# Preliminary Thesis Report

# Innovation and Governance:
# A Case Study of the Norwegian Financial Services Industry

Study Programme:
Master of Science in Business – Major in Strategy

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# CONTENTS

# ABSTRACT

The objective of this preliminary thesis report is to provide a foundation for our final master thesis. The financial crisis in 2008 paved the way for the FinTech (financial technology) revolution, which is expected to significantly transform the financial industry as digital innovations change the way banks deliver value. Confronted with trends such as peer-to-peer lending, crowdfunding, blockchain technology, automatisation and machine learning, banks must either innovate or die.

We plan to conduct a multiple case study of the race for mobile payment platforms (MPPs) within the Norwegian banking industry. By investigating the strategic decision making that led to the development of Vipps, mCASH and Mobile Pay, we aim to gain a deeper understanding of how banks should govern their activities to stay innovative. Ultimately we aim to build a model for effective strategic decision making when faced with disruptive technology developments. By placing our emphasis on the literature of innovation and governance, we hope that our work will bridge the gap between governance decisions and innovation theory.

We focus on blockchain due to the severe uncertainty surrounding this technology and its implementation in the financial services sector. We aim to shed some light on the future development of blockchain by linking our case study findings of MPPs to current blockchain developments in the Nordic market. In this way, we hope to provide empirically backed suggestions for managers working with FinTech in the financial industry.

# I. INTRODUCTION

The global banking industry is at a crucial point in its history, still picking up pieces from the 2008 financial crisis while facing a seemingly endless universe of financial technology ("FinTech") developments; from artificial intelligence to blockchain to big data, banks must either make or buy to meet unprecedented levels of customer expectations and regulatory requirements. The revised Personal Services Directive (PSD2) will open up European banks' monopoly on information and galvanize competition (Hellström, via EVRY), while the implementation of the Basel Accords continues to tighten the banks' financial resources and opportunity for leveraging capital (Winje & Turtveit, 2014). Meanwhile, people are increasingly devoted to their technological devices; the average American checks their phone over 46 times a day, a trend that Deloitte Vice Chairman Craig Wigginton attributes to people using their phones for financial transactions (Eadicicco, 2015).

This explosion in Internet and mobile use means that traditional bank relics are falling by the wayside. John Cryan, Executive Officer of Deutsche Bank AG, has forecasted the disappearance of tangible cash within a decade (Moor, Choudhury, & Martinuzzi, 2016), while Norwegian banks have attracted considerable media coverage for their closing down of branch offices (Nikel, 2016). At the same time, banks are racing to catch up with technological developments and stay relevant. CEO Brian Moynihan of Bank of America asserts that the bank spends more than $3 billion a year on coding (Moor et al., 2016).

The objective of this paper is to establish a foundation for our master thesis, which aims to predict the future of distributed ledger technology in Norwegian financial institutions by retrospectively analysing the developments in digital payment platforms. At first, we will briefly explain blockchain and recent developments in the Norwegian FinTech sector. Thereafter, we will introduce our research questions and objectives, before moving on to a literature review of innovation theory and governance theory. Lastly, we will elucidate on the chosen research strategy and give an overview of the methodology of our master thesis.

## BLOCKCHAIN

*"The technology most likely to change the next decade of business is not the social web, big data, the cloud, robotics, or even artificial intelligence. It's the blockchain, the technology behind digital currencies like Bitcoin"*

TAPSCOTT AND TAPSCOTT (2016, P. 2)

1

Bitcoin is an encrypted digital currency (cryptocurrency) based on cryptographic codes instead of a centralized, trusted party such as a bank. Cryptocurrencies initially emerged as a *"covert post–financial crisis protest against the global banking system" (Plansky, O'Donnell, & Richards, 2016, p. 4)*. However, the underlying distributed ledger technology (commonly referred to as blockchain) promises to change the very way in which people transact information and property (see Appendix 1 for an illustrated depiction of the blockchain and how it operates). Blockchain enables two parties to transact directly with each other without the need for a trusted third party (Nakamoto, 2008), effectively replacing the role of banks (Williams-Grut, 2015).

Blockchain is a value-exchange protocol allowing computers to communicate with each other and can be visualized as a single database running on millions of computers simultaneously in a peer-to-peer network. This database uses a *proof-of-work* protocol to authenticate new transactions and prevent users from double-spending their digital assets. As these transactions are processed in blocks of transactions a time, each processed block is cryptically linked to the largest pre-existing chain of blocks to form one unique and immutable *blockchain*. A consequence of this design is that no single transaction can be rewritten without rewriting every following transaction in every following block of transactions.

As a digital construct, blockchain is not limited to cryptocurrency but can be used to exchange all manner of goods and services. The potential applications include auditing, registering votes in elections, paying musicians directly for songs streamed, creating verifiable source data on any number of products and building an entirely decentralised autonomous organisation (DAO) that requires no employees through so-called smart contracts (see Appendix 2 for a list of applications). By eliminating mediating institutions, transaction costs are heavily reduced and trading can happen in real time.

The financial services industry is clearly affected by this revolutionary technology; however, progress in developing applications has been slow due to both regulatory and technical uncertainty surrounding the technology. A recent development that draws a parallel to some of the more basic applications of blockchain is the digital payment platforms in the personal banking market (Vipps, mCASH, and Mobile Pay).

## II. BACKGROUND

While London has emerged as the FinTech capital of the world (Imbach, 2016; Lunn, 2015), the customer sophistication and regulatory environment of the Nordic markets has resulted in its own flourishing FinTech scene. Much of the success has been claimed by Swedish start-ups like iZettle (card readers for small businesses), Tink (personal finance app), and the "unicorn" Klarna (online purchasing) (Williams-Grut, 2015).

However, Norway is also well-represented with over 90 companies involved in FinTech to help the Scandinavian countries reach their joint goal of becoming a leading world FinTech hub by 2020 (Hannestad, 2017). The budding FinTech cluster features regular conferences and FinTech festivals; an Oslo FinTech Expo held in February of 2017 attracted 44 FinTech companies, as well as representatives from BCG, Accenture, EY, PwC, Capgemini, and more.

### Figure 1. Overview of Norwegian FinTech players
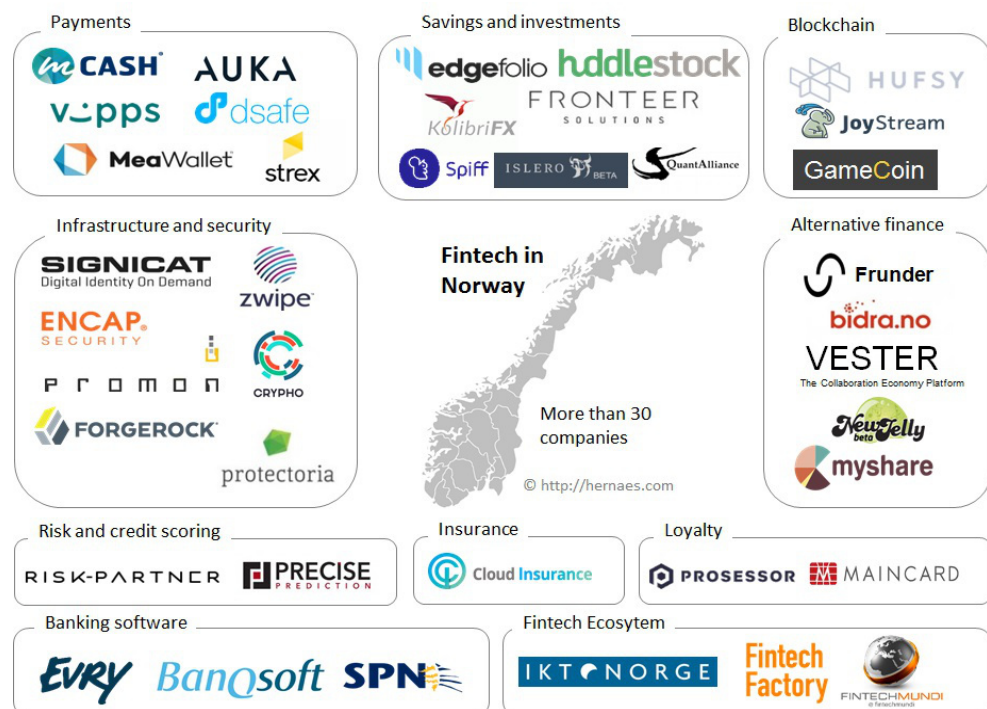


*Source: http://www.fintechfactory.no/news/2016/4/19/the-norwegian-fintech-landscape (Hærnes, 2016)*

Naturally, commercial banks operating in the Norwegian market are also keen to maintain a presence on the FinTech scene. The largest banks in Norway by deposit market share are DNB (45%), Nordea (11%), Danske Bank (6%), Sparebank 1 SR-Bank (4%), Sparebanken Vest (3%), and Handelsbanken (3%) (Finans Norge, 2014); the same ranking applies when measuring for gross lending volumes with DNB at 27% and Nordea at 12% (Finans Norge, 2015). These

banks offer a wide selection of financial services to both personal and corporate customers, including savings, deposits, loans, and financial trading.

During 2016, private customers in the Norwegian personal banking market witnessed a "war" between the bank-sponsored mobile payment solutions **Vipps** (DNB), **mCASH** (Sparebank 1), and **Mobile Pay** (Danske Bank and Nordea) These digital payment platforms enable users to send money to friends P2P (peer-to-peer) and pay for goods and services P2M (peer-to-merchant) via easy-to-use mobile apps. The apps operate as value networks by connecting customers to each other through an established infrastructure. Because of their reliance on scale, the value of these digital payment platforms depends on the number of agents participating, and with whom the platforms facilitate connection (Katz & Shapiro, 1985; Stabell & Fjeldstad, 1998)

The DNB-backed Vipps has managed to reach critical mass in the Norwegian market and has claimed the throne of mobile payments, while the competing Mobile Pay maintains a strong presence in the other Nordic countries.

### Figure 2. Vipps claims throne in Norwegian market
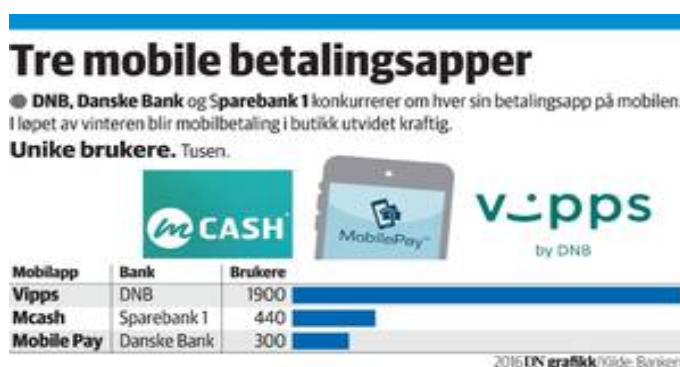


*Source: http://www.dn.no/nyheter/naringsliv/2016/10/13/1050/Bank/-dnb-kommer-aldri-til-a-gi-fra-seg-vipps (Ekeseth, 2016)*

Competition remains high as the banks continue to invest in their respective mobile payment platforms (MPPs). Internet giants Facebook and Google are expected to join the battle with added features in Facebook Messenger and the creation of a Google Wallet, enabling users to easily transfer money (Google Wallet, 2017; Newsroom, 2015).

The social media threat has prompted financial services providers to recently increase their efforts for collaboration. Danske Bank and Nordea were joined by Gjensidige (Gjensidige, 2017) to promote Mobile Pay, and Sparebank 1 announced it would integrate its mCASH with DNB's Vipps (Bjørnestad, 2017).

# III. RESEARCH QUESTION AND OBJECTIVES

In this master thesis, we will investigate how the Norwegian financial services industry is adapting to new technology. We focus on the recent developments in mobile payment platforms (MPPs) to inform a prediction of how blockchain technology will be implemented in the future. Our goal is twofold: to fill a gap in the literature on innovation governance decisions, and to reduce the immense uncertainty surrounding shared ledger technologies in the financial services industry. With a focus on the make or buy decision of innovation technologies, we submit the following problem statement:

> ***How can Norwegian banks successfully implement blockchain technologies in the personal banking market?***

It is crucial to understand the type of innovation that a company is facing when making strategic decisions, and the impact this has on firm performance. Additionally, one of the most critical strategic decisions that a company can make concerns the governance structure when developing digital innovations. As such, we have further divided our problem into the following research questions:

1. What type of innovation do blockchain and MPP technologies represent?
2. How might firms successfully implement technological innovation?
3. How can an organisation choose an efficient governance structure for developing innovative technologies?

*RESEARCH OBJECTIVES*

**1** Identify the type of innovation represented by blockchain technologies and MPPs

**2** Identify the criteria for successfully implementing technological innovation in firm strategy

**3** Determine the factors of an efficient governance structure when dealing with innovative technologies

To fulfil our research objectives, we review the academic literature on innovation theory and the considerations necessary for effective governance decision-making when dealing with innovative technologies. In this way, we build a strong theoretical foundation on which to perform our case study.

# IV. LITERATURE REVIEW

Positioning our research plan within the relevant academic context, we first introduce the current theories of innovation before discussing literature that addresses the questions of governance. Furthermore, we point to a lack of existing literature on governance choices where innovation and value networks are concerned. This literature review then leads into a description of our research methodology, which aims to bridge this gap in the literature by formulating a model for strategic decision making when facing digital technology.

## *INNOVATION*

Peter Drucker defines innovation as "*the effort to create purposeful, focused change in an enterprise's economic or social potential*" (Drucker, 1985, p. 67). Much research within the strategic discipline has questioned incumbents' ability to innovate: Joseph Schumpeter's early work claimed that only new and small firms have the flexibility necessary to orchestrate the "gales of creative destruction" and lead innovation in an industry (1934). Although Schumpeter later offered an opposing perspective of "creative accumulation" whereby large incumbent firms are the key innovative players owing to their well-equipped R&D labs, the initial theory of creative destruction has continued to influence innovation management since its conception (Belloc, 2012).

In his seminal paper, March (1991) discusses the difficulty of balancing firm resources between exploration of new possibilities and the exploitation of old certainties. March argues that organisational learning tends to favour exploitation, which provides short-term success but can be self-destructive in the long run. Bower and Christensen (1995) extend this line of reasoning by introducing the term *disruptive technologies* in their article "Disruptive Technologies - Catching the Wave". The article emphasised how leading companies fail to stay on top when confronted with new technology and changes in the market structure.

The primary reason why companies fail in the long run is their inability to invest in new, unprofitable technology introduced in seemingly insignificant markets (exploration). Before managers decide whether to develop a new product or launch a new technology, they usually investigate the needs of existing customers and estimate the market size of new product innovations. Customers of already established products rarely demand new product innovation because these do not address their needs as effectively as existing products (Bower & Christensen, 1995).

Christensen and Bower (1995) make a distinction between *sustaining* and *disruptive* technologies. Sustaining technologies are characterized by their ability to improve the performance of established products and offer customers something more or better in attributes they have shown to value in the past (Bower & Christensen, 1995). Contrary to sustaining technology one finds what Christensen (2002) classifies as disruptive technology: innovations resulting in worsened product performance.

Disruptive technologies are characterized by bringing to the market *"a very different value proposition than had been available previously"* (Christensen, 2002, p. XVii). Products based on disruptive innovation are typically cheaper, smaller, simpler, and easier to use (Christensen, 2002). Mainstream customers are often unwilling to adopt disruptive technology in applications they already know and value (Bower & Christensen, 1995)

Generally disruptive technologies target small fringe markets and offer lower margins, and are therefore financially unattractive to established firms. Sustaining technologies, on the other hand, target tried-and-true profitable segments with higher marginal revenue potential; thus, managers tend to favour this technology and devote firm resources towards the development of sustaining innovations. In the long run, this prioritization may cause firms to fail when technologies of the fringe market take over mainstream customers and displace current product offerings.

Christensen (2002) highlights how rivalry and competition between firms lead to more innovation than customers demand and are willing to pay for. In their search for higher profits and prices, suppliers "overshoot" the market.

This is illustrated in Figure 3, where the centre line represents the rate of improvements that customers can utilize or absorb. In the short run, disruptive innovations underperform relative to sustaining technologies, but once the technology gets a foothold in the market, entrants are likely to be fully performance-competitive

The literature on disruptive innovation claims incumbents are too slow and too poorly incentivized in developing disruptive technologies to properly develop them. However, flexible new entrants are keen to grab the opportunity and focus on dislodging dominant technologies, thereby providing them with an advantage in disrupting the market (Andersen, Shakil, & Hummelvoll, 2016; Obal, 2013).

## Figure 3: The Disruptive Innovation Model
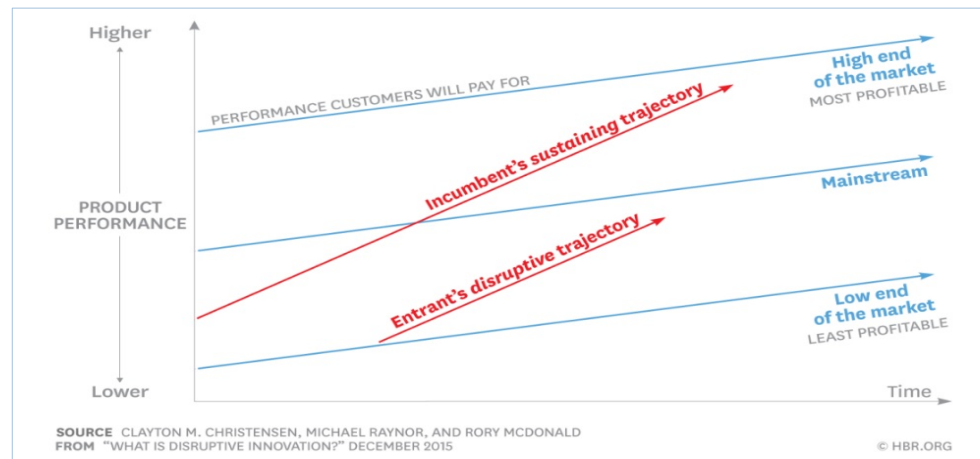


*Source: "What is Disruptive Innovation?"*
*(Christensen, Raynor, & McDonald, 2015)*

Christensen advises companies to create an organisational spin-off "core shaping group" closely tied to top management and small enough for small markets that can address fringe customer groups selectively. Furthermore, this core shaping group should plan to fail early and inexpensively as it can experiment without putting the bottom line of the entire organisation at stake.

Although the literature on disruptive innovation has changed the way businesses and scholars think of technological change and innovation, the theory and framework developed is not without criticism (see Appendix 3 for an overview of the literature's development). Erwin Danneels (2004) questions the term *disruptive innovation,* criticizing Christensen for not having established a clear-cut criteria to determine whether or not a technology is considered to be a disruptive innovation (Danneels, 2004); Christensen and Raynor (2003) claim that the Internet is disruptive to some firms, but sustaining to others, depending on whether it is consistent with the firm's business model (Danneels, 2004).

### *ORGANISATIONAL STRUCTURES*

At the heart of strategic decision-making lies the issue of organisational structure and corporate governance, which essentially questions the boundaries of the firm: what activities should the firm perform and for what activities should the firm defer to the market? Among others, this strategic question pertains to the make (production) or buy (outsourcing) decision. However, existing literature on governance structure rarely address innovation or alternative value creation logic.

In questioning the nature of the firm, (Coase, 1937) argues that firms exist to minimize the cost of economic activity by circumventing the faulty price mechanisms of the market (Andersen, Binde, & Hoff, 2015); the boundary of the firm can be said to exist where this minimization problem is no longer possible (Teece & Carroll, 1999). Williamson (1991) identifies three variables that determine the cost of a transaction: asset specificity, uncertainty, and frequency. Resulting from opportunity costs, the extent to which transaction investments would lose value if redeployed for another purpose defines the asset specificity of that investment (Church & Ware, 2000).

Williamson (1991) argues that the optimal organisational structure is the one that minimizes these dimensions of transaction cost; i.e. the nature of the transaction will determine the structure that the firm should employ (Andersen et al., 2015). Accordingly, Williamson (1991) identifies three discrete structural alternative for firms to choose from:

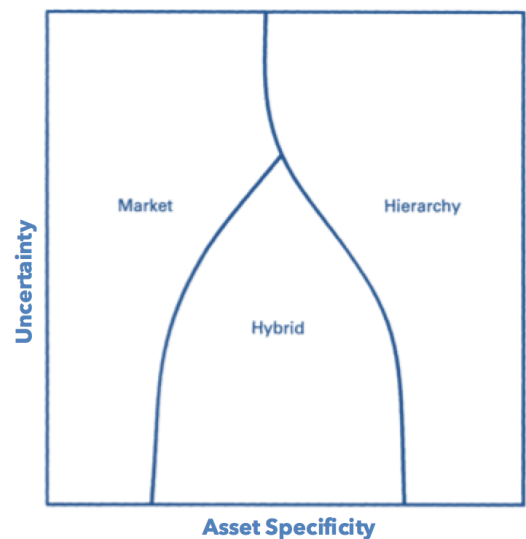## Figure 4. Williamson's Discrete Structural Alternatives

| GOVERNANCE STRUCTURES | | |
|---|---|---|
| **Market** | **Hybrid** | **Hierarchy** |
| ❖ Exchanges with independent third party | ❖ Interorganisational relationships | ❖ Internal to the firm |
| ❖ Classical contract law | ❖ Disputes likely solved by arbitration | ❖ Authority & administrative controls |

*Based on: Comparative Economic Organization: The Analysis of Discrete Structural Alternatives (Williamson, 1991)*

## Figure 5. Williamson's Model for Uncertainty in TCE

Hybrid forms of organisation are disfavoured by high levels of uncertainty, which often accompanies innovation and technological development (figure 5). Therefore, the make or buy decision for innovation firms should boil down to either market or intra-firm structural alternatives.

However, by his own admission, the applicability of Williamson's TCE theories is limited when it comes to innovation (Williamson, 1991, p. 292).



*Based on: Comparative Economic Organization: The Analysis of Discrete Structural Alternatives (Williamson, 1991)*

Organisational economics also addresses governance structure through agency theory, which pertains to any relationship where one party (agent) has the express power to make decisions that affect the interests of another party (principal). The agency costs of information asymmetry and conflict of interest (Jensen & Meckling, 1976) in innovation is particularly high due to its long-term nature, high risk, unpredictability, labour-intensity, and idiosyncrasy (Holmstrom, 1989).

As bonding (incentivising) costs for this activity are naturally higher, agency theory prescribes a shift to increase the monitoring and corporate control mechanisms by moving the relationship closer to the firm (Eisenhardt, 1989). Francis and Smith (1995) show how concentrated ownership and monitoring are effective at mitigating the high agency costs of innovation. Therefore, agency theory implies that firms should avoid the market alternative (buy) and instead develop innovations in-house (make).

Barring the implications that can be drawn from the classic literature and the managerial contributions from Christensen, there is little academic research to suggest ways of making effective governance decisions when dealing with innovative technologies. Furthermore, there is a range of literature that discusses the make-or-buy decision for manufacturers (Dabhilkar, 2011; Platts, Probert, & Cáñez, 2002; van de Water & van Peet, 2006; Veugelers & Cassiman, 1999). Yet, there is limited academic literature that discusses this strategic issue for firms operating with the increasingly prevalent value shop (e.g. hospitals, consultancy firms) and value network (e.g. telecommunications services, banks) value creation configurations (Stabell & Fjeldstad, 1998).

However, organisational economics theory limits the choices of an organisation to market, partner, or intra-firm. Christensen's innovation theory expands the concept of hierarchy by suggesting spin-offs that still operate within the organisation, but have a different relationship to the firm's resources. Boudreau and Lakhani (2013) propose to move beyond the make or buy decision with *crowdsourcing*, whereby companies use the power of the crowd to innovate and develop new technologies at newfound levels of scale and diversified skills. Crowdsourcing provides a spectrum of alternatives between the otherwise discrete options of market and hybrid structures (see Appendix 4).

## V. METHODOLOGY

In this research paper, we aim to produce a theoretical model for strategic decision making in disruptive markets. Empirically, our goal is to offer predictions for an uncertain blockchain development timeline by analysing the development of mobile payment solutions in the Norwegian personal banking market. Therefore, we will conduct a multiple-case study focusing on the strategy development of four Norwegian banks: Nordea, Danske Bank, Sparebank 1, and DNB during the period 2014-2016. The inductive research design should allow us to build theory with the analysis of the resulting data.

The object of our research is a situation where most of the key players in the mobile payments race had access to the same information about customers, market, and technological developments; yet, there was one actor that outperformed its competitors in the race for mobile payments. Therefore, subjectivism (social constructionism) allows us to analyse how the different actors interpreted this same information differently and made different decisions throughout the process (Saunders, Lewis, & Thornhill, 2009).

*"Building theory from case studies is a research strategy that involves using one or more cases to create theoretical constructs, propositions, and/or midrange theory from case-based, empirical evidence"*

EISENHARDT AND GRAEBNER (2007, P. 25)

Case studies are typically based on a variety of sources and describe a phenomenon in rich detail. Following (Yin, 2014), performing case studies would be the preferred method when (1) the research questions are formulated as "why" and "how" questions; (2) when the researcher has limited control of behavioural events; and (3) the study focuses on a contemporary phenomenon. Although this type of research strategy may be beneficial for our study, doing case studies is also one of the most challenging of all social science endeavours (Yin, 2014). One challenge is to justify inductive case research, which rests heavily on the researcher's ability to gain valuable insight into complex social processes that quantitative data cannot easily explain (Eisenhardt & Graebner, 2007).

Another frequent challenge facing researchers when building theory relates to the process of case selection and the aspect of generalization, whereas the answer to this challenge is to highlight how the purpose of inductive research

is to develop theory, not test it (Eisenhardt & Graebner, 2007). In our thesis, we have chosen to investigate the race towards mobile payments because we think the case is suitable for understanding how managers of leading Nordic banks chose to strategize for technological developments and uncertainty.

There is disagreement in the research literature as to the importance of reliability and validity in qualitative research (Bryman, 2015; Yin, 2014). The reliability of our study comes down to our capabilities of performing accurate qualitative data analysis on relevant concepts and using the Computer Assisted Qualitative Data AnalysiS (CAQDAS) tool(s) correctly. In addition, our own interpretation might hamper the study's reliability as other researchers potentially could find different results based on the same study. Achieving construct validity is difficult in case studies because researchers are likely to influence the study through their subjective interpretation (Yin, 2014). To overcome this challenge, we aim at using multiple sources of evidence and have key informants reviewing the conclusions made in draft case study reports.

## DATA COLLECTION

We rely on both primary and secondary data sources to answer our research questions and extend the literature through our multiple-case study. In addition, we have conducted some preliminary research.

### Preliminary Research

To gain knowledge about the area of research we have performed preliminary research since the beginning of August 2016. This research took place as unstructured interviews with various industry experts within the Norwegian banking industry. In total, we have conducted 8 preliminary interviews with subjects working in organisations related to our problem statement:

- 3 employees working with blockchain projects in a large Nordic bank
- 1 representative from a public body that manages the payment infrastructure in Norway
- 1 Blockchain Researcher at a major Norwegian IT company
- 2 people actively engaging in proliferation of bitcoin knowledge in Norway
- 1 employee in a Norwegian mobile payments company

Preliminary research is an important stage in narrowing down the scope of the thesis. In addition, it may save researchers valuable time and effort as it allows

for changes and adjustments before too much time is committed to the project (Bell, 2009).

This initial exposure to our area of interest resulted in a more nuanced understanding of market developments and organisational difficulties encountered when developing innovative technologies. For instance, our interview with an employee working on business blockchain development in a large Nordic bank resulted in the following quote:

> *"The traditional approach is to investigate business issues and connect it to a technological solution. However, in this case we need to work with the technology and experiment with it. That kind of thinking is controversial. There is some management handling that needs to be done."*

In this way, we could realise the hierarchical pressures that incumbent banks may face when dealing with uncertainty and financial technology development. Because of this insight, we repositioned our research agenda from a pure blockchain study to include other technological challenges faced by the bank.

### Primary Data

Primary data will be attained through semi-structured in-depth interviews (IDIs) with key personnel from those organisations and banks connected to the development and support of mobile payment platforms in the Norwegian market. These semi-structured interviews will make use of interview guides constructed in a way ensuring feedback on our major themes (disruptive innovation and governance), yet allow for latitude to ask further questions and openly explore novel insights and emergent themes (Saunders et al., 2009).

Upon written consent, the interviews will be recorded to enable us to a re-examine the interviews several times and thereby thoroughly grasp what the interviewees say and how they say it (Bryman, 2015). If the interviewee is reluctant to being recorded, the member of the group responsible for taking typist notes with their PC or pen and paper must ensure to take more thorough notes.

### Sampling

Initial interview objects are selected via fixed purposed case sampling, albeit with a limited view into the critical personnel for our purposes. Although we are potentially restricted in our access and ability to disclose findings, our interview subjects will likely come from one or more of the following organisations: Nordea, Sparebank 1, mCASH, Danske Bank, DNB, Bits, EVRY

and possible other organisations as they come to light. We approach this research project by applying snowball sampling, where the objective is to contact a small group of actors relevant to our research topic and then extend on this network by being introduced to key personnel that can provide us with the qualitative data pertinent for our thesis (Bryman, 2015).

Access is an important issue to address in sampling primary data. As an external researcher and student, gaining physical and cognitive access can be difficult and depends on effectively communicating the benefits that our research has for the firms: a thorough understanding of strategic decisions made during the MPPs development and their effect on performance differentials can aid target organisations' decision making in the future, specifically regarding the make or buy decision of financial technology.

We aim to mitigate our access restrictions by actively networking with the aforementioned organisations as well as companies operating in the periphery of financial technology developments; on the 9th of February 2017, we participated at a FinTech Expo in Oslo where both incumbent financial actors and start-ups were present to discuss recent trends and new business ideas (Eventbrite, 2017). By attending meetings and conferences relating to our research objectives, and making use of our personal networks, we hope that this will enable us to attain only the most relevant primary data while reducing the amount of work to chase down potential new interview objects.

The worst-case scenario based on our current interview agenda is that the multiple case study degrades to a single case study. However, considering the competitive environment in which all actors participated, we expect that access to at least two critical participants will provide valuable insight and allow us to answer our problem statement.

### Interview Process

We intend to conduct between approximately ten semi-structured interviews during our thesis project. Our goal is to interview at least two actors within each relevant institution, preferably representing both technical and business development. We are investigating benefits and disadvantages of developing systems for mobile payments in-house, in alliances with others, and by outsourcing the development. Therefore, it is essential to interview subjects with technical expertise as well as managers with strategic responsibility within the bank, as their perceptions might diverge. In addition, we will interview informants

with knowledge related to our area of research, such as rules and regulations in the financial services, blockchain development in the Norwegian banking industry and other relevant actors that we get in touch with along the way.

One of the main advantages of conducting in-depth interviews is their flexibility, although the process of performing interviews and transcribing them are time consuming (Bryman, 2015). Therefore, it is critical that we start the interview process as soon as possible. In the attached Gantt chart (see Appendix 5), we illustrate the research process and set a deadline for the of April, by which time the interview process should be finalized to allow time for coding and analysing the results in May. Drafts of interview guides are provided in Appendices 6 & 7.

### *Secondary Data*

In our thesis, we will mostly base our results on the interviews conducted, but we find secondary data to be useful when exploring existing work on the topic and for supporting/verifying the collected primary data. In addition, secondary data can assist in narrowing the scope of primary data collection, thereby improving the quality of the results and conclusions drawn. An advantage of using secondary data is that it can save us time as the information is already available. Examples of secondary data we will be using are whitepapers published by IT and consultancy companies, news articles, blogs, working papers, surveys and other information which will provide us with useful knowledge about FinTech in general, mobile payments and blockchain projects within the financial services.

### DATA ANALYSIS

To increase our understanding of the data gathered, we will code and analyse the interviews with one or a combination of the following CAQDAS software programs: RQDA (integrated with R for quantitative linking), Compendium (visual mapping of qualitative data), Transana (audio file analysis). This would require us to spend time learning how to use the software as we are unfamiliar with the program (see Appendix 5). The aim of the data analysis is to conduct a thematic analysis by categorizing and coding key concepts (Bryman, 2015).

# VI. ETHICAL CONSIDERATIONS

It is important for us to take ethical considerations into account when working on our thesis. As a starting measure, we will inform all participants about the objective of our thesis and how we will conduct the study. This is particularly important as we will be discussing sensitive issues such as strategic positioning and technology development with competing banks. Revealing our intent to compare competing financial services providers may hamper our access, but it is important for us to be open and honest. We do not want to harm our participants, therefore it is important for us to maintain the confidentiality of records and anonymity of accounts (Diener, 1978). We will make sure that issues relating to confidentiality and anonymity are negotiated with and agreed upon by potential research participants beforehand. Moreover, if the participants request a non-disclosure agreement (NDA), we will agree to this insofar it does not preclude our thesis from being graded by the relevant parties.

# VII. THESIS ORGANIZATION

To finish our thesis within the 1st of July 2017, it is important to organise our time and tasks well and continuously work on the project. we have organized our work using a Gantt chart (see Appendix 5) to keep track of the deliverables and milestones. The Gantt Chart will work as a project management tool and guide us through the project (Saunders et al., 2009). Another critical factor for completing this thesis in the desired timeline is clear and open communication between the two of us, aligning our expectations throughout the project. We have put in place certain organisational tools for more effective communication and task management, including Trello, shared referencing tool library, Google Drive, and a shared Google Calendar for organising events and regular meetings.

*APPENDIX 1. ILLUSTATED EXPLANATION OF KEY BLOCKCHAIN COMPONENTS*
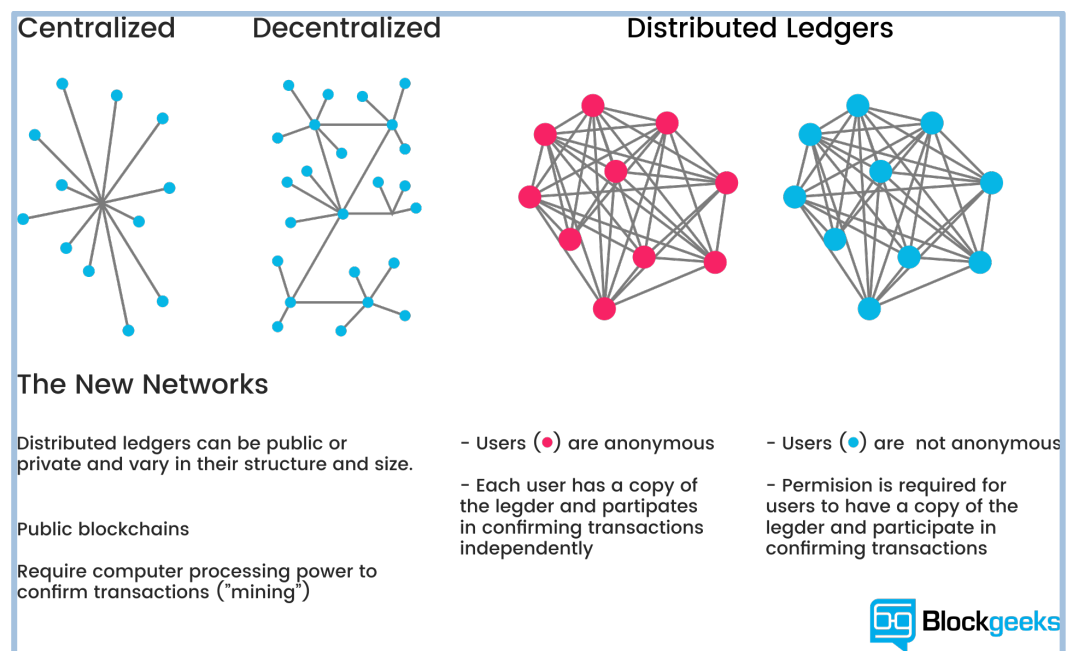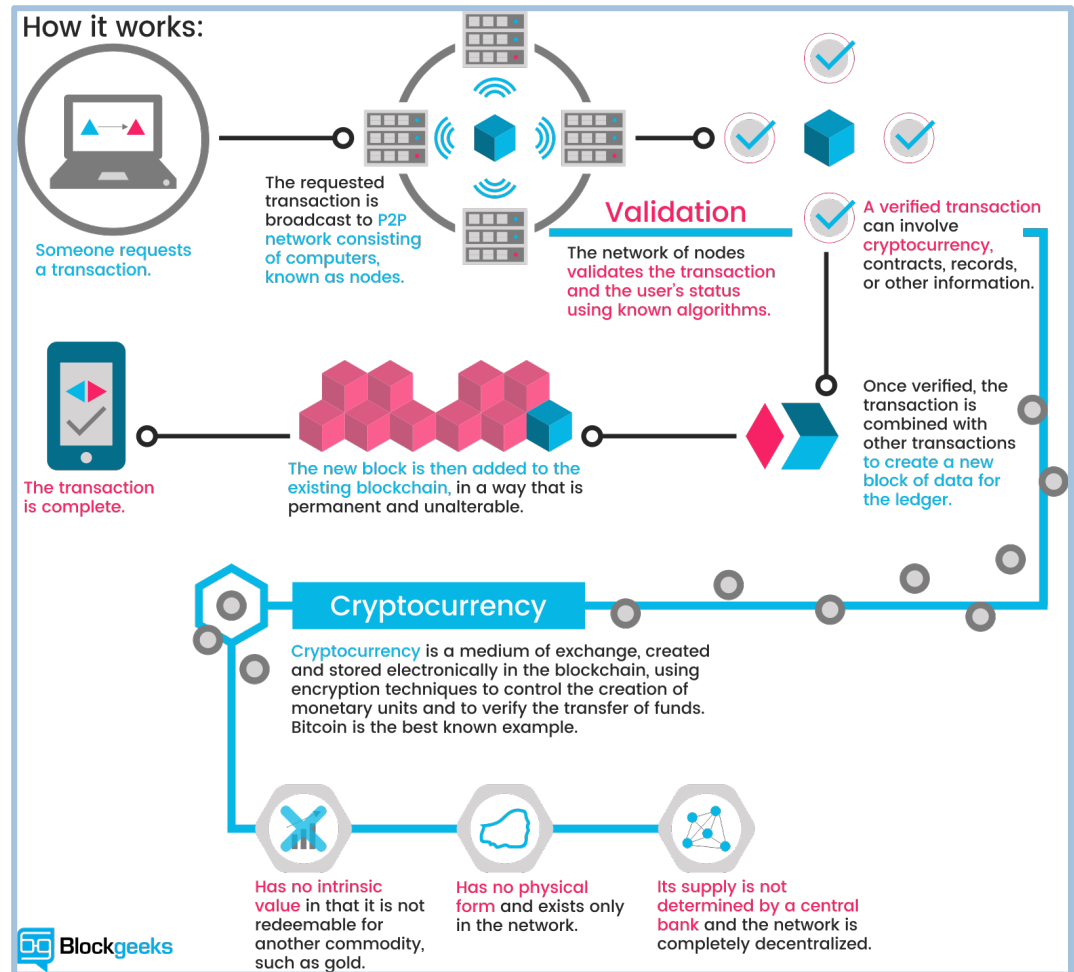


*Source: http://blockgeeks.com/guides/what-is-blockchain-technology/*

*(Rosic, 2016)*

Web 3.0

The blockchain gives internet users the ability to create value and authenticate digital information. What new business applications will result?

**Smart contracts**

Distributed ledgers enable the coding of simple contracts that will execute when specified conditions are met.

**The sharing economy**

By enabling peer-to-peer payments, the blockchain opens the door to direct interaction between parties — a truly decentralized sharing economy results.

**Crowd funding**

Blockchains take this interest to the next level, potentially creating crowd-sourced venture capital funds.

**Governance**

By making the results fully transparent and publically accessible, distributed database technology could bring full transparency to elections or any other kind of poll taking.

**Supply chain auditing**

Distributed ledgers provide an easy way to certify that the backstories of the things we buy are genuine. Transparency comes with blockchain-based timestamping of a date and location — on ethical diamonds, for instance — that corresponds to a product number.

**File storage**

Decentralizing file storage on the internet brings clear benefits. Distributing data throughout the network protects files from getting hacked or lost.

**Prediction markets**

Prediction markets that pay out according to event outcomes are already active. Blockchains are a "wisdom of the crowd" technology that will no doubt find other applications in the years to come.

**Protection of intellectual property**

Smart contracts can protect copyright and automate the sale of creative works online, eliminating the risk of file copying and redistribution.

**Internet of Things (IoT)**

Smart contracts make the automation of remote systems management possible. A combination of software, sensors, and the network facilitates an exchange of data between objects and mechanisms.

**NeighbourhoodMicrogrids**

Blockchain technology enables the buying and selling of the renewable energy generated by neighbourhoodmicrogrids.

**Identity management**

Distributed ledgers offer enhanced methods for proving who you are, along with the possibility to digitize personal documents. Having a secure identity will also be important for online interactions — for instance, in the sharing economy.

**AML and KYC**

Anti-money laundering (AML) and know your customer (KYC) practices have a strong potential for being adapted to the blockchain. Currently, financial institutions must perform a labour intensive multi-step process for each new customer. KYC costs could be reduced through cross-institution client verification, and at the same time increase monitoring and analysis effectiveness.

**Data management**

In the future, users will have the ability to manage and sell the data their online activity generates. Because it can be easily distributed in small fractional amounts, Bitcoin — or something like it.

**Land title registration**

AsPublicly-accessible ledgers, blockchains can make all kinds of record-keeping more efficient. Property titles are a case in point. They tend to be susceptible to fraud, as well as costly and labour intensive to administer.
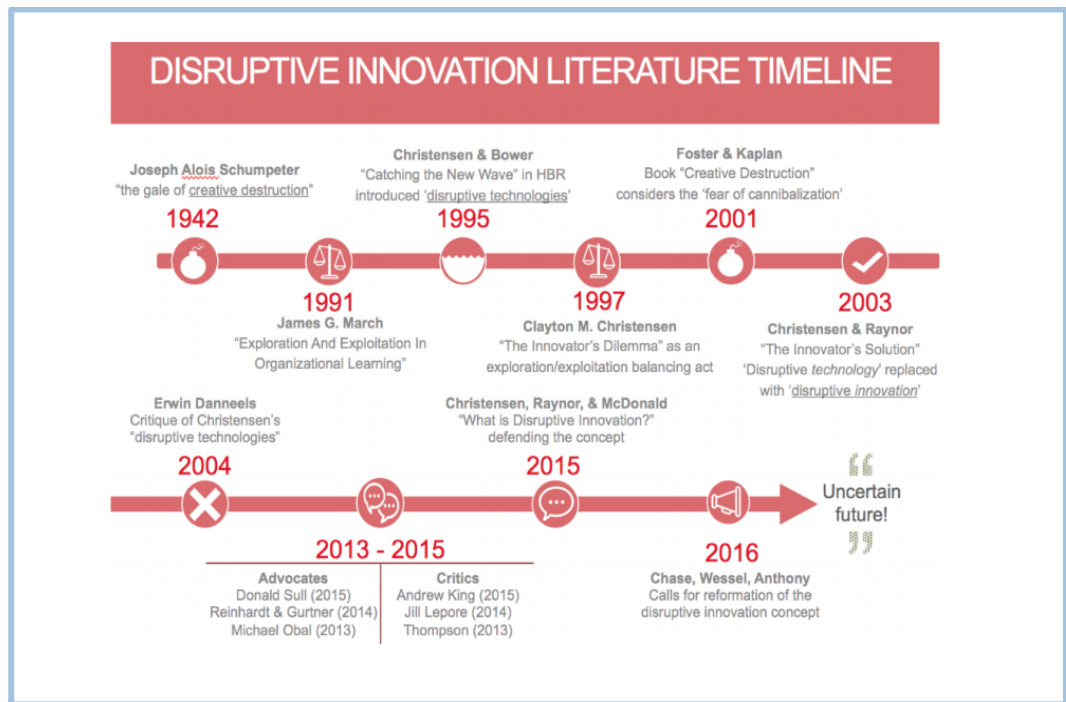
**Stock trading**

When executed peer-to-peer, trade confirmations become almost instantaneous. This means intermediaries — such as the clearing house, auditors and custodians — get removed from the process.

**Blockgeeks**

*Source: http://blockgeeks.com/guides/what-is-blockchain-technology/*

*(Rosic, 2016)*

*Source: Andersen et al. (2016)*

*APPENDIX 4. STRATEGIC RECOMMENDATIONS FOR CROWDSOURCING*



*Source: Using the Crowd as an Innovation Partner (Boudreau & Lakhani, 2013, p. 64)*

**Gantt Chart - Timeline of Research Project (June 2016 - July 2017)**

■ Days to complete

Tasks (top to bottom):
- Write Preliminary Thesis Report
- Map out resources, contacts and databases*
- Negotiate access*
- Book interviews and make an interview plan
- Literature review*
- Make interview guide
- Register project in NSD
- Conduct interviews
- Transcribe interviews
- Familiarising with CAQDAS tool
- Code interviews
- Analysis of Data
- Compile first draft of thesis
- Evaluation
- Second draft
- Feedback and evaluation
- Third draft
- Feedback and evaluation
- Final editing
- Submit Master Thesis

Timeline dates: 01.01.2017, 21.01.2017, 10.02.2017, 02.03.2017, 22.03.2017, 11.04.2017, 01.05.2017, 21.05.2017, 10.06.2017, 30.06.2017

This is an outline for some potential questions we would like to ask banking managers.

- Short introductions
- Discuss recording and NDA

1. Can you please tell us a how you (and the bank) experienced the "mobile payment race" in 2015-2016?
2. What was the primary focus for the bank during this period? (speed, keep up, follow, innovate)
3. Which factors were essential in deciding how to go about this mobile payment development?
4. Which strategy did you follow to develop MPPS? (Develop internally, in alliances, or outsource)
5. What was challenging by organising the development in this manner?
6. What was beneficial by organising the development in this manner?
7. What did bank xxx learn from this experience?
8. How would you describe the climate between the competing banks?
9. What do you think bank xxx would have done differently if they were to launch a new technology today?
10. Are there other aspects of the MPP that we have not touched upon, which you find to be of interest?
11. How is the culture for innovation in bank xx?
12. What do you think of the role of banks in the future?
13. What other types of FinTech developments do you see in the coming years?

- Summarize
- Ask clarifying questions
- Anything to add?

*\* The semi-structured nature of the interview allows interview subjects to divert from the above template to provide novel information and open for other topics worthy of further exploration.*

This is an outline for some potential questions we would like to ask technicians working on the development and launch of MPPs.

- Short introductions
- Discuss recording and NDA

1. Would you please tell us about the process of developing MPP? (in-house, alliances, market, communication, speed etc.)
2. How did you decide which features to develop? / Who decides which features to develop?
3. Which factors do you see as critical when developing a new financial technology?
4. How do you analyse what services/products/technology customers are interested in using?
5. What challenges did you face during the development of MPP?
6. Did you face cost overruns? Why? Why not?
7. Was the product delivered on time? Why? Why not?
8. How do you experience the quality of bank XX' app compared to competing apps?
9. Do you think bank XX is satisfied with the way the MPP was developed?
10. What would you have done differently if bank xx would launch a new product/technology?
11. Who makes decisions on where to develop new technology? How is this process?
12.  How is the culture for innovation in bank xx?
13. What do you think of the role of banks in the future?
14. What other types of FinTech developments do you see in the coming years?

- Summarize
- Ask clarifying questions
- Anything to add?

*** The semi-structured nature of the interview allows interview subjects to divert from the above template to provide novel information and open for other topics worthy of further exploration.**

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