoretisk rammeverk. Gjennom analysering av de dynamiske og flyktige kognisjons-teknologiene er det viktig å avdekke hva dette betyr for oss som ikke bare forbrukere—men som mennesker. Ved å kode menneskelige aspekter inn i teknologi opplever vi en eksternalisering av kognitive prosesser som beregning eller hukommelse—og vi opplever en endring i hva det vil si å være menneske. Gjennom dette er det mulig å undersøke hvordan teknologiske verktøy kan heve biologiske grenser for menneskelig evne. Selv om implementeringen av teknologi oftest hylles som et verdifullt verktøy for å effektivisere visse prosesser, tar denne avhandlingen sikte på å avdekke de usynlige konsekvensene av å innføre noe angivelig så 'enkelt' som en lyspære—og kritiserer bruken av teknologiske midler som endrer biologiske aspekter ved kropp, sinn og samfunn.

Denne oppgaven er forankret i utforskningen av den tosidige evolusjonen av menneske og maskin—dvs. kunstig og ekte—og henter inspirasjon fra Bernard Stiegler sin hypotese om en delt «organologi» mellom det biologiske og det teknologiske. Det er et utbredt søkelys på hvordan teknologisk eksternalisering av kognisjon er skadelig for menneskelig natur og hvordan teknologisk forhøyelse av evner påvirker mennesket både individuelt og kollektivt—positivt of negativt. Videre er det viktig å nevne at oppgaven innehaver et teknologisk deterministisk synspunkt—derav at teknologi og mennesker har lik utveksling i en sosiokulturell utvikling—og at fokuset vil være på «beregningsteknologier», og ikke teknologi generelt.

Med beregningsteknologi som en sentral påvirkningskraft for sosiokulturell evolusjon, er det en nødvendighet for å avdekke *hva* verktøyene vi bruker gjør *med* oss, i stedet for bare å se på hva de gjør *for* oss. Vi må forstå *hvorfor* verktøyene våre lages, *hva* de er laget for, *hvem* de er laget for og *når* de brukes. Videre, med tanke på representasjonen av teknologiske verktøy i moderne tid – er det viktig å avdekke hvordan representasjon av teknologi kan veies mot hva teknologi faktisk er, og gjør- innenfor konteksten av å påvirke kropp, sinn og samfunn.

Acknowledgements

This thesis has been written as a part of the masters' program in 'Digital Culture' at the University of Bergen and is being submitted 23. November 2021.

First and foremost, I would like to extend my heartfelt gratitude for all those who have listened to my crazed ramblings throughout my time in this study program. I am glad that I have been able to have long and interesting discussions with my fellow students, friends and family over the course of this thesis, and that they have understood what I love doing.

Secondly, I would like to thank the various professors at the Faculty of Humanities, who have given me many directions to steer my thesis. From my counselor Scott Rettberg and his creative examples that inspired me to approach the topic of technological elevation—I extend my gratitude.

Third, I would like to thank my family, for ever supporting and loving. Your motivational words always matter the world to me. I would like to thank my father for inspiring me to go down the path of digital culture—and my mother for providing all the support I could wish for.

Lastly, I would like to thank my girlfriend Ida, who through countless hours of listening to my nonsense—still was willing to listen, and to be there for me.

To all of you who read this—thank you.

November 2021,

Sondre Rong Davik.

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1.0 Introduction

In the 21st century, humans have risen to enormous heights in aptitude due to our innovational nature. As a species that is remarkable in using—and creating—tools to enhance our capability, we have achieved copious amounts of things that would have been unimaginable to us without the technological tools that assist us. In early times of our historical role as toolmakers we would look upon the sky and dream that we could fly like the birds, and at that time it would have been unimaginable that in the 21st century commercial flight can bring us across the globe in the manner of hours- or that its possible to jump from an airplane at 3000 meters in the air and still safely land back on the earth by the help of a parachute. While it seems that these technological tools are very trivial in the grand scheme of human nature, it is important to analyze them, especially since we have become numb to the consequences that the technologies impose.
Due to the degree of which we use technological tools to elevate our innate biological capability, and how much it changes what it means to functionally be human in a society—it is vital that we look upon the implications of technological elevation on the body, mind and societies if we are to understand how humans' evolutionary progress is going to grow into.

In this thesis, there is a prevalent focus on the impacts of 'computational' technologies, and not just *any* piece of technology, as the generalized concept of 'technology' encompass too large of a field. Due to the fact that the whole purpose of technology intrinsically is to effectively improve a process, it is vital to stress that the computational technologies that are being elaborated upon considers the externalization of human processing. Furthermore, it is being explored how this conceptual externalization impacts the biological human. The function of the tool itself is not in the focal area. The technological elevation that is acquired from the contextual tools constitutes an examination of the various aspects of humans and this thesis presents how the concepts of obsolescence, oppositional force and submission are present within these aspects of humans—due to technological elevation.

In early history effective tools meant that survival was more guaranteed—since it improved upon the domains of survival, shelter, hunting and the like. In modern times we are in such complex assemblages of society—often interacting with advanced systems on a daily basis, and it's all thanks to the co-existing evolution of humans and technology. If we never considered the exceedingly influential consequences that technological innovation—and implementation therein—has on human evolution, we would never be able to understand humans within the context of societal development. Through understanding how technology and human evolution exist in an interchangeable relationship—it becomes possible to explore the notions of how technological elevation within specific domains impact the discourse of what it means to be human in a technological domain.

Modern technologies not only provides ways to assist in elevating capability of individual people, but also provides technological elevation of the very environment they reside in. Through introducing the domain of computational technologies and the inherent technological elevation, in societies—a plethora of complex interactions manifest. The simple concepts of navigating through a city centrum would be inconceivably hard if you did not understand the concepts of the technologies that are being used. Technology that offers computational processing externalized implies that the users therein has the possibility to comprehend the output of the technology. In the example of traffic lights, you need to know what means 'go' and what means 'stop', or else the computational technology will not work as intended. This applies to all technology that is intended to be used directly and can be used to exemplify how learning to use the computational technology—in this case the traffic light—can diminish the comprehension of the process *without* the tool—i.e., crossing the road when it's 'safe'.

In modern times, upon introducing the realm of the digital and the algorithmic, the inscribed functionality and computation introduces some ramifications on the biological. Upon exploring the field of autonomous—*externalized*—human computation, it is important to ask if computational technology that acts inside the human semantical realm of comprehension implies that the computational process of the biological is different—for better or worse—outside of the externalized domain. This is at the core of this thesis, where through examination of both individual and collective consequences of technological elevation can give the readers some insight into the implications of modern technological assemblages. By exploring the techno-biological evolution, and how the biological human fit into the discourse- this thesis aims to investigate some of the big conceptual and metaphysical implications of human nature and tries to untangle the complex discourse of technological elevation within the context of directly altering the biological human.

1.1 Methodology

This thesis is written in an essayistic and explorative manner, that focuses on raising questions for its readers, and argues that technology is caught in a duality of beneficial and detrimental consequences to both the individual human and the human society, due to technological elevation of capability. The inquiry of the thesis is wide-ranging and executes an expansive investigation on some of the most pivotal areas of impact technological elevation of capability has on humans.

Through a prevalent focus on how computational technology can change the most vital aspects of humans, and the thesis look towards all technologies that elevate cognitional and physical elements to levels unattainable without the technology at hand and defines these technologies within the domain of computational technologies.

Within the domain of computational technology—there exist a vast collection of topics, concepts and complex theories that are—while contemporary and important to analyze—sometimes really difficult to explain in simple terms. Through writing this thesis and accumulating knowledge though extensive research, I have learned much of the concepts in context and I have come to understand how these various theories and concepts interconnects within the domain of analyzing technology—and how vital is to *understand* the concepts, and not just mention that they "are there". Therefore, through acknowledging that the technologies that we employ in the 21st century—as well as historically—are so integral to how humans act, interpret and think on a fundamental level, it becomes clear that it is a bare necessity that we try to understand the duality of man and machine if we are to understand what implementing contemporary technologies means for us as humans. By focusing on technologies that makes it possible for its users to elevate their physical and/- or cognitional capability—as well as the interchangeable necessity for tools and users to adapt to each other—it is possible to construct a theoretical foundation of analyzing the relationship between tools and toolmakers- and how this relationship acts as a requisite for the development of society as a whole.

I have employed a theoretical-philosophical perspective and base my research on several great theoretics within the domain of human-technology duality, with the purpose of examining some of the socio-cultural consequences of technological elevation through digitalization and digitization. Digitalization is defined as *"the use of digital technologies to change a business model […]"* by Gartner (Gartner, 2021)—which is one of the leading technological guidance businesses in the world. While digitalization applies to the implementation of digital technologies in a business, it does not uniformly imply that digitalization is *only* in businesses, and rather accounts for the general implementation of digital technologies into a given context environment—inherently transforming the environment it is implanted into. 'Digitization' on the other hand, accounts the direct transformation from analogue to digital format—especially considering data.

Digitization considers direct conversion from analogue to digital, and digitalization considers not only the change in format, but also the change model of the structures and the impact on the environment it impacts. Through using these two definitions, it becomes possible to discuss how the implementation of computational technologies alter not only that which it is intended to supersede, but also the environment of which it acts in. Exploring this notion of environment, it is important to stress that this thesis assert the contextual environment of implementation as two different domains—both relating to humans. The first moves 'inward' and therefore accounts for the 'individual' aspects that are impacted. The second moves 'outward' and considers the 'collective' aspects. For practical purposes, these two domains will be split into each separate part of the thesis.

Through the creation of this thesis there is a hope to uncover some of the deeply rooted implications and consequences of the digitalized world we find ourselves in- in turn uncovering contemporary cases of imposing technology and/or- artificial solutions that elevate human capability, which inadvertently impose a direct change of the capability outside of the coalescence. Furthermore, I inquire about the purpose—or meaning behind the actions and how these choices can be either hidden or visible to those implementing the technology. To exemplify it is possible to take the historical example that was mentioned to me by one of my professors in the spring of 2019—where they noted that the creation of the 'lightbulb' not only altered the fact that it was then possible to have a sustainable light source on by the flick of a switch, but that the creation of the light bulb also marked an extension of functional work hours due to the increased safety, longevity and cost-efficient new light source that made it possible to work at later hours. While this is just one of many examples of what the electrified light bulb changed—it still marks how the light bulb principally alters the contextual environment that it was made for. This example can be used within this context to display how implementing technology not only supersede older versions, but also largely impact the socio-cultural elements around the artefacts it exists in interaction with, based on the conceptual elevated capabilities it can provide. By using examples such as these in coherence with the works great theorists such as Bernard Stiegler, Marshall McLuhan, David. E. Nye, Karl Marx, Christian Harteis, Katherine Hayles and more, it is possible to map out the conceptual implications of implementing computational technology—and how the computational technology in turn alters the human experience, on an existential level.

Albeit the analysis of direct purpose is relevant within the context of implementing technologies—this thesis accounts for the implications of the codes' *meaning* rather than *function.* I search for the purpose and meaning in code, and not the efficiency of its infrastructure. This approach is inspired by the words of Mark C. Marino in his book 'Critical Code Studies' (2020), where Marino states that *"[…] beyond the aesthetics of the code, there are questions of discourse (connotations, implications, resonance), social and material history, and ideology, just to name a few of the realms of inquiry that interpretation attempts to answer"* (Marino, 2020, p. 38). Here Marino implies that code serves as a structural manifestation of its creators' intentions—and should be treated as a man-made tool, that is functionally restricted to the comprehension and capability of its creators, consumers and platforms. It is through this concept of how algorithmically produced computational technology is based on human interaction and usability and furthermore becomes cemented in an interchangeable relationship where the technology continuously adapts to its users, and the users of the technology continuously adapt to the technology at hand- that the thesis aims to uncover what this means for us and our societies.

Through benefitting from concepts such as *"anthropomorphism"*, *"mnemotechnology"*, *"cognition"*, *"umwelt"* and *"semiosis"* it is possible to form a constitutional argument for how computational technologies innately exist within the human domain of comprehension.
Anthropomorphism is defined as the concept of applying human characteristics towards that which is not human (Park, 2007) and can be claimed to be present in most modern computational technologies- and even more so in mediated representations of conceptual technologies. Anthropomorphism can manifest in the representation of e.g., animals or objects who talk, think, or behave like humans. Some examples can be that of 'Lightning McQueen', 'Wall-E' or Thomas the Tank Engine just to name a few. This concept also applies to algorithmic representation wherein autonomous code that offers output data in the form of dialogue or other human-like methods, is anthropomorphic. Throughout this thesis, I argue that all forms of computational technology that is constructed within the human semiosis is anthropomorphic, due to the functionality being based within a given semantical domain. This implies that the functionality of autonomous technology act as an extension of its creators' semiosis, and can inherently be asserted as having human traits—despite its non-human disposition.

Mnemonics is the concept of exteriorizing cognitive functions within what we call "mnemotechnical" technology or techniques (Scott, 2009), and considers the art of encoding- or inscription as a technological medium for human cognitive functions. While the concepts of anthropomorphism and mnemotechnology discuss the 'technology—"cognition", "umwelt" and "semiosis" considers that of the human mind and answers how the human mind transcribes into computational technology. Through defining cognition as the ability to operate on a given computational framework (Hayles, 2017), and through projecting of it onto technology, there is introduced a concept of a cognitive assemblage outside of the human body. This causes a shared comprehension between technical system and can assist in elaborating on how computational technologies impact the foundational cognition of humans. In the same manner as how traffic lights call for an understanding of their function so they can externalize processing, cognition is defined as the ability to comprehend the functionality of technical systems—or semantical relationships within a given *umwelt*—in relation to their context. By asserting that humans have their own domain of comprehension, as explained by Jakob Von Uexküll in his theory of the 'Umwelt' (Uexküll, 1909), it is possible to establish a theoretical framework of how humans perceive the world. Within this theory, it is asserted that each sentient entity has their own comprehension of the perceivable world, and inherently has their own semantical mapping of the self in relation to objects. This theory is benefitted from so it becomes possible to explain the encoding of the human semiosis—which is defined as the semantic representation of the human Umwelt—in computational technologies, with the intent to illustrate *what* we externalize in computational technologies.

Through using these theories combined, this thesis aims to unveil how humans innately encode computational technologies within the human semiosis, and how these technologies in turn can provide technological elevation based on the same encoding both individually and collectively, in any given environment.

3.0 Individuality and Obsolescence

In this chapter I aim to delve into the discourse of how technology impact the human—*biological*—assemblage of being. Through showcasing various established concepts and theories that fundamentally examine what it means to be human in light of human and technological combination, it is possible to reinforce the field of study on digitalization and inherently the human condition in coherence with the use of technology.

By benefitting from the themes that emerges from Bernard Stiegler's work—which largely focus on the reconceptualization of what technology truly is—this chapter aims to follow in Stiegler's footsteps and assert technology as tools of human evolution that interchangeably must be understood in order to understand humans themselves. Due to the contextuality of human and technological development, it is important to state that that this chapter intends to showcase the intricate concept, relationships, and interchangeability of 'tools' and 'toolmakers' (Benjamin, 2012) within a contemporary and/-or historical context and does not presume to foretell the future outside of hypothetical theory.

Furthermore, it is important to state that neither technology nor its creators are exempt of any innate changes in light of a digitalization process, but rather experiences a synthesizing of sorts, where the two parts adapt to the context of which they engage in.

Accordingly, to then discuss the potentiality of what can hypothetically happen if the "tools" become '*smarter*', '*better*', or *'superior'* to that of the "toolmakers"—or 'too smart' for the context of which they are placed in- or created for, it is relevant to focus on the consequences of exponential general intelligence and calculative capability. Within the context of hypothetical futures, and within the domain of technological—and the interchangeable human—evolution it is far-reaching but necessary to speculate what *potentially* can happen in the future, even if it is largely speculative. Hence, this chapter introduces the hypothesized singularity theory from Ray

Kurzweil (Kurzweil, 2005) to the discussion, to spark a discussion of hypothetical futures of where the technology reaches an understanding greater than that of its creators. While these theories are very fringe and are nigh impossible to completely justify, the hypothesis that Kurzweil present is a great addition within the context of discussing what can hypothetically happen if technology with exponential capability acts outside the human semantical realm of comprehension.

Kurzweil justifiably argues that self-learning algorithm is a potential threat once the learning process achieves a self-governing exponential growth as an independent actor. While the singularity theory presents a frightening scenario of our technological future, it is an important argument to be included in the context of analyzing the co-evolving human and technological evolution that is inspired by Bernard Stiegler, and further justifies the necessity for understanding the technology that is rooted within human comprehension even more- so that hypothetical futures such as that of the singularity can be avoided.

In modern times computational technology has become so commonplace that most people wouldn't think twice about how it works or how many people are using these technologies, or how they are "diminishing biological aptitude". However, once you introduce various technologies on a massive scale—as is often experienced in modern developed countries—there manifest a form of obsolescence on its individual citizens that needs to be accounted for.

Within the context of commercialized hardware and software technologies, obsolescence often-most account for the deliberate corporate decisions to make certain aspects of their technological devices out-of-date, incompatible or just not supported after the product has been on the market for a certain time and relating the concept to the biological- the concepts encompasses the same domains. While it is possible to account for the component within the devices to have a planned lifespan—which is a business concept called 'planned obsolescence'—it is also important to note that the rate of which modern technological products are innovatively changing and adapting to new developments is also impacting how quickly hardware and software integrations are becoming incompatible with newer solutions. While some of the decision-making behind designing technology to be unusable after some time can be considered unethical as a capitalistic venture, the technology in itself is also experiencing a vast growth in (externalized) capability, which supports the natural obsolescence of hardware and software compatibility. According to Moore's

Law—which was an observation from Gordon Earl Moore that stated that the number of transistors on a microchip exponentially doubled every two years (Moore, 1965)—there is an exponential growth in the capability of computing every two years. Although the theoretical application of Moore's law has been considered to be false in more recent years—due to the impracticality and impossible application of transistors that are so inconceivably small—the principle of exponential capability of technology still prevails; it just doesn't account for the annual doubling of transistors. Due to the capability of artificial intelligence and deep learning it is possible to state that Moore's Law is still alive in a sense, if the foundational element of the theory remains—which is the doubling of computers capability. In accordance with this ever-increasing capability of the technology it is natural to experience technological obsolescence after any given time—depending on the technological device in context. Therefore, it is normal to experience an expected process where technology is often swapped out for newer and better versions, and the old ones become obsolete. While this is a natural phenomenon and is not only found within the digital technologies, i.e., the dull knife will get either sharpened or replaced with a new knife if it becomes dull- it also implies that there is an obsolescence of certain elements that includes the users of the technology and their inherent level of interaction with the technological object at hand. This can be exemplified through either analogue technologies or digital technologies, where the easiest analogue example would be moving from a screwdriver to an electric hand-held drill. The tool functionally completes the same tasks but are used differently. They both serve the same purpose, but they require different levels of comprehension, and understanding of the tool and not only the task.

Coherently with this train of thought, there derives a fundamental question about what it truly *means* to be 'intelligent' or 'smart' in a technological environment. According to Merriam-Webster—*America's leading provider of language information*—'smart' is being defined as *"having or showing a high degree of mental ability"* (Merriam-Webster, 2021), which proclaim 'smart' to incite presumption of high levels of achievability, capability, competence and how these pertain to how expeditiously one can reach a conclusion. While this is a fair definition of 'smart' within the scope of semantics, it is important to uncover the implications of 'smart technology' and understand how humans using technology that is commercialized as 'smart' is impacting the human nature itself. Through using an example that displays the difficulty of truly understanding technology as ‘smart’, it is very beneficial to look at how humans and technology hybridize within this discussion.

For the purpose of illustrating this implication, the example in context considers a mathematical equation, but the definition is not rooted within mathematics, but rather in the conceptual input and consequential output of a semantical communication process. The example regards two different people, one of which (person A) that is capable of solving an advanced mathematical equation within the span of a few minutes. This indicates that person A could be considered to be smart because within this context, the task was completed quickly and efficiently. Contrary to this, if another person (person B) were to spend several hours solving the very same mathematical equation, the person could be prone to not being considered as smart- due to the long time it took, even if the answer is same. The example in this context is very contextual and subject to interpretation due to the fact that the person might be considered ‘smart’ from an uneducated person’s perspective and could be considered ‘*not* smart’ from an advanced mathematician’s perspective regardless, as well as how the task in context is very specific and the general concept of ‘smart’ is not limited to solving a single equation. This example does however help to exemplify the intricate and contextual definition of intelligence in a setting that is supposed to be ‘objective’. Following this train of thought—where the definition of smart is to be considered as which rate one can equate and compute, and not the theoretical *potential* of solving the equation at all, then machines are *already* smarter than humans. This chapter aims to discuss the intricacies of this example within the context of technology and obsolescence, and in order to truly benefit from the example of the two people and their mathematical skills within the context of analyzing technological enforced obsolescence of biological aptitude, it is possible to introduce a *calculator* to the example.

This chapter aims to uncover the implications of using technology to increase cognitional capability within this example, and how the definition of smart—i.e., as having high cognitional potential capability—can be seen as artificial through this.

To differentiate between the calculative speed and achievability, we can look towards what constitutes intelligence in the context of task-completion. Furthermore, the examination of how what constitutes intelligence fit into discussing the alteration of the human mind, body, and society with the use of computational technologies. The ‘calculator complication’ serves as an example of

one of the three domains that are under examination in this chapter, where there is a prevalent focus on uncovering how computational technology impact the cognitional mind of humans through the use of technological tools that outsource computational processes in tools.
If we look towards the hybridization between humans and technological tools, we uncover many implications in regard to the physical body and how technology changes the interactions therein. To exemplify the far-reaching concept, it is possible to note the development from hands to a shovel, to an excavator and so forth—showing how the physical process of using hands for digging has been made obsolete and unnecessary—in light of having the technological counterparts available.

Technology is at a point where humans are now dispassionately integrating physical technology into their 'spherical self' due to convenience, regardless of the technological appliance. It is now possible to integrate software and hardware directly into ones very being—and this chapter takes upon itself to examine how this notion of physical integration or hybridization is constituted through the implementation of technology—especially that of digitalization—where the main purpose in this context is to 'improve' or refurbish on the 'organic' and human counterparts. This is at the core of the domain of obsolescence of body.

To add to this, there is also the intangible concept of humanity, or core semiosis—which is henceforth defined as that which makes humans individual self-acting entities. The conceptual definition represents the human counteragent against 'artificial' and acts as the bedrock of illustrating how creating technologies such as e.g., AI- or mnemotechnical technology is intrinsically differentiated from a 'living' or 'true' intelligence. By acknowledging this domain, it is coherently asserted that if technology is inherently based on direct inscription or encoding of "if/then" semantics, through the use of programmable computational technologies. This form of semantic algorithm exist within the boundaries of human comprehension and has to elude concepts of that which makes humans 'alive', lest it is programmed and becomes contrary to its definition as artificial. This domain is not directly engaging with processes liable to being replaced by simplistic automation, such as cataloguing or simple calculation, but remains as a vital factor within the discussion of technology that impacts the actualization of the humans' *self* or *meaning.* This presumes that computational technologies such as e.g., an AI- is an 'extension' of its creators' semiosis, and is consequently not an individual entity, unless it achieves independent thinking and manifest the singularity theory from Kurzweil.

This aspect is the last of the three domains that are being examined in the obsolescence chapter but is perhaps the most interwoven aspect of them all. The concept of 'humanity' is so intangible and builds on an unknown force that it is nigh impossible to define—especially if you add religious connotations, but still holds a vital part when dissecting computational technology.

The concept of humanity is not being used religiously but is rather being benefitted from in this chapter as a conceptual exposition of individuality and the self.

As a principial force, humanity is being used in this thesis as the definitive aspect that differentiates a hypothetical complex algorithm and the biological—physical existence of humans. Due to the philosophical and complex implications of computational technology in relation to the intangible concepts of consciousness, it is vital to assert the artificial as exactly that; artificial. This is due to the concepts being so complex on a metaphysical level, that the inclusion of philosophical implications of the soul or spirit are negligible to its purpose.

3.1 Mind

When altering processes through implementing technology- one inherently alters the method of understanding the process therein. Subsequently, it is paramount that the conceptual transformation of processes that is 'digitalization' not only conceives safe, contemplated, and surefire solutions for both people and business' vitality also acknowledges the unpredictable consequences on the human mind. To illustrate this, it is possible to draw from Christian Harteis' concepts in his book *"The Impact of Digitalization in the Workplace; An Educational View"* (2018), where Harteis emphasized how digitalization not only changes the work in itself, but also what you learn when introducing new technology, i.e., learning how to use the buttons on a calculator and not learning raw mathematics (Harteis, 2018). Drawing from the examples of the mathematical equation and the two people calculating, it is possible to create the bedrock of a very important discussion within this domain.

Recognizing how technology changes computational processes of not only processes, but also the processes of the mind that involves the comprehension of a process itself, the concept of educational building blocks can illustrate the conception that one would instinctively build ones' competence and knowledge upwards—not horizontally—forming a 'data set' for the human mind. Evidently, some calculational processes becomes benign or 'improved' upon over time due to advances in modern science and so forth- but through the change of tools available to someone, there is an innate change in the calculative capability if the capability is rooted in technological elevation. This causes a diminishing of individual aptitude, but an increase in potential capability. This implies that regardless of i.e., learning basic mathematics before learning advanced calculus, it is possible to 'skip' the entire process of comprehending basic math (forming educational building blocks) if they are provided with i.e., a calculator, and are provided with a rulebook of how to use it.

While digitalization can be considered as the principal driving force of modern structural change in societies; due to its definition as a process of implementing technologically driven development—it is implied that the technological integration within a setting such as i.e., business, or private life is not relevant in coherence with theories of altering the perception and expertise of the technology itself—but rather that the technology itself reciprocates a societal evolution of comprehension due to the premise of using the tools that are implemented. Therefore, one can state that introducing computational technologies withing a given environment inadvertently alters peoples' state of being or knowing through conceptually making them learn to use the new technology.

Theoretically this approach to imposing technological change in e.g., a workplace, there is implied an altercation of peoples' mental and physical aptitude in relation to the technologies, which innately carry over into their private lives. Since the technology also has the ability to change the peoples' mental capabilities on an individual level, there emerges a fundamental change on their social, spiritual and familiar domains, due to the technological elevation changing the relationship with the work process in context. For example- increasing the workflow demand in workplace through technological effectivization, a worker can experience e.g., a shift of balance between the professional and the personal—and inherently the computational technology in the workplace impacts the workers' personal life, due to the technology raising the capability of the process—and the worker.

Due to the widespread concept of technologically enforced obsolescence of mind—wrought on by technological tools or systems, there is a necessity for an analysis of the computational processes and capabilities within a process that exist within the context therein. This accounts for both the human and the technological part—both individually and interconnectedly.

If we consider the bio-technological hybridization between technological systems and workers within a digitalizing context as a disorganized structure, where human computation in accordance with automated processes is part of an interchangeable and a reciprocated construct, it is possible to uncover the implication and severity of the change deriving from adaptation towards new technologies. Within the context of a human-technological evolution and the cause and effect of implementing technology into any given setting, it is possible to discuss the fundamental components of the process of implementation that are poignant in changing its structure.

First and foremost, we have the creators of the technologies, who are unintentionally subject to the same parameters and/-or semiosis. These 'creators' are directly restricted to the human sphere of comprehendible reality (i.e., umwelt) and, if there are more than one, the creators' accumulative capabilities. The people within this domain are directed by the purpose of creation—which can be defined through either capitalistic, social, or scientific or any other specific application. For the context of this chapter, there is a prevalent focus on computational technologies that are prevalent within modern workplaces. Chronologically, the next part of the process is directed by the technology itself, where the users interact—and deliver an input—and compute the output deriving from the technological system. This can be presented through e.g., databases, computer networks, cataloguing systems or other variants of information and communications technology (ICT), or even something as simple as holding a hammer, where the hammer must be wielded by its handle to be operated efficiently. While the technologies' specific or narrow work-processing is inherently much more efficient and expeditious than that of the creators of the technology, there is a still a human-machine duality within the technology itself, where the technology that is made for humans—and theoretically—could replace humans, is only as 'knowledgeable' or capable as its human counterpart disregarding the calculative efficiency. This can again be exemplified through the example of a simple hammer, where the hammer has a handle with the sole purpose of functioning as a technological extension of a human arm, amplifying the humans' ability to hammer things, but the hammer cannot transgress the boundaries of its assigned function independently—lest it changes its innate function and design.

Thirdly, there is the human—or in the context of a workplace; a 'worker'—that interacts with the technologies to complete contextual processes. It is within the context of production where the machine gives a potential output based on the interaction of its user and based on whether the machine algorithm functions completely autonomous or if it requires an input from the worker, it does serve a function that the human can comprehend, signifying that the technological process is performed for the human counterpart.

By introducing the digital realm to this discussion—where the value of digital technologies can be based around a rethinking of Marx's labor theory of value (Marx, 1967), where in modern times it is more relevant to derive value off of the computational technologies' capability to captivate attention, and not the socially necessary time and effort it takes to produce something. The original version of the labor theory of value was based on the assertion that value should be based on the time and effort it had taken to produce a commodity and critiqued that the value of capitalistic commodity was not representative of the work put behind it. Hence the labor theory of value asserted that all value should be derived from the means of production—and that the social necessary labor, would define its value measured in time and toil. Due to the concepts of especially modern technological elevation, it is important to understand that through computational technologies- it is possible to bypass the labor that Marx implied to define value. Hence, in modern times of prevalent technological elevation—especially in the digital realm—value should be derived from the effectivity of its function, which in the age of mass surplus is *attention.*

Considering how computational technologies are in a state of continuous development and in coherence we as humans adapt and change with it—it is possible to relate the domain of humans in this context with the process of tailoring the products that are delivered, which implies that the product that is created is specially designed for the consumers. Furthermore, considering that the users of technology are so different in capability of using the technology at hand, it is important to state that all users have different levels of competence. The most important categories are that of the ‘amateur’ users, the ‘normal’ users, and the ‘super’ users- which define the level of which the users’ capability in engaging with the technology at hand.

Within the domain of contemporary digital technologies this implies that the consumers themselves are the product that they consume. Through extensive societal advances that allows for affordance, availability and leisure, digital product—*as general product*—is manifold in a sense that the value is shifted from possibility of manufacturing towards the interest—or attention—in the product itself. Hence the products that are more tailored towards its users wishes and requirements are “worth more”, and the value therein is valued in the metrics of how well the product fits the user, and how much the user is willing to give to use the particular product in context. The intertwined relationship between creator, technology, human and product- is not considered as hierarchical, though there are some hierarchical elements within the relationship between them in contextual environments. There are no ‘set’ rules for hierarchy within this assemblage. In modern times it is difficult to assert the creators on top hierarchically due to the prevalence use of technological elevation of capability to produce the computational technology in context. In this sense the creator and the technology is in a status quo, where knowing which came first can be analogous to the chicken and the egg, posing the question of ‘which came first’.

The relationship between these elements serves as a pinpoint to illustrate how technology that is implemented in society and how technologies can be ranked above humans due to the humans’ dependency on the machine labor in daily life. This is not a universal assemblage for all environments, but the display therein rather aims to illustrate how most modernized and digitalized societies’ automated processes now can have a place within the hierarchy of any given setting due to its role as an independent actor with authority within the same setting. Due to the limitations of e.g., hands-on user interface design with individual users, it is possible to state that the limitations of the technologies can limit or bottleneck the capability of its users due to it simply not functioning as intended. While it is a mundane statement that if technology doesn’t work, it halts the flow of e.g., work-processes related to the technology, it is a vital remark within this model as it displays the hierarchy of certain workflow processes, and it implies that in certain situations the technology in itself—which is tailored from people for people—is more vital in an information flow setting. This situation is mostly prevalent in the digital systems that require an information flow within the given system, but the principle still stands. While there is a level of dependency on technology in the bio-technological evolution, the interaction between humans and technology is not rooted in digitalization being this massive element that overpowers all other elements. Technology and humans evolve together, and humans are just as dependent on technology as technology is dependent on humans to function.

Through the concepts of what is known as "mnemotechnical" technology- which is explained by Denis Byrne (2016) as the computational process of how the mind is able to create a sort of artificial memory through the use of an external source- it can be explored how externalization of e.g., memory can alter the computational processes of the mind. Examples of this concept differs greatly, as it can account for methods such as the knuckle mnemonic where you can use a visual method for counting which months in the year has 31 days in them, by counting the specific knuckles on your hands. It can also account for things such as road signs to show the direction, or songs to remember the alphabet. It accounts for inscription and encoding onto technological storage and shows how encoding and decoding of information can expedite the process of gathering information. The concept derives from ancient Greece, where the process was regarded as the *"art of memory"* and was named after the Greek goddess of memory Mnemosyne (Britannica, n.d.). The Greeks distinguished between two main forms of memory, where one regarded the physical, natural memory, and the other one accounted for an external memory that was stored in techniques and was—in contrary to the natural memory—an *artificial* form of memory. While the original definition of mnemonic memory accounted for various techniques and strategies for easier memorizing and access to stored information, it can be used in modern times to illustrate the mnemonic virtues of digitally produced design that allows recipients to experience an intuitive and comprehensive user interface without being used the specific technological system beforehand. Using the techniques of mnemonic values to exemplify, it is possible to state that the externalization of cognitive processes is manifested in a shared pool of information that is theoretically accessible to its contributors.

3.2 Body

This segment uses the concept of body in relation to concepts of work and worker obsolescence, with the purpose of illustrating how the physical aspects of humans are impacted by computational technologies.

The most common conception about implementing technology—especially in light of digitalization—is the commonplace notion of how *"machines will take over"* and *"we will all lose our jobs"* to robots, since they are so much *"quicker, smarter and cheaper"*, and so forth.
To properly address these misconceptions—that are often-most based on fear and a lack of knowledge—this segment elaborates upon the concept of obsolescence of 'body' within the context of technological elevation—which acts as a physical manifestation of the physical aesthetics, presence, and interaction that humans have in a society and in a workplace setting.

For the purpose of examining how the physical body is at risk of obsolescence in a workplace setting, it is vital to examine what constitutes the notion of physical work and how the semantical definition of work is so rooted in the physical notion of a worker. In contrary to modern times, where 'work' infers the direct process of interacting, producing, or altering something for paid salary, the word historically entails a process that has been defined in a historical context as something focusing on the hardships of labor and toil. To clarify, one can elaborate upon the origins of the English word for 'work' which correspondingly as the French word for work; 'travail' and the Spanish word for work; 'trabajo' originates from the Latin word 'trepaliare'; which means to torture, to inflict suffering or agony (Seabrook, 2013). In light of the historical context, it can be asserted that the relationship between work and worker derives from that of pain and suffering, and that there is a presumption of agony through the historical definition of the word.

The conceptual definition of 'work' is interpreted considerably different in the 21st century—and the word 'work' no longer means suffering and agony- but rather defines a set of duties fulfilled for wages or salary. The renewal of the words' etymological meaning, moving away from the notions of pain, suffering and agony towards the conception of simple completion of tasks—most often salaried—is an unambiguous reflection of societal change, and consequently reflects the synchronized nature of technological and societal development. As stated by Trebor Scholz in his book *'Digital Labor: The Internet As Playground and Factory'* (2013) on page 15; *"[...]the essence of technology is not solely technological"*, and while this is a plainly apparent assertion—it is a fact that is of great value when discussing the implications of implementing new technology into a contextual environment. If we are to uncover how digitalizing not only changes the work-tasks or the cognitive elements, but also the physical humans that reside within the given environment- we need to explore how the tools of digitalization conceptually impact the peoples' personal physical and social capabilities on an individual level, and how the people that are impacted interchangeably have the power to impact the technologies' purpose physically.

In the 21st century, there are many notions of what constitutes work, labor, worker, and laborer, and due to its intangibility and conceptual nature in relation to digital labor there is a necessity to label these various interactions and present them within a contemporary context.
It is through this where the concept of digital labor arises, where the context of work within the digital eludes the concepts of toiling and slaving, and rather introduces new concepts of what it means to work in the 21st century. Following this train of thought, it is now possible to look upon the 'physical' human experience through the lens of digital work with the intention of uncovering what constitutes work or labor in modern times. Though the concept of work derives from the archaic—physical—descriptions of work as something miserable or painful- we are now sometimes experiencing work as something fleeting, trivial or even intangible due to the digital realm changing the physical toil of the labor.

To uncover how and why work went through the change from 'manual' to 'digital'- and how this shift has impacted the workers' processes and tasks on a physical and functional level, it is important to understand what digital labor is, and how it can change the physical components of work.
In perspective, digital labor is only something that has become relevant in the latest 40 years or so, and due to the transformation from manual—*or* analogue—labor to digital labor being such a substantial change within some sectors. While the process of implementing computational technologies surely alters processes of the mind, it also changes our very body and the way that

we physically engage with the world. Technological advances has caused humans to not only change how we think and what we know, but it has also largely altered how we move, what we see, and even how good we can see. It even stretches so far to altering our very health and prolongs our physical lives through altering the body directly, marking a true hybridization between biological and technological. The way that technology alters the physical body of humans is such a pivotal element within the purpose of technological elevation, where the prerequisite therein are tools that can alleviate physical work through machinery. If we for example look upon how through the Covid-19 pandemic, and how the presence of workers within a workplace was in many situations shifted to attendance within the digital realm of group meetings and the like. Through this there was conceptually an obsolescence of the physical presence of the biological body.

While digital labor is wholly a concept that entail *workers*—especially those who work within the digital spectrum—it also includes many of which are not directly engaging in the labor process. Digital labor is a broad concept, and it does not omit workers that does not use technological tools in their work-processes, as long as they are within a digital 'structures' or 'representations' of society. Digital labor is at the intersection between man and machine-labor, and it conjoins the two within a domain that is based on elevated capability. From this one can assert that there are several distinctions within the concept of digital labor which categorizes the various archetypes of the newfound digital workforce. Considering that achieving efficient and beneficial digital labor is one of the main objectives of modern businesses undergoing work-related digitalization, there is a prevailing practicality and necessity of including these subdivisions of digital labor within the discussion of obsolescence. After all, digital labor does prelude the diminishment of manual labor, and inherently makes the entire concept obsolete ad infinitum- until something new arises.

First and foremost, digital labor is the synthesized assemblage of workers that have hybridized with technology, but through the architecture of digitalized societies—and workplaces—there is an ambiguous definition of what the 'labor' in digital labor actually means. Therefore, there must be an elaboration on the distinction between the levels of labor—which can separate the concepts of 'intentional work', i.e., employment, which tasks we are paid employees for. It is paid and is not rooted in a desire to complete the task, but rather a desire to get paid. 'Creative (digital) labor', e.g., writing fanfiction or modding, which is based on the premise of work that is *chosen* and is completed only by the grace of its workers' self-indulgence.

In the words of Lewis Hyde, in his book *"The gift : how the creative spirit transforms the world"* (Hyde, 2007), *"there is no technology, no time-saving device that can alter the rhythms of creative labor"* (Hyde, 2007). It is untouchable to obsolescence due to the assertion of 'creative labor' as something malleable, inconstant, and abstract. Creative labor defines the processes of work that are subject to individual aspiration of purpose, which states that the processes can only be made obsolete due to the laborers' own intentional choice, or if the necessary tools necessary to complete the work are compromised. Examples of creative labor can be e.g., blogging, streaming or other forms of content-creation on entertainment platforms. This online activity is fun and work at the same time and can also be known as play labor (playbor) and creates a data commodity that is sold to clients that are willingly paying for something they don't necessarily have to pay for. Websites such as YouTube.com or Twitch.tv are two of the most prevalent platforms for this type of labor. Platforms such as these can provide a *"simple-to-join, anyone-can-play system"* (Scholz, 2012, p.11), where the value of labor is largely dependent on the attention it gets. While the notion of playbor does not fit in with the labor theory from Karl Marx that accounted for waged labor, the concept of playbour does allow for a rethinking of how labor is now decentralized and is spread out online. According to Scholz the divide between leisure time and work causes every aspect of life to drive the digital economy (Scholz, 2012), but also implies that there is a clear presence of unwaged labor that is relevant to the reconceptualization of Marx's labor theory of value—which instead derives value from attention, rather than the social necessary effort required to produce the product of value. The concept of playbor diminishes the physical toil and suffering from the human workers and can therefore be considered as an instigator of obsolescence of the physical body.

Through digital labor there is an assemblage of human experiences, thoughts, interactions and communication that passively occur, and is liable to become structurally and algorithmically gathered so that the technology and its developers learn. While it is mostly not intentional by the workers themselves to produce anything in this regard, this domain is largely focused on the manufacturing of data sets for the consumption advertisements or specified commercialization. This aspect of digital labor does not encompass direct work, but more so describes a consequence of existing within the digitalized domain of a digitally constructed space. This aspect of digital labor alone establishes the foundation of discussing how the consumers of technology are ‘becoming the product’ that they consume. One company which has been especially scrutinized for this model is ‘Facebook’, whom have been accused of selling user-data to its customers, which are mostly third-party advertisers (Scholz, 2012, p.12). For the purpose of tailoring advertisements toward its users. Through intricate changes and imposed laws, the General Data Protection Regulation (GDPR) came to be in May of 2018. (European Commission, 2021). This change imposed a law-given right to de-select data collection permissions and caused the change in many websites as of 2018 to display this option upon entering the website. Through this change, there derived a fundamental change for website traffic illustrating the concept of ‘dark patterns’ (Brignull, 2010) which entails various forms of design methods in user-interface, that in order to benefit the website—and/-or the companies involved, aim to ‘trick’ the users. In this case of the websites and the GDPR law, these dark patterns would include design choices such as *for example* the ‘misdirection’ design (Brigsnull, 2010) which involves for example a large, green, one click button that said “accept” and you would be permitted into the website upon clicking the button once. In contrary to this easy bypass, there is the much more complex- multiple, ‘insignificant’ and bland buttons you would need to press to de-select the data collection permissions. Through the concept of these dark patterns where the ‘easy choice’ is the one most beneficial to the company gathering the data, it is possible to draw similarities between the domain of digital labor and the ‘accept button phenomenon’, where the ‘easy’ choice is to submit your digital self to the conglomerate domain, so that in turn your data becomes a product of which yourself is the consumer. While misdirection is one example of how design impacts the users, there are many other types of dark patterns that can also carry over to the realm of digital labor, such as e.g., disguised ads, forced continuity of memberships, hidden costs or confirmshaming—which will be elaborated upon in chapter 4.4. “Design related reasons for opposition and submission”.

Benefitting from the domain of machine-labor, which entails the processes that are automated and functions freely within the parameters of function set by its manufacturer, it is possible to uncover the implications of semi-skilled or unskilled labor. It is the domain of work-processes that does not require direct interaction with human workers, after the initial input is given—completely omitting the human counterpart from the algorithmic processing that occurs between the input and output of a process. It is presented in the segment as a stand-alone domain due to its intrinsic role in the digital workplace hierarchy, where it controls the parameters of function of the ‘unskilled-’ and/or- ‘semi-skilled laborers’. While the work-processes are not intently monitored by the technology itself, there is still an innate output based on the input from the workers—this being the workload in context—and it is therefore vital that the interaction is in relation to each other where the machine-labor acts as a mediator between the employee, employer and product. Machine-labor can be asserted as an inanimate computational process, and not as a ‘laborer’ in itself- however, it still stands as a requisite for many processes and cannot be omitted within the domain of digital labor as an independent actor.

Lastly, semi-skilled labor is within the spectrum of digital labor based on the premise of working without—*or little*—prerequisite training. This is the sphere of which contemporary work is often assisted or wholly monitored as well as controlled hierarchically by machine-labor. This domain acts as the bedrock of the fact that innovation and technological modification naturally result in antecedent or ‘previously’ satisfactory qualifications becoming obsolete. Also, this domain establishes the necessity for cultivating a continual and pertinent development of comprehension and qualification, while still managing the self-evident decline of professional qualification for all workers within a workplace. After all, as we are entering the digital age, and technologies are constantly evolving, we—as both humans and workers—need to evolve with it.

Through looking at these various levels of machine-labor intertwined with human labor, it is evident that there is a diminishing of the physical interaction of human workers within a workplace that benefits from computational technologies. The implementation of computational technologies makes the body less needed in terms of the raw process-completion, but it will not make it redundant in itself. Intrinsically technology is designed to make various processes more effective, but not to make the human itself superfluous. While there are examples of human roles within a workplace being made obsolete, it is important to state that again, the use of mechanical replacement makes for a technological elevation of capability—and an inherent diminishing of aptitude. Hence, it is vital that the worker in context adapts to the technology, or else they will experience a disconnect from the role that they have been in.

3.3 Humanity

At the core of the final of the three aspects of obsolescence; "humanity", lies the contemporary concepts of mnemonics and anthropomorphism, where both are being used to exemplify how the concept of individuality can exist within the discussion of digitalization, and why it stands in relation to technological implementation as such a pivotal factor for its success, despite its intangible and amorphous connotations. Furthermore, to increase the significance of the humanity in technology, it is important to state that there is an element of subjectiveness that needs to be accounted for in a technological world.

To exemplify it can be stated that there is a clear difference between *learning* what is e.g., beautiful, contrary to intuitively thinking that something is beautiful. Whether or not beauty is subjective is a discussion that dates back to ancient Greece, with some of the great poets and philosophers through the ages having resonated between an absolute beauty and a subjective beauty. In one of Shakespeare's early comedies, *Love's Labor Lost*- Shakespeare stated that *"beauty is bought by judgement of the eye…"* (Shakespeare, 2001), and albeit this notion of how beauty is in the eye of the beholder is one that is considered as a great cliché, the point stands as a great example in this context to show how the human notion of what is beautiful- is subjective to each person that is witnessing the object of beauty in context. Since something as fleeting and individual as beauty is being used as a factor for what constitutes innate 'humanity', it is vital to state that the notion of subjective beauty is not one that can be measured uniformly, and hence cannot be wholly taught or inscribed, but rather has to be *experienced*. While it is possible to gather data and produce a calculative response in relation to what is most probable to be considered aesthetically pleasing, the process still requires a human to spectate the medium as such or for it to even have any meaning as beautiful at all.

Through this it is relevant to discuss the interchangeable relationship between human and computer sign interpretation, and what the basic interpretation of sign means for the aspect of spirit. Considering that autonomous algorithms are—currently—limited to the semiotic realm, it is self-evident that the algorithm, or the AI, only exist as a representation of its creators' accumulative data. This implies that while technology might be experienced as something that far exceeds humans in capability, this is not true in all quarters. The technology only prevails in accessing stored data—or potential data—faster. However, it lacks in the domain of creating *new* data outside of the human semiosphere, lest the data is rendered useless for its original purpose.

Automated technology might perform in a manner that makes it 'look' like a human is doing the work, but there is a clear assertion that the algorithm will never be human, and the aspect of the spirit aims to uncover why that is. Despite the clear difference between mechanical and biological, there is also a conceptual difference that is rooted in the domiciles of the self, the meaning of things and feeling through interpretation.

Anthropomorphism is defined as the concept of applying human characteristics towards that which is not human (Park, 2007), and mnemonics is the concept of exteriorizing cognitive functions within what we call "mnemotechnical" technology or techniques (Plato & Scott, 2009). These two concepts acts as denominators of projecting humanity towards technology and accounts for a lot of the biological and instinctive psychological processing modules of the human brain, which enables humans to have a logical conviction of something 'non-human' acting, representing, or imitating the human experience, both animatedly and inanimately.

Anthropomorphism is an innate cognitional faculty of human comprehension—found in almost every aspect of externalized human computation—it is included as the foundational component of perceiving the complex distinction between human and artificial intelligence within the context of human-created technology. It is even present in the in the very definition of 'artificial intelligence', signifying that the intelligence in context is not "real" compared to the biological intelligence of humans and is consequently treated as a representation of intelligence rather than a manifestation of it. Furthermore, since the concept of humanity is being used in the discussion of technological impacts on humans, the aspect can lay claim to the fact that all of technology—especially that of autonomous algorithms or artificial intelligence—is integrally connected to the human semiosis in a sense that accounts for the technological tools as a mechanical extension of the biological.
Through this idea of how the data set of autonomous technology is composed of signs, interpretations, and meanings of interconnected representations and comprehendible perceptions

of the world—which acts as the semiotic representation of reality that humans can comprehend—the data set can inherently offer autonomous processes to use the processing module of the same perception. This would not be possible without both anthropomorphism and mnemotechnical technology intertwined, as the data set is composed of human-comprehendible data, as well as being stored within an exteriorized asset, that can be accessed through the same semiotic domain.

Through the studies on the theoretical domain of comprehension that is known as "Umwelt"—which was coined by Jakob von Uexküll in 1909, describing the different animals' semiotic, observational plane of existence (Uexküll, 1909)—it is explained how mnemonic technology and anthropomorphism both conceptually derive from imbued semiosis in technology and consequently exact a scrutiny and critique in the event of perceptible imitation and mimicry.
Inherently, this requires a specific perspective of analyzing which focuses on the computational, conscious, and cognizant distinctions within the discussion of technological elevation and how it impacts humans, due to the illusory elements of mnemonic technology, and the potential this technology has to act within the human semiosis.

Through stating that there exists a domain—or 'sphere' if you will—of perception and comprehension of living beings, and by relating these to how an entity hypothetically would then observe the world, Uexküll aimed to uncover how the biological and instinctive interpretations any distinctive biological creature had of the world could change the definition therein.
Uexküll stated that all entities have a "self-centered world", and that all organisms hypothetically have a different Umwelt even if they share the same environment. Whenever two umwelt co-exist and communicate there is a foundation for what is called a 'semiosphere' which would be defined by Uexküll as the interconnected definition of the same perceptible domain. This can be explained through the concept of a human and a dog both understanding a ball- where the ball is perceived as an object existing for play, but inherently both entities—that being the human and the dog—would have different associations connected with the object, regardless of the symbiotic comprehension of function between the human and the dog.

Through the theories of the Umwelt and the semiosphere it is possible to introduce the same theories to computational technologies such as i.e.: artificial intelligence, where the defined human realm of comprehension offers the availability to investigate the distinctions between biological intelligence, and Artificial Intelligence. This is largely based on the form of computational technology that is most resemblant of human intelligence, which is the technology that can compute on a data set within the human semantic realm of comprehension. With the intention of figuring out what encoding the human semiosis means for the future of technological elevation—and inherently our biological selves—it is pivotal to understand not only *how* we externalize our Umwelt, but also *why*.

Asserting that the infrastructure of computational technologies in this context is rooted in artificial intelligence that is theoretically only acting within its given domain, it is consequently possible to assert that code in itself is rooted within a set of predisposed parameters. Due to AI's inability to exceed these parameters while still being within the human semantical realm there is ample room to discuss how the hypothetical capability of AI is stagnating in development through the inherited parameters of function.

Autonomous algorithms will always be subject to its code and data sets, and due to algorithmic bias within datasets being duplicated and amplified in the system, there derives implications of e.g., algorithmic racism or discrimination based on faulty data sets, that in theory—only happens because of human error.

This is at the core of *'The imitation effect'*, which entail the concept of algorithmic systems mirroring its creators' semiosis, consequently making the systems shackled to its creators' limitations. This derives from the foundational principle of algorithmic function being based on a series of "if/then" statements which are introduced within the framework of human semiosis.

Through this concept there derives some philosophical implications regarding the legitimacy of life or intelligence through the presumption—or theory—of mind, which considers the process of ascribing a mind to one-self and *others*, due to the observation of 'intelligent' behavior. This concept can also be applied towards simple inscription the concept of mnemonic technology is based on the premise of inscribing information onto an object, i.e., the art of writing. Through understanding Stiegler's perspective on the *"grammatization of the real"* (Abbinnett, 2015), it is debatable that the exteriorization we have of modern memory has become a function of the virtual, and that onto-technological programs has encoded life and with it has exteriorized the real into the virtual. In theory this implies that mnemotechnical technology bridges the biological and technological in a sense that structurally changes the content of what can be encoded and decoded, i.e., what is included in the human semiosis.

Some of the implications of mnemonics, anthropomorphism, semiosphere and umwelt in technology that are representative of human aspects are closely linked to the aspect of humanity through the concepts and theories to paint the picture of how the technology in context impacts the organology of humans and how technology shapes the definition and boundaries of the human capabilities, such as for example the 'eye'.

According to Stiegler, the eyes of humans have through extensive technological advances become an organ that can now be altered in a variety of ways has not always been possible. Through technological advances, the eyes have changes in potential capability- either through altercations in visual stimuli, amendment of biological error or damage, or even just getting the option to use glasses. Much in the same ways as the human eye, we are using technology to alter the human instrument of memory. By disembodying or 'detaching' our memory—using technology to directly exteriorize human cognition in mnemotechnical technology—it is debatable whether our biological memory is being improved or if it is degrading.

In Kriss Ravetto-Biagioli's book "*Digital Uncanny"*- the example of an exhibit is put forth (see figure 1). The exhibit states a situation where you walk into a room and see a large eye present on a TV screen and how "*[…]this eye contact does not constitute reciprocal acknowledgment as would be the case in a face-to-face encounter between subjects […]"* (Ravetto-Biagioli, 2019, p.1) it is wholly artificial.

Figure 1 "Surface Tension" by Rafael Lozano-Hemmer (1992) as referenced in Ravetto-Biagioli's "Digital Uncanny" (2019, p.2)

Through this exhibition it can be shown how the 'eye' is made solely for the perception of human peers, and it has no function outside of making the technological display *seem* alive, through the imitation effect. By exteriorizing biological functions in computational technology there is a diminishing of the inherent capability of the biological and a strengthening of the functionality of the technological. Through this it is important to state that the process of hybridization between the biological and the technological does not assert that the concept of humanity is diminished in value, but rather undergoes a transformation of mechanisms within computational processes.

By following one of the primary themes that emerges from Bernard Stiegler's work—which is the attempt to reconceptualize technology as something "pharmacological"- drawing aspects from the historical Greek word *pharmakon—"[…] which has been passed down as a signifier with a number of contradictory meanings"* (Abbinnett, 2015, p.65), it is possible to assert the hypothetical "obsolescence of humanity" as a pivotal danger of technological elevation. These meanings are equivalent of pharmacological representatives, such as 'poison', 'drug', 'sedation' or 'remedy', and implies that the definition of technological development is strongly rooted in the idea that technology is paradoxically both a poison and a remedy at the same time (Derrida, 2004). Stiegler's works are deeply committed to the notion of how the constant externalization of biological functions into the technological—while good for the conceptual development of our capability—is a poison for our humanity—and our biological aptitude.

When machines autonomously replace the mundane by externalizing computational processing—removing the seemingly trivial processes within a society—humans can hypothetically become more focused on the aspects of the self and to live out one's desires. In theory, when we reach a certain technological point of commercial surplus- there will be an excess of available product. If that product then is very easy to get a hold of, that the true value will not be measured in materialistic metrics, but rather solidifies the reconceptualization of Marx's—attention, and how the metrics of technological value derives from its ability to retain attention—i.e., entertainment.

3.4 Encoding and decoding the human semiosis

Anamnesis is a psychological theory that Plato developed throughout his dialogues "Meno" (Plato & Scott, 2009) and "Phaedo" (Plato & Grube, 1977). The idea is that by introducing a concept such as e.g., 'writing' humans are creating a platform of which where we can outsource our memory into a pool of information, where those with access can freely gather information at their behest. According to Plato, the urgency for acquiring new knowledge oneself would be diminished by access to this pool of information, due to the fact that it is not socially 'necessary' to find answers oneself, and it is easier to just look at the answers that others have provided. A simple but effective example is the practicality of a recipe, which diminishes the necessity of trying out different tastes to uncover what is a good combination, due to it already having been discovered and inscribed.

While the concept of inscription implies that it is possible to achieve a level of innate learning, it also introduces the idea of how the art of writing might manifest a theoretical decline in the search for new information and might decrease the researchers' lust for finding answers that are not written down yet. While the written inscription of words has long been the dominant form of storing information—especially that of knowledge—we now have to account for the algorithmic- and computational technologies that we can now inscribe functions into. These new emerging computational technologies that previously only were represented in hypothetical and fictionalized settings, are now becoming reality, and it is vital that if we- as humans are going to accept, comprehend and benefit from these technological advances—especially that of computational technologies such as AI—we need to untangle and discuss the implications of anthropomorphism and mnemotechnical technology, and how the inscription of—human—computational thinking manifest in technology, and how this manifestation impact us vice versa. Although the computational technologies act on algorithmic data sets that are based on human semiosis—the deceptive appearance of a 'superior intelligence' and/or- personality is not a prerequisite for the human apocalypse, utopia, or any other hypothetical futures regarding the human society- and is only a hypothetical potentiality that necessitates that algorithmic learning becomes self-sustainable outside of said human semiosis (Kurzweil, 2005).

While robotics and artificial intelligence are revolutionizing the menial tasks of businesses' lower-end functions, there are still elements of the processes that are reliant on the human workers. This accounts especially for the jobs that require interactions between humans, such as for example therapy, healthcare or teaching.

Through the co-existence between autonomous and manual labor, the bedrock of human computational processing necessitates that the autonomous processes' inherent appliance is towards human domains. While autonomous robotics and artificial intelligence can both be independent of direct human interaction within its algorithmic processing, their procedural programming will always be set within the boundaries of its creators' parameters of function—considering that the AI- is functioning as it 'should'. This is due to the concept of artificial intelligence and automation having been created within the parameters of human semiosis, or the 'semiosphere', which consequently defines the conceptual limitations of the AI's infrastructure.
Evidently the parameters of the semiosphere define a predisposed set of possible calculative outcomes which consequently puts the moral and legal responsibility and accountability on its creators and *not* on the technology in itself.

Even though AI- is benefitting from humans' Umwelt, semiosis, neural networking, perception of semiosphere that enables algorithmic processing, AI is still not 'intelligent' by any meaningful definition of the word. Artificial Intelligence- created and acting within the human semiosis is as of now- an imitation and reproduction of human concepts of intelligence and acts as a manifestation of the human capabilities and limitations. This means that we need to treat AI as an 'extension' of the human creators of the AI and not as its own entity—*legally*. This begs the question whether the separation of AI and manual workers is an *issue* for the obsolescence of mind and body. Essentially the AI is 'better' provided that it *can* complete the same task. But it cannot always complete the task given due to the limitations in the current code. Hence, we are at a crossroads. Even if AI is subject to the Autopoiesis, which is the concept of allowing AI to recursively self-organize and self-create within these inherited parameters of function, it will still not transgress the boundaries of their creators' parameters. Therefore, the higher the levels of complexity of the AI, the higher the ethical responsibility needs to be for its creators.

To prevent computational technologies such as AI from becoming imbued with the wrong intentions- such as for example malicious behavior, one must govern the data set consequentially governing the calculative potentiality. In light of autopoiesis, and the seemingly self-governing process of data set generation—it is important to include the human operator to the process so that the AI does not produce results that is considered *bad* for humans. This can be exemplified through the concept of the Chinese room (Searle, 1980), where the machine in itself does not *understand* the meaning of things but can reach a semantically correct result based on the semiotic relationship of words. The experiment of "the Chinese Room" exemplifies the implications of an elevated capability. By showing how the aspect of 'understanding' eludes the interpreter of the signs, John Searle proposed a scenario where there was a person who did not speak Chinese in the slightest inside a closed room. Inside the closed room with the man, there was also a book—the "rulebook", as Searle named it—which explained the sign relation between Chinese letters, but not their translation or meaning. The room had two slots, one for 'input' and another one for 'output'. The person in the room had to inspect the symbols that came through the 'input' and correlate them with their corresponding symbol as stated in the rulebook, and then send them out the 'output' slot- purely based on the instructions found in the rulebook. The person would not know the 'meaning' of the symbols, nor its correlation with the other symbols, but would still have the ability to convey information successfully, without the recipients understanding that the person in the room does not know any Chinese at all (Searle, 1980).

At the core of this thought experiment, there lies an underlying intent to uncover the fallacy of "thinking machines" and Searle use the Chinese Room example to assert that machines—in the sense of computational technologies—cannot 'think' by any meaningful definition of the word. It is stated that computational technologies only act on a rulebook without comprehending the content of the information, and inherently the machine eludes any comprehension of meaning.

It is therefore vital that the creator of the technologies' advocate good responsibility to make sure that the 'right' computational algorithms are encoded in the 'rulebook'—that being the data set—further amplifying how the technologies are subject to its creators' parameters and should not be asserted as a separate entity therein, unless it acts outside the theoretical framework of the human semiosis. While discussing artificial intelligence and its 'potential' capabilities of the future however—it is important to stress that while we are all subject to the parameters of our own existence as humans, and AI—as a byproduct of humans' accumulative perception of the semiosis—cannot transgress the boundaries of humans' Umwelt while functioning within it.

It has been theorized by Ray Kurzweil that if AI- becomes a self-acting independent entity, separate from the semantic world of humans, we will experience something known as 'The Singularity'. This concept builds on AI- achieving exponential growth of computational capability, in turn making for a potential surpassing of human intelligence. However, due to the dangers of anthropomorphizing this concept of a 'super-intelligence' it must be classified as a 'mindless' intelligence, or in other words an intelligence without our current anthropomorphized semiosis. Ironically—without a concept of 'mind' ascribed to the AI- we as humans- will not have the ability of recognizing if it has surpassed us or not, due to the intelligence existing outside our comprehensible concept of reality, and we would not have any notion of comprehension over what the AI would do, since it exist outside of the human domain of comprehension.

By dissecting the concept of anthropomorphism in technology and connecting it with the concept of directly digitizing the mind, it is possible to illustrate how obsolescence of body, mind and society manifests in the 21st century more thoroughly.
For the purpose of illustrating the context of anthropomorphism in technology considers Artificial Intelligence and some of its core elements as key factors for making the essence of being *human*

obsolete through either the attempt, or the inadvertent function to encoding and decoding the biological semiosis of humans.

By this, it is meant that the concept of coding autonomous algorithms within the human semiosphere is intrinsically all about making an autonomous ‘entity’ that acts on the parameters of its creators. Hence, it can be stated that making autonomous technology such as artificial intelligence is always going to be an encoding of the human semiosis, which in turn makes the algorithm a projected entity that is inadvertently, or intentionally, going to be human-like.
To some degree we might even state that making autonomous algorithms within our semiosis is like creating a technological device "in our image", whether if we intend it or not, since we paradoxically are not capable or making comprehendible algorithms outside of our semantical realm of comprehendible sign interpretation. Following this, it is vital to address technology that is fundamentally designed *for* humans, *by* humans within the context of technological innovation, which is clearly designed with the intention of effectivizing an item or process by using a collaborative goal-oriented approach.

New and innovative technologies most often prompt a change in several forms of interactions through how biological processes that are already being externalized in—to be—obsolete technology- are being made obsolete due to the technological tool that has been previously used, are becoming obsolete. This is a commonplace business practice of e.g., software updates, where the user interface might change, and the user will have to adapt to correspondingly externalize the computational process accordingly. It is therefore important to account for how the users of the technology perceive new technology in line with the old versions.

The innovative cycle of technology is a never-ending cycle of obsolescence and re-invention, where the user of the technology is stuck in a loop of planned obsolescence and complete reinventions of tools that the users have become extremely dependent upon. Due to the implications of the hybridized bio-technological co-dependency being in this loop, it is important to address various domains within the discussion of anthropomorphism in technology—especially that of AI—to declare what can be done to prevent an obsolescence of biological computation upon reinvention and innovation of technology that houses externalized cognition.

Within this domain of rhetoric and ontology it must be asserted that computational technologies such as Artificial Intelligence is a conflicted field of research due to its inherent position as a '*gray area*' between fictionalized- and theoretically possible outcomes.
Since the potential futuristic capabilities of artificial intelligence are mostly hypothesized, so are the ethical challenges that might arise. Following this it can be stated that anthropomorphism can cause damage to the field of research through the concept of applying prepossessed and biased methodology to an ever-changing conceptual technology. In light of this it is important to add that anthropomorphism in research cannot be fully eliminated—but rather needs to be *managed*, as a way to avoid the pitfall of erroneous conclusions.

The domain of interpretations and conceptual reception of computational technologies consider the necessity for researchers of the field to not succumb to "make-believe" when conceptualizing important ethical challenges posed by emerging technologies. Inherently this aspect considers the obsolescence of theory and thought, as the emergence of new conceptual technologies begets new conceptual implications. This also entails how the previously mentioned anthropomorphized *conclusions* of AI's future can be influenced by for example predisposed fear- or uncritical optimism of AI—which could have been formed from fictionalized concepts of what AI is. This can in turn have a stagnating effect on AI as a modern computational tool, due to the *imbued* expectations of e.g., human obsoletion or redundancy—though this is not necessarily the case. By asserting that fictionalized concepts of Artificial intelligence only represent *theories*, it is necessary to root out many of the misconceptions of the technology so that we can avoid the common biases of computational technologies. Furthermore, we need to address the potentiality of unseen consequences that might arise due to the over-use of imbued expectations, which can be hard to uncover due to the biases made partial by initial impressions.

The concept of ascribing a mind in computational technologies offers a plethora of implications regarding the ethical responsibility and accountability of autonomous and seemingly independent actions.

Considering that computational technology is not a thinking nor self-aware entity in and of itself, but only algorithmically act upon the semiotic domain of comprehension of its creator—it is subject to be proclaimed as a legal non-human entity; also known as a *juridical person*. This makes for an argument that exclaims computational technologies as non-sentient, self-functioning actors—and furthermore creates the necessity of a legal framework that is specially tailored for judicial implications involving AI.

Though computational technologies are already limited in capability through the inherited parameters of the semiosis—this accounts for a further restriction in light of legality, and consequently produces a stagnating effect of obsolescence on the technology's potential capability due to the necessity for bureaucratic inspection and regulation.

The implications of anthropomorphism in machine learning or programming does not only consider the very structure of the programming in itself but also the anthropomorphized semiotics that the creator or programmers themselves have benefited from during creation of the codes infrastructure. As stated earlier, AI is based on the principle of 'if/then' statements which define the parameters of function in coherence with complexity. However, if we dive deeper into the functionality of the code, there is another aspect with consider the limitations of the code in and of itself—which is the potential capability of the programmer.

While AI can be created to act autonomously—and therefore compute information vastly faster than their human counterpart- it is still subject to the parameters of the functionality and design of its code. And the code is furthermore built upon the concepts of human semiosis, which introduces natural limitations in the form of human capability. It is through combining the natural limitations with the functionality of computational technologies that we achieve technological elevation.

This inherent process of 'natural' limitation in calculative processing acts as the crux of data rate limitation in computational technology, where it is asserted that computational technologies such as AI will never supersede humans in computational capability—even though they already supersede us in computational speed—unless they separate themselves from the boundaries of the human semiosis—or in other words—the "shackles" of their creators. At the crux of converging human and technological computation, achieving technological elevation of biological capability, there is room to assert that the natural limitations are being raised with the help of the mechanical.

4.0 The Collective, Opposition and Submission

While the use and implementation of technology impose several changes on humans on an individual level as mentioned previously, there is also the domain which accounts for the collective reception of technology as a community—altering interpretations and expectations of the technology itself—based on various justifications. Through this chapter, there is a focus on what is regarded as the ‘key elements’ of opposition and submission to that which enforce technological elevation—especially that of the implementation of it *(i.e., digitalization),* with the intention of uncovering how computational technologies impact the socio-cultural environment.
In modern times we are experiencing a current change in both ourselves as well as our societies through our biological evolution being intertwined with the exponential development of technology—bringing with it some implications that are changing not only the tool, but also the environment that the tool is implemented into. Through this, there derives a necessity to uncover the truths about these areas of impact on both an individual and collective level, so that it becomes possible to understand how these technologies impact not only us—but also the societies we live in.

In accordance with the philosophies of Bernard Stiegler, this thesis asserts that that it is exceedingly difficult—if not impossible—to understand technology without understanding humans, and vice versa. It is therefore vital to uncover how technology functions within the context of which it is placed, and how the reception, regulation, expectation and coherent consequences therein all reciprocally shape technology at a collective level.

Considering the fruitless endeavor in conceiving the evolution from animals to humans and from humans to society without asserting the importance of technology in the matter- and the assertion that humans and technology are interchangeably co-dependent on each other—it petitions the question of whether or not the tool rules the human or if the human rules the tool.

To uncover what drives technological development in accordance with societal development, it is possible to draw from the theoretical examples David, E. Nye in his book *'Technology Matters'* (2006). In the book Nye elaborates on of how any given society experiences its changes based on the technology it has available internally, and how humans as a race have been using tools for at least 400,000 years. According to Nye, technologies are not foreign to humans, but is rather an element that is inseparable from human nature (Nye, 2006), and inherently tools are part of society—and its development. This is the fundamental concept of technological determinism, where it is implied that changes in technology is the pivotal element for change in society- due to the concept of how we shape our tools, which in turn shape us (McLuhan, 1963/2003).

However, if a society is only as developed as its technology allows, which in turn is based on the technological elevation that its inhabitants potentially can experience, it stands to reason that societal development is rooted in the potential capability of externalizing the inhabitants' human functions in technology. However, if the technological elevation of a societies' capability is based on sources from an externalized source outside of the society, the society can suffer *"the steel axe phenomenon"* where the production of the technology exist outside of the societies' inherent capability of reproducing the technology themselves (DeLisi, 1990). Hence there is a necessity to keep the concepts of technological determinism within the domain of the specific society in context, lest the society will not become sustainable. Adaption, comprehension and leadership is key to sustaining technological implementation, both on an individual- and a collective level.

Since the growth of technological capability is theoretically exponential (Moore, 1965) technological innovation and capability is racing past many of the domiciles of our societies- and we—as humans—often find ourselves dumbfounded within the very process that is supposed to be for us. Because of this theoretical exponential growth several elements of bureaucracy, society and comprehension can experience being overshadowed by the technology, and it becomes very difficult to regulate, monitor and evaluate the technology without a foundational lack of knowledge of how the technology works, or what its purpose is.

With the fields of expertise between the domains of the society and the domain of the technological being so vastly different, and theoretically being at risk of growing apart for each new innovation—

it is important to successfully combine them together, in a sense that is not detrimental to both domains' evolution. While there are a variety of elements such as e.g., good leadership, infrastructure or technological competence- necessary for a digitalization process to be successful, this chapter aims to uncover the conceptual implications of the technology in itself—and attempts to rethink the concept of digitalization as something that imposes a series of changes to society rather than business.

It is a complex statement to say that implementation of technology should be subject to a governing power due to the unforeseen consequences it can have—but it nevertheless still call upon an elaborate investigation of these hypothetical consequences, and not only the technology potential of the technology. A specific technology might impact many more areas in so many various levels than originally intended, and these various areas of impact might be really hard to conceive until after the time of implementation. An example of this is the light bulb- which introduced not only 'electric light' but also changed the time of which the light could be on inside. It also introduced a physical power grid that was necessary to run power to the light bulb and made it safer to have light on in one's home. Hence, the light bulb not only gave easier access to light, but it also made it possible to work longer in the night—in theory altering the work hours that were possible—and it made it possible to bring other pieces of electric technology into one's home—due to the power grids that were necessary for the light bulb to function. Many of these effects are inadvertent—not necessarily *bad*, but nonetheless vital to consider- especially in the age of technology we live in presently.

Through the discourse of 'hidden' consequences of technology, it is possible to assert technology as both a poison and a remedy for human aspects- originating from the same area. To illustrate it is possible to draw examples from commercial flying, where the increase in accessible- and affordable transport can lead many disadvantages as well as advantages within the domain of for example gentrification, global economic prosperity, pollution and many more.

While elaborating on the elements of advantageous or disadvantageous consequences is detrimental to the discourse of this thesis, it is still constructive to assert a critical perspective on some of the consequences that are regarded as foundational for creating oppositional or submission-based reception of the technology in context. All major digital transformation challenges center around people, and not the technology. ‘Technology’, as a concept, may be straightforward, but people are not straight forward in the slightest (Gruver, 2020). And while this statement seem very uncomplicated, it quickly becomes strikingly complex when discussing the impact that technological innovation and implementation has on society.

Although this chapter has its roots within something as seemingly simple as the implications of ‘humans and how they handle using new tools’, it does not in the slightest diminish the importance of understanding how technology—made for humans, by humans—truly impact humans and their societies. This accounts not only for direct interaction, but also indirect interaction. To each innovative side of technology there is a parallel necessity to adapt as humans—and it is time to assess whether the effectiveness of innovation outweighs the inconvenience of adaptation. To be able to analyze the—often hidden—consequences of the technology that we either oppose or submit to, it is vital to understand *why* technology can be ‘opposed’ or ‘submitted’ to.

The purpose of this chapter is to raise awareness of the collective influence inhabitants of a society has on technological application—where technological elevation acts as the instigator of opposition and submission to technology—and inherently the potential stagnation of the technology therein. Furthermore, it elaborates on the socio-cultural and the opinionated implications of the interchangeable relationship between humans, society and technology collectively.

Technology is at its core made for humans, by humans, and the intricate relationship between human and technology is formed through a sort of reciprocal relationship to ‘something’ else (Blackburn, 2008). The severity of the reciprocal contrasts of a structured analysis varies a great deal, but through analysis it gives meaning to the effectual relationship of technology, humans and society, with the intention of uncovering the hidden consequences of implementation as well as the function in relation to the environment it is implemented in.

It is then relevant to analyze the effect of society and convergence in relation to technological opposition and submission, and how the inhabitants in context address the ‘hidden consequences’ off their levels of adaption, comprehension and applicability upon implementation of conceptual technology that allows technological elevation.

Even though digitalization conceptually has certain degree of 'natural' opposition or submission within it due to the vast diversity of changes that it encompasses, it does not diminish the importance of examining the justification of elements such as fear, uncritical acceptance, malcontent, excitement or abstain from selected technologies. This examination considers within the context of this thesis especially that of the modern digital technologies and is not limited to the binary notions of only a 'love' or 'hate' opinion.

Through the four domains of representation, ideology, economy and design, there is a prevalent focus on areas of the collective society that technology impact, where all the domains have the innate ability to amplify the sentiment of opposition or submission for its inhabitants.

1. **Representation**- *Media/Internet*
2. **Ideological reason**- *Cultural reason/Choice*
3. **Economic reason**- *Judicial reactions*
4. **Design**- *Applicability/Compatibility*

Figure 2 The four collective domains that are impacted by technological elevation.

Due to digitalization processes having a very broad conceptual area of impact; much more than only the various technologies that are functionally implemented within the process, it is also important to include the faculties of the human society and how the perception of technology is shaped within the constructs of its presentation and representation within the given context. This means to say that within the given setting that the technology is introduced, defines a lot of its given reactions and interpretations, asserting that analyzing aspects such as opposition, submission, stagnation and acceleration applies a theoretical emphasis on the context of implementation. Through this it can be unveiled that the context can accommodate a predisposed (or lack of it) sentiment towards specific technologies. Regardless of it being before or after the physical implementation of the technology, the display of it, and the context of how it is displayed- impact the process itself as well as interacts with a manner of socio-cultural elements surrounding the area of implementation, both directly- and in-directly.

Within the context of this chapter, it is important to state that the elements that are presented are within the specific contexts that are presented—and the sentiment therein—considers only that of the specific subjects that are included within the theoretical digitalization process and does not account for the implementation of digitalization ubiquitously—as this would be very imprecise.
The purpose is therefore to figure out how technologically imposed change impact any given society—as well as the inhabitants within the society in context—while considering the inhabitants' roles within the contextual society, as well as the function of the technology in context.

The intricate complications of the technologies' foundational *purpose* that have been imbued in them, and the manifold of domains that digitalization theoretically can affect are of pivotal importance, but it must be stated that it is not wholly possible to ascertain the direct causes for each individual aspect of opposition—but it is, however, possible to create a theoretical foundation for examining the different areas of technological implementation based on theoretical, philosophical and practical altercations of specific examples. By looking at these examples through the lens of consequences of human and technological interchangeability (and the various implications therein) it can be used as the bedrock of examining the reasoning behind opposition and submission therein.

4.1 Representation

Based on the theoretical implementation of the human semiosis and the ‘comprehension’ that inherently artificial intelligence derive from the human semiosis as mentioned earlier, there is a prevalent lack of emotional resonance and meaning in autonomous processes such as e.g., algorithms and systems. Since automation operates through *pure logic of probability, and […] has no feelings, feels no fear and has no hope* (Frisch, 1957, p.72), Max Frisch proposed that robots have the ability to perceive the world more accurately than man, since the ‘robot’ calculates without dreams, and is controlled by its own findings, and cannot make mistakes (Frisch, 1957).

However, in contrary to Frisch’s argument, it is the ignorance of man that maintains the necessity to learn, and it is the expectations of technology that often-most shape the technology to be what it is. While Frisch implies that fear and hope is something that is stagnating humans’ perception of the world and inherently our capability of seeing hidden consequences of technology, it can also assist us in creating innovative solutions—by using fictionalized elements to support a theoretical hypothesis of what is possible. In turn, the accumulative attitude towards specific technologies from a group, can be shaped through these same fictionalized elements, making people either opposed or submissive to conceptual technology that is similar to the fictionalized representations of it.

While media-representation is definitely something that can skewer receptions of various technologies, fictionalized representations of technology is also something that can assist its development. While Frisch states that the ‘robot’ can calculate more concisely than man, it cannot calculate outside of its given domain, in turn making the conceptual reception of concepts such as AI- based on the allure of science fiction. Through movies such as the famous 1980s *“The Terminator”* (Cameron, 1984) people have become affiliated with the concepts of artificial intelligence and robotics and relates this to discussing what it means to be human and asserts a space to discuss speculation of what the future might bring. Through movies such as for example The Terminator, there lies the clear assumption that artificial intelligence claims the role of the classical villain, where the goal is to “take over the world” and “destroy all humans”. While The

Terminator is excellent cinema in its own right, there is no denying that the mere existence of this representation of AI as evil impact the viewers' perspective on technology, given that there is not much critical thinking of the subject within the context of the film. If the viewers' only knowledge of AI- is theoretically based on them watching 'The Terminator' in the 80s it is evident that there exist a notion of pre-existing fear of *"AI taking over the world"*. In modern times the representations of—especially AI—has become more nuanced and complicated- but through mediated representation—whenever it would be historically—the principle remains. Like The Terminator in the 80s, there will always be present a notion of a predominant sentiment regardless of whether it has a positive or a negative effect on the conception of it, just through the fact that mediated representations represent the technologies conceptually.

Regardless of its content, it is important to understand how fictionalized representations of technologies can impact the creation, comprehension and acceptance of real technologies. Hence, the fictionalizing of technology can be considered as one of the driving factors for technological innovation.

However, it is not only cinema that is part of this domain, as in modern times we have experienced the rise of the internet, social media, globalized communication and many more. Since the first workable prototype of the internet in the late 1960s, with the creation of ARPANET *(Advanced Research Projects Agency Network)* (Bothner-by et.al, 2017), the global ICT's (Information and Communication Technologies) that are acting through the internet, or media has been a pivotal factor for some of the biggest representations of modern technologies.

Accordingly with use, relevance and role as a vital component for globalized communication, internet has assumed a strong position in relation to modern reasons of opposition and submission. Media and the internet are so integral to the social and societal digital representation of technology; both constituting a vast field of research within ICT's, cultural manifestation, powers of state and social media—all of which are intrinsic elements that the leadership of digitalization must chart out, to avoid failing the transformations. Hence, the internet- nor traditional and new media is excluded from the discourse. The communicative impact of these 'powers' are not to be underestimated, but at the same time one must remember that not everyone on the planet can gain access to these mediums consistently—or even at all. According to the data provided by the

International Telecommunication Union (ITU, 2015) it is possible to chart out the use of personal computers—as well as the use of internet—in the different continents, which can assist in illustrating the differences in availability of modern digital technologies.

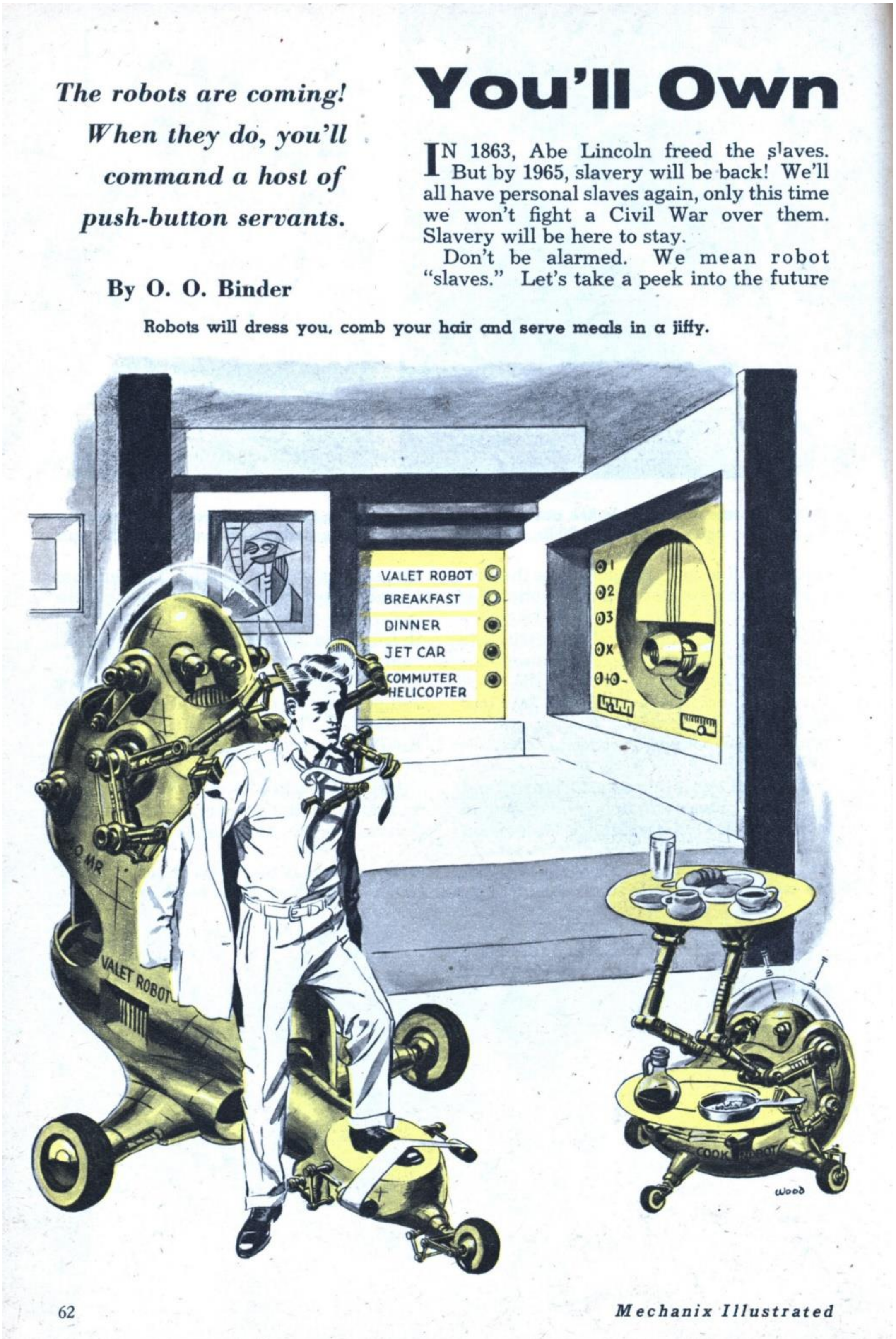
	Per 100 Inhabitants (%)									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014*
Households with a computer										
Africa	2.9	3.3	3.9	4.4	4.9	5.5	6.7	7.8	N/A	N/A
Arab States	14.7	17.0	19.4	22.8	26.3	28.3	31.7	34.0	N/A	N/A
Asia & Pacific	19.8	20.9	22.6	24.4	26.2	26.9	29.0	31.0	N/A	N/A
CIS	16.6	20.8	24.5	31.6	37.1	41.8	46.0	50.4	N/A	N/A
Europe	52.4	56.3	61.2	65.1	68.5	71.9	74.2	76.2	N/A	N/A
The Americas	40.9	42.8	45.5	48.1	49.4	51.8	55.3	58.4	N/A	N/A
Households with Internet access at home										
Africa	1.0	1.3	1.5	1.8	2.5	3.7	5.9	7.5	9.4	11.1
Arab States	9.5	11.2	13.4	15.2	19.0	24.4	28.8	31.2	33.7	36.0
Asia & Pacific	11.8	13.5	15.8	16.6	17.8	20.1	24.1	28.0	32.0	35.9
CIS	11.1	14.0	16.8	20.7	26.1	33.0	38.1	43.4	48.2	53.0
Europe	42.0	46.4	51.7	57.8	62.4	67.8	70.7	74.0	76.2	78.0
The Americas	32.7	34.5	36.8	38.9	42.2	44.4	48.2	51.8	54.6	57.4
Individuals using the Internet										
Africa	2.4	3.3	3.9	5.9	7.3	9.8	12.6	14.6	16.8	19.0
Arab States	8.3	11.1	13.4	16.2	19.1	23.0	26.6	33.8	37.4	40.6
Asia & Pacific	9.4	10.6	13.4	16.2	18.9	22.5	25.2	28.1	30.1	32.4
CIS	10.3	12.6	16.8	19.5	23.8	34.0	40.8	45.5	50.8	55.9
Europe	46.3	49.7	56.0	60.2	63.2	66.6	69.2	71.4	73.1	74.8
The Americas	35.9	38.8	42.7	44.1	46.1	50.5	54.8	58.1	61.8	65.5

Figure 3 ICT indicators for developed and developing countries and the world (totals and penetration rates, ITU World Telecommunication, 2015.

While the lack of access is a pertinent point to be made in the case of technological representation—it is still important to remember within the assertion that 'technological elevation causes an effectual obsolescence of humanity'- it not implied that all technologies must uniformly be the same for there to be an effect of obsolescence, opposition- or submission. According to the data from ITU, it is evident that there is more availability of computers and internet in the western world. With the argument that fictionalizing a technological concept applies to the ‘real’ production of it—combined with the notions of access to the platform therein—there is an element of misrepresentation and corruption in data sets. By fictionalizing technology, we interchangeably alter 'what' we want and 'what' we research. While it remains an important aspect of inspiration for development, it is possible that the fictionalizing is stagnating the possibility of creating something 'new'. An example of how representation is seeded in the structure of the data set is used by Ruha Benjamins in his book *“Race after Technology”* (2019) in which Benjamins discussed how racism can be manifested in representation through engineered inequity, and illustrates how the data sets shape the discourse of biased infrastructure—or design—and inherently can alter the reception of the technology—especially that of autonomous algorithms—based on either the *lack* of representation, or *too much* representation. An example that Benjamins uses, is an article in Mechanix Illustrated from 1957 (Benjamins, 2019), where there is a depiction of how *“[…] by 1965, slavery will be back”* (Mechanix Illustrated, 1957) in the form of “robot slaves” *(see figure 4)*. This example show how the representation of the fictionalized technology of that time was rooted in the ideological ‘supply and demand’ of that time.

While fictionalizing can be asserted as an important factor for creating something new, as it involves the hypothetical application of unthought technologies, and their potential use- it begs to question whether the represented purpose of the technology is morally and ethically right. In the case of the robot slaves depicted in Mechanix Illustrated, the comparison is drawn uncannily close to that of the historical human slaves—and in turn states that this time, there won’t be fought a Civil War over the rights of the enslaved (see figure 4).

While the concept of asserting autonomous technology as slaves is redundant to the fact that the technology is designed to complete tasks—externalized from humans, the *representation* of it is shaped on the mediated sentiment of what the technology is. Through this effect of representing technology within a conceptual interpretation outside of its main purpose—it is possible to stagnate the development of the technology based on the premise that the development is rooted in a misguided intention to develop something that is not beneficial to the capability of the technology. While the fictionalization and representation of technological possibility is good for its development, it can also navigate the development towards something that is stagnating to the function of the technology.



The robots are coming! When they do, you'll command a host of push-button servants.

By O. O. Binder

You'll Own

IN 1863, Abe Lincoln freed the slaves. But by 1965, slavery will be back! We'll all have personal slaves again, only this time we won't fight a Civil War over them. Slavery will be here to stay.

Don't be alarmed. We mean robot "slaves." Let's take a peek into the future

Robots will dress you, comb your hair and serve meals in a jiffy.

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Mechanix Illustrated

Figure 4 Illustration predicting the comeback of slavery through robotics, Mechanix Illustrated, 1957, as referenced in Ruha, Benjamins, 2019.

4.2 The Corporate

Business- or economy related reasons for opposition or submission is added to this thesis with the justification that through analyzing the strategy and visions that derive from corporate digitalization and/or- implementation of computational technologies in a workplace, there emerges a justification to scrutinize the elements that consider supply and demand of computational technologies- and the leadership of which abide by this domain. Through exploring an organizational perspective on the implementation of computational technologies into specific environments, it can be uncovered how the implications on the workforce (representing inhabitants in the environment) impact the processes (i.e., work), and how the technological elevation within the environment is shaped in thread with the implementation. By exploring the theoretical implications of i.e., alienating workforce through a change in the required competence of interaction, it is possible to uncover the theoretical remedies for preventing a failed implementation—that can correspondingly be applied within the context of non-work environments that experience the same level of alienation.

By including this domain, it is possible to uncover the conditions for worker opposition and submission within a workplace which in turn unveils how bureaucracy impact the cooperation between leadership and worker and how this furthermore shapes the discourse of impact on societies. Considering that the most prevalent form of imposing technological elevation in modern time is through the digital transformations of businesses, it is a necessary element to include within this thesis. The prevalent focus of this thesis is placed on how technological elevation can increase capability—and decrease innate aptitude—and how computational technology can act in detriment towards the biological human, and the aspect of business-infrastructure is a substantial domain for exemplifying the administrative amendments of these implications in modern times.

In Tony Saldanha's book *"Why Digital Transformations Fail"* (Saldanha, 2019), Saldanha states that "digital transformation is our current generation's attempt to transform in the face of the Fourth Industrial Revolution", expressing how technological transformations, i.e., digitalization, is one of the "great industrial revolutions of mankind" (Saldanha, 2019). Though modern concepts of digitalization is very business-oriented in application, it is very helpful to benefit from some of these perspectives to create a foundational argument of how difficulties of implementing technology not only lies with its recipients, or the product but also within the structured context of implementation as well. The challenges that the business aspects propose can create an effect of oppositional- or submissive force for the workers within a digitalizing business—while still impacting other domains outside the business. Due to the difficulties of successfully managing a technological (especially that of digital) transformation internally- the success and failure of historical business-related digitalization processes can be benefitted from to uncover what was the main reason for their rise or fall.

Within the claim that we are living a great industrial revolution as of right now, the necessity for critical analysis of the imposing elements arises, and this causes the consequential scrutiny of marking mistakes even more vital in this discussion. Furthermore, Saldanha states that upwards of 70% of all digital transformations fail as of 2019 (Saldanha, 2019), even further amplifying the necessity for a conceptual change in how digitalization is impacting its contextual domains. Saldanha purposefully attempts to create a checklist methodology in his book, where he states that through analyzing digital transformations through a ‘five-stage digital transformation model’, it is possible to lower the extremely high percentage of failed digital transformations. This is listed as followingly: first; “foundation”, which focuses on implementation and active updates. Secondly there is “siloed innovation”, which emphasizes a need for embracing the disruptive elements to learn properly. Third there is “partially synchronized transformation”, which considers the systematic and seamless change from old to new, where the old technology is being upgraded, instead of ‘swapped’ in a disruptive manner. Fourth, “fully synchronized transformation” is based on the premise that the business itself should have innovative culture as a core concept of its business so that major disruptions are not commonplace in the workplace. Lastly, Saldanha emphasizes the concept of a “living DNA” as the goal, where the business operates on the premise that digital innovation is not something that is disruptive to its workers.

While Saldanha excels at providing the digital transformations with the step-by-step guide for what to ‘watch out for’ as a leader of a business intending to digitalize their business—he does not

account much for the societal implications of digitalization nor technology itself, but rather focuses on the adaptive capabilities and the necessity for competence.
He does not account for the consequences that the technology intrinsically has on the people instead of the business, and while his roadmap is great for understanding how to maintain good discipline through a digitalization process, it becomes hard to apply these same five stages when discussing conceptual implications of the technology itself.

After all—a business is consistent of people, and inherently the digital transformations should in essence be *for* the people and not against it. Inherently one can speculate that the digital transformations mostly fail due to the people, and not the technology. Since such a high percentage of digital transformations are subject to failure, it is emphasized that it is not an easy task to digitalize businesses internally. This drives the necessity to uncover the reasoning behind opposition and submission to technology both internally and externally- in order to prevent businesses to suffer their demise during the fourth industrial revolution. According to Saldanha the reasoning behind the failure of digital transformations is based on the fact that the transformations take more discipline than one might expect, despite that the technology already exist and the models for implementing the technologies are already available (Saldanha, 2019).

However, I hypothesize that from the perspective of the humanities- it is possible to uncover why e.g., implementation of digital technologies in non-digital workplaces can have such a detrimental effect on the success of the business of the 21st century, through the analysis of historical examples of implementing technological innovations and bringing to light the relationship between them—which has been various manifestations of oppositional or submissive inclination.

Through the historical example of the 'Luddites' and their complete abstain from workplace digitalization, it is also possible to relate the implications of a disruptive digitalization process, that caused its workers to riot. In the book *"Against the Machine: The Hidden Luddite Tradition in Literature, Art, and Individual Lives"* (Fox, 2002) Nicols Fox elaborates on the history of the Luddite movement in the 19th & 20th centuries and the movements' intention behind the opposition of industrial revolution. Fox assert the luddites as the followers of Ned Ludd, whom in 1811 led the angry rebellion against the *"mechanical weaving machines that were taking their jobs* *and disrupting and destroying their communities and their lives."* (Fox, 2002, p.12). Luddism was rooted in the very same fear of technological innovation that we face so often in modern times and builds upon the conceptual fear of the unknown and the prejudicated conclusions that technological tools inherently act only to 'replace' and not to 'make better'.

Though the modern concepts of opposition to implementation of technology often has the same reasoning as the original luddites from the 19th century- they fundamentally engage with different technologies. Due to the context of the environment however, the principial concept is the same. The fact that imposing technological elevation poses a large threat to manual labor, due to the externalized capability being vastly superior, and machinery and humans being incompatible- in the sense of hardware- making an awkward and clumsy match (Fox, 2002), it preludes that the anger that is directed at machinery is conceivably removing the workers wholly within a specific domain. Furthermore, Fox explains that the essence of Luddism is not violence, but is merely a tradition that respects *"tradition, intuition, spirituality, the senses, human relationships, the work of the hand, and the disorderly and unpredictable nature of reality,* which stands in opposition to the […] *mechanistic or reductionistic construct of the world"* (Fox, 2002, p.12.). The luddites—in their rebellion and ideology—opposed the introduction of imposing technologies, especially that of the mechanical weaving machine in the early 19th century, showing that the 'separation from nature' and manual physical labor caused an uproar within the workers of manual labor.
While the Luddites based their oppositional force on the impact the technology had on their work, there are also elements of disdain upon that which is considered 'unnatural'- the context of which is rooted in the 'human' notions of what it means to be a biological and physical, member of a society. For the Luddites, work was more than just the completion of tasks, and machinery designed to replace human workers negates that sentiment. Due to this unnatural change, there originated an oppositional force to the implementation of innovative technologies through the hatred or disdain of the artificial- or mechanical representation of humans replacing the biological counterpart.

It is possible to see this phenomenon in modern times as well, through the disdain of that which can hypothetically diminish human aspects, such as e.g., human interaction being diminished by social media. While Luddism isn't prevalent in modern times, it most certainly exist. Through a direct abstain of some sectors of technological innovation—such as for example the refusal to using social media—there are certain elements that are similar to that of luddism. Following in luddism is not about uniformly refusing technological innovation, but it can be about breaking free from the interchangeable evolution of humans and technology. By disengaging in various forms of technological appliances based on the premise that the technological innovation is detrimental to the area of implementation—one is touching upon the modern concept of 'neo-luddism', which is the modern counterpart of traditional luddism. Neo-luddism does not imply that all technology is inherently evil, bad or dangerous- but rather attempts to form an ideology for criticizing technology and the inherent tendencies some technologies has towards specific domains. Neo-luddism claims that many technological innovations should be opposed, due to the inherent consequence of the technology. This can be illustrated through e.g., how a 'gun' is not inherently evil, but by owning a gun you are more likely to shoot someone than if without it—so innately the gun has a predominantly negative effect on society, based on the premise of the technology's functionality. Through the concept of corporate choices and their consequential effect over their workers role as workers—there is a prevalent necessity for appropriate ruling of context upon implementing new technologies, lest the people of the environment renounce the implementation and experience a form of luddism within the context of the workplace—such as was experienced in the early 19th century. Pairing the history of the luddites with the change model presented by Saldanha, there is composed a theoretical necessity for the correct leadership and the innate ability to adapt to the interactions of technological elevation. Accommodating the technologies to the people that are affected, is just as vital as the necessity for the people to acclimate to the technologies. Achieving non-disruptive technological elevation in an environment is an exceedingly difficult task and should not be taken lightly—as is expressed by the responsibility of those instigating the implementation—which is often-most corporate leadership in modern times.

4.3 Ideology and Culture

Although *'ideology'* or *'culture'* is a concept that is very hard to define, it is apparent that it encompasses a large variety of people within the same territory, both geographically and conceptually. There are many aspects to consider in the context of cultural opposition to technology, that not only consider the inhabitants of a community, but also the community in and of itself. Therefore, in this segment any cultural connotations will imply domains such as the familiar, political, religious, educational, social or just general sense of association between the people within the context given, as these factors not only govern the individual humans within the society, but also the collective. Through the collective reception, implementation and use of technological tools through these domains it is evident that there are many examples of large changes in society that is often-most trivialized by the ease of transition and use of the technology in context, which stands in contrast to other technological implementations that has been experienced as 'denied' by society and has not reached a full implementation therein. An example of this can be the introduction of the 'single-sign on' feature in web-design that allows for a seamless login authentication on a variety of websites. Evidently, this implementation has been accepted as a technological tool to be used but is not something most people contemplate as a tool at all. This type of technological implementation is something that can be considered as *good*, because it goes by unnoticed, but technological change that is disruptive, and makes the user notice the change or even worse- dislike the change, is considered *bad*.

Following this train of thought, it is very difficult to ascertain what constitutes a good and bad technological change within any given context without the knowledge of what the people *really* need, which can be difficult to uncover without being a part of the contextual environment oneself. Through the conceptual changes that are imposed by digitalization processes- it is evident that the societies' predominant perspectives on technological solutions is largely based on the representative of similar cases of implementation, be it historical, fictional or hypothetical.

In relation to the degree of success or failure of this case, there is formed a notion of oppositional—or drive—force within the governing parties' inherent *acceptance* or *reluctance* towards acquiring new technologies, which can hypothetically shape the process additionally. Since digitalization impact so many of the elements that 'culture' consist of, it is important to specify how culture and digitalization ties together within the context of socio-technological development- and how the combined force of these two domains together impose drastic change upon not only ourselves, but also our communal society.

This segment encompasses the ideological and/-or societal sentiment towards technological innovation *(i.e., the environment does not want the technology)*, socio-cultural implications of technological tools *(the technology is incompatible)*, and a phenomenon coined “the steel axe phenomenon” (DeLisi, 1990) *(the technology is effective, but external)*—which draws from the tribe of Yir Yoront as a historical example of technological implementation provided externally.

Through the concept of ideological and/or- societal sentiment it is possible to describe both the oppositional or the submissive force towards technology that is predisposed within a community—and the opposition is largely based on a group mentality rather than an individual preference. While the concept of abstain can be found in many domains, this segment will only encompass the abstain from particular technologies in specified a context, and how the justifications of the renunciation therein are based on the society and culture.

By being asserted as the defining factor of what is correct and wrong within a society, the contextual ideology itself can be exclaimed to drive the opposition to technology on a foundational level. Not all societies renunciate technology uniformly, and how the societies have been shaped internally and historically has an integral role within the process that leads to a hypothetical renunciation therein. Therefore, it must be stated that there will not be a generalized examination of all societies, but there will rather be a focus on a select example that can assist in exemplifying some specific drastic elements of oppositional force on a societal level. Within the context of opposition and submission, there will be drawn examples from the Amish- with the purpose of uncovering the conceptual oppositional force that builds upon a communal cut-off, based on the values of the group being inconsistent with the function of the technology. The historical example of the Yir Yoront offers a vital argument in how externalized technological implementation can be extremely detrimental to cultural elements of a society. The preaching of the Christian Gospel leader Jack T. Chick, who implied that ICT- was the work of the devil, can show how oppositional force to technology can also have roots in the dogma of the direct leadership within a contextual environment. I am using these examples within the context of this thesis as metaphorical and foundational examples to provide insight into the conceptual implementation of technologies within a given context—and to provide insight into the inherent reception from the contextual people involved in the implementation. Due to these examples being rooted in large-scale conceptions of technology, they can provide an argument for how the concept of technological elevation of capability is predisposed to a series of obstacles that takes roots in its conception.

First, there are the Amish communities—which can be considered as the most commonly known communities' consistent of people that abstain from the use of specific technologies.

While the common belief that the Amish completely reject 'all' modern technology is false, they still have very strict practices regarding the general implementation of new technologies. The Amish communities rejects the uncritical implementation of technology, but *not* the entire process therein. Amish communities are directly more critical about what technologies to bring into their society. Due to the hypothetical consequences the particular technologies can pose to their society. While most modern societies are uniformly integrating the newest technologies into their societies with the promise that they can become faster, smarter, and more efficient- the Amish people place a lot more focus on the deliberation of using technology that is not necessarily living up to these promises according to their beliefs. The Amish are very careful when considering which technologies, they bring into the fold of their communities. They carefully consider which technologies are beneficial to them, and which are detrimental to their way of life and their relationship with each other (Kraybill, 2001). They are centered around values that they consider to be in harmony with God and each other and dedicate their lives to rural farming villages where they maintain their beliefs through a 'set of rules' that are called the 'Ordnung'. The rules of the Ordnung are not written down. They are just known by the members of the community (Kraybill, 2001). Through the fact that their rules are not written down but actually just are 'rules that everybody knows', it shows that their society is one of willingly and collectively not participating in the implementation of innovative computational technologies. By virtue of avoiding writing down the conventions of their communities, they are avoiding a domain of which involves the conceptual preservation of their communities historically, as the conventions might change due to interpretation and lack of ability to look up information.

As a former Amish community member, Mike Dehaan has written about his experiences going from being Amish to being a Mennonite, changing what he inherently is 'allowed' to use and not use. Following this, Dehaan made a homepage named "AmishValleyProducts" (Dehaan, 2012), providing Amish merchandise for sale. He states that he is able to do this because he was raised in an Amish home but joined a 'more liberal Mennonite church at the age of 19', allowing him to obtain conveniences like electricity, internet, phone service and vehicles and giving him the opportunity to promote and make the Amish products available in ways that the Amish themselves cannot. Dehaan states that his Amish friends have chosen to live life without these conveniences, and therefore Dehaan takes it upon himself to mediate these methods of trading Amish merchandise (Dehaan, 2012).

While Amish societies does not partake directly in the use of the use of most modern technologies, there are according to Dehaan some communities that use *"diesel generators or solar panels to charge cell phones [...]*" (Dehaan, 2012). This is due to the Amish societies deeming the technology as beneficial to their society, more so than harmful. Furthermore, Dehaan states that the key concern is not so much the use of electricity, but rather maintaining a permanent connection with the world" (Dehaan, 2012).

Following that trading of merchandise on 'Amish Valley Products' is completed due to a third-party element—that being Mike Dehaan—who have connections with both sides of the technological separation, it is possible to state that the Amish has clear indirect interaction with the technology they abstain from, by outsourcin*g* their notion of oppositional force. In this scenario the Amish abstain from direct engagement in the use of the tool, but not the process. This makes for a great example of how oppositional force of technology is not always rooted in unconditional abstain, but evidently can consist of various foundational reasons as to *why* one will not use the technologies in context. In the specific case of the Amish societies, there is evidence of them trying to avoid disconnecting with their religious and human roots and therefore shun the use of things that are based on computer-controlled automation, due to the processes not being 'human'. In Amish communities there is placed a great deal of value on dependency of each other, and using automation is considered as something that would diminish the importance of worker-roles within the community.

While the Amish communities are considered a worldwide phenomenon due to their particular take on new technologies and how the Amish communities isolate themselves—peacefully—from modern society, they can be used within the context of this discussion to illustrate how there is an element of participation within the concept of digitalization. The process of digitalization is not invariably forced upon all the people who would experience the process firsthand.
As an example, like the Amish—the workers that are exposed to digitalization might lose connection with social bonds if they abandon the Amish ways- due to exposing themselves to technological elevation and societal 'ascent'. Within the Amish culture, one early Mennonite form of discipline was "meidung", or "shunning". A person who failed to follow the Ordnung rules could be shunned by family and friends, if they had broken the ideological rules of the community. Beyond social isolation, this also kept the person from economic participation in the community. When that person repented, they would be restored to full fellowship (Dehaan, 2012). The concept of shunning those outside the societal domain of a certain community does apply to other domains as well.

Through the concept of planned obsolescence and technological incompatibility—combined with the commercialism and industrialism of the everchanging new technology—there can be drawn similarities between the Amish and the process of digitalization. While Meidung was perfectly 'possible' and offered even, it might have been avoided due to the fact that leaving the Amish societies would in some cases require severing all social bonds with family and friends. Although this is an alternative offered, it is not an easy choice to make. In light of this, following the element of choice, it is not guaranteed that technological innovation provides the affected parties with consensual degrees of change to their daily lives, meaning that the abstain that derives from drastic change can be rooted in the perceived preservation of a community.

The effect of alienating those who does not abide to the societal choice of e.g., abstain—as in the case with the Amish—where too much change upon the individual and the societal is imposed by technological innovation, inherently impacts the implementation therein. To avoid the alienating and disengaging effect of a societal choice, it is important to impose technological innovation that is uniformly good—or neutral—for its intended participants and does not alienate those who oppose it. Preferably, the process of implementation would accommodate to the contextual environment, rather than attempting to force the contextual environment to adapt.

While the Amish are widely regarded as religious, they are not used within the context of this thesis as a separated religious group- but rather as a community that renounces the prevalent use of technology based on the premise that its consequences are too detrimental to the human experience. However, considering that religious connotations often justify technological abstain in many scenarios, it is important to account for this. Due to religious representation of evil and its represented elements through holy scriptures, it is not very difficult to imagine that there could be some sort of religiously driven opposition to technology, but due to its intangibility and faith-driven practice, religious speculation and fear of technological innovation is often rooted in unwarranted sentiment.

Through comic style strips the Pastor Jack T. Chick produced over 200 short evangelical stories that were called the 'Chick Tracts', which were released through Chick Publications (Chick, 1988). These short stories often took place in a setting where the figures would sin, or it would depict a tool of sin, that should be avoided. The tracts had an intention where the reader should be scared of what they've seen and should seek redemption in Christianity as a result.

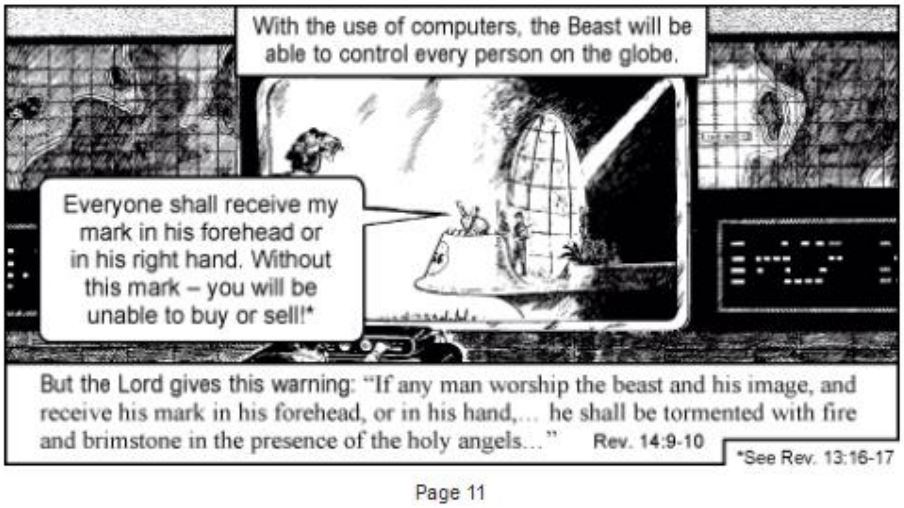

Figure 5 An evangelical tract illustrating how the use of computers will leave the mark of the beast on its users. From 'The Beast' from Chick Publications, 1988.

As it reads on the first slide of this cartoon from Jack T. Chick; *"With the use of computers, the Beast will be able to control every person on the globe"* (Chick, 1988). This tract implies that the dangers of technology consider the widespread malicious intent of the 'devil' and is to be avoided or you will be damned.

While there are some connotations to the bible to support this theory, there are not many, but for some people, the technological opposition arises due to this theory that the computer is the medium of evil. Chick uses Revelations 13:16-17 to strengthen his claim within this tract; *"[…] everyone shall receive my mark in his forehead or in his right hand. Without this mark—you will be unable to buy or sell"* (King James Bible, 2013, Revelations 13:16-17) and associates the mark in the bible with the mark that technology leaves on humans- be it social security numbers or "digital barcodes".

Furthermore, on the bottom of the illustration, Chick references Revelations 14:9-10, that states that *"if any man worships the beast and his image […] he shall be tormented with fire and brimstone in the presence of the holy angels"* (King James Bible, 2013, Revelations 14:9-10), which according to Chick solidifies the punishment that will be due upon accepting these technologies.

While Jack T. Chick preached for over 40 years and published over 200 evangelical tracts, up until his death in 2016, it is still questionable whether or not his vast generalizing of information and communications technology caused the oppositional force of technology to grow or diminish—due to him having used religious examples to fearmonger his readers into opposing technology, that might be rooted in misguided teachings. Furthermore, there might be an effect where his followers experiences a direct submission to the pastors' innate oppositional force, ironically causing an effect of submission to the opposition—rooted in trust and faith of the pastors' word.

Nevertheless, this example of religious and ICT association can be used to oppose technology is very relevant in this discussion, as it can show how association with specific environments can result in an oppositional force that *may* be rooted in factors that are misguided or directly incorrect, as well as how the representations through preaching might be rooted in a misguided fear of the unknown. The representation therein that Jack T. Chick has presented his readers with is that of religious texts that has roots in a different era, and completely negates the entire concept of technological innovation—opposing the innovation in itself, and not the hypothetical consequences of the computational technology. It is from this perspective that the opposition can be severely detrimental to its development, since the interchangeable relationship between human and technology is then stagnated due to the premise of it being unconditionally detrimental. This implies that by virtue of opposing innovation unconditionally within a domain there is an element of opposition to the evolution of humanity both individually and collectively. To mend this conflict of interest it is vital that not only the innovation, implementation and technology itself is acclimated to its environment—but the environment needs to adapt and accommodate for the conceptual changes it imposes. This applies to all sectors of implementing technologies, as well as the digital realm.

4.3.1 The Steel Axe Phenomenon

In the text “Lessons from the Steel Axe: Culture, Technology, and Organizational Change”, Peter S. DeLisi elaborates upon the tragic fate of the Yir Yoront, which was an Australian indigenous tribe who can offer a startling example of the often-dramatic interplay between culture and technology (DeLisi, 1990). The Yir Yoront is a prime example of how the introduction of specific technologies can have devastating consequences on society—following the tragic demise of their society, imposed by a cross-cultural and cross-technological engagement in the early 1930s.

During this time various steel objects from Europe, including the very impactful steel axe, started to penetrate the Yir Yoront culture. In fair exchange for labor and allegiance, the missionaries would give steel axes to women and children, which upset the previous conventions of the society. Previously the women could only use axes if it was borrowed from someone male in her family. Conceptually the introduction of the steel axe did not only impose a change in effectivity, but also caused a whole range of implications internally in the Yir Yoront society (Clarke & Torrence, 2003).

As a further consequence of the steel axe gift, men now had to borrow steel axes from women and girls, marking a major shift in the relationship between the male and female members of the Yir Yoront tribe. The construction of stone axes that previously symbolized power, masculinity, and self-reliance would now be rendered inanimate and superfluous due to the gifts from the missionaries, leading to the diminishing of important socio-cultural dynamics within the society.
Furthermore, the annual journey that the Yir Yoront would venture on to gather materials for the stone axes, would now not be necessary. Since the Yir Yoront did not need to exchange for stone anymore, significant social events faded away, leading to the neglect of trading and festivals centering on initiation rites and other totemic ceremonials.

Eventually, the introduction of the steel axe made it so that the Yir Yoront society gradually dissolved as a result of evolving technology (DeLisi, 1990) and stands as an unmitigated example of the plausibility of devastating consequences imposed implementing technological tools.
Although the contextuality of the Yir Yoront example is based on the implications of interfering with societal development and cross-cultural relations that might be considered polarized or uneven, it still holds relevance in modern times, as it simplistically exemplifies the 'worst-case scenario' of a digitalizing process within a business; by showing that wrongful implementation of a technological tool potentially has a devastating effect on the contextual place of implementation.

To apply the concepts of the 'Steel axe phenomenon' in modern times, and benefit from the concept within a digitalization process—so that modern societies and/or- businesses can avoid the same fate as the Yir Yoront, it is important to focus on the same aspects which caused the steel axe to destroy their society.
Considering that the effects were imposed by an external agent, who did not cause the downfall of the society intentionally—there arises a need to look inward into the society and/or- business in this context and understand *how* a technological tool that is meant to *help*, actually can cause devastating change. Further elaborating upon the assertion that the steel axe is a theoretical *improvement* of the stone axe, and how the steel axe was introduced radically into a society that did not have the means to produce this technology themselves (at the time of implementation), it can be said that the Yir Yoront would suffer a different fate, had they discovered the steel axe themselves. The fact remains that the steel axe in itself did not call for the downfall of the Yir Yoront society, but the production therein was the main problem.

In regard to the Yir Yoront, it can be speculated that the outcome would have been different if the society had learned to create and benefit from these tools independently of third-party involvement. Through not being able to adequately produce, maintain or afford to lose the technology that is being implemented due to how the provided technology supersedes a vital cultural component of the society, it can be stated that the requirement for implementation is too external from its infrastructure and inherently causes the society and/or- business to crumble under its own inability to adapt.

It is debatable whether or not the Yir Yoront would crumble had they had the possibility to obtain the means of production over a longer period of time, but it still stands to show that radical third-party implementation of technological elevation can cause the contextual environment of implementation to collapse under its own inability to produce the technology.

In conjunction with theories on externalizing mental capabilities, there is an intersection where the concept of how technology impose an artificial elevation of capability can be applied to a collective, where even if the educational skips are theoretically not too challenging for society on an individual level, it is devastating when all inhabitants collectively go through the process and the infrastructure of the society is not successfully able to adapt, comprehend and build on the technology internally. Effectively this makes the contextual society and/or- business reliant on the technology without having the means to produce the product themselves.
This inherently causes power relations to be outsourced due to the leadership- and societies' lack of expertise, and in turn causes the technological elevation to become extremely detrimental to the society in context.

This phenomenon derives from externalizing the technology that forms technological elevation directly, and it exemplifies the necessity for any digitalizing environment to have the innate ability to adapt, comprehend and apply further technology, lest their inhabitants and entire society will suffer the Yir Yoront fate.

Exploring this phenomenon, it's debatable whether the stone axe phenomenon imply that it is good to oppose large technological leaps that 'come on a silver platter', but there is simply not a single answer. The necessity for learning how to produce, use and understand externally provided technology at hand is vital for the environments' sustainability—and while the steel axe phenomenon is a great example of where this failed, it could have been *theoretically* possible for the Yir Yoront to learn how to produce the steel axes themselves, if they had access to a method of learning the means of production, as well as having the change model accommodated to the environment. Nevertheless, the society would have been changed by learning the procedure, and their culture would have had to adapt to the new reconstituted society regardless. Through benefitting from the example of the Yir Yoront and the evangelical tracts of Jack T. Chick, it's possible to assert that there is a vital element of technological innovation present in the collective perception and admission into a society. While the introduction of computational technologies *seem* very straight forward and 'easy' in the grand scheme of effectivizing a process—and its environment—it is exceedingly important to include the importance of how the mere introduction of a change model necessitates that the technology is *designed* with both the individual components and the collective components of humanity in mind. Technology is made *for* humans, *by* humans- and considering the digital realm and computational representation of humanity in modern technologies, it is even more important to discuss the severity of not considering the human element in the design of technology and in its inherent implementation.

4.4 Design

As one of the most pivotal aspects for personalized opposition and submission to technology, there is the direct aspect of design. Design controls the way information and communication technology can mediate information and it shapes the users access to information accordingly with their skill of use. It shapes what, when and how the users perceive the tools that they interact with. It encompasses the content of a technological mechanism, where the design is shaped in a manner that is complementary to the function of the tool and the user inherent.

In the digital domain, it accounts for front-end development such as web design or the visual aesthetics of interfaces, where the interface is subject to a variety of different patterns or models. The infrastructure of the design is not intended to be universally known nor changed by its users- and hence it begs the question of how engineered design can impact the users' sentiment towards the technological interface, based on the premise that interfaces are often subject to functionalistic and capitalistic venture.

Considering that interface design is architectural can in itself can cause both opposition and submission through the idea that the choices that have been made- have been made with a user in mind. Through an example provided by Christian Harteis—of how *"[...] the hammer owes its* *shape to both its purpose and the physiology of a human body*"—and how *"[…] software is equivalent to this example due to each software solutions having at least one idea of user inherent"* (Harteis, 2018, p.03), it can be shown how intentional design choices of computational technology can create a foundation for opposition and submission.

Furthermore, through drawing inspiration from the labor theory of value of Marx (Marx, 1967) and rearranging the defined value of a commodity from labor hours required to produce that commodity and moving over to the concept of 'attention'- it becomes very relevant to discuss how design that is created with the intention of captivating attention improves the value of the product- and inherently causes opposition or submission due to the functionalistic and intentional design. The domain of design has the capability to alter the very purpose of production of computational technologies, and not only how it is received. Due to the labor theory of value being shifted to the domain of attention, and clicks, likes and viewers is now a measurement of value in the digital space, there is a deceptive element that takes root in structural web design that take root in the form of something called "dark patterns".

Dark patterns consider the various tricks that are used in web design that intentionally makes the user do things that they did not intend to (Brignull, 2010). Harry Brignull, the creator of this concept of "malicious design" is an UX-design specialist who coined the term 'dark patterns' in 2010 and advocates watching out for how websites—usually corporate—can trick through the use of 12 different types of deception. Some of these include, but are not limited to: 'misdirection', which is purposefully distracting the user from something else, by the use of colors or interface functionality. There's 'Confirmshaming', which considers making the user feeling guilt, so they will opt into something they didn't originally want *(see figure 6)*. Then there is the 'roach motel' model, which entails the 'easy in, hard out' model, where it is very easy to e.g., start a membership, but it is very difficult to cancel it. The roach motel model can be exemplified through the website of Amazon, where the process to delete your account is very tedious compared to other websites. The process of deleting an account has to be done through submitting a request towards customer support- and then furthermore there are 4 steps that needs to be done in order to delete the account (Amazon, 2021), which can be considered as deliberate design with the intent of preventing users from deleting their accounts.

Lastly, there is the ‘hidden cost’ model, which considers hiding the cost of additional fees such as freight or tax until checkout, which is prominently found in online services such commercial booking services, where the final price is hidden in the ‘small print’ (Brignull, 2010).

While design patters most often cause a seamless experience, it is important to understand how design intrinsically impact the user subconsciously during their interaction to create notions of opposition or submission to the system they are engaging in. This goes especially for websites and the inherent web design choices behind the interface but can also apply to systems within specific technologies. If the user don’t think about the design it is considered ‘good design’ and if it becomes disruptive, then it is ‘bad design’. Hence there derives a level of subconscious submission to technology through design options such as for example the confirmshaming concept, where one option positively reinforce, and the other declines negatively. Thus, in this example the disruption of the design is outweighed by the convenience, and the user submits to the conditions.

Figure 6 An example of "confirmshaming" by Dan Bruno from his collection on Tumblr, 2019.

Humans are creatures of habit, and due to the convenience that technologies can bring us, we often turn a blind eye to all the things that is required of us to use the technology. Equally like the structure of the interface- or the software, there is also the functional design of the hardware- which encompasses the applicability of technical components as well as the software. Looking at how compatibility between newly implemented technological systems impact the user—often disrupting the flow of a task if they are incompatible or if they require additional expertise to function—there can develop notions of opposition to the system. This might occur where 'new' and 'old' technologies collide and do not work together but is limited to the functionality of the technology in context.

In some cases, the hardware might itself be designed to become obsolete, so that it is required to upgrade the components. This can cause a notion of *necessary* submission to the economic ventures of the developers of the technological tool. Examples of this varies, but it can be stated that software updates of a smartphone operative system is one of the most common examples. Through the implementation of drivers, updates, and e.g., updates to applications on a smartphones' software, there is an upper limit of compatibility between hardware and software, where the hardware is directly not usable with the newest software versions in some cases. This example of discontinued functionality is called *planned obsolescence* and can show how the computational technology as a *product* changes the users' interactions with it—further imprinting notions of opposition or submission, imbued by those who designed the product. While oppositional force may be found in the disrupted flow when using, or perceiving the product, the submission might be found in either trick design, or the necessity to succumb to the products' newer versions, so that the externalized cognition does not become obsolete. The oppositional force of design builds on the premise that there is either disdain towards the specific product, or that the product itself causes a disruption of the externalized processes of the user. The submissive force of design builds on the premise that the user can succumb to what the designer functionally and intentionally implement into the architectural interfaces.

With the implementation and use of convenient technological solutions, and the commercialized functionality and performance that they bring with, we are met with a layer of expectations in how the given technology 'should' be- and the inherent implications of supply and demand. The creation of these technologies can be considered to be limited within the scope of that which the consumer has envisioned.

Through the presumption that most technologies are a simple tool that are supposed to work for us and is not simply a tool to autonomously decode symbols, we have a tendency as humans to place meaning, function and sometimes even a (presumed) embodied consciousness within the object. Through theories of anthropomorphism, pareidolia (which is the psychological phenomenon of seeing patterns, such as faces, where there are none) and other rationalized explanations of the human perception of other entities, it does not account for the innate fear or discomfort of observable elements that would indicate a presence of mind.

This is elaborated upon through the concept of the ‘Uncanny Valley’; which is described as the *‘uncanny’* feeling of discomfort when encountering an entity that is close to being lifelike—but is noticeably not. Due to the implications of representation of computational technology having an element of innate opposition, it is important to include.

The concept of the uncanny valley was created by Masahiro Mori, who was a robotics professor at the Tokyo Institute of Technology in the 70s. The original text from Masahiro Mori was written in Japanese in 1970 but was translated and republished by Karl F. MacDorman and Norri Kageki in 2012. In the text, Mori hypothesized how the feeling of discomfort was directly linked with the resemblance of humans, and how the reception would abruptly change from association and empathy to discomfort and disgust, when the representation closely—but not completely—resembled that of a human (Mori, 1970/2012).

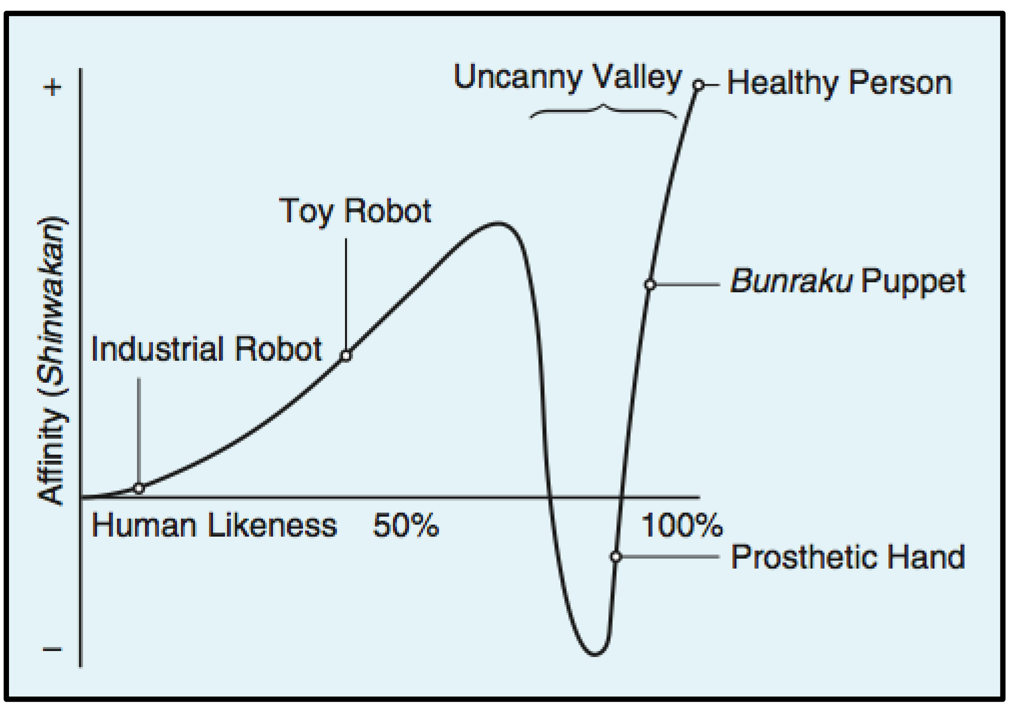

Figure 7 Created by Masahiro Mori in 1970, (Mori, 1970/2012)this graph depicts the uncanny valley and how approximately 75-95% likeness to humans, constitutes an oppositional force rooted in a sense of uncomfortableness.

Through the visual manifestation of human aesthetics in modern technology, and the conceptual encoding of human aesthetics onto something inherently lifeless, an effect of discomfort originates. The audience of the aesthetical phenomenon might experience a causality of sentiment that originates from the direct design of the technology in context, and hence the reason for good design is amplified, so that the collective reception of the visual representation is not detrimental to its function.

While the uncanny valley only accounts for specific the detrimental effect it has on its recipient's affinity—the example can be conceptually used to exemplify how design affect its viewers affinity inherently. Finding the right balance between aesthetics and functionality might be difficult, but it is decisive for shaping not only the affinity, but also the acceptance of the representation into the contextual environment it is displayed in.

Figure 8 An example of the uncanny valley from the movie "The Polar Express" (2004)

By employing the very same concept beyond the visual aesthetics and applying it to the algorithmic processing of computational technologies such as artificial intelligence, it can be theorized that through relating the uncanny valley and the externalization of cognition- the algorithmic output correlates to the input in such a manner that the appearance of humanity is rooted in an aesthetically

imbued notion of human intelligence. This symbiosis makes it possible to discern if the bestowment of consciousness or theory of mind correlates to the representation of the computational technology and implies that the design of both software and hardware- is vital in shaping its acceptance through a collective audience.
If the design of any technology causes the reception therein to takes roots in an effectual sentiment such as *the uncanny valley*, it is evident that the—objective—functionality and purpose of the computational technology does not matter, as the implementation therein would encounter an oppositional force and the adaptation and comprehension that is necessary to successfully implement it—would be absent.

Additionally, is it important to state that functionality plays an important part in the successful implementation of technology into an environment. When we rely on computational technology for completion of tasks and if it consequently fails or succeed at this—we tend to blame the technology itself and not its fundamental parameters of function—that defines the purpose and capability of the machine in context. The aesthetical representation plays a large part in the conceptual reception of computational technology—especially within the domain of robotics and digital avatars. However, considering the design implications of functionality and the theoretical issues of compatibility between various computational technologies, the implications of design and functionality together form an argument for not only the design of technology for a society, but also the design of technology in and of itself—so that the constituent parts actually work.

Although it is straight forward to state that for example putting an engine in a hand-held hammer is not going to work, the principle remains that the necessity for knowing that it doesn't work is rooted in the comprehension of what the piece of technology is and does functionally. This is knowledge is not always assured when dealing with the exponential realm of technological—especially that of digital—innovation, and furthermore stress the necessity for competence, adaptive capability and good leadership for the successful implementation of innovative technologies. Especially that of computational technologies that act on the human semiosis and has within it the ability to elevate the biological capability of humans.

5.0 Conclusion

Through the creation of this thesis there was an underlying goal to uncover the deeply rooted implications of contemporary technology—unveiling the hidden consequences of technology that has the ability to elevate ones' capability within a variety of domains. Through benefitting from this concept of technological elevation of capability, this thesis stresses that in order to understand humans, we need to understand the technology that the contextual humans use.
Deriving from Bernard Stiegler's notion of an interchangeable evolution of humans and technology the thesis underlines the importance of analyzing technological elevation and the effects and ramifications it has on the biological human.

The thesis is divided into two main parts, into the aspect that moves 'inward' into the individual human causing obsolescence of the biological, and how this is caused by notions of technological elevation. Secondly, the aspect that moves 'outward' look upon the collective—societal—changes that are imposed by emerging technologies. Through the example of the lightbulb, which is a technological device that upon implementation not only changed the accessibility of light, but also inadvertently changed things such as e.g., work hours, due to the option of having light on for longer periods, it can be expressed how the socio-cultural impact of technology is not limited to the function of the technology, but also to the often-inadvertent changes onto users and environment that it imposes.

Understanding technology is vital in order to understand humans—and vice versa—and the thesis look upon what constitutes technological externalization in order to wholly comprehend why and how technology can elevate human capability. Benefitting from concepts such as Umwelt, which was coined by Jakob Von Uexküll in 1909 and theorizes that all living entities have their own innate comprehensive and semantical perception of the world—showing how humans' conception of the semantical relationship between things is based on a biological and innate perception and is not shared directly with any other species. While it's possible to share a fellow comprehension of an object between species—through a combined semiosphere—the Umwelt still recognizes independent structural semantical relationships. Through the concept of the Umwelt, it is asserted that there exist a domain of comprehension seemingly unique to the human biology—which upon introducing semantics is called the human semiosis. The concept of technological storage medium of the encoded semiosis is inspired by Plato and his definition of inscription as mnemotechnical technology, where mnemotechnical technology or techniques is defined as the art of exteriorizing memory in 'systems' such as e.g., the mnemonic knuckle-calendar. When we then introduce the concept of autonomous technology we are met with the theoretical implications of externalizing virtues of humanity in technology. Encoding information that is semantically relatable inside the human Umwelt—into technology—can cause technology to seem human, but by acknowledging that the domain of externalized cognition is subject to a rulebook, and the semantics are rooted within this rulebook, the presence of a mind in autonomous technology is built upon an anthropomorphized notion of what the technology truly is. These concepts are being used to constitute an argument for how technological elevation is innately rooted in the human semiosis.

Furthermore, this thesis claims that the interchangeable evolution of technology and human imposes a synonymous necessity for adaptation, comprehension and leadership if there is implemented innovation within the domain of computational technologies.

Through this thesis there is an underlying attempt to uncover the core reasons why the implementation of technologies might fail—be it due to e.g., sentiment, incompatibility, lack of adaptability or design—both individually and collectively. This is explored with the assistance of a series of examples, that illustrates some of the core issues of implementing technological elevation. While there are no absolute methods to introduce technological change- since it is so dependent of what the people and the environment needs, wants and should theoretically have, this thesis assert a theoretical foundation for examining the consequences of imposing technological elevation, and give the reader insight into some of the vital but overlooked concepts of implementing technological innovation through a heuristic and essayistic exploration of the impacted domains.

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