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The adoption of blockchain technology in corporations



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Preface

This thesis was written related to my final bachelor's degree in marketing management with specialization in digital marketing. In this thesis I have had the opportunity to explore a topic that has long been of great interest of mine. In recent years, I have found decentralization, and especially blockchain technology very intriguing. To be able to combine my long last passion with this thesis has made this process both interesting and fun. It has been fascinating to observe and examine how corporations can adopt blockchain technology and make it their greatest advantage. The thesis work has been an educational process where I have gained further insight into how blockchain technology can be adopted and impact the future of corporations. As a result, I have through the assignment acquired an expanded competence and experience that I consider valuable to possess in the years to come.

I would like to extend a big thanks to my supervisor Maria Sääksjärvi at the Norwegian School of Management's campus Oslo, her commitment and accessibility throughout the process. As my supervisor, she has been an important source of support and encouragement through the progress of the thesis. With her engagement and constructive feedback, the thesis has been nothing but inspirational. Finally, I would like to thank all the participants in the in-depth interviews. You gave me insightful information that I consider essential for the thesis.

Enjoy along the way!

Table of contents

Table of contents

PREFACE	1
TABLE OF CONTENTS	2
SUMMARY	4
1.1 INTRODUCTION AND MOTIVATION.....	5
1.2 THEORETICAL CONTRIBUTION	6
1.3 RESEARCH QUESTIONS	7
1.4 OUTLINE:.....	8
2.0 THEORETICAL FRAMEWORK: BLOCKCHAIN	9
2.1 BLOCKCHAIN TECHNOLOGY EXPLAINED.....	9
2.3 BLOCKCHAIN TECHNOLOGY = WEB 3	10
2.3 USE CASES WITH BLOCKCHAIN TECHNOLOGY:	10
2.3.1 <i>Supply chain</i>	11
2.3.2 <i>Digital marketing</i>	12
2.3.3 <i>Banking</i>	13
3.0 THEORETICAL FRAMEWORK: ADOPTION	15
3.1 THE DIFFUSION OF INNOVATIONS THEORY.....	15
3.2 THEORY OF REASONED ACTION	16
3.3 THEORY OF PLANNED BEHAVIOR.....	18
3.4 TECHNOLOGY ACCEPTANCE MODEL	18
3.5 OTHER RELEVANT LITERATURE	19
3.5.1 <i>The adoption process</i>	19
3.5.2 <i>Decision theory</i>	20
3.6 CHALLENGES OF BLOCKCHAIN ADOPTION	21
3.6.1 <i>Blockchain and GDPR</i>	22
4.0 METHODOLOGY:	23
4.1 INTRODUCTION	23
4.2 THE PURPOSE OF THE THESIS ANALYSIS.....	23
4.3 THE QUALITATIVE RESEARCH INTERVIEW	23
4.4 OPERATIONALIZATION	24
4.4.1 <i>Interview guide</i>	24
4.4.2 <i>The recruitment of informants</i>	25
4.4.3 <i>Conducting the interviews</i>	25
5.0 RESULTS:	26
5.1 INTRODUCTION:	26
5.2 PRESENTATION OF THE SELECTION:.....	26
5.3 WHAT IS THE BEST USE CASE WITH BLOCKCHAIN TECHNOLOGY?	28
5.3 WHAT CAN BLOCKCHAIN TECHNOLOGY SOLVE FOR CORPORATIONS?.....	29
5.4 HOW CAN CORPORATIONS ADOPT BLOCKCHAIN TECHNOLOGY?.....	31
5.5 WHAT ARE THE CHALLENGES WITH THE ADOPTION OF BLOCKCHAIN TECHNOLOGY?.....	33
5.6 OVERVIEW OF THE RESULTS	37
6.0 DISCUSSION:	38
6.1 INTRODUCTION:	38
6.2 REVIEW OF THE RESULTS:	38
6.2.1 <i>What is the best use case with blockchain technology?</i>	38
6.2.2 <i>What can blockchain technology solve for corporations?</i>	39
6.2.3 <i>How can corporations adopt blockchain technology?</i>	40
6.2.4 <i>What are the challenges with the adoption of blockchain technology?</i>	42

6.3 PRACTICAL IMPLICATIONS AND VALIDATION:	43
7.0 CONCLUSION:	44
REFERENCES:	46

Summary

In this thesis I have sought to shed a light on the adoption of blockchain technology in corporations. The results presented highlights the benefits and reflects on the challenges regarding adoption of blockchain technology. As a result, this study aims to expand the understanding of the adoption of this technology. While being narrow in scope, the research may provide suitable framework for future studies surrounding blockchain adoption. The foundation of the research is based on the established theoretical framework of the Technology Adoption Model with further extensions from the Theory of Reasoned Action and Theory of Planned Behavior. Furthermore, I have made use of The Adoption Process and Decision Theory to substantiate my findings.

This thesis may help corporations see how blockchain technology can be utilized, and how to facilitate this type of adoption. The evidence from corporate disclosures indicates that blockchain is still at the early stages of adoption. The findings from this analysis also shows that the adoption of blockchain technology may differ on a country-by-country basis. With that said, the study helps get a better understanding of how corporations can benefit and adopt the technology. It goes to show, that easy-to-use implementation and education is needed to gain further trust in the future of technology. Stablecoins and other specific use cases may ease the complexity surrounding adoption of blockchain. This study points out that regulatory clarity is needed for corporations to take further steps towards mainstream adoption. This type of technology can create new areas of business and yield a competitive advantage for corporations. Corporations can use this study to gain insights and better understand the adoption process within blockchain technology.

1.0 The adoption of blockchain technology in corporations

1.1 Introduction and motivation

Since the introduction of the Internet around the 1990's, we have seen a massive adoption of internet technology all over the world. With the exponential growth of the technology, most new applications of technology are either utilizing or built on the existing internet. This also applies to blockchain technology. Like the internet, blockchain technology is facilitating and improving businesses, organizations streamline processes and operations can drive value through the creation of a new digital business model (Deloitte, u.d.). In other words, blockchain technology has the potential to be the first digital medium of value, similar to how the internet was the first native digital medium for information (Tapscott & Tapscott, 2016). Consequently, this can have a huge impact on corporations in the years to come.

Blockchain started out as experiments of time-stamping digital documents and creating a digital currency (Tapscott & Tapscott, 2016). With a world ever more connected to the internet, the technology has gained traction. Even though traditional structures for storing and transferring data have been efficient for a long period, increased exposure to cyber risks over the years have resulted in amplified needs for alternative technological solutions (Tapscott & Tapscott, 2016). Blockchain is one of the most noticeable new technologies within the field. Today, blockchain is not just a supplement to existing cybersecurity solutions but has the potential to be an innovative way of storing and transferring data that increases security and transparency (Tapscott & Tapscott, 2016). For corporations, utilization of blockchain technology have the possibility to replace existing systems, as well as creating new business possibilities (Tapscott & Tapscott, 2016). Governments also realize the urgent need for digitalized development within storage and distribution of documents to keep up with the evolution of the world (Tapscott & Tapscott, 2016).

Blockchain technology can be complex, but the main idea is simple; blockchain can be seen as a global distributed ledger or database running on millions of

devices and open to the public (Tapscott & Tapscott, 2016). Information, and anything of value (money, titles, art, scientific discoveries, votes etc.) can be stored and moved securely and privately (Tapscott & Tapscott, 2016). With this technology, trust is established not by powerful intermediaries like banks, governments, and companies, but through codes and mass collaboration (Tapscott & Tapscott, 2016). Blockchains can ensure integrity and trust between strangers. This form of technology makes it possible with trustless transactions, where two or more people need not know nor trust each other to do business (Tapscott & Tapscott, 2016).

The increased traction for blockchain technology makes an interesting starting point for this thesis. However, the real value of a technology is realized when it is being adopted at a broader level. Thus, the aim with this thesis will be to discover how corporations can utilize blockchain and how to adopt it. The purpose will be to find out how corporations can make it their greatest advantage, and what challenges there may be with adopting blockchain technology.

1.2 Theoretical contribution

Even though blockchain technology have gained some excitement, related research is focused on the technology itself, rather than adoption. However, as the technology gain attention, more research has been done by corporations on the matter. Some of the most noticeable corporations in the field are Deloitte and IBM. Both have written analysis and reports where they discuss the advantage and possible positive impacts of the technology. As a result, this thesis will use some of the surveys and reports presented, to highlight the impact of blockchain technology on corporations.

Deloitte is best described as the brand under which tens of thousands of dedicated professionals in independent firms all over the world collaborate to provide audit and assurance consulting, risk and financial advisory, and much more (Deloitte, u.d.). They see an emerging opportunity for organizations in all sectors to create and use compelling services for their customers using the power of disruptive innovation (Deloitte, u.d.). In 2021 they did an insightful survey surrounding the possibilities and the impact blockchain could have on corporations (Deloitte, 2021). This survey polled a sample of 1 280 senior executives and practitioners in

10 different countries (Deloitte, 2021). The result from this survey reflects the different countries and sector's opinion surrounding blockchain and digital assets (Deloitte, 2021). They uncovered several findings this thesis will make use of to illustrate the impact blockchain technology may have in the years to come.

IBM has also done a lot of research on blockchain technology, and they rank among the world's largest information technology companies (IBM, u.d.). They sell IT services, cloud and cognitive offerings, enterprise systems and software (IBM, u.d.). Today, IBM operates in 171 countries, and provides a wide spectrum of hardware, software, and service offerings (IBM, u.d.). IBM is one of the world's top contributors to open-source projects, and they are focused on transforming how people, governments and businesses transact and interact. With their unique ability to provide clients the blockchain technology fabric, consulting, and systems integration, IBM help clients leverage the global scale, business domains and cloud integration experience required for the applications (IBM, u.d.).

The research and explanation done by these two corporations will play a fundamental role throughout this thesis and illustrate the possibilities and potential with blockchain technology. There are new and emerging opportunities for corporations in different sectors to create and deliver compelling services for their consumers using blockchain technology. This paper will look at the adoption process of blockchain technology and the advantages and challenges that are inevitably through the implementation and utilization of this technology.

1.3 Research questions

In this thesis I will be focusing on the following research questions:

1. What is the best use case with blockchain technology?
2. What can blockchain technology solve for corporations?
3. How can corporations adopt blockchain technology?
4. What are the challenges with the adoption of blockchain technology?

1.4 Outline:

Chapter 2 will present the theoretical framework for blockchain technology. The chapter describes the abilities of blockchain and finishes up with discussing some of the use cases.

Chapter 3 reviews the most important theoretical literature when it comes to adoption. This chapter seeks to outline different relevant models before some of the challenges regarding the adoption of blockchain will be presented.

Chapter 4 explains the methodological framework I used to conduct the empirical study. Furthermore, I also highlight the reasoning behind my method and the recruitment of informants.

Chapter 5 presents the results from my analysis. First, I present the sample, then the findings from the different research questions. Towards the end of the chapter, I highlight the results with a model.

Chapter 6 discusses the results presented and reviews the different research questions. At the end of the chapter, I outline the practical implications and the validation of the sample.

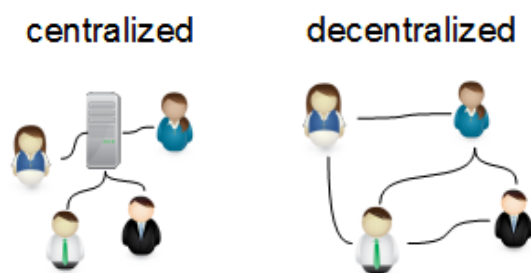
Chapter 7 presents my conclusion of the study.

2.0 Theoretical framework: Blockchain

This part of the thesis is dedicated to explanation of the fundamentals of blockchain, illuminate how the technology function, and highlight distinctive applications in relevant sectors.

2.1 Blockchain technology explained

The concept of blockchain technology was first explored in 2008 when Satoshi Nakamoto released the whitepaper on a digital peer-to-peer system for digital cash, named Bitcoin (Nakamoto, 2008). Nakamoto proposed a system based on a distributed ledger, where all transactions are verified by network nodes (Nakamoto, 2008). Blockchain technology is built on top of the traditional World Wide Web, thus dependent on the underlying Internet technology (Nakamoto, 2008). Blockchain can be described as a “protocol of trust” (Tapscott & Tapscott, 2016). From a business point of view, trust is one parts expectation that the other party will act in accordance with the four principles of integrity: honesty, consideration, accountability, and transparency (Tapscott & Tapscott, 2016). With blockchain technology we can get trustless transactions that can remove these factors of trust. The trust will then be based on algorithmic and mathematical conditions, and this will remove the need for third-party trust, and trust between interacting parties (Beck, 2016). This illustrates how decentralized protocols differ from centralized solutions:



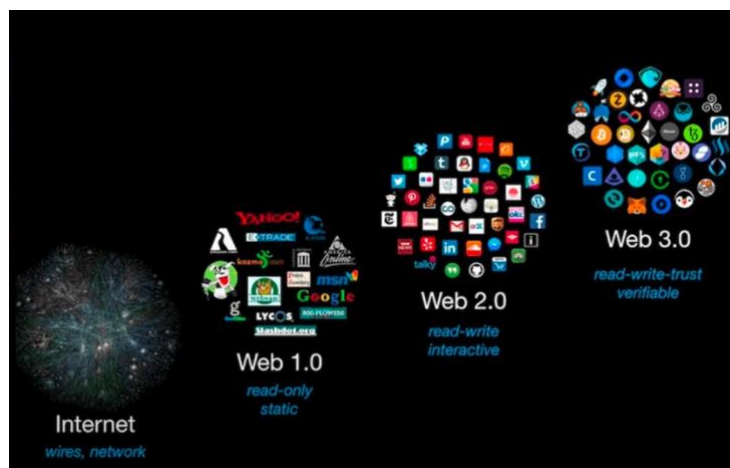
Source: (Gansky, 2014)

Blockchain can be described as a shared, immutable ledger that facilitates the process of recording transactions and tracking assets (IBM, u.d.). For instance, an asset can be tangible (a house, car, cash) or intangible (branding, patents, rights). Virtually anything of value can be tracked and traded on a blockchain network, this can reduce risk and costs for all involved (IBM, u.d.). The data block can

record the information of your choice: what, when, who, where, how much and even the condition of a food shipment (IBM, u.d.).

2.3 Blockchain technology = Web 3

To get a better understanding of the evolution of blockchain technology, we can look at the history of the internet. Web 1 (roughly 1990-2005) was about protocols that were decentralized and community-governed (Dixon, 2022). Further, Web 2 (roughly 2005-2020) was about siloed, centralized services (Dixon, 2022). In this phase, a very large percentage of the world's population rely heavily on big technology companies (Dixon, 2022). These providers such as Google, Apple and Amazon dictate what services their users can use and act as intermediaries between their users and their users' needs (Dixon, 2022). Today, we are at the beginning of the Web 3 era, which combines the decentralized community-governed ethos of Web 1 with the advanced, modern functionality of Web 2 (Dixon, 2022). Web 3 refers to this phase of the internet that promotes decentralized protocols using blockchain technology. It aims to directly address the issues of ownership and control of data, providing solutions to the major setbacks and shortcoming of the internet as we know it (Dixon, 2022). Web 3 is the internet owned by the builders and users, orchestrated by blockchain technology. In the picture below, we can see how the different phases have evolved throughout the years.



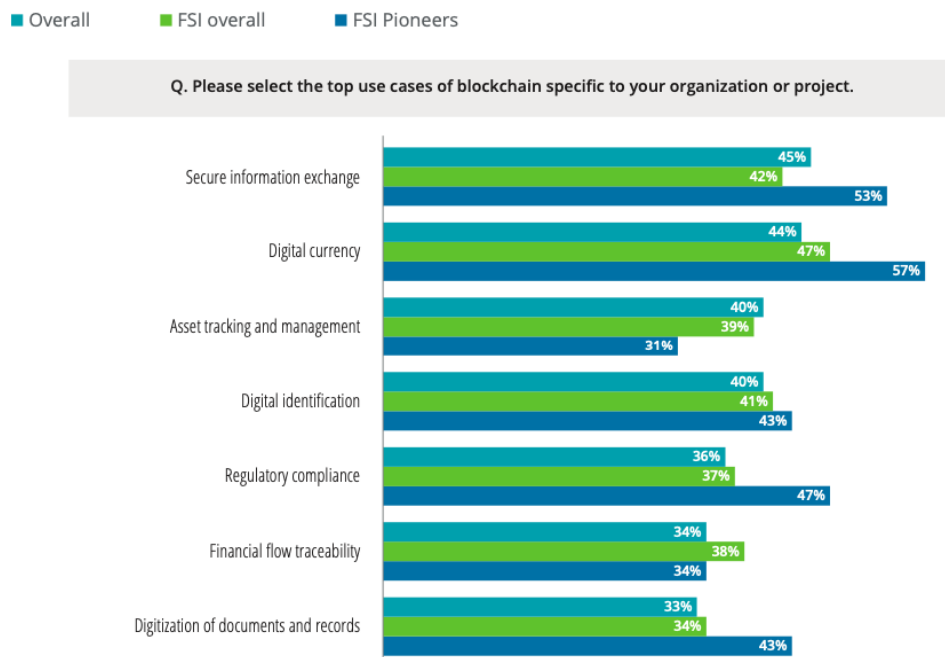
Source: (Bent, 2021)

2.3 Use cases with blockchain technology:

Blockchain technology's core characteristics include decentralization, transparency, immutability, and automation (Tapscott & Tapscott, 2016). Taking a deeper look into where these elements can be applied in modern life, various

industries, and creating a multitude of use cases, illustrate the ability to create more transparency and fairness while also saving business time and money. The technology is impacting a variety of sectors in ways that range from how contracts are enforced, to making the government more efficient (Deloitte, 2021). In Deloitte’s survey below, we can see some of the top use cases outlined by the participants.

Blockchain use cases: (Survey, 2021)



Notes: The reason the percentages equal more than 100% is because respondents were allowed to submit more than one answer (Deloitte, 2021). N = 1 280 (2021 overall), N = 320 (FSI overall), N = 70 (FSI Pioneers). Source: Deloitte’s 2021 Global Blockchain Survey

The key takeaway from this study is the security and transparency blockchain technology provides. There are different sectors that can benefit from blockchain technology through utilization in supply chain solutions, digital marketing, and the banking system. The next step is to examine and observe how blockchain technology is applied, utilized, and implemented in different sectors today.

2.3.1 Supply chain

Blockchain technology has the potential to improve supply chain’s transparency and traceability as well as reduce administrative costs (Deloitte, u.d.). When utilizing blockchain the supply chain can help participants record price, date,

location, quality, certification, and other relevant information to manage the supply chain more efficient (Deloitte, u.d.). With information through a blockchain the traceability can improve, it can reduce the loss from counterfeit and gray market, enhance visibility, and potentially facilitate for an organization's position as a leader in responsible manufacturing (Deloitte, u.d.). Blockchain can help business by increasing transparency, reducing risk, and improving efficiency and overall supply chain management (Deloitte, u.d.).

In recent years, large corporations and startups are exploring uses of the technology inside the supply chain sector. IBM blockchain has a replicated solution that transforms dispute resolution between multiple parties. The heart of the solution is a blockchain network that can serve as a single source of truth that is visible to permissioned parties (IBM, 2020). This solution is automated through smart contracts and agreed-upon business rules. To use this system, participants send process data to the blockchain directly from their system of record, granting visibility to selected participants (and to no one else, preserving privacy in an environment where multiple parties are participating) (IBM, 2020). This solution also avoids errors that come from manual data entry processes. Home Depot is a company that has taken advantage of the customizable solution. This company is using IBM blockchain to gain real-time, shared, and trusted information of goods throughout the shipping and receiving process (IBM, 2020). This reduces the number of vendor disputes and accelerates the dispute resolution (IBM, 2020). From this implementation the company is currently realizing a 65% reduction in disputes as well as seeing dispute resolution times of just days instead of weeks or months (IBM, 2020). This means strengthened supplier relationships with collaboration and trust. Home Depot is now scaling to hundreds of partners and adding new applications that will continue to expand the growth of the company (IBM, 2020).

2.3.2 Digital marketing

Blockchain technology can potentially play a huge role when it comes to digital marketing, therefore is the next section dedicated to outline and examine 6 different impact areas that blockchain can have on digital marketing.

Firstly, blockchain will be able to increase data security (Gill, 2021). Data security is a major problem for many businesses that trade online. Blockchain can solve this, by verifying and approving, anonymous and public to all, all transactions (Gill, 2021). As a result, this can increase the security around the marketing for companies. Furthermore, ads can also be more specific and targeted to the desired audience (Gill, 2021). With this type of technology, we can remove the “intermediary” such as Google to which companies have to pay fees (Gill, 2021). With blockchain, users and companies can automate and work together to a greater extent. The third impact with blockchain is the flow of information (Gill, 2021). Customers can get more control over what's being shared, and they can work more specifically to consumers in the target group. They will be able to reach consumers in the desired channels. The fourth benefit is the way smaller businesses can gain more trust from consumers (Gill, 2021). Consumers will gain trust through a transparent supply chain system. In other words, they will be able to track down what the products have been through in the production. Another positive effect with blockchain is the payment system (Gill, 2021). There are several secure payment methods, as well as a low probability of counterfeiting because of the transparent technology. This will result in a more efficient and seamless payment experience. Finally, blockchain will help prevent counterfeiting and contribute to sustainable marketing (Gill, 2021). This technology will help stop counterfeiting of products, likes, followers etc., because everything must be approved through the blockchain.

To recap, blockchain technology have potential to impact companies and marketing positively by reducing costs, increasing insight into the company and their consumers, which will make it be easier to reach the targeted groups more specifically.

2.3.3 Banking

In 2018 Deloitte conducted a Global Blockchain Survey with 1 000 banks that examined how interested the industry is about Blockchain technology (Survey, 2018). In this survey more than 95% of the respondents affirmed they would make some level of investment in blockchain technology. In retrospect, it looks as though the curiosity revealed in the Deloitte study has turned into action. Chris Naprawa is president of TAAL (a vertically integrated blockchain infrastructure

and service provider for enterprise) and sees significantly more blockchain integrations into banks today (Forbes, 2021). The president has stated that he has observed that banks are overhauling their digital infrastructure and adopting blockchain innovations to address complex cost and operational challenges (Forbes, 2021). He underlines this by saying some banks and governments to which they're affiliated have accelerated the technology into their day-to-day operations (Forbes, 2021).

Blockchain technology can provide better security for the banks. With the ability to couple payments through smart contracts, allows banks to connect multiple data points, follow pre-set conditions or utilize data to navigate transactions that require interdependencies (Forbes, 2021). This solution makes it easier for banks to manage complex transactions in a much more streamlined and secure way. Other areas like loan closing workflows, invoicing and supply chain financing are some of the opportunities for adopting blockchain for more secure transactions (Forbes, 2021). Beyond security, blockchain provides banks the opportunity to also streamline complex workflows and optimize internal processes (Forbes, 2021). Most of the inner workings of banks are still built on siloed systems, this often results in manual processes. With blockchain the banks can enhance the connection between different critical infrastructures and eliminate the manual process in which large amounts of data are exchanged (Forbes, 2021). To sum up, we can see that blockchain will bring security and efficiency to the banks.

3.0 Theoretical framework: Adoption

As this thesis seeks to research how blockchain technology can be adopted by corporations, this chapter is dedicated to describing different theoretical frameworks related to adoption of innovations and technology in-depth.

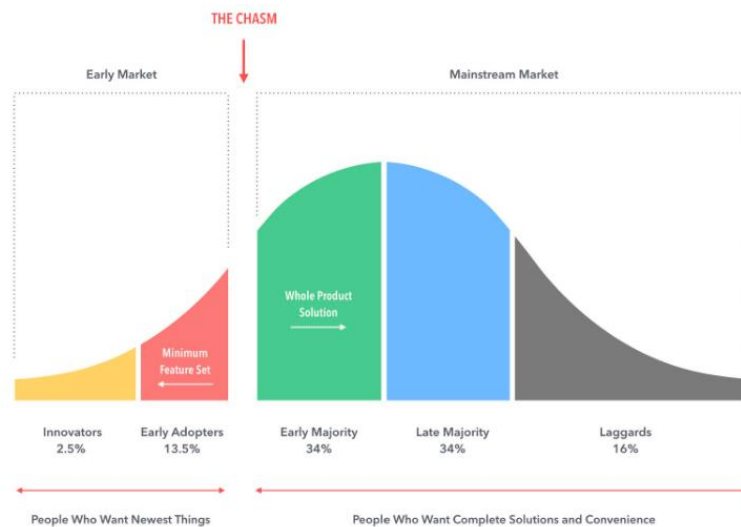
In this research, different models of adoption will be presented. I will also discuss which model will be the most relevant when it comes to adoption of blockchain technology. The theoretical research on adoption of technology as an academic field is based mostly on research from the early 1990's. However, as early as 1962, Rogers Everett presented the diffusion of innovation model, which has been the framework for most of the theory based on adoption in the past decades. Rogers was instrumental in establishing a systematic study in the ways innovations are adopted by potential users. In later years, other relevant models have come to use, and the technology acceptance model is another widely credited and referenced model (Davis, 1989). This model has for instance been applied to the adoption of both email and internet technology. On the other hand, blockchain is relatively new and immature both in terms of adoption and research. This thesis will contribute to the theoretical field by combining different recognized models of technology adoption and applying it to new technology.

3.1 The diffusion of innovations theory

The diffusion of innovations theory is based on outlining how new technological and other advancements spread throughout societies and cultures, from introduction to widespread adoption (Halton, 2021). This theory seeks to explain how and why new ideas and practices are adopted, with timelines potentially spread out over long periods. In other words, Rogers Everett's diffusion of innovation theory is highly relevant when it comes to adoption of technology like blockchain and is therefore suitable as a theoretical backbone for this thesis.

Rogers viewed adoption as a decision of "full use of an innovation as the best course of action available", and rejection is a decision "not to adopt an innovation" (Halton, 2021). Diffusion can be described as "the process in which an innovation is communicated through certain channels over time among the members of a social system" (Halton, 2021). The four key components of this definition are innovation, communication channels, time, and the social systems.

To get a visual understanding of the diffusion of innovations theory, we can use the graph below. Rogers explains the passage of an idea through stages of adoption by different actors. To start with, we have “innovators”, who are open to risks and the first one to try new ideas (Halton, 2021). Further, we have the “early adopters”. These people are interested in trying new technologies and establishing their utility in society. The next phase is the “early majority”, this group paves the way for use of innovation within mainstream society and are part of the general population. If we break down the barriers of blockchain adoption, and make it more user friendly for corporations, we can see more of most of the society adopt the technology. Up next in the model is “late majority”. This is the other part of the general population, where people who follow the early majority into adopting the innovation as part of their daily life. Lastly, we have the “laggards”. This group lagged the general population and adopted innovative products and new ideas. The gap called “the chasm” can be viewed as a part of the adoption process to which the technology reaches mainstream adoption.



Source: (htt)

3.2 Theory of Reasoned Action

The Theory of Reasoned Action explains the deciding factors in individual intention towards technology usage and adoption (Ajzen & Fishbein, 1975). This model seeks to define technological adoption through behavioral attitude, subjective norm, behavior intention and actual behavior. In other words, the model argues that it is an individual's behavioral attitude and subjective norm that can affect the individual's intention of utilizing a new type of technology (Ajzen

& Fishbein, 1975). Behavior intention explains why the individual wants to utilize this technology, and measures actual behavior (Ajzen & Fishbein, 1975). Through this model, Fishbein and Ajzen state that: if the intention behind usage is strong enough, this will over time result in actual usage (Ajzen & Fishbein, 1975). Through this model, Fishbein and Ajzen state that: if the intention behind usage is strong enough, this will over time result in actual usage (Ajzen & Fishbein, 1975). In relation to blockchain adoption, individuals and corporations start to see more actual usage of the technology, and with time this may lead to more mainstream adoption.

Behavioral attitude can be described as “a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object (Ajzen & Fishbein, 1975). In this context, this means that an attitude is the current learned opinion towards a technology. On the other hand, an attitude is not synonymous with behavioral intention, because subjective norms affect this decision. Attitude on an individual level is affected by behavioral beliefs (Ajzen & Fishbein, 1975). Fishbein and Ajzen (1975) describes subjective norms as a social consequence of behavior and revolves around how the individual deals with external influence on behavior. The model indicates that intention leads to a specific and actual behavior (Ajzen & Fishbein, 1975).

Research on the subject shows that people tend to perform behaviors about which they have positive attitudes and avoid behaviors toward which they have negative attitudes (Sheppard, Hartwick, & Warshaw, 1988). Theory of Reasoned Action explains that attitudes toward specific behaviors are based upon expectations or beliefs about what the likely consequences of the behavior will be (Sheppard, Hartwick, & Warshaw, 1988). If corporations believe that blockchain technology primarily positive consequences will result from the behavior, they will have a positive attitude toward the behavior and be more likely to adopt it. For example, a corporation might believe that adopting blockchain technology will be more efficient and profitable, but opportunities to invest in other technology may be missed. If the corporations can see the benefits with blockchain, and if they get a good understanding of the possibilities that can lead to better revenue, they will probably have a positive attitude toward adopting the technology.

3.3 Theory of Planned Behavior

The Theory of Planned Behavior can be described as an extension of the TRA-model (Ajzen & Fishbein, 1991). This model was introduced by Ajzen in 1991 to modernize the original model, because the TRA-model inadequately predicted how individuals act, when the person is not in complete control over their own actions (Ajzen & Fishbein, 1991). In this model Ajzen included “perceived behavioral control”, which encompasses internal and external constraints in behavior. In other words, “people's perceptions of the ease or difficulty of performing the behavior of interest (Ajzen & Fishbein, 1991). The model states that if the individual has less control over individual actions, the intention will be severely influenced by “perceived behavioral control”. In this scenario the individual's own confidence will affect the actual behavior. The “perceived behavioral control” will also affect the behavioral intention, subjective norm, and attitude towards the behavior.

3.4 Technology Acceptance Model

With the Theory of Reasoned Action and Theory of Planned Behavior as background, Fred Davis came up with the Technology Acceptance Model (Davis, 1989). This model is designed to measure the adoption of new technology based on customer attitudes (Davis, 1989). Unique for the Technology Acceptance Model, Davies introduced “perceived usefulness” and “perceived ease of use”. Fishbein and Ajzen pointed out that beliefs affect attitude, and these two elements determine the attitude towards use and the following intention and actual usage of new technology. The Technology Acceptance Model also includes “external variables”. These provide the bridge between the internal beliefs, attitude and intentions represented in TAM and various individual differences, situational constraints and managerially controllable interventions impinging on behavior (Davis, 1989). Davis describes “perceived usefulness” as “the degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989). In other words, “perceived usefulness” explains the intention and attitude of usage in the TAM-model. On the other hand, Davies defines “received ease of use” as “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989). Put in simpler terms, even though the informational system is perceived useful for the user, it could be interpreted as difficult or impossible to use. With adoption of blockchain

technology, effort and understanding from the user is highly needed. Perceived ease of use affects both perceived usefulness and attitude towards usage.

In later years, studies by Venkatesh and Davis showed that ease of use also influenced the behavioral intention directly (Venkatesh & Davis, 1996). Other studies, proceeding the original theoretical framework have stated that attitude towards use has zero (or a partial) mediating effect on actual intention of use, and usage of new technology (Taylor & Todd, 1995). More recent studies show that “perceived usefulness” and “perceived ease of use” have a direct effect on intention of use (Venkatesh & Davis, 2000).

3.5 Other relevant literature

3.5.1 The adoption process

Blockchain and crypto is viewed as a complicated phenomenon by most of the world. There is complex technology combined with advanced procedures, which can make the adoption of blockchain challenging. Blockchain and IT in general are moving fast forward and it can be difficult to get a good understanding of everything. Each actor has its own motivation and purpose for the use of the service, and the adoption of blockchain will affect authorities, banks, corporations, and consumers worldwide.

“New products force consumers to change their behavior, and that has a psychological cost. Many products fail because people irrationally overvalue the benefits of the goods, they own over those they don't possess.” (Gourville, 2006)

This quote gives a good perspective on customers' psychological costs when it comes to using something new. Further, we understand that customers often feel they have something better than what is being presented as the new idea.

Adoption is described as the mental process every potential customer goes through from becoming aware of the service, to becoming a loyal customer or rejecting the solution (Andreassen & Lervik-Olsen, 2016). Andreassen and Lervik-Olsen divides the adoption process into 5 stages:

1. Attention: The customer becomes aware of the service but does not have sufficient information to decide.

2. Interest: Further, the customer seeks information about the service internally and externally.
3. Evaluation: The customer weighs pros and cons and compares with other services.
4. Trying: The customer tries the service for the first time to evaluate the benefits and quality.
5. Adoption/rejection: In the end, the customer decides to continue using the service or reject it.

(Andreassen & Lervik-Olsen, 2016)

New technology often requires different data solutions, as well as giving up on the incorporated solutions. Learning something new and giving up something will represent a “cost” for the consumer (Andreassen & Lervik-Olsen, 2016).

Adopting a new solution entails change, and in a figurative sense, a psychological pain for the consumer. It will be essential to identify these “pains” and overcome them through a solution that more than compensates for the costs (Andreassen & Lervik-Olsen, 2016). In theory a customer (corporation) will adopt a solution if the sum of gains exceeds the sum of losses. On that note, we need to understand the distinction between economic theory and practice. Psychological effects associated with gains and losses are what explain behavior and rational behavior. Thus, customers will not always be profit maximizing financially conscious. Financial, psychological, real, and felt costs will always follow the adoption process.

3.5.2 Decision theory

To gain a deeper understanding of decision theory and the psychological aspect of gain and loss, we can make use of Kahneman and Tversky's “Prospect theory model”. In the context of consumers, the adoption of innovation has several psychological benefits and costs. Because of the lack of understanding regarding how the consumers balance gains and costs when adopting a new service, the probability of innovation flops is greater than innovation successes (Andreassen & Lervik-Olsen, 2016). The sum of benefits and the attachment to the old solution, can be considered the cost of switching (Andreassen & Lervik-Olsen, 2016). This comes to show the intersection between opposing change and seeking solutions for the corporations. With the help of the model of Kahneman and Tversky, we

understand that “loss weighs heavier than gains” (Andreassen & Lervik-Olsen, 2016). A loss or negative value is perceived as worse than a corresponding gain or positive value. To sum up this model, customers think that by not adopting the new solution they lose nothing.



Source: (Kahneman & Tverskys, 1979)

3.6 Challenges of blockchain adoption

Different challenges arise when it comes to the adoption of blockchain technology. In this part of the thesis, I will try to outline some of the challenges and give a better understanding on the road ahead.

Firstly, a debated challenge regarding blockchain technology is the high energy consumption. Blockchain technology follows Bitcoin's infrastructure with Proof of Work as a consensus algorithm (Iredale, 2021). This system requires a huge amount of computational power. According to estimates from Digiconomist, Bitcoin and Ethereum together are using over 300 terawatt-hours of electricity per year, which is more than Italy, Saudi Arabia, and Mexico use (Digiconomist, 2021). However, Ethereum will solve this problem, when it upgrades to Proof of Stake later in 2022 (Ethereum, 2021). This mechanism requires users to stake their ETH (Ethereum's native token) to become a validator in the network (Ethereum, 2021). These validators are responsible for the same thing as miners in Proof of Work: ordering transactions and creating new blocks so all nodes can agree on the state of the network (Ethereum, 2021). Research from the Ethereum Foundation estimates that this can cut energy use by at least 99.95% (Ethereum, 2021). The energy expenditure of Ethereum will then be roughly equal to the cost of running a home computer for each of the nodes on the network (Ethereum, 2021).

The public perception and knowledge base is another factor for the adoption of blockchain. Most of the public is still not aware of the possibilities of the technology (Iredale, 2021). For blockchain technology to be successful, it must earn acceptance. To solve this, blockchain companies need to educate society and show real world use cases to people and corporations (Iredale, 2021). Before the general adoption is possible, members of the public need to understand how blockchain can help the world going forward (Iredale, 2021). As a result, this can help eliminate the negative implications and make the technology shine by itself. Vitalik Buterin (founder of Ethereum) has put the paradox of blockchain adoption into words:

“The main advantage of blockchain technology is supposed to be that it's more secure, but new technologies are generally hard for people to trust, and this paradox can't really be avoided” - (Buterin, u.d.)

3.6.1 Blockchain and GDPR

The biggest challenge with blockchain adoption is the regulatory landscape (Iredale, 2021). Because of the lack of regulation, there are also added security risks with the technology (Iredale, 2021). The regulatory framework we can link to blockchain technology is The European Union's General Data Protection Regulation (GDPR) (Parliament, 2019). On the one hand, GDPR seeks to facilitate the free movement of personal data between the EU's various Member states (Parliament, 2019). On the other hand, they establish a framework of fundamental rights protection, based on the right to data protection in Article 8 of the Charter of Fundamental Rights (Parliament, 2019). The GDPR is based on the underlying assumption that in relation to each personal data point there is at least one natural or legal person (the data controller), whom data subjects can dress to enforce their rights under EU data protection law (Parliament, 2019). Blockchain, however, seeks to achieve decentralization in replacing a unitary actor with many different players. This makes the allocation of accountability and responsibility burdensome. Furthermore, the GDPR is based on the assumption that data can be modified or erased where necessary to comply with legal requirements (Parliament, 2019) Blockchain renders such modifications of data purposefully onerous in order to ensure data integrity and to increase trust in the network. Consequently, the very technical structure of blockchain technology as well as its

governance arrangements stand in contrast with the requirements of the GDPR regulations.

4.0 Methodology:

4.1 Introduction

This section of the thesis begins with a repetition of the purpose of the analysis, then an explanation of the chosen research design, and then how the interviews were conducted.

4.2 The purpose of the thesis analysis

The purpose of the analysis for the thesis is to obtain different viewpoints regarding the adoption of blockchain technology. This analysis will contribute insight into the answer to the thesis' research questions. In this thesis I will be focusing on the following research questions:

1. What is the best use case with blockchain technology?
2. What can blockchain technology solve for corporations?
3. How can corporations adopt blockchain technology?
4. What are the challenges with the adoption of blockchain technology?

4.3 The qualitative research interview

Qualitative study gives valuable insight, theory, and highlights data phenomena (Maxwell, 2008). The interesting part of qualitative study lies in how the informants give insights to things that have happened, and how those perspectives and experiences precede their own actions (Maxwell, 2008). Creswell also describes qualitative study as an investigating method to research a selected phenomenon in depth (Creswell, 2009). The research objects are deliberately chosen with the intention of obtaining relevant answers around the phenomena one likes to highlight (Creswell, 2009). Qualitative interviews are increasingly used as an independent research method and have since the 1980s become an important part of social research (Kvale & Brinkmann, 2015). This method can also be viewed as a tool for developing an understanding of the phenomena being studied (Thagaard, 2018)

A qualitative research interview seeks to understand the world from the perspective of the interviewer (Kvale & Brinkmann, 2015). To manage this, the informant's opinions are a key factor. Throughout the research process, the focus lies on the informants' perceptions of the phenomena, and not the researcher's opinion (Creswell, 2009). In qualitative interviews, the researcher conducts one-on-one interviews with the selected informants. These interviews can be semi-structured, which means that the interview questions are relatively open and intended to provide views and opinions from the informants (Creswell, 2009). In this thesis, I have chosen to conduct a semi-structured interview. The purpose of a semi-structured interview is to obtain a description of the interview object's world of life, and further interpret the meaning of the phenomena described (Kvale & Brinkmann, 2015). With this type of interview, we seek to understand topics from the interview object's own perspective (Kvale & Brinkmann, 2015). Semi-structured interviews are neither an open conversation nor a closed conversation, related to a specific questionnaire (Kvale & Brinkmann, 2015). This was something I was aware of when designing the interview guide, and during the interviews themselves.

4.4 Operationalization

The theoretical concepts in the conceptual model of the thesis must be operationalized before the data is collected (Gripsrud, 2016). This Operationalization part seeks to clarify how the concepts will be measured, and how the thesis will utilize the gathered information.

4.4.1 Interview guide

An interview guide should contain several components (Creswell, 2009). Firstly, formalities such as time and place, in addition to an instruction with the key concepts of the topic, should be in place. What characterizes a good interview guide is introductory questions, followed up by open-ended questions that give the interview objects the opportunity to go into more detail and elaborate on their beliefs (Creswell, 2009). In this thesis I used a descriptive design model, because the questions were about how the informants experience, how they view blockchain and their thoughts surrounding adoption of this technology (Kvale & Brinkmann, 2015).

Key words can be utilized by the interviewer to facilitate open thinking, and help provide opportunities for follow-up questions (Tjora, 2021). I used keywords as a tool to help the interview objects on the way, if they felt some of the questions were unclear.

4.4.2 The recruitment of informants

The number of interview objects has a great impact on the degree to which one can generalize and test hypotheses (Kvale & Brinkmann, 2015). I have chosen to include five informants in my study. When I included five informants, I got the opportunity to do an in-depth analysis of each interview. According to Kvale and Brinkmann (Kvale & Brinkmann, 2015), in-depth analysis can be challenging if the number of informants is too large. Creswell also points out that a smaller sample is a typical feature of qualitative studies, to be able to go in depth on a phenomenon (Creswell, 2009). My goal with this thesis will be to shed light on the adoption of blockchain technology in corporations, through analyzing the findings of five informants. Creswell also highlights the extensive time aspect of obtaining and analyzing qualitative data as a reason for having a small sample (Creswell, 2009).

The goal of the sample is to select informants who can help me understand the adoption of blockchain and which barriers there might be. Creswell calls this “targeted sample” (Creswell, 2009). I deliberately used this sample, this because a systematic sample can be homogeneous, and it provides conclusions that can represent the population to a greater extent than a sample based on random variation (Maxwell, 2008)

4.4.3 Conducting the interviews

In line with Kvale and Brinkmann, I started the interview with an introduction on the subject and thanked them for their participation in the project (Kvale & Brinkmann, 2015). I told them about the purpose of the study and explained how the sound recording worked. Further, I clarified any questions the informant may have and then started the conversation with guidance of the interview guide. The interviews varied in length, depending on how much the informant elaborated (ranging from 40-60 minutes).

5.0 Results:

5.1 Introduction:

This section starts with a presentation of the sample and why these specific informants were selected. I have conducted five in-depth interviews with informants from different corporations, in different positions, and with different knowledge when it comes to blockchain technology. I will divide the results from the interviews into the different research questions, to diversify the information more easily.

5.2 Presentation of the selection:

I wanted to get the best possible points of view from different relevant informants. On one side, you have the more blockchain experienced professionals. On the other side, you have corporations with less experience on blockchain technology. From the corporations experienced with blockchain technology, I sought out Chris Moose from IBM US and Richard Walker from Deloitte US. Moose works as a Blockchain Partner & Healthpass Ecosystem Developer, and Richard Walker is Digital Assets Leader in Financial Services. These two have extensive experience in the field and helped me get a better understanding of blockchain and how adoption of this technology can help corporations. Moose was early interested in blockchain technology and got fascinated by the ability to establish trust between participants. Similarly, Walker also got fascinated by this technology and started back in 2015 to build programs on top of Ethereum. Three years ago, he started to focus on blockchain and digital assets for financial services as a primary role. He has been a consultant for 29 years and always had a focus on different tech strategies. Walker described blockchain as a strategy:

“Blockchain is a strategy conversation, enabled by tech” (Walker, 2022).

On the other hand, I have three informants from different corporations in Norway that have yet to adopt blockchain technology. To get an overview of how corporations viewed blockchain technology, it was essential to get in contact with different types of corporations. Furthermore, it was interesting to hear their thoughts on how the technology could be utilized. First, I talked to Marie Moxnes who has over 8 years' experience as a marketer and now works for a Norwegian fintech company called “Two”, which specializes in payments between

businesses. “Two” have yet to implement or use blockchain in their system, but states that:

“It can be relevant in the future” (“Two”, 2022).

Next up, I talked to Hanne Sorteberg at Storebrand. Storebrand is a Norwegian corporation focusing on long-term savings and insurance.

“Storebrand actively follows trend reports and development in the blockchain space” (Hanne Sorteberg, 2022).

Lastly, I talked to Fredrik Midttun, leader of the origination leasing in Santander. They provide car financing and leasing agreements for private people and businesses. Like the other non-blockchain corporations:

“Santander hasn't considered blockchain specifically” (Fredrik Midttun, 2022).

He followed up with:

“Santander wants to be a progressive company, with innovative ideas, but it's difficult in a strictly regulated banking sector (Fredrik Midttun, 2022).

These corporations shared some knowledge surrounding blockchain and the possibilities following the technology, but were:

“Unsure of the usefulness today” (“Two”, 2022)

This makes their reflections on the subject interesting, and these are all giving great insight on how different corporations view the adoption of blockchain technology.

Corporation	Blockchain experience
IBM	Yes
Deloitte	Yes
Two	No
Storebrand	No
Santander	No

5.3 What is the best use case with blockchain technology?

First, I will present how IBM and Deloitte see the use cases of blockchain technology. Moose started to explain the use cases with this:

“The best use case with blockchain technology is anytime you have to establish trust between two or multiple parties” (Moose, 2022).

Furthermore, Walker argued that:

“Blockchain is a mechanism for reaching consensus and can help people collaborate to a common goal. The overall architecture is to create trust among untrusted parties, by giving the trust to a consensus mechanism built into the network” (Walker, 2022).

Moose also stated:

“With blockchain technology we can move from a contractual relationship to a market relationship. Blockchain is the abstraction layer that allows transactions to happen” (Moose, 2022).

Both respondents see a huge potential of blockchain technology in different sectors. Moose pointed out that:

“Decentralized finance (DeFi) can impact the financial industry massively” (Moose, 2022).

He further underlined:

“The supply chain and ad tech industries can benefit greatly with the right adoption of blockchain in the coming years” (Moose, 2022).

Walker highlighted:

“One of the top use cases is self-sovereign identity, using blockchain for owning your own data. Further, the secure information exchange that blockchain can provide. Corporations can have ensured on where the data or money came from and where it goes” (Walker, 2022).

Another killer use case is:

“The exchange of value” (Walker, 2022).

The two also shared some hands-on experiences from their daily work as well. Today, Walker collaborates with a large bank in the US to enable payments for the financial service industry, management, and real time security settlement. On the other hand, Moose pointed out that:

“There is a phenomenal amount of organized crime and terrorism within the pharmaceutical supply chain. Most people don't realize this, but people selling fake products is a huge problem. Blockchain can solve this by approving the legitimacy of pharmaceutical products and keeping users safe” (Moose, 2022). Especially when Covid-19 hit, Moose looked at how you could use blockchain for verifiable credentials, to protect consumers.

On the other hand, we have the informants from corporations that have yet to integrate blockchain into their business model. “Two” and Santander highlight the:

“Transparency and efficiency that blockchain can provide” (“Now”, 2022).

Santander also mentioned the:

“Benefits with smart contracts and the security side of it” (Santander, 2022).

Both Storebrand pointed out:

“It could be interesting to see different insurance solutions with the use of smart contracts” (Storebrand, 2022).

With that said, these informants did not feel their corporations were ready to integrate blockchain technology. Santander argued:

“Lack of knowledge around the technology makes it difficult to make use of it today” (Santander, 2022).

Storebrand stated:

“There may be different needs for blockchain solutions, which our business model does not solve today, but we have not explored it enough” (Storebrand, 2022).

Santander also underlined:

“The endless possibilities”,

but thinks:

“It is too early for their corporation to try it out now. We want to see other corporations integrate it and make good use of it first”. (Santander, 2022).

5.3 What can blockchain technology solve for corporations?

Walker started to point out:

“Blockchain can solve friction in any supply chain model, make it possible to track products, view and see where products are distributed” (Walker, 2022).

Indeed, every respondent mentioned the efficiency in transferring money.

“Blockchain also can make money transferring more efficient” (“Two”, 2022).

With that said, the corporations that had no experience with blockchain were:

“Uncertain when it comes to using it in the best way possible” (Storebrand, 2022).

Walker came with a deeper explanation on what corporations can do with blockchain that they can't do today:

“It has great potential in expression and utility of the finance function and that's where digital assets come into play. With blockchain technology corporations have an alternative asset to hold other than fiat, they can self-custody the currency they have and move it around the world for free 24/7 to meet capital liquidity requirements in the entities where they have business globally. For instance, they can use the digital assets as collateral for capital requirements” (Walker, 2022).

He further mentioned:

“They can earn yield on staking, and limit cost by doing spot effects trade as they move money across borders and get greater visibility on where the capital is” (Walker, 2022).

In other words, blockchain can streamline money movements. Walker emphasized that there will always be money in motion. He argued:

“Blockchain can limit the money “locked” in movement globally, and as a result we can unlock an incredible amount of capital and liquidity to put into productive economic use” (Walker, 2022).

For instance:

“In production, investment, materials etc. When we take friction out, we can increase the efficiency of the global economy. With friction out of the picture, you also demonetize the money movement mechanisms” (Walker, 2022).

Walker substantiated the statement with a report showing companies globally paid 40 billion dollars just to move money in 2020. This was only the fee on money movement.

“With blockchain technology we can try to build a much better monetary system” (Walker, 2022)

On the other hand, the corporations with no experience with blockchain were more skeptical and both “Now” and Storebrand argued that they needed a better “case” if they were to implement it. They believed in the future potential of the technology but felt they didn't have enough knowledge to know how to make use of it today.

“We do not know enough about the technology to make use of it today. The way it is used today is not simplified enough to let people and corporations know how to make the most of it” (“Now”, 2022).

Storebrand argued that if they were to implement it:

*“We need it to be sustainable and not to go beyond their brand and credibility”
(Storebrand, 2022).*

Further, they mentioned that:

“Norwegian corporations have a lot of trust and as a result do not need blockchain as a trust layer. Today the banks and financial system can deliver it securely and cheaper without blockchain” (Storebrand, 2022).

5.4 How can corporations adopt blockchain technology?

This was the most prominent topic in the interviews and the informants shared different views on how corporations can adopt blockchain technology and how it can be easier to adopt in the future. Moose explained that:

“IBM has created and uses Hyperledger based blockchain technology to help corporations implement the technology. They also have different enablers on top of that to make adoption even easier to implement” (Moose, 2022).

This is private permission networks that also can be used in very small and narrow use cases.

He also expressed how they help on the educational side:

“We help people and corporations on the education side, to understand what it is and how to use it” (Moose, 2022).

IBMs consultants make it easier for corporations and people to get a better understanding of the blockchain space. The focus here is to explain blockchain in relation to Web3 and make it a bit more digestible for people. He outlined that:

“People are a bit fatigued around new technology, but it will be very transformational when the adoption gets to more people and corporations”
(Moose, 2022).

IBM talks to corporations in the context of what industry they are working in, nevertheless they also compare it to how Web 1, Web 2 and mobile affected organizations was adopted.

“Any sophisticatedly advanced technology seems like magic, and it just has to be more commonly used in the years to come” (Moose, 2022).

Walker explained how Deloitte are working on adoption:

“Deloitte is focusing on adoption and making digital assets accessible, through an DLT architecture” (Walker, 2022).

They view blockchain digital assets as three things:

“a new asset class, a new digital currency and a new financial market infrastructure” (Walker, 2022).

These three aspects are moving at a different pace.

“The latter is going to take the longest, because of the complexity of the financial market infrastructure globally that exists” (Walker, 2022)

Deloitte started back in 2017 on a five-year plan of adoption. Walker expressed:

“The adoption thesis is exceeding all expectations if we look at where the ecosystem is today” (Walker, 2022).

He further highlighted:

“There are hundreds of banks in America that are offering buy/hold/sell services for customers. That's the first phase to expand adoption. Once we have adoption, we can bring banking services to the ecosystem and extend credit into the ecosystem” (Walker, 2022).

Walker referred to the chairman of Elmax London, which told him:

“Blockchain adoption is ABC: adoption, banking and credit” (Walker, 2022).

According to Walker:

“We are headed toward mainstream adoption, because of security, transparency, low cost, and the achievement of scalable processing levels”. The adoption rate in recent years shows that the future of money is digital, and blockchain architecture is the future of money” (Walker, 2022).

When he gives advice to different banks in the US he says:

“The industry is replatforming into blockchain architecture, you have no choice as to whether you participate, your only choice is what you do, and when you do it” (Walker, 2022).

The informants also shared some thoughts on how the adoption process could get easier. For corporations to move to the next level of blockchain technology, Moose stated:

“It will be more usual to appoint a Chief digital officer” (Moose, 2022).

With new technology and the world moving forward, he believes:

“Corporations need that person to solve these new sets of problems that come with a more digitized economy and moving into Web 3” (Moose, 2022).

Walker emphasized that the adoption gets easier year by year. If he were a corporation seeking to adopt blockchain technology, he would:

“Contact one wallet provider like Copper, Fireblocks or Metaco”. Get a wallet subscription and start to get familiarized with the system and put some of the working capital into use” (Walker, 2022).

He further pointed out:

“Preferably would begin to use that structure for targeted capital requirements, like moving money across borders without converting it to the local currency and for free” (Walker, 2022).

He finished his point by describing this as:

“The future of decentralized wallet architecture” (Walker, 2022).

5.5 What are the challenges with the adoption of blockchain technology?

Every respondent saw challenges with the adoption of blockchain. They shared a good overview of how the situation is today and what needs to be taken into consideration. Moose argued:

“We need to go through how we can solve different types of decentralized organizations” (Moose, 2022).

Moose also shared:

“I have some concerns around privacy and data regulations (GDPR), because you can’t get that into the blockchain” (Moose, 2022).

Further he argued:

“The regulatory environment will have a lot to say when it comes to corporations adopting blockchain. As a result of this, people are sensitive to what information goes on a blockchain” (Moose, 2022).

Moose further explained:

“Corporations need to understand that this type of technology means that they are adopting a new business process or a new market strategy that’s going to be underpinned by blockchain” (Moose, 2022).

He compared the adoption of blockchain technology with the adoption of email.

“The reason people adopted email was because they wanted a method to communicate, engage consumers or solve business problems”. Email is just the protocol, the same way blockchain is just a protocol” (Moose, 2022).

He followed the statement up:

“The important part is to get people to know what you can do with this new protocol”. When more people see tangible evidence on better traceability, carbon tracking, more efficient payments etc, we can drive adoption further” (Moose, 2022).

Moose also shared some concerns when it comes to corporations adopting blockchain technology without really allocating the right resources to it.

“The security aspects are really important to understand and how corporations can engage with the technology in the best way” (Moose, 2022).

He fears:

“Corporations are short sighted and don’t embrace the new technology” (Moose, 2022).

Walker compared the adoption of blockchain with the adoption of mobile when he stated:

“The corporations that were slow to adopt mobile were left behind by those that quickly adopted mobile, same goes for blockchain” (Walker, 2022).

Walker also emphasized:

“Regulatory clarity is needed”. This is the biggest enabler and the biggest obstacle” (Walker, 2022).

He explained the statement when he stated:

“it's the biggest obstacle if it's not done in a coordinated fashion, with good governance design. Regulation handled poorly will stop innovation and adoption”
(Walker, 2022).

As a result, it will be crucial for the regulators to understand the implications of the technology.

“Regulations done well will increase clarity, confidence and give people what they need to invest in the adoption” (Walker, 2022).

The blockchain ecosystem is:

“Very resilient and digital assets go where they are treated well” (Walker, 2022).

Walker underpinned at the end:

“We need to make sure it will continue to be treated well in the free world”
(Walker, 2022).

On the other hand, it was interesting to hear the challenging aspect of adopting blockchain from the non-blockchain corporations. Storebrand pointed out:

“It would be easier for them to adopt blockchain if they had access to a finished product they could implement” (Storebrand, 2022).

If the blockchain solutions were easy to integrate into the system with a seamless transition, they could explore different use cases within the corporation. To lower the barriers, they want:

“Firsthand experience with some practical solutions to explore it” (Storebrand, 2022).

With that said, they argued:

“We need expertise to be able to move forward with blockchain technology”
(Storebrand, 2022).

To fit their business model:

“It must be cheaper and more robust than today's alternative” (Storebrand, 2022).

Santander also shared some concerns regarding the authorities and regulations.

“We have people working with new technology, but it will take time for Santander to make use of blockchain technology as long as the regulations are unclear”
(Santander, 2022).

The Santander group is the world's fifth largest banking group and regulated by AML. Consequently, he believes:

“It will be difficult to navigate in a highly regulated environment with blockchain technology” (Santander, 2022).

Despite this, Santander believe:

“With clear regulations it can probably bloom fairly quickly” (Santander, 2022).

They followed up with:

“It can be a competitive advantage to be “first mover”, but then they have to restructure the whole business model for the bank” (Santander, 2022).

Today,

“Santander is dependent on centralized systems to collect their money in various areas, but this may change in the future” (Santander, 2022).

If they managed to develop a new business model with blockchain integrated:

“I could clearly see the corporation benefit from the situation” (Santander, 2022).

Santander also shared some thoughts on the knowledge surrounding the technology:

“We need more knowledge and be more familiar with the technology, before utilizing it” (Santander, 2022).

On the same note, Santander mentioned:

“Decentralization may challenge the way banks work today and disrupt their business model” (Santander, 2022).

Santander outlined:

“There must be some slightly smaller corporations that show areas of use and how to implement the technology” (Santander, 2022).

He also pointed out that he thinks:

“This type of technology may better suit countries with less trust in the public than Norway for instance” (Santander, 2022).

“Two” pointed at the complexity of the technology as the biggest obstacle:

“Today, I think the technology is too complex for some corporations to make use of it.”

5.6 Overview of the results

Corporations	Use cases	What blockchain solves	How to adopt blockchain	Challenges with adopting blockchain
IBM	<ul style="list-style-type: none"> -Trust -Market relationship -DeFi 	<ul style="list-style-type: none"> -Supply chain -Ad tech -Money transferring 	<ul style="list-style-type: none"> -Hyperledger -Education -Chief digital officer -Tangible evidence 	<ul style="list-style-type: none"> -Concerns around GDPR -New business process -Short sighted
Deloitte	<ul style="list-style-type: none"> -Trust -Consensus mechanism -Self sovereign identity -Secure information exchange -The exchange of value 	<ul style="list-style-type: none"> -Supply chain -Money transferring -Increase the efficiency of the global economy 	<ul style="list-style-type: none"> -DLT architecture -ABC: adoption, banking, and credit -Digital money -Wallet subscription 	<ul style="list-style-type: none"> -Regulatory concerns -Biggest obstacle -Biggest enabler
Storebrand	<ul style="list-style-type: none"> -Trust -Insurance -Smart contracts 	<ul style="list-style-type: none"> -Money transferring 	<ul style="list-style-type: none"> -Need a good "case" to implement -Need more knowledge 	<ul style="list-style-type: none"> -Access to finished product -Firsthand experience -Need expertise
Santander	<ul style="list-style-type: none"> -Transparency -Efficiency -Insurance -Smart contracts -Endless possibilities 	<ul style="list-style-type: none"> -Money transferring 	<ul style="list-style-type: none"> -Need more knowledge -Countries with less trust 	<ul style="list-style-type: none"> -Highly regulated environment -Unclear regulations - "First mover"
Two	<ul style="list-style-type: none"> -Transparency -Efficiency -Smart contracts 	<ul style="list-style-type: none"> -Money transferring 	<ul style="list-style-type: none"> -Need a good "case" to implement -Need more knowledge 	<ul style="list-style-type: none"> -Unclear regulations

6.0 Discussion:

6.1 Introduction:

In this part of the thesis, I will use the results from the interviews to discuss the research questions. The findings from the interviews will be the settlement layer for what we later can conclude with.

6.2 Review of the results:

6.2.1 What is the best use case with blockchain technology?

Based on the findings from the results, all the informants saw use case potential in blockchain. Nevertheless, some of the informants argued they needed more expertise on the subject to make use of it. It was interesting to see the different arguments from the informants in relation to the Technology Acceptance Model. More specifically, how the different informants view the different use cases in relation to “perceived usefulness” and “perceived ease of use”. Santander underlined “*the endless possibilities*” blockchain could bring to the table and clearly shared optimism regarding “perceived usefulness”. Nevertheless, Santander argued that “the perceived ease of use” was too complex and that they didn't have enough knowledge at this point. They have all heard of it and have some thoughts regarding the technology, but it is too complex to integrate into their business model today. In this regard, there may need to be more corporations like IBM and Deloitte helping to bridge the gap between blockchain and non-blockchain corporations. In these early years of adoption, it will be essential to have corporations ease this new technology into different sectors. With easier integration and education in each country, corporations may have a larger appetite for new technology. Further, Storebrand argued that another solution could be to give corporations access to “finished products”. This could lower the barrier for the adoption and make the blockchain solution ease more into their business model. An easy-to-use product could be the first steppingstone for some corporations that may want firsthand experience.

Another aspect to take into consideration regarding the use cases, will be which countries is in the greatest need for blockchain technology. With the security and trust in Norway, there is reason to believe they have a more conservative

perspective to new technologies. Consequently, we may see smaller corporations adopt it in countries like Norway first. Hence, corporations need time to be convinced on blockchain solutions. On the other hand, countries with less trust may be in greater need of a “protocol of trust” in these early stages of adoption.

There are certainly other sectors that also can benefit from this technology. It will be interesting to see which sectors will make the most of it in these early years of blockchain adoption. It comes to show that the supply chain and ad tech industries can benefit greatly. There are clear use case scenarios in these industries. Moose outlined the need of security and transparency in the supply chain sector. With the right tooling from blockchain, they can approve the legitimacy of pharmaceutical products and keep the consumer safe. This can be a lifechanging upgrade for the pharmaceutical supply chains all over the world and something every country will benefit from. To facilitate this transition, this industry may also need help to integrate the technology. It will be essential to give supply chains the right guidance and ease it into corporations’ daily work. For instance, easy-to-use QR-codes on products can help show the course of history for a product. I believe solutions where the consumer doesn’t even know blockchain is being used, will make the adoption easier. IBM also works on lowering the blockchain barriers for supply chains. This solution is automated through smart contracts and may be a solution for different supply chain sectors. With concrete use cases for different sectors, corporations will increase the desire to make any supply chain more efficient with blockchain technology.

6.2.2 What can blockchain technology solve for corporations?

When it comes to what blockchain can solve for corporations, the informants mentioned the benefits with money transferring. It was interesting when Walker mentioned the potential integration of stablecoins. With that said, the corporations with no blockchain experience expressed uncertainty in how they could use it in the best way possible. I think this is an essential part of the blockchain adoption. From my point of view, I think stablecoins can be the Trojan Horse that will bring smart contracts to the masses. Stablecoins are a fundamentally simple concept, with a blockchain-based token whose value is pegged to another currency (typically the US dollar). This results in a superior form of fiat. They simply cannot be ignored by institutions, academics, or regulators at this point in my

opinion. This makes stablecoins an essential bridge between the blockchain ecosystem and the real-world economy. However, stablecoins regulation is inevitable. This can include guidelines on what can be called a “stablecoin”, shutting down fraudulent schemes and require regulations on specific actions for instance. I believe it's not in a regulator’s best interest to crack down on stablecoins. Regardless of what the uncertain future of stablecoins will look like, this can bring the blockchain ecosystem to the masses. When I talked to the informants in non-blockchain corporations, there were clearly still many improvements that needed to be made around the user-experience and the onboarding process. All the non-blockchain corporations argued that they needed a good “case”, to make use of the technology. Corporations need to experience the firsthand benefits. Nevertheless, a large part of the shift towards stablecoins usage will probably happen on the institutional front. First internal operations, then external operations. With this in mind, we need to simplify the blockchain solutions like Moxnes pointed out. Greater education around self-custody and different FinTech’s focusing on simplifying the experience with blockchain and stablecoins, can drive adoption further.

6.2.3 How can corporations adopt blockchain technology?

In this part of the thesis, I will make use of the theoretical framework to discuss what I learned from the informants. On the one hand, it was interesting to hear how IBM and Deloitte helped corporations with blockchain adoption. Both corporations operate with a Distributed Ledger Technology, and work closely with adoption towards corporations. This is a new financial market infrastructure, and integration can take time because of the complexity of the global financial market infrastructure. According to Walker, *“there are over hundred banks in America using some sort of blockchain technology”*. If we see these numbers in relation to the diffusion of innovations theory by Rogers, there is reason to believe we are in the “early adopters” phase on a worldwide basis. There is still a long way to go with the adoption of blockchain, nevertheless it's a good indicator that banks in the US are starting to see the advantages. In other words, we are right up against the “chasm” phase in the diffusion of innovations theory. Crossing the “chasm” is the point you reach when the innovation needs to be ready and usable for mainstream users. We are early in the adoption curve, and according to the informants there is still a way to go when it comes to delivering simplified

blockchain solutions. The informants see huge potential in blockchain based applications, but increased simplicity is needed. When users try out new technologies and products that are not ready for them, they often churn away from it. If it's too complex they may also get left with a negative experience. It's clear we need to make a huge investment in usability and help tooling to engage with blockchain technology. Consequently, we can lower the barriers for corporations to enter the technological future. In the future, people may not know that the system they are using is run on blockchain technology. With a seamless transition from the technology that corporations use today, more people can utilize the benefits of blockchain. We need to more broadly understand how corporations discover, adopt and onboard the ecosystem and make sure it is truly accessible for them. Otherwise, we will just end up widening the “chasm”.

Throughout the interviews all the informants saw potential with blockchain technology. The non-blockchain corporations argued that it may be too early to adopt into their business model. When individuals and corporations start to see more actual usage of the technology, there is reason to believe that the intention of usage will increase over time (Theory of Reasoned Action). Consequently, we can see more of the blockchain adoption bloom. With that in mind, intention of usage can vary from country to country. Some countries may have more actual usage of a protocol of trust, meanwhile other countries need to see it bloom elsewhere before they take the leap. Regarding the different situations countries are in, a weakness in this analysis is that I only have discussed adoption with Norwegian corporations. Through the interview I learned that adoption of blockchain technology varies a lot on a country-by-country basis. Norwegian corporations may not be the first in line to adopt the technology, and we may see more blockchain adoption in Norway at a “late majority”-state, when we take the whole world into consideration. Because of the uncertainty in the Norwegian non-blockchain corporations, there is reason to believe that the US blockchain adoption is further down the road, compared to Norway. I think it can be dangerous for corporations to end up in this group, due to the many benefits with the technology. On the other hand, corporations who start to use blockchain at a later stage, may have learned a thing or two from the people already using it. Therefore, the adoption process IBM and Deloitte do for corporations has a huge impact when it comes to effective corporations' business models.

6.2.4 What are the challenges with the adoption of blockchain technology?

During the interviews, it became clear that the biggest challenges with the adoption of blockchain technology are the regulations. GDPR will play an essential part in regulating the blockchain ecosystem and help corporations get a greater understanding of the complications. On one hand, there is a significant tension between the very nature of blockchain and the overall structure of data protection law. Some regulators have also stressed that the relationship between the technology and legal framework cannot be determined in a general manner but rather be determined on a case-by-case basis. On the other hand, it has been highlighted that this technology could offer distinct advantages that might help to achieve some of the GDPR's objectives. Thus, regulators will have the chance to increase clarity, confidence and give people guidance in the blockchain space.

The key point highlighted by the respondents was the lack of legal certainty as to how various elements of data protection law ought to be applied in the blockchain context. It will be important with regulatory guidance on how specific concepts ought to be applied where blockchain technology is used. On one hand, supervisory authorities could coordinate action with the European Data Protection Board to coordinate specific guidance on the application of the GDPR to blockchain technologies. With regulatory guidance, corporations could get the additional certainty which the informants stressed in the interviews. The non-blockchain corporations expressed the difficulty of designing compliant blockchain use cases because of the lack of legal certainty as to what exactly is required to design a compliant product. On the other hand, regulatory guidance on how the GDPR is applied to blockchains, could bring more certainty and transparency to the wider data economy, not just to the specific blockchain context. This highlights how crucial it is for the regulators to understand the implications of the technology. Consequently, there are opportunities for real change in several areas of the fundamental building blocks of the global financial markets for those corporations that can navigate the current regulatory dynamics and uncertainty.

Another challenge the respondent surfaced was the complexity of blockchain technology. With a new complex technology and the world moving forward it can be beneficial for corporations to appoint a "Chief digital officer". Moose argued

that this can minimize the gap between complex technology and the regular corporations. The non-blockchain informants mentioned that they had people working on new technology, but it may take some time before Norwegian corporations take the leap. I find it reasonable to believe that people working on new technologies in Norwegian corporations see some of the benefits, but they do not have all the tools and information to make it their greatest advantage. Another solution to make blockchain less complex and more tangible is to seek guidance from corporations that helps bridge the gap. IBM and Deloitte are corporations with a huge amount of knowledge and experience in the field. These corporations can help open doors other companies may not think exist in the technological space. On the other hand, I can understand that Norwegian corporations feel the distance from theory to practice today is too big. Today, Walker collaborates with a large bank in the US to enable payments for the financial service industry, management, and real time security settlement. It is this kind of collaboration that can drive the adoption and possibilities further. It comes to show that it may be easier for banks in countries like the US to adopt blockchain because the knowledge is easier to access. On the other hand, Moxnes and “Now” helps B2B e-commerce sales, and it would be interesting to see how these kinds of corporations could collaborate with the integration of blockchain.

6.3 Practical implications and validation:

There are several limitations of the completed study that must be taken into consideration. These are related to the sample, the method used, as well as the limited research across borders.

The first limitation I want to point out is the limited insights from corporations outside of Norway and the US. I would get a deeper understanding of the situation with different points of view from other international corporations. However, both Storebrand and Santander is two world-known corporations with deep understanding of the technological landscape. Further, it could be interesting to see a larger sample of corporations in a quantitative research design. As a result, this could give a more nuanced picture of the adoption process. Even though the results indicate some solution to how corporations can adopt blockchain, the results would be more applicable with a larger and more international sample. The

size of the sample could have implications for external validity and generalizability.

Another limitation with the thesis is the lack of perspective from corporations that already has integrated blockchain. This perspective would be relevant to reflect on both the positive effect of blockchain, and to get a deeper understanding in the challenges regarding adoption. Moreover, to get insight I different challenges that may arise with this technology. This study is limited to only non-blockchain corporations in Norway, future research could investigate other sample countries to identify differences and similarities regarding the adoption of blockchain. There is reason to believe that a difference in corporate cultures and business law and regulations could result in different underlying factors regarding adoption.

Blockchain technology is maturing as a technology, and fundamentals for adoption is assumed to change during this development. Future research and education regarding this technology is needed to drive adoption further. This thesis can help provide a natural supplement to existing research within the field. The research design in this thesis will provide an approach to collect data measuring the adoption of this technology.

7.0 Conclusion:

In this thesis I have sought to shed a light on the adoption of blockchain technology in corporations. I will be careful in drawing concrete conclusions from this. However, believe that this research can be a framework for future studies within the field of adoption of this technology. The results presented highlights the benefits and reflects on the challenges regarding adoption of blockchain in corporations. Furthermore, the results have substantiated the traditional models for adoption of Internet technologies, meaning that it also could provide a good framework for future technologies that are either built on top of the internet, or has similarities to internet technology.

With a nuanced perspective, I have tried to outline that blockchain technology may be a significant shift in different sectors, such as supply chains, marketing, and banking. Furthermore, we can learn from both the interviews and the

secondary data the importance of regulatory clarity. As a result of regulatory guidelines, corporations can more easily see the path of adopting blockchain technology. This thesis has also highlighted some of the other challenges with the adoption, and how corporations more easily can approach adoption of the technology. The results of the study indicates the importance of easy-to-use solutions and how important the educational aspect will be in the years to come.

The thesis has also showed how the development and use of blockchain technology may in time constitute a big change in how one securely stores and utilizes data. It can have significant implications for corporations looking to meet the demands of the future. In addition, this thesis brings to light how corporations can utilize blockchain technology and how it can be adopted. Similarly, hen drawing the lines back to the mid 1990s, corporations worked hard to understand the internet and how it would affect their business. Today, blockchain is ushering in a new generation of the internet, and if corporations don't want to be left behind, they'll need to understand the adoption of the technology.

To sum up, this thesis may help corporations see how blockchain technology can be utilized, and how to facilitate this type of adoption. Corporations can act in accordance with this information and gain a head start in adoption of blockchain technology. This type of technology can create new areas of businesses, and help corporations yield a competitive advantage. As we can learn from this thesis, blockchain technology could make corporations more effective, and if adopted widely, reshape the economy.

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