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THE IMPACTS OF MARKET FAILURES ON THE DIFFUSION OF INNOVATION

Master's Thesis

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ABSTRACT

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The role of product and service innovations has been emphasized in many industries to maintain competitive advantage and market position. It is important for companies to understand the changes in customers' adoption of innovations and purchasing behaviour in a market-distorting environment, so that they can focus on the most important things for the company. This study examines changes in the adoption and management of innovations in a single firm and in a particular industry from the perspective of case company.

The study was conducted using qualitative research methods, collecting data from a case company employees with open-ended questions and combining the results with observations from the literature. The results show that customers are particularly embracing incremental product innovations that they have already experienced before the market disruption. In addition, changes in customers' purchasing behavior show that purchases were transferred mainly to products needed to run their own business. Larger and fixed term investments were avoided, especially for service innovations.

TIIVISTELMÄ

Tekijä: Teemu Vihervaara **Työn nimi:** Markkinahäiriöiden vaikutukset innovaatioiden diffuusioon	
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Diplomityö. Lappeenranta-Lahti University of Technology, School of Engineering Science, tuotantotalouden koulutusohjelma. 79 sivua, 10 kuvaa, 7 taulukkoa ja 1 liite. Tarkastajat: tutkijaopettaja Kalle Elfvengren ja professori Marko Torkkeli	
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Tuote- ja palveluinnovaatioiden rooli on korostunut monella toimialalla kilpailuedun ja markkina-aseman säilyttämiseksi. Yritysten on tärkeää ymmärtää asiakkaiden innovaatioiden omaksumisessa ja ostokäyttäytymisessä tapahtuvia muutoksia markkinahäiriöisessä ympäristössä, jotta toimenpiteet osataan kohdistaa yritykselle kaikista merkityksellisimpiin asioihin. Tämä tutkimus käsittelee yhdessä yrityksessä ja tietyllä toimialalla innovaatioiden omaksumisessa ja niiden johtamisessa tapahtuneita muutoksia case-yrityksen näkökulmasta.

Tutkimus toteutettiin laadullisilla tutkimusmenetelmillä keräämällä dataa case-yrityksen työntekijöiltä avoimilla kysymyksillä ja yhdistämällä tuloksia kirjallisuudesta nousseihin havaintoihin. Tulokset osoittavat, että asiakkaat omaksuvat erityisesti inkrementaalisia tuoteinnovaatioita, joiden käytöstä heillä on jo ennen markkinahäiriötä ollut kokemusta. Tämän lisäksi asiakkaiden ostokäyttäytymisessä tapahtuneet muutokset osoittavat, että hankinnat siirrettiin koskemaan pääsääntöisesti heidän oman liiketoimintansa suorittamiseksi tarvittavia tuotteita. Isompia ja määräaikaisia investointeja vältettiin erityisesti palveluinnovaatioiden osalta.

ACKNOWLEDGEMENTS

It has been said that 70 percent of a person's learning takes place by doing the tasks themselves, 20 percent of the learning takes place by following other people's actions and only 10 percent of the learning takes place through education. Whether the model is true or not, now is the time to shift doing the tasks in "real life".

The university has provided me with great opportunities and lessons in life that I will certainly be able to take advantage of in the future. I am extremely grateful for the people that have been there for me during my time at the university. Especially, I would like to say my greatest thanks to my family who kept my back even in difficult times. As John Wooden once said: "Success is peace of mind which is a direct result of self-satisfaction in knowing you made the effort to become the best you are capable of becoming", so now for my part, I can truly say that I have succeeded.

Lappeenranta, 24.1.2021

Teemu Vihervaara

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LIST OF ABBREVIATIONS

Abbreviations	*Full Forms*
MNE	Multinational enterprise
SME	Small and medium-sized enterprises
NPD	New product development
SaaS	Software-as-a-Service
GDP	Gross domestic product

1 INTRODUCTION

1.1 Background

Predictability is one of the most important features of a market economy and for companies' executives it's their most important task to create a company atmosphere where people can predict the consequences of their actions. Without predictability, the everyday life in company will become uncertain and short. (Stevenson and Moldoveanu, 1995) Rapidly changing and globalized business environment, however, has made it more difficult to predict the market and thus also the external and internal activities of companies. The predictability of markets and companies has always been hampered by various types of market failures, which may spread very rapidly in the global business environment. Such changes in business environments means also that companies have to adopt their actions accordingly – in business and marketing plans, innovation strategies, organizational designs and also in financial management. (Brea et. al, 2020)

This master thesis is conducted on behalf of Company X. The information and literature available on market failures and their implications for the diffusion of innovation is very limited, mainly related to the time of the financial crisis. There are also no comparison cases available, and in addition to this, the number of scientific articles and studies is small. Therefore, this research is very useful for the academic scientific community, and especially for the case company. The innovation is in the hearth of the Case Company X, so it's also crucial to plan, how these innovations are distributed for the customers during the times of market failure. However, at the moment there is no completely accurate picture of how customers react to new innovations in a market-disrupted business environment, and as a result, the predictability of operations is weak at the time of market failures. Thus, the company wants to stay anonymous and it will be called Company X. Company X works with innovative technology both in domestic as well as international markets.

1.2 Objectives, research questions and limitations

The main aim of this master thesis is to give a clear picture, how different types of market failures affects the diffusion of innovation on certain customers. The conclusions and results of this master thesis carried out using qualitative research methods have a clear benefit for Case Company X, as they provide researched information for the diffusion and publicization strategy of new innovations. With this information, the company is able to better differentiate itself from its competitors, and thereby also strengthen its own market position.

There is one main research question, that is then divided to sub-questions as shown in Table 1 with their objectives. With the help of main research question, this thesis is able to provide a unified picture of the impacts of market failures on the adoption of product and service innovation. Moreover, with the sub-questions the company will get information on buying behavior of their most important customers as well as how the market will react to market failure in terms of number of patents.

Table 1. Research questions and their objectives

Research question	**Objective**
1. How market failures affect the adoption of product and service innovations?	- To provide the company a clear picture of the diffusion of innovations during the times of market failure in their most important customer segments
2. How the buying behavior of customers change during market failures?	- To understand better, does the changes in business environment affect the buying frequency or the amount of money spent on Company X change
3. How do companies manage the innovation process during a market failure?	- To understand what changes are made on company's innovation management because of market failure, if any
4. How does the number of innovation change as a result of market failures?	- To better understand, how competitors adopt to market failures and if they're pausing their R&D activities

The results of this thesis can be used both in MNEs as well as in SMEs. However, the information available is mostly concerning MNEs, so the results are also more relevant to companies with big innovation budgets and having operations in multiple countries. Literature, patent information and statistics from multiple sources were used to address the research questions and to cover the key objectives. Also, some magazine publications were used to offer up to date information.

1.3 Realization of the research and the structure of the thesis

This master thesis is divided into two main parts: literature review and empirical study part. With the help of the literature review, the reader gets a coherent understanding of the topic of the master thesis, and at the same time it is possible that by combining the information found in the literature, partial answers to research questions can be formed. LUT Primo, Research Gate, Google Scholar and the Company's internal reporting database have been used to search for relevant literature. Most of the sources date from 2000 to 2020, but the work has also utilized a few older sources if the theory is still relevant. In order to ensure the reliability of the sources, the work has sought to use peer-reviewed articles in as many ways as possible. The literature was searched for with the following keywords: market failure, innovation adoption, customer buying behavior and innovation management.

Empirical part will offer answers to research questions based on qualitative research methods. Semi-structured interviews were conducted with the senior employees of Case Company X, since they have the most up to date knowledge on the adoption of different products sold by Case Company X in Finland. The details of methodology are described more closely in chapter 5.

To cover all the research objectives, this master thesis is divided to 8 main chapters as shown in Table 2. Each chapter have then their own sub-chapters in order to ease up the reading process. The thesis begins with introduction to topic and its background while also accenting the importance of the thesis. Short company overview will also be given in chapter 1 as well as addressing the scope, structure and limitations of the thesis.

The second chapter delves into the literature on innovation adoption and management with its sub-chapters concentrating more on factors affecting innovation adoption. In the third chapter, literature review is conducted on different types of market failures and their effects on business environment. The fourth chapter aims to describe, how different customer types behave during the times of market failure in terms of buying and which factor affects the buying process.

The fifth chapter will give an overview on research methodology while also describing data collection, analysis and quality. In the sixth chapter all the findings are identified and then in the seventh chapter these findings are discussed and analyzed. Last but not least, the eight chapter will conclude by presenting main findings and answers to research questions.

Table 2. The Input-Chapter-Output

Input	**Chapter**	**Output**
To provide arguments on the importance of the thesis while also arousing the reader's interest for the topic	1. Introduction	- Company overview - The scope, structure and limitations of the thesis - Introduction of the research questions and thesis objectives
Literature review on general theories of innovation management and adoption of innovation	2. Innovation Management and Adoption of Innovation	- Innovation and idea definitions - Distribution of innovation adoption - S-curve - Managing service and product innovations
To identify different types of market failures and their consequences on business environment	3. Market Failures	- Financial crises - Infectious diseases and their consequences - Natural disasters - Delivering world-class innovations during a market failure
To find the most common features on customers' buying behavior	4. Consumer Behavior	Changes in customers' buying behaviour due to the market failures
To clarify research methods, data collection and analysis	5. Methodology	Methods used, samples and context
To identify observations raised from empirical part	6. Findings	Interview results presented
To gather and analyse findings and give suggestions for the company Present possible topics for further research	7. Analysis and Discussion	Suggestions for the company X on open innovation, innovation adoption and factors affecting the adoption of innovations
To present main findings and answers to research questions	8. Conclusions	Summary of the thesis

2 INNOVATION MANAGEMENT AND ADOPTION OF INNOVATION

2.1 Ideas, inventions and innovations

In order for companies to survive, they must be able to adapt and evolve with their business operations. It has been said that a company must be able to implement changes by being resilient, otherwise it will not succeed in the markets and the company will go bankrupt before long. The basis for emphasizing the importance of innovation dates back to the early 1930s, when Schumpeter emphasized the importance of new products in economic growth. At that time, the innovation process was seen to begin with the emergence of a new industrial sector, which on the one hand led to the emergence of radical product innovation and on the other hand to also radical process innovation. Radical innovations were often followed by slightly more moderate but more widespread incremental innovations. Based on this knowledge, it can be said that the innovation process has been well known for a long time, but at that time there was no complete understanding of how innovative success could be achieved, let alone managed. (Schumpeter, 1934)

Indeed, many began to explore ways in which the creation of innovations could be made systematic and thereby guarantee the company a sustainable competitive advantage. The studies initially sought to explain the increase in the amount of money spent on product development and the national economy, but no direct correlation was found in the studies. Gradually, the innovative success was found to be due more to the company's internal resources and their use than to the amount of money invested in product development. Eventually, the market had formed a unified understanding of successful innovation management - it is built on the capabilities of the company's internal functions and the relationships between them, both with each other and with competitors and customers. (Trott, 2016)

Before diving in managing innovations deeper it’s important to define what innovation and its sub-concepts really mean. One of the most diverse and famous definitions of innovation is probably written by Myers and Marquis (1969): “Innovation is not a single action but a total process of interrelated sub-processes. It is not just the conception of a new idea, nor the invention of a new service, nor the development of a new market. The process is all these things acting in an integrated fashion". Innovation is not only about products or services but can be seen as a process arising from creativity that ultimately leads to the commercialization of an idea. Trott (2016) also sees innovation as a broader process and has defined innovation in his own texts so, that it consists of a theoretical concept combined with an invention, and these together lead to the commercialization of the innovation. On the other hand, Trott also emphasizes the importance of technology and science in creating innovation, while noting that the innovation process itself consists of several specific features and thus makes the management of the process challenging. Eventually, Trott's original definition of innovation has changed during the time to be the following: "Innovation is the management of all activities involved in the process of idea generation, technology development, manufacturing, and marketing of a new (or improved) product or manufacturing process or equipment." The product is thus more of an output of innovation, so the difference between these concepts is also explained quite comprehensively. Tidd and Bessant (2018) also emphasize the role of commercializing an idea in defining innovation and combining it with demand pull and technology push. They also agreed that innovation is more about the process of growing ideas into practical use than just coming up with the ideas: "Innovation is a process of turning opportunity into new ideas and of putting these into widely used practice". It's very easy to understand why innovation management is often perceived as challenging because probably the main reason for the challenge is the abundance of definitions, and the fact that people often confuse innovation with the mere invention of ideas.

Upon further examination of innovations, it has been possible to identify five categories into which innovations can be divided: new products, new methods of production, new markets, new business processes and new supply sources. (Schumpeter, 1939) This view dates back to a time when the world was not so globalized, and the internet and platform economy was not invented. That's why it might feel out-of-date and that seems to be the case since for example Trott (2016) sees seven different categories for innovations: product innovation, process innovation, organizational innovation, management innovation, production innovation, commercial innovation and service innovation. In order for this not to be too easy to understand, the term "service product innovation" is also added to the category, which is related to the development of a company's offering of new service innovations aimed at creating new sources of turnover. (Oke, 2007) These innovation categories are also agreed by Tidd & Bessant (2018) with slight modifications since the have also managed to identify position and paradigm innovations: position meaning changes in the context in which the products and services are introduced to the markets, and paradigm meaning changes in models which determines what the company does. Tidd's and Bessant's view can be summarized as the 4Ps of innovation space as shown in Figure 1.

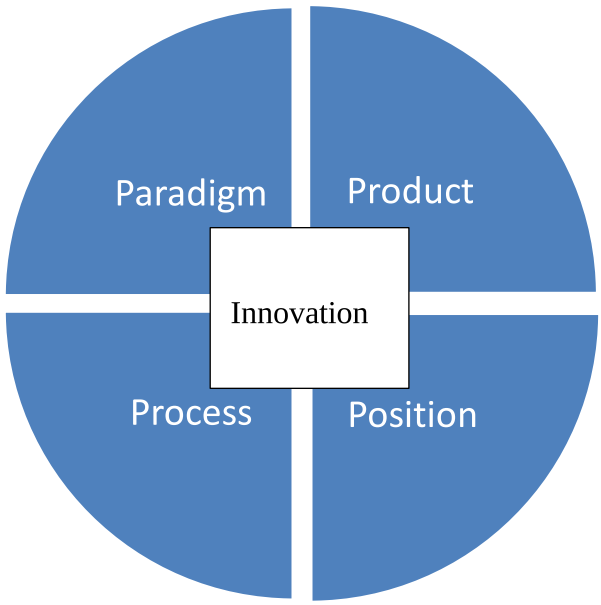

Figure 1. The 4Ps of innovation space

To be able to define the different types of innovations, it's also essential to address the difference between incremental and radical innovations. Incremental innovations are, for instance, new product versions, so doing what has been done before but just little bit better. Radical innovations are totally new products, that no-one has been able to manufacture, so doing something totally different. Only by understanding the different types of innovations, the company is able to tackle the key issues in managing innovations across the innovation space. It's not the same way to approach incremental than radical innovations, even though the "novelty" is much in the eye of the watcher.

To conclude, research results have indicated that innovation has a major role when it comes to company's competitive advantage and its development. Especially firms focusing on services must, in the long-term, invest in innovations if they are trying to create sustainable competitive advantage, because nowadays there are lots of new markets with new needs that are not serviced to their fullest potential, and only with the continuous innovation these markets and needs can be further addressed. It’s no wonder that reaching the full potential is easier by being the first one on the market and thus deploying the blue ocean strategy. (Anning-Dorson, 2016)

2.2 Managing Product Innovations

Introducing new products is one the main activities of companies and one of the most important determinants for their survival. According to multiple studies, it has been indicated that there is a correlation between innovative firms and leadership status. (Goldenberg and Mazursky, 2002) When it comes to product innovations, studies have found three cornerstones of high-performing businesses: 1) Having an NPD process with tactical road maps that can drive the new products to markets quickly and successfully 2) Having the right number of sufficient resources devoted to product innovations and 3) Having an innovation strategy for new products and technologies. The studies showed that often the strategy for innovation was the missing link in the majority of businesses. (Cooper, 2000)

Doing the up-front homework prior to the beginning of the development stage, building in the voice of the customer, and getting sharp and stable product definition, have all been found to have a highly positive impact on new product outcomes. On the other hand, it can also be considered equally important to select the right projects: the competence and resources available must be in-line with the challenge of the project. There might be a short-term focus in the company’s development efforts and thus there’s too much small projects, or the situation can be the other way around, and there are lots of big projects consuming way too many resources. Cutting the corners will affect the quality of execution of key tasks meaning fewer breakthrough innovations, longer innovation cycle times and overall poorer new product performance. (Cooper, 2000) That’s why the proper management of product innovations is crucial element of company’s success.

Managing of product innovations is critical for the most of manufacturing enterprises and due to the close link between product innovation performance and company performance, executives must ensure this process is managed properly. In the past, the focus was more on individual projects and their management, but now the studies have highlighted that managing portfolio or bigger number of innovation projects is better in terms of NPD performance. Ideally, the portfolio should consist of few high-risk projects combined with low-risk ones. This distribution between radical and incremental innovations would guarantee decent growth potential while as well also taking care of continuous income. (Clark and Wheelwright, 1995)

Figure 2 represents one very basic model for managing product innovations. With the help of the model, it is possible for executives to identify the best ways to plan and develop an effective process for managing the NPD: the model also provides a structure for coordinating and managing innovation process. The model consists of five key activities: 1) Analysing the business environment and identifying opportunities 2) Generating and investigating innovations 3) Planning the projects 4) Prioritising the project and assigning teams and 5) Implementing the plan. (Cormican and O’Sullivan, 2004)

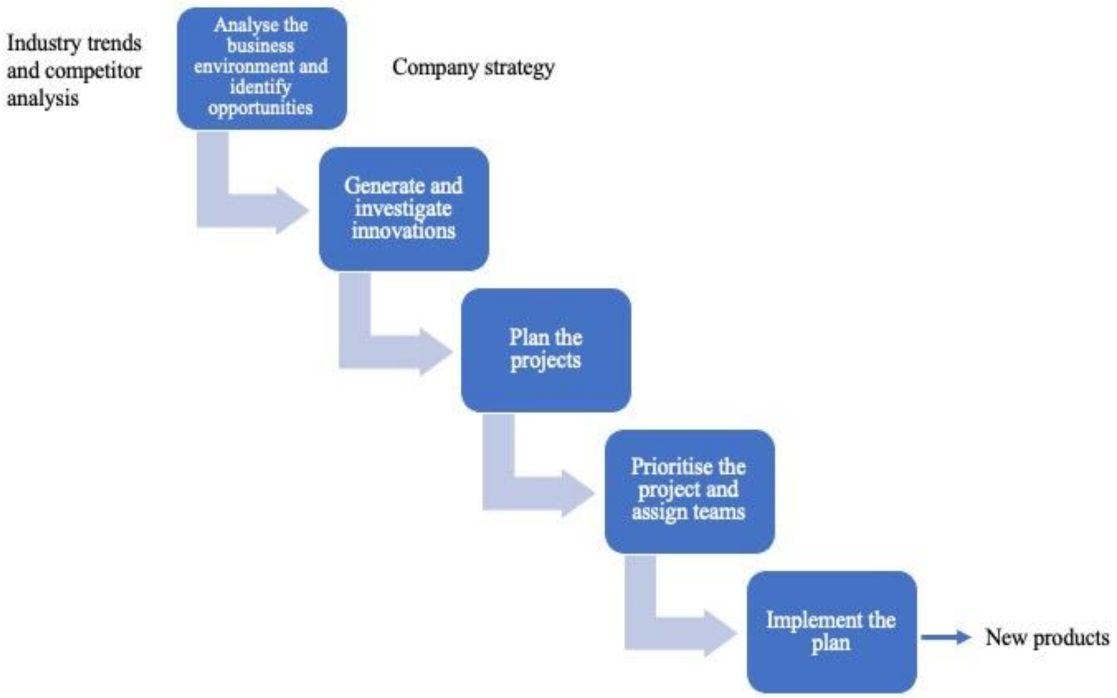

Figure 2. The basic model for managing product innovations

Building the most effective framework for product innovation management includes people, processes and technologies. With these issues in background five key factors contributing to successful product innovation management model can be presented: 1) Strategy & leadership 2) Company culture and atmosphere 3) Planning and selection and 4) Teamwork and communication.

A product innovation strategy's main aim is to define objectives for product innovation efforts in relation to the company's overall strategy. The innovation strategy should include targets to focus on and also necessary baselines for implementation. Even though creating an innovation is much of a teamwork, still the leader has the biggest responsibility in the process. Creating a vision and effectively communicating it by setting clear objectives are the main tasks of a leader in product innovation management. (Liberatone and Stylianou, 1995)

Company's culture and atmosphere can be enablers and barriers to sharing or reusing information inside the company and thus innovation. Company culture can be said to be enabling when it's open and people motivate and engage each other. There should also be room for failures, cause in the end, that's the only way to achieve great success in terms of product innovations. The openness should also be taken into account in internal business processes, systems and structures. (Banks, 1999)

Most of the company's resources dedicated to product innovations should be focused on the projects which are customer-focused and closely link to the new product strategy and targets. The only way to achieve customer-focused product innovations, is to really know and understand the market needs and all the company's operations must be driven by these needs. It's also crucial to involve customers in the NPD process to establish the voice of the customers. (Cormican and O'Sullivan, 2004) According to Tidd (1997) the balancing between the composition of product innovations and company's competencies and capabilities is the main skill in successful innovation management.

Since the product innovation process is intensive in terms of knowledge, it is therefore vital to communicate it properly (especially in companies where product innovations are developed globally and virtually). Internal communication (between different functions) is of course important, but in addition to that some studies have shown that strong relationships with suppliers can have a positive effect on company's product innovation management. (Terziovksi et al., 2002)

2.3 Managing Service Innovations

Service innovations are ubiquitous and their role in creating economic growth and prosperity is growing even more in today's business environment. Nevertheless, the framework for managing service innovation is still limited, and there is not much literature available either. Although Schumpeter (1934) provided a broad definition of innovation, most of the literature has taken a position on technological innovation alone. In part, this emphasis on product and technology innovations in the literature is likely to be due to the fact that the customer plays a significant role in producing service innovations.

One of the most common definitions of service innovation is probably the following: "A service innovation is a new service experience or service solution that consists of one or several of the following dimensions: new service concept, new customer interaction, new value system/business partners, new revenue model, new organizational or technological service delivery system." The first dimension is more generally known as service offering, and it describes the value that is created as the service is delivered between the company and customer. Many new service offerings are unifying service-related elements that already exist separately or as a part of other services in a new combination. (Frei, 2008) The second dimension of service innovations is new customer interaction and the role of customers in value creation. The process of interaction between the company and the customer is an important source of service innovations, especially when the service company itself provides support for innovations. (Grönroos, 2007)

New value system or set of new business partners are also part of producing the service innovations. Most of the new services are produced through combinations so that all the parties in the value chain actively provide the service: some service innovations for instance require a platform (SaaS -softwares) for them to become successful. When it comes to the fourth dimension of service innovations, new revenue models, it's vital to note that only a small fraction of new service innovations become successful. The reason is most likely the problems in distribution of costs and revenue, when there are multiple parties involved in the value chain of services. The role of revenue and cost distribution model is therefore increasingly important and play huge role in the success of service innovations. (Päällysaho and Kuusisto, 2008)

The new delivery system is extremely important for successful service innovations: generally, it’s meaning the organizational structure of the service firm itself. In order to allow service employees to perform well in the production of new services, appropriate management and organizational structure are needed. For instance, producing a new service, might need new skills or new way of managing the company, so indeed it’s an important dimension. Last but not least, also technological side of delivery system can be enabler when it comes to introduction of new services (such as self-service concepts and custom-made services). To conclude the dimensions of service innovations, the innovations are typically combinations of these single dimensions. The significance of each dimensions will of course vary across individual service innovations. However, innovations on company’s business model can be seen as a systems-level innovation where each these dimensions are changed. It’s vital to note also that one company can have different business models in their service innovations. (den Hertog, van der Aa and de Jong, 2010)

Guile and Quinn (2017) presents multiple principles that are important in managing service innovations. These principles include: 1) Maintaining relationship between service developers and customers 2) Keeping the company flat and open to new ideas and finally 3) Giving recognition to champions to drive the process of innovations. On the other hand, Tidd and Hull (2006) recognize 36 factors affecting the effectiveness of new service development. However, they see that factors such as market assessment, strategy formulation and core business competencies have the main role in effective management of service innovations.

2.4 Adoption of innovation

It's crucial for companies to understand, why and how innovations are adopted (or not) since it can help to develop more effective (and realistic) business plans. The company needs a deep understanding of the factors that promote or limit the diffusion of innovations and thereby affect the rate and level of diffusion in different markets and customer groups. These factors are presented in chapter 2.5 in more detail.

The adoption of innovation is often described as: "The process by which an innovation is communicated through certain channels over time among members of a social system. It is a special type of communication, in that the messages are concerned with new ideas". Since getting the new idea adopted is often very difficult, there has been lot of attention paid to research on diffusion of innovation. Typically, it's more about the speeding up the rate of diffusion of an innovation because many innovations may require a long period from the time they come to market to the time when they are fully adopted. (Rogers, 2003)

Innovation is not adopted at the same time in a social system. By diving deeper into the diffusion of innovations, researchers have been able to identify five different types of an adopter categories as the classification is done on the basis of innovativeness: 1) Innovators 2) Early adopters 3) Early majority 4) Late majority and 5) Laggards. Innovators are those who are seeking actively information about new ideas. They have high rate of exposure on media and they are the first ones to adopt a new idea meaning they are not depending on the evaluations of other people on innovations. Early adopters are the ones having the highest degree of opinion leadership in most social systems. Other people look to this category of people for advice and information about the innovation. As it was previously mentioned, most companies try to speed up the rate of diffusion, and regarding to that, the early adopters are the ones with key roles. Early adopters decrease he uncertainty about new innovation by adopting it, and then distributing evaluation results to near-peers. (Rogers, 2003)

People adopting the new innovations just before the "mean of a social system" is called as the early majority. Compared to early adopters and innovators, early majority do not hold the position of opinion leadership. The time taken by the decision is much longer in early majority as they often discuss with their peers before adopting a new innovation: "Be not the first by which the new is tried, nor the last to lay the old aside". After the average member of a social system, innovations are adopted by late majority. The adoption of new innovation may be due to pressure coming from social networks or just an economic necessity. The decision of adopting the new innovations is highly based on other people and almost all the uncertainty must be removed from the new innovation before the adoption really happens with late majority. (Rogers, 2003)

Last but not least come the laggards who have no opinion leadership at all. Their decision is based on the people who also have more traditional values. The cycle of diffusion of innovation is almost starting with a new round when laggards adopt the innovation: innovators might already be using the most recent ideas. Mostly the lateness is due to limited resources, so that laggards really have to think that a new innovation is not failing before they are able to afford it. (Rogers, 2003) Distribution of categories is shown in Figure 3.

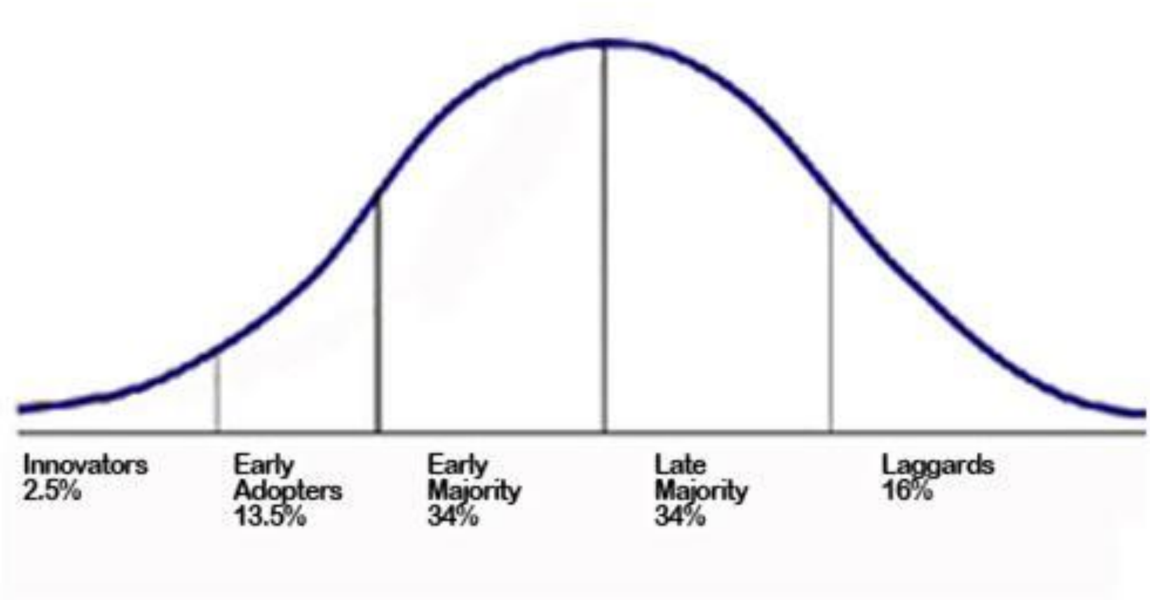

Figure 3. Distribution of adopter categorization (Rogers, 2003)

As different categories have been defined, it's also vital to look for variables related to innovativeness (on the basis of which the division is made). These variables include socioeconomic status, personality variables and communication behavior. Typically, the socioeconomic status marks earlier adopters as the ones with higher standards of living (more educated and wealthier). The innovators, for in turn, are the richest category and thus there might also be cause-and-effect between their adoption of innovations and wealth: new innovations are generally costly to adopt. It’s also about risk with innovators: they have enough wealth to also do some failures and carry the risks. It’s often stated that there is a positive and linear relationship between socioeconomic status and degree of innovativeness. Although personality variables are mentioned to have an effect on innovativeness, there’s not much literature available because of difficulties in measuring personalities. Some generalizations have still been made that earlier adopters have much more empathy than late adopters and they have also more rationality. On the communication behavior the situation is same so there’s not much literature available but still some characteristics have been identified. For instance, the people adopting innovations first are the ones with wider networks outside their local systems. (Griffiths and Kickul, 2008)

In addition to variables related to innovativeness, there are also a few additional factors affecting diffusion of innovations such as culture and communicability. In cultures where there is more individualism, the spread of innovations takes longer than in collectivist cultures. It is also important to understand cultural differences because marketers are able to make effective use of early adopters and opinion leaders in different cultures according to the urgency of the situation. On the other hand, the role of early adopters is also crucial when it comes to reducing complexity and increasing comparative advantage in order to attract users to adopt a new innovation. On the other hand, communicability is crucial in the implementation phase of innovations, as it has the greatest impact on the decision of early adopters and opinion leaders to embrace innovation. It is also important for a company to be able to interpret its own customer group and its innovation attributes in order to optimize the spread of innovation. (Tolba and Mourad, 2011)

3 MARKET FAILURES

3.1 Financial disruption

One of the most recent financial disruption is the global financial crisis in 2007 – 2009 as financial disruption acted as a painful reminder of the multidimensional nature of crises since they affect not only poor countries but also rich countries. Financial disruptions can arise from either internal or external, and private or public sources. Often, financial market failures spread rapidly and, as a result, become multifaceted – requiring a number of large-scale and rapid policy action in fiscal policy, both locally and globally, to restore the situation. As the financial crisis of 2007 – 2009 showed, it is extremely important for companies in a globalized market to have a more comprehensive understanding of the factors that led to the crises and their consequences, as they have an impact on companies' business environments. (Claessens, 2014)

Financial disruptions are often described as follows: "Substantial changes in asset prices and credit volume, severe disruptions in financial intermediation and the supply of external financing to various actors in the economy. Financial crises are typically multidimensional events and can be hard to characterize using a single indicator." As the definition of financial disruption is quite a broad, there have been identified two main types of financial disruptions: those economic disturbances which have been identified by quantitative methods and those which can be identified by qualitative methods combined to human assessment. Quantitative methods usually identify currency and sudden stop financial crises, and qualitative debt and banking crises. Currency crises often lead to devaluation and force politicians to protect the currency by consuming international money reserves or raising interest rates sharply, and because of these measurable variables, quantitative methods are suitable for identifying them. Similarly, in debt and banking crises, variables are often not measurable, so qualitative methods are required. When it comes to identification and dating, different definitions has been given by different authors, but mostly they define currency crises when the exchange rate deviation exceedes 15 percent of the annual rate. (Reinhart and Rogoff, 2009) However, some authors disagree by saying that at least 25 percent change at exchange rates should be seen in order to identify it as a currency crises (Frankel and Rose, 1996).

The average number of financial disruptions seems to be coming in clusters as Figure 4 represents. The numbers presented include financial disruptions such as banking, debt and currency crises and also sudden stops, although some of these crises occurs more frequently: between 1970 – 2011 there were 147 banking crises, 217 currency crises and 67 debt crises reported. (Laeven et al., 2012)

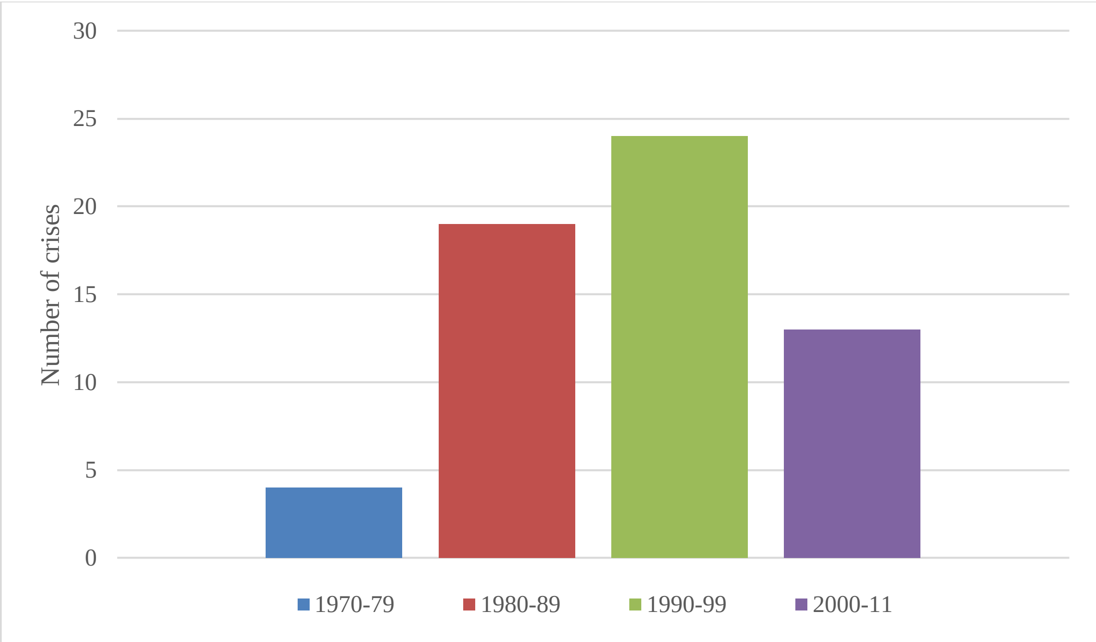

Figure 4. The average number of financial disruptions per decade (Claessens, 2014)

As mentioned earlier, economic shocks are almost invariably global and, as a result, their effects are enormous, especially from an economic point of view. When looking at the economic implications of the banking crisis, for instance, they have averaged a loss of around 23 % of GDP since the first four years. Although this figure is average, actual costs vary widely from country to country, but it has been found that overall losses are higher in developed (33 % of GDP) than in emerging (26 % of GDP) markets. The effects of economic shocks are also reflected in declining consumption, investment, production rates, employment, and both imports as well as exports. If we look at consumption alone before the financial disruption and compare it with the environment during the crisis, we find that consumption is 7 to 10 times higher before the disruption.

In addition to huge financial losses, according to Kannan et al. (2014), recovery from the crisis is also weak and slow. The same attention has been paid by several other researchers (Reinhart and Rogoff, 2009; Jorda et al., 2011), and they also agree that the level of national production is still about 10% lower seven years after the crisis than before the crisis, partly due to low employment and productivity rates. Often, public debt also rises during financial crises (by 12 % on average), while tax revenues fall and government spending rises. (Reinhart and Rogoff, 2011)

By predicting financial crises, some of the consequences could certainly be avoided, as measures to prevent the crisis could be put in place in advance. Although much research has been done on predicting economic market failures, no particular indicators can explain or predict the timing of crises. On the other hand, similar studies have been able to identify the causes that have contributed to the emergence of economic market failures: macroeconomic imbalances and disruptions, both inside and outside the country, have traditionally been factors that have led to crises. Economic market failures may also appear to be due to “stupid” reasons such as sudden runs on banks and the emergence of asset busts. (Claessens, 2014)

Implications of financial disruptions on innovation

Innovations are seen as investments in companies and one of the most significant misconceptions about the decline in innovation investment during financial disruptions can be proven wrong, as several studies show that more than half (65 %) of European companies say that they have kept innovation investments unchanged despite the crises. On the other hand, it has been mutually successful to study companies that reduce the amount of money spent on innovation, and these companies are united by a larger size and a large innovation budget in terms of share of turnover. A partial reason for the decline in innovation investment can also be found in the location between suppliers and the companies: developing companies are located in high-income countries, while suppliers operate mainly in lower-income countries where crises make it difficult to develop new products and services. (Filippetti and Archibugi, 2011)

However, some researchers disagree, as their findings show that 25% of companies suspended investment in innovation due to financial disruptions. Companies that have access to public financing were less likely to stop investments while newly established companies were more likely to do so. It can also be seen that companies which lost out on export market sales were on higher temptation to stop innovation investments. While investment projects remain essential for the development of technological capabilities, the financial disruptions typically have negative effects on companies' innovation activities, and also in the longer run for innovation-based sustained growth. (Paunov, 2012)

Even though there are lot of negative effects on innovation activities, at least according to some researchers, every cloud has a silver lining. More than 80 % of the interviewed firms were planning to invest more on innovation activities in the next two years. It's also encouraging to see that countries tend to recover relatively quick if GDP per capita growth is something to believe. In the end, these findings combined suggest that financial disruptions tend to have only small negative effects on companies' innovation capacities. (Paunov, 2012)

There have been multiple studies also on how human capital can help companies to minimize negative impacts on their innovation activities caused by financial disruptions. Human capital act as a coping mechanism to cushion the effect of the crisis on innovation performance. Intangible capital is particularly important in low-tech industries, where human capital has a positive association with innovation performance, so at least low-tech sectors could mitigate the crises effects by developing wide knowledge base and absorptive capacity. (Zouaghi et al., 2018) Many contexts also emphasize the company's strategic measures as factors of organizational adaptation to the new post-crisis operating environment. Strategic measures often involve greater investment in innovation, and ensure the best long-term strategic orientation in terms of both operating profit and market value. (Martin-Rios and Pasamar, 2018) To conclude, the relationship between innovation and financial disruptions seems to be that innovation activities that are already under way are systematically completed, but the aim is often to avoid launching new projects during financial crises.

3.2 Natural disasters and climate change as a market failure

Natural disasters are defined as "powerful natural phenomena that are caused by nature and that sow death and destruction in their wake". Natural disasters are linked by several features, such as the fact that they are caused by the forces of nature but can be accelerated by humans and the events are surprising and short-lived, often causing significant economic damage. The risk categories of countries against natural disasters vary considerably, and especially in large international companies, disasters and measures against their effects should be analyzed according to whether the country is developing (often with a smaller budget for measures) or developed (with high investment). The total cost of natural disasters exceeds $ 100 billion, and this figure does not even take into account the decline in GDP and industrial production in the worst affected countries. (Tavor and Teitler-Regev, 2019)

The relationship between companies' innovation activities and natural disasters still remain as a mystery despite a few studies. According to the World Bank (2016), innovation is seen more as a way to prevent or reduce the effects of natural disasters. If the threat of climate change (increasing the risk of natural disasters) is taken into account, then a consequence can be presented: in order to achieve reductions in GHG emissions, a huge technological transition is needed, and innovations play a crucial role there. There will also be need to renew some policies as the large adoption of innovation is only achieved by a large range of actors such as companies, governments and individuals. (Rubin, 2020)

In the long run, natural disaster (including climate change) will create a positive wave of innovation. Companies will have to develop new solutions and services to meet the risks posed by nature, and this, on the other hand, will also be reflected not only in new investments, but also in new job opportunities. Due to the technical upheaval caused by natural disasters, productivity and the economy are also likely to turn to growth. This theory is also supported by the fact that when new technologies arrive on a large scale in companies and people, secondary innovations emerge when these new technologies have to be adapted to the demands of everyday life. This positive cycle will therefore ultimately lead to both an increase in the number of innovations, but also an increase in labor demand economic productivity. (Fankhauser et al., 2008)

3.3 Infections and viruses

Infectious diseases, due to their unknown nature, often cause large-scale global market disruptions, the most recent example being COVID-19, which led to a 5 % drop in the U.S. stock market overnight alone. (Joye, 2020) The economic effects of diseases are of course reflected in increased health care costs, but also in changes in purchasing behavior caused by fear and panic. For instance, when Ebola spread around the world in 2013 and 2014, several countries saw a nearly 10 percent drop in the country's GDP. The market disruption caused in part by diseases is exacerbated by their uneven distribution: some (usually developed) countries may even benefit financially, while some suffer severe losses as a result of the disruption. (Bloom and Cadarette, 2018)

Infectious diseases often change people's work and leisure time, and when looking at studies done on the effects of the coronavirus, it is found that more than 90 % of managers believe that the crisis has lasting effects on the needs of their clients. At the same time as customer needs change, companies need to balance between costs, productivity and health of staff. While executives believe that investment in innovation will return to normal once the epidemic is over, it is not surprising that investment in innovation will decline. Only pharmaceutical companies considered their investment to be normal, as can be seen from Figure 5. (Am et al., 2020)

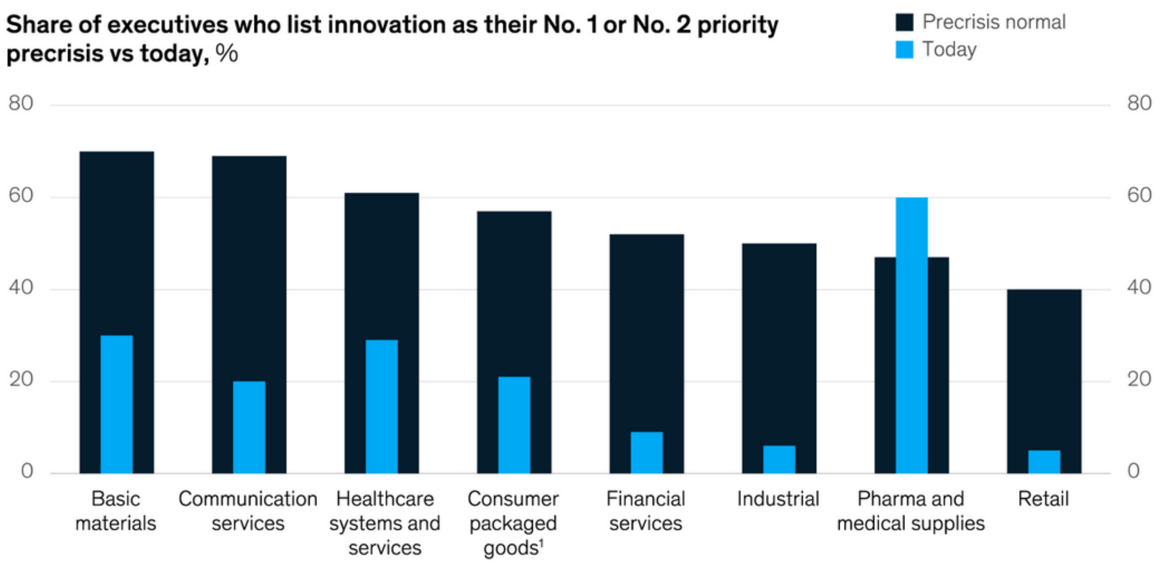

Figure 5. Innovation during epidemic (McKinsey & Company, 2020)

According to business leaders interviewed in the study, investments in innovation are declining due to four factors: companies focus their time on supporting their core businesses, looking for commercial opportunities, saving money and minimizing risk, and waiting for markets to become more predictable. However, in a market-failing environment, it would be very important to adopt a company's core business to meet changing customer needs, identify and quickly analyze niche markets, and ensure that the resources in the innovation portfolio are properly targeted, as many companies fail to cope with their old offerings. (Am et al., 2020)

Only by understanding the shifts and opportunities in market-failing environment, companies are able to deliver innovations that can help to gain competitive advantage in the long term. Examining previous global pandemics (and crises), it can be seen that those companies that continued to invest in innovation do about 30 % better than the average companies in the market, thus guaranteeing themselves accelerated growth for up to three to five years as Figure 6 shows. (Am et al., 2020)

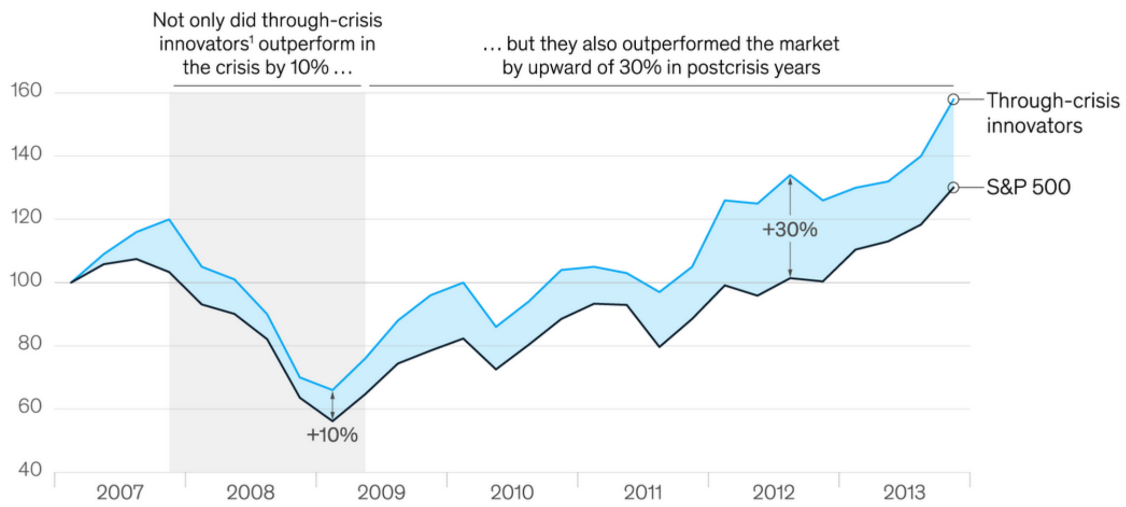

Figure 6. Innovation through a crisis (McKinsey & Company, 2020)

3.4 Delivering world-class innovations during a market failure

Innovations are multidimensional and complex, company-wide projects that can help a company succeed in a market-failing environment. Many researchers have tried to find a generalizable formula that could be used to interpret which factors can be used to deliver the best innovations. Be that as it may, the research revealed eight factors that can be identified for any larger company when it comes to successful product or service innovation. These factors are shown in Table 3. (De Jong et al., 2015)

Table 3. Common factors in companies succeeding in innovation (De Jong et al., 2015)

Factor	**Description**
Aspire	Define a target for growth through innovation
Choose	Set boundary conditions for innovation projects and allocate transparent resources to those projects
Discover	Try to develop systematic process where solutions to problems, technology that enables the solutions and business models to generate money can be discovered
Evolve	Constantly reevaluate the competence of company's business model
Accelerate	Tackle the hurdles that barrier the company's innovation by enabling co-operation, continuous learning, customer involvement and clear policies for decision-making
Scale	Ensure that the number of potential customers are in-line with the resources spent
Extend	Collaborate with other parties to ensure adequate knowledge and skill
Mobilize	Tie innovations to the day-to-day operations and culture of the company

Aspire

When innovations are designed to ensure a company's success in a market-failing environment, it is important to tie them strongly to the company's growth. By ensuring that each innovation project has a designated owner and defined resources in terms of both time and performance targets, it is much easier to demonstrate the impact of completing that innovation project on a company's growth goal. (De Jong et al., 2015)

Choose

Innovations are risky in nature, so it is important for a company to take care of risk management. It is never possible to know in advance where valuable innovations are taking place and it is expensive in terms of both time and money to go through all the aspects, so the company must create boundary conditions for innovation projects. Boundary conditions can be used to identify the projects that are best suited to a company's innovation portfolio, which on the other hand help to implement the company's long-term strategy. It is also good for the company to agree internally on governance processes and transparency with regard to innovation, as this will make it easier to assess the overall composition of the portfolio in the long term. (Chan and De Jong, 2014)

Discover

With a systematic innovation culture, a company is able to focus its innovation activity on three areas: solving a valuable problem, developing the technology needed for the solution, and integrating the solution into a business model that generates profit for the company. Opportunities for innovation should be sought beyond the company's boundaries by engaging in productive and insightful partnerships with other stakeholders. (Capozzi et al., 2013)

Evolve

Companies that have been in the market for a long time also need to constantly develop and ensure that the business model is competitive against agile competitors such as startups. Often, large companies' innovations focus on products and services rather than a business model, and the reason is probably that the core business model is reluctant to take risks until it is clearly under threat. Developing a business model and ensuring its competitiveness requires constant market analysis to distinguish the right signals from mere "noise". The company should constantly fund a few test projects outside its core business that will enable them to deliver even more added value to key customers if successful. (De Jong et al., 2015)

Accelerate

The biggest barrier to innovation is often the company and its internal practices themselves. It is, of course, understandable that a company must have clear rules for innovation projects, but the "rush" should not act as a deterrent to everyday learning, cross-border cooperation and decision making, as these play an important role in developing successful innovations. Innovations are developed for customers, so the most successful companies of all test their promising ideas right at the beginning of the process in close collaboration with key customers. The above factors, combined with the cross-functional collaboration of the company, help to ensure that end-user feedback is taken into account in the development of innovation – thus significantly increasing the likelihood of success. (Capozzi et al., 2013)

Scale

It is important to ensure the appropriate scope and dimension of a particular innovation in advance so that the right resources and risks are in line with the implementation of the innovation. In the case of product innovation in particular, resources and characteristics need to be precisely defined so that a new product can be delivered in good cooperation with manufacturers at a sufficient speed, quantity and quality. (De Jong et al., 2015)

Extend

It won’t be long before almost every innovative company admits that successful innovation requires working closely with external partners. Collaboration can also often speed up the process and reveal new angles to create value for customers and ecosystem partners, and above all, costs can often be shared, reducing the risk borne by the company. Thus, the creation of an ecosystem has significant implications, as they are more likely to achieve the above benefits: first it should be decided which four or five already existing partners could best support the company’s innovation strategy. Following these choices, it is important to go through the networks regularly and, if necessary, prune or grow them. (Eckert, 2018)

Mobilize

The most successful innovations arise from a foundation where innovation, company’s strategy and performance are closely linked. By linking innovations to a company’s financial goals and long-term strategy, it is easier to share responsibilities between different projects internally. The company culture should also be open and helpful, where ideas and information are shared freely, for example by placing teams together who do not normally work with each other. A high level of internal cooperation is not achieved in an instant, but long-term work has its own reward here as well. (Sull, 2015)

4 BUYING BEHAVIOUR OF CUSTOMERS

The two main aspects should be defined while speaking of consumer behaviour: behaviour level and policy level. Behaviour level can be described as consumer collect, purchase, use, evaluate and deal with product to meet its demand. From policy level it can be described as “all consumer’s action involved in the process of acquire, consume and process product or service.” (Biao et al., 2010) In short, consumer behaviour can be summarized as the process that individuals or groups go through in making their buying choices in order to satisfy their needs. It is also a mix of customer’s buying awareness combined with external factors to result in a change in the consumer’s behaviour. Typically, the most influential factor turns out to be the economic instability in country. If we look how crisis have affected consumer behavior, researchers have been able to gather their findings as follows:

- consumers try to spend less, and new trends become more common because of changes in buying behaviour caused by crisis
- consumers are not loyal to one brand but change for cheaper brands quickly resulting for smaller spending
- consumers are not willing to pay more for “value adding” products if the product can be substituted with cheaper price

During crisis (such as financial crisis back in 2008-2009), it can be seen that consumer confidence as well as spending budget significantly reduced. Budget reduce was mostly due to rising unemployment bringing consumers psychological pressure to save more money. Consumers were quick in changing brands during crisis thus leading also in changes of shopping places and for instance online shopping did get more common because of its practicality and easiness, So in a market-failing environment consumers will typically pay more attention to what they are buying and why they are buying it. (Sharma and Sonwalkar, 2013)

It is also clear that the effects of crises must also be studied in terms of companies and changes in their buying behaviour. Business-to-business sales are becoming less and less linear as customers research and evaluate products more closely before making purchasing decisions. Companies that are willing to take advantage of digital tools (such as engagement marketing) and reallocate sales and marketing resources to match the collaboration between company functions in a way that facilitates the customer's purchasing decision will benefit most from the changed purchasing behaviour of companies. (Lingqvist et al., 2015)

While the change in company's buying behaviour is significant, if successful in implementing the change process, the benefits to the company will also be huge: up to 20 % more leads and a 10 % increase in the number of first-time customers. As companies buying behaviour becomes more and more consumer-like as crises: customers expect sales representatives to be familiar with their business, and corporate customers are also exposed to the impact of personal relationships. The role of so-called "influencers" in corporate decision-making increases during crises when the possibility of risk is to be reduced. Business-to-business commerce is further digitalized, and customers expect the supplier's website to have real-time services (pricing and communication tools) – not to mention the role of sales representatives and customer service: studies show that six different channels of interaction are regularly used in company's purchasing decisions. (French et al., 2011)

In order to respond in the best possible way to these changes in buying behaviour, action is also required for the company selling products or services. In particular, changes in three issues arise: delving deeply into the customers decision-making process by customer segment and clarifying customer expectations and needs at each stage of the process, changing the organizational structure to facilitate sales and marketing collaboration, and allocating resources to those activities that have the greatest positive impact on customer's decision-making. To be able to implement these changes mentioned above, knowledge from a variety of sources, and an understanding of the industry is needed – often this requires meeting customers and analyzing how they actually make their decisions. One possibility is to take advantage of existing data, and conduct market research based on it to find out more in-depth insights. (Lingqvist et al., 2015)

Studies also show that the traditional wisdom of declining customer purchases during crises is true. From another perspective, this means that suppliers need to prepare for declining sales and slower business development during market failures. On the other hand, the time released from sales can also be used to train the company's staff and carry out internal projects, if financial resources allow. Second, in a market-disruptive environment, suppliers should focus on economically smaller opportunities, as they significantly reduce the likelihood of customers buying. Third, firms should take cultural differences into account when trying to predict changes customers buying behaviour in a market-failing environment: for example, customer purchases may not fall in cultures characterized by low uncertainty avoidance and long-term orientation. (Habel et al., 2020)

5 METHODOLOGY

The purpose of this section is to describe the methodology used in the study, and to reveal the factors that influenced the choice of those research methods. The chapter also provides an overview of how the interviews were conducted and how the information obtained from them was analyzed.

5.1 Research context

The purpose of the interviews conducted in the context of this study is to find opinions and answers to the two research questions presented in the introductory chapter:

- How market failures affect the adoption of product and service innovations?
- How the buying behaviour of customers change during market failures?

The thesis utilizes qualitative research methods by interviewing senior employees of the company to meet the objectives of the work and answer research questions. The end result of the thesis should have given the company a clear understanding of the changes that market failures cause to innovations, their number, diffusion and management.

5.2 Methodological choices

In terms of methodology, many studies include combinations of quantitative and qualitative methods, as there is often a desire to combine diverse ideas coming through open-ended questions with mere data. As no previous quantitative answers to the research questions of this thesis can be found in the literature, the conclusions have to be formed on the basis of the answers of the interviewed people, so to rely only on qualitative research methods. Qualitative research methods seek to find interactions between participants’ opinions and theories by combining methods developed for data collection and analysis. (Saunders, 2016) Kothari (2004) agrees that qualitative approach can be conducted with techniques such as group and depth interviews.

In selecting the most suitable company individuals for the interview, the following things were emphasized: experience in managing innovations, understanding of operating in a market-disturbing environment, and interest in developing new ideas and processes. All of the interviewees worked at the time of the interview for the company for which this thesis was conducted.

The study is a cross-sectional study because it combines certain phenomena (market failure) that occur at a specific time. Such studies describe how a phenomenon occurs in a particular style of organization and attempt to describe what factors are associated with the phenomenon's emergence. This way more and more information is available on the phenomenon under study, which can be used in decision-making. To understand the impacts of market failures on diffusion of innovation, semi-structured interview was chosen as a research method. Semi-structured interviews are non-standardized, commonly used methods in qualitative research, where the researcher has a list of interview themes and possible key questions, but the themes and order of questions vary between interviews according to the "flow" of the interview. It is very typical that the interviewer needs to add or remove some questions during the semi-structured interview. (Sanders, 2016)

On the other hand, this study can also be seen as a business-related case study, often looking at a particular case and the individual involved and his or her experiences, which are then reported as a report and analysis. Case studies are quite popular because they make it easy to present complex and, in some cases, difficult-to-understand business questions in a simple and down-to-earth format. Often, case studies are particularly practical and normative, and the results of the studies can, for example, be used to report on specific areas or problems in at least one organization or in a particular business environment. Due to normativeness and practicality, case studies are occasionally criticized as studies that lack a sufficient level of scientific accuracy. Nevertheless, case studies are particularly useful for gaining an increasingly broad understanding of changing business practices in their social context. (Eriksson and Kovalainen, 2008)

5.3 Data collection

As it was already mentioned, some senior employees of the company were interviewed to provide answers to the research questions. The themes of the interviews were sent to the interviewees a week in advance so that the interviewee could prepare as well as possible for the research topic. The interviewees were selected on the basis of the above criteria in such a way that the company contact person selected the most suitable people for the interview and agreed with them about two weeks in advance on the time of the interview by telephone. Due to the current pandemic situation, the interviews were conducted remotely via a network connection and Microsoft Teams, and for the manual analysis of the data, the interviews were recorded with the permission of the interviewees. The interviews began with an introduction to the deeper purpose and process of the study, followed by a shift to questions and themes. Each of the interview took roughly an hour. The names of the interviewees will not be published due to the non-disclosure agreement, but functions where interviewees are working, and the interview date is presented in Table 4. In total 8 persons were invited to the interview, but because of the data saturation we agreed with company X's contact person that four interviews were enough. Also, the interview questions and themes are listed in Appendix 1.

Table 4. Interviews' information

	Function	**Interview date**
1.	Sales	5.1.2020
2.	Sales	13.1.2020
3.	Marketing	15.1.2020
4.	Logistics	15.1.2020

The company to which this study was conducted hoped that employees from as many different functions as possible would be interviewed, as this would also provide them with a unified view. By interviewing different functions, both sales and marketing employees were included in the research results. In addition to the criteria already mentioned, the company selected employees for the interview from as many different "levels" as possible, from the direct customer interface to the company management, in part to eliminate the problem of the reliability of qualitative research.

5.4 Data quality of the research

According to Sanders (2016), there are a few issues with semi-structured interview when it comes to data quality. Due to the non-standardization of interviews, other researchers may have challenges finding and revealing the same findings. In addition to this, the atmosphere of the interviews can have a surprisingly large impact on the responses received and the conclusions drawn from them. Interviewer and interviewee activities, such as gestures and non-verbal communication, can have downward effects on the reliability and validity of the study. To minimize these factors that undermine the reliability of the study, it should be understood that a semi-structured interview is only suitable for studies where the repeatability of the interviews is irrelevant - so it is good that the interviews reflect real-time changes in the environment.

It is also often perceived as difficult to generalize findings using qualitative research methods, as a relatively small number of responses are required to achieve the findings. In order to improve generalization, it would be good to have as many interviewees as possible - but bearing in mind the resources available. Sometimes the significance of the findings is also difficult to emphasize, but this largely depends on the abilities of the researcher. (Sanders, 2016)

When research in qualitative research methods focuses on data quality, it often refers to the researcher’s ability to access the interviewee’s knowledge and experience. Although the topic of this master’s thesis was broad, respondents were given sufficient context and interface with the topic to allow them to express their views on the topic. The participants in the study were selected for the interviews according to the above criteria, but in addition to this, the Company X emphasized the voluntary nature of the interviews, thus emphasizing the readiness and transparency of the interviewees to answer the research questions. During the interviews, trust was also built between the interviewer and the interviewees.

6 FINDINGS

The purpose of this chapter is to present the findings and results found in semi-structured interviews conducted using qualitative research methods. The section consists of three subchapters, which deal with the number of innovations published by the company, customers' buying behaviour and the adaptation of new innovations from the perspective of market failures and their consequences.

6.1 Changes in Company X due to market failures

The interviewees saw the changes in the company as directly proportional to the type of market failure and its impact on the industry in which the company operates. Thus, the company made more changes during a market disruption where the impact of the disruption on the company's industry was greater: for example, as a result of the corona pandemic, investments in the industry declined as the crisis began and more and more players suspended or discontinued investments. As a result of the effects of the crisis experienced by the industry, the company also had to react to the changed environment, although initially there was uncertainty among decision makers. According to the decision-maker interviewed, the company had to respond to changes in the market by adapting its own operations both in terms of personnel safety and business security. Changes had to be made to sales channels to secure staff, and this was perceived as challenging due to poor predictability.

One decision-maker interviewed said that, during the crisis, the company proactively sought to develop and train its staff in order to make the most of the time freed up due to changes in sales channels. In addition, according to almost all interviewees, the company saw the right moment of the crisis to accelerate the company's internal development projects in order to make the most of the crisis-induced transition to remote working and the digital training it provides.

One person working at the customer interface mentioned that, the effects of market failures on the industry are directly proportional to the way in which the market failure affects customers' operations. In addition to this, the interviewee was able to form the impression that the effects of some market disturbances, such as the corona, are more visible in the industry outside the capital region area than inside it. Equally, according to the person working at the customer interface, the nature of a company's industry is such that the effects of market failures are visible with a delay and expressed his view as follows.

> *"It is partly too early to even interpret the effects of market failures on the industry and the market as soon as the disruption ends, as the real effects will only become apparent later."*

When the interviews delved deeper into changes in the industry and the market, some of the interviewees (especially those working in sales positions) said that the company is generally interpreted as more expensive than its competitors in the market, making it more difficult to achieve business goals. The fact that competitors had made their pricing even more aggressive in a market-disturbing environment may also be partly due to the challenge and the person working in sales summarized the changes in market as follows.

> *"More and more players are paying more attention to cost-effectiveness in times of market failure, rather than to sourcing value-added services and innovative."*

According to sales staff, the measures taken by the company to minimize the effects of market disruption were perceived as good and considerable. For example, at the time of the COVID-19, the company created sufficient facilities for safe work, and management's communication about the company's crisis strategy was clear. In order to respond to the changes in the industry and the market, new ways of working were also required on a personal level. Decision-maker interviewed summarized the transition inside the company as follows.

"Working during the corona is also a personal risk, and that's why it's been important to think about which business events, for example, have been possible to organize remotely rather than traditionally physically, but without the lack of physical presence."

Overall, all interviewees felt that the changes in the market and the company's response to these changes had been successful, and the company had performed at a good level given the circumstances. The company's financial performance and the avoidance of restructuring (lay-offs and redundancies) are the best indicators of the company's good performance. However, some of the people interviewed also expressed minor negative feelings and admitted that the atmosphere in the company tightened during the market disruption and so-called "race fatigue" was noticeable. One interviewed person summarized the atmosphere during the market failure as follows.

"Due to uncertainty, from time to time in a market-disturbing environment there were negative feelings related to, for example, the preservation of work and financial security."

6.2 Changes in the number of innovations due to market failures

According to the interviewees, no changes were made in the number of published innovations in the company during the market-disrupted business environment. Some of the interviewees said that the number of innovations to be published had even increased at the time of the market failure but pointed out that this was due to an increase in resources devoted to product development a few years earlier. Although the company was aware of the risk posed by new innovations, the number of innovations or release date were not changed. Internal processes related to the publication of innovations were transferred to digital channels in a market-distorting environment, but according to the interviewees, the publishing process handled in this way also worked extremely well.

Company's management pointed out that, market failures did not affect the number of innovations published by the company. Typically, in a market-failing environment, the three-time release strategy was adhered to, but still so that the majority of innovations were incremental product innovations. Equally, investing in service innovations was perceived as important in the company's management, but in a market-disrupted environment, involving customers in a development project seemed challenging. In any case, in terms of competitive advantage, service innovations are important in a market-distorting environment, as they play a very important role in customer engagement. One of the interviewees summed it up as follows.

> *”If we look at the data from previous market failures, we can see that customers committed to services continued to work with our company almost normally or with very small changes. The role of service innovations is exceptionally large when it comes to coping with a market failure. New innovations are also perceived as good sales boosters.”*

Based on the interviews, in terms of the number of innovations, it can be stated that the Company X’s chosen innovation strategy was also correct from the literature review’s point of view: those companies that continued to innovate during a market failure outperformed the rest of the market on average, as the study by McKinsey & Company found. During the market failures, the main focus of the innovation strategy shifted to product innovations, despite the fact that Company X kept its innovation budget unchanged.

Interviews with those working in the decision-making position revealed that the company's innovation budget remained unchanged in a market-disruptive environment. Market failures were seen as good opportunities to catch up with competitors by developing own product and service portfolio in terms of innovation. However, the effects of innovation activities will only be visible after a certain period of time, so in the best case, when a year-long market disruption is over, the company will have completely new innovations in the recovering market. The interviews also focused on management's feelings and recollections of whether the company's innovation budget and the number of innovations published through it were reduced, and the comment from a person working in product marketing describes the situation as follows.

> *“Never during a market failure did our company talk about reducing or closing down innovation activities. Instead, some of our competitors stopped developing new innovations, and now looking back we certainly benefited even more from the market failure.”*

Some of the interviewees also mentioned the so-called corporate responsibility behind the company’s innovation activities – in order to get the industry and the economy back on track, the company wanted to play its part in innovating solutions to achieve these goals.

6.3 Adoption of product & service innovations in a market failure

The company publishes several new innovations every year, and as mentioned earlier, the number of innovations did not change in a market-distorting environment. Despite market failures, the company did not compromise on testing new innovations with customers, but its role was felt to be more important than before.

No changes were made in the launch of new innovations compared to the normal market environment. However, some senior staff mentioned that the communication strategy for new innovations was changed to place more emphasis on cost-effectiveness and cost, as competition between other players in the sector was perceived to be intensified and, of course, adequate measures were needed to address this. In addition, those working in marketing mentioned that in order to lower the threshold for customers to invest, a digital marketing campaign was implemented, the main goal of which was to attract customers to larger investments.

“The marketing campaign was based on the company's idea of giving the industry and customers a competitive advantage in a market-distorted environment and guiding them to avoid unnecessary and non-cost-effective solutions.”

People working in sales positions mentioned that, new product and service innovations are offered first to the company’s best and most committed customers. Customers' commitment in the company is determined on the basis of sales and purchase frequency in euros. When the interviews found out how these customers have received new innovations in a market-distorting environment, the responses were divided into both extremes - some interviewed felt that customers were very enthusiastic about new innovations and adopted them quickly, while some felt that innovations were not on top of customers’ mind, and their uptake was slower than expected and desired.

The interviews allowed us to delve deeper into the adoption of innovations and some of the interviewees even identified certain characteristics both in customers who adopted innovations quickly and in those who delayed adoption. The characteristics of these customers are presented in Table 5 which also clearly shows that the characteristics are almost opposite to each other.

Table 5. Customer characteristics in adoption of innovations

Characteristics of customers who quickly adopted the innovations	**Characteristics of customers who slowly adopted the innovations**
Long co-operation with the company X	Short co-operation with the company X
The customer's sourcing (manager) is technology oriented	The customer's sourcing is more traditional and sustainable
The customer is interested in the efficiency of their company's operations	Cash flow is perceived more important than efficiency

In particular, the company's senior executives mentioned that the speed of customers' innovation adaption was most affected by how much their own operations were affected by the market failure. The role of customer's management was emphasized in those companies that quickly adopted innovation – management was committed to developing the company's business and productivity, and therefore wanted to take advantage of the benefits new innovations offered.

Those firms where the adoption of innovations was slower than before due to market failure were typically those most affected by the market failure. These customers, who did not adopt new innovations so quickly were basically those in which the company management was weakly aware of market trends and the slow decision-making process was emphasized in the organizations. The interviewed person working in marketing summarized the reason for such a big difference in the adoption style of customers as follows.

"I believe that the differences in the adoption style of customers are partly due to the size of the industry – some sub-areas of the industry are more sensitive to the effects of market failures."

As mentioned earlier, Company X focused more on product than on service innovation in a market-failing environment, and perhaps partly for this reason as well, mostly incremental product innovations were adopted by customers during crises. The reason for the higher demand for product innovations, according to salespeople, was that customers were reluctant to start learning and adapting to new ways of working in the midst of disruptions. Indeed, the adoption was mostly for those products that were already familiar to the customer, but for which a new, improved version had now been released. The comment of person working in sales summarizes the feelings exhaustively.

"As soon as the COVID-19 started, the pipeline of service sales emptied overnight. Fortunately, later in the crisis the digital marketing campaign brought some help."

The decline in the attractiveness of service innovations was due to both the strategy chosen by Company X to focus on product innovations, but also to the fact that the introduction of service innovations required interactive communication with customers. Basically, at a time of market failure, customers spent time securing their own business, so there were no resources for interactive collaboration in terms of neither money nor time. Service innovations were often perceived as economically larger entities, and the efficiency gains they brought were not necessarily seen by customers as necessary.

6.4 Buying behaviour of early adopters in a market failure

The importance of new innovations for a company will not be realized if the innovations do not bring economic benefits to the company. For this reason, it is extremely important for a company to have a clear picture of how a market-disrupted business environment affects the buying behaviour of customers who, in a normal business environment, acquire new innovations first.

All the interviewees agreed that, customers' buying behaviour became more cautious in a market-disruptive environment. As a rule, customers shifted their purchases to essential products only, and instead larger investments were postponed or canceled until market predictability had returned to normal. Many of the interviewees stated that they noticed a clear cause-and-effect relationship between customers' purchasing behaviour and market failure: the buying behaviour of those customers whose business had been most affected by the market failure changed the most (purchases decreased). If, for instance, the customer's business had suffered a great deal from market failures and the customer's company's staff had had to be restructured, then the investments were limited to those products that enabled the customer to secure its own business.

Person working in direct customer contact pointed out that, customers also seek to avoid far-reaching (and possibly fixed-term) contracts in a market-failing environment. In addition to this, there was a change in the purchasing behaviour of customers during the crisis: more and more customers switched to online shopping. In this case, the functionality of e-commerce and the availability of customer service were emphasized, and so-called impulse purchases were left out.

According to the decision-maker interviewed, the company responds to customers' changed purchasing behaviour by investing especially in marketing through digital channels to meet the needs of its customers. As also mentioned earlier, the company developed the competence of its staff in order to be able to serve customers as comprehensively as possible, despite the changes made in the company's sales process.

When people working in the customer interface and sales were interviewed, they said there were some perceived small changes in customers' buying behavior. As customers' projects continued uninterrupted, there was also demand for the company's products and services. In any case, it was clear that customers avoided larger investments and long-term contracts, and these changes were far beyond the post-market turmoil.

> *"Market failure is often more of a psychological factor and a good excuse for refusing to cooperate."*

Some of the company's sales staff were of the opinion that the frequency of customers' purchases decreased and thus also sales in euros decreased. However, these changes recovered fairly rapidly after the most acute phase progressed.

> *"Customers shifted their purchases to only the necessary products and services, and so-called impulse purchases were missed. However, there were clear customer-specific differences between the size and financial position of the companies, ie companies with a stronger market position and cash register did not reduce their purchases so easily."*

Although the company made changes to, among other things, delivery charges, these measures were perceived as poorly responding to customer needs, and as a result, some of the interviewees pointed out that the full potential of the changes was not realized. One of the senior executives interviewed mentioned that digital marketing focused on too large entities and not on the basic needs of customers, which would also have made the company's business more secure in a market-disruptive environment. More suggestions for the Company X will be given later in chapter 7.

Most of the customers who buy from Company X are business customers, so the pace of changes in buying behaviour is not as fast as on the consumer customer side. Although there were small changes in the companies' buying behaviour, for example in terms of frequency and sales in euros, the biggest change was in the sales channels, according to the person working for Company X's marketing. For instance, due to the nature of the COVID-19 market failure, most customers switched to using more digital channels, but in addition to this, contacts with the company’s customer service increased. In the past, it was typical for the industry to physically meet customers and the company, but due to the current market failure, more and more customers have switched to less interactive digital channels and more direct contacts have moved to large business entities where price negotiations play a bigger role. Analyzing the changes in customers' buying behaviour in the company was considered extremely important in order to be able to respond to the change as qualitatively as possible. Among other things, Company X increased the number of people working in digital channels and customer service to meet the increased demand.

The interviews also revealed that, according to people working in the logistics, the frequency of customers’ purchases increased during the market failure, but the number of products collected per order decreased. This observation in itself contradicts the comments on frequency of purchase mentioned earlier, but the situation is certainly explained by looking at it from the perspective of a different function.

7 ANALYSIS AND DISCUSSION

This chapter focuses on analyzing the results obtained from semi-structured interviews and seeks to draw conclusions from these results that the firm can use in its decision-making process in the future. Chapter 7.1 focuses on opening up the changes made in the firm in relation to the market failure, and Chapter 7.2 discusses how innovation activities changed in a market failure environment. Chapters 7.3 and 7.4 deal with aspects related to the adoption of new innovations and customer buying behavior, and based on these sections, chapter 7.5 makes suggestions to Company X as to whether and how to publish innovations in times of market failure. Figure 7 shows the overall picture of the section 7.

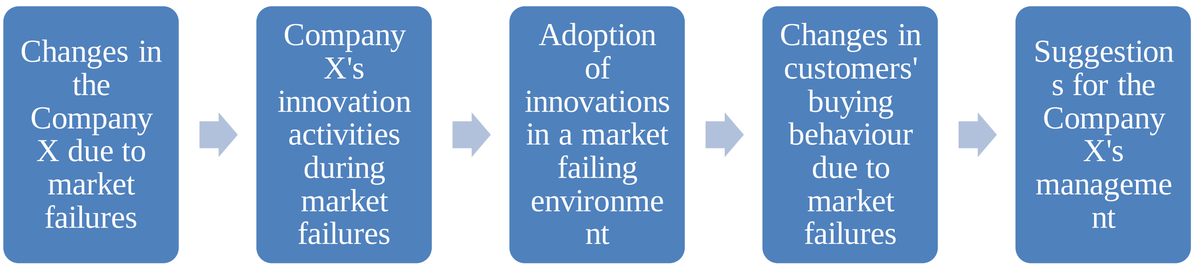

Figure 7. Overview of chapter 7

7.1 Changes in Company X due to market failures

Based on the findings of the interviews, the changes made by Company X were directly proportional to the type and nature of the market failure and its impact on the industry. Figure 8 shows the links between these issues and an overview of what changes are being made in the company in a market failure environment.

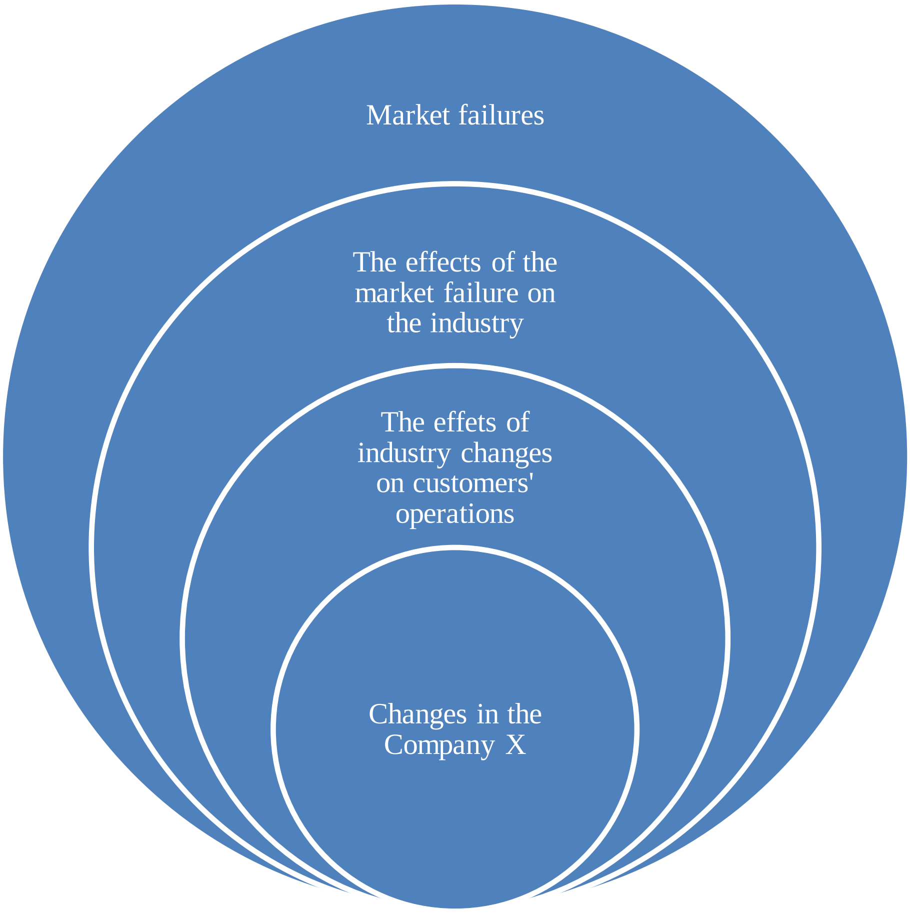

Figure 8. The relationship between the market failure and changes in the Company X

The effects of a market failure are the first to be realized in the industry in which Company X operates and, of course, depending on the type of market failure, its effects are different. For example, the financial crisis in 2008-2009 had a much more radical impact on the industry compared to the current COVID-19 pandemic and its visible effects. Some market failures, such as the financial crisis in its day, may halt almost all public and private investment, forcing many companies to restructure their businesses. When the effects on customers' business are large, they are also reflected in Company X and therefore require adaptation to the changed business environment in terms of both business strategy and objectives.

For Company X, an analysis of the effects of market failures on both the industry and customers is required in order to be able to adapt its own operations to the changed environment as effectively as possible. Based on the results of the study, the geographical location of the customers, among other things, had a strong impact on how radically the market disruption affected their operations. Especially in the area close to the capital, the effects of market disturbances were felt in the fastest time frame compared to inland urban areas. Understanding geographical differences and exploiting them in analyzing the potential effects of a market failure can be vital during a crisis.

Looking at past market failures and how to deal with them, Company X's efforts to adapt its operations to the new business environment have been successful: compared to the industry average, the company has outperformed the entire market, mainly due to successful personnel management in a market failure. Committed to the company's values, people are at the heart of the business and ensuring the success of the organization, and because of this, despite the unusual business environment, Company X continued to invest in staff and its development. Based on the research results, the company's values were also reflected in practice - training in people and accelerating internal development projects was also made in times of market failure, and this was seen as having a clear effect on how to protect already achieved market position, but above all to prepare to win market share from competitors to overcome the market failure.

Open communication between the company and its employees should be kept in mind during the implementation phase of changes in the company, and if there are changes in the business environment, the business objectives should be revised to reflect the changed environment. According to the results of the semi-structured interviews, Company X is generally perceived in the market as a premium brand, and thus in a tightened market situation, the role of price is emphasized in customers' purchasing decisions. In this case, it would be particularly important for the company to support business security by combining sales and marketing forces, and to prove to the market that the premium is the right size by providing value-added solutions for both products and services. Open communication in a market-failing environment also enables employer to communicate about the company's (financial) situation, which gives employees predictability in terms of financial security for planning their own future.

7.2 Company X’s innovation activities during market failures

Maintaining innovation activities is one of the cornerstones of a company in order to survive in a highly competitive industry, especially in a market-disrupted business environment. From the findings found in the literature, it was possible to show that those companies that continued to innovate despite the crises fared significantly better than the industry average. In addition to this particularly useful finding, the literature identified factors that would make it increasingly easier to overcome a market failure and then operate in a “new” business environment. The basis for everything in managing innovation in a market-distorting environment is, of course, the right kind of (growth) goal and resource allocation: with the right level of resourcing and vision, it is possible to ensure a long-term sustainable and profitable innovation development process, and its outputs can be mirrored in real time to the company's business model. Accelerating innovation in a market-failing environment, including through staff training and the definition of clear thresholds, was also seen as having a positive impact on delivering world-class innovation in a market-failing environment. Market failures often lead to a lack of predictability, so it is important to focus a company’s innovation activities specifically on those products and services where the resources used are in line with potential buyers.

When mirroring the above-mentioned factors found in the literature to Company X's innovation activities in a market failure, similarities are quickly observed, which suggests that the measures taken by the company will certainly ensure market position and competitive advantage in the long run. Based on the results found in the semi-structured interviews, the company continued its innovation activities in a market-disrupted environment almost normally. In the light of the figures, there were no significant changes in the number of innovations, except for a shift in emphasis to product innovations instead of service innovations. From the literature and interviews in the light of the factors found, there also seems to be a rational justification for shifting the emphasis: allocating sufficient resources and focusing in particular on those innovations that see market potential in relation to the resources used.

Company X also adapted to the changed business environment by aligning internal processes to suit the new situation. The impact of the policies was felt to be good and to ensure continuous staff learning and customer engagement, ultimately leading to tackling the worst barriers to innovation activities. Last but not least, the innovation budget was kept unchanged and, based on the results of the interviews, the company did not say a word about reducing or closing down innovation activities. This was still reflected in the market-disturbing environment by adhering to the three-yearly innovation release dates.

Company X hoped to receive development suggestions for future operations based on the findings in the literature and interviews. Based on the results, innovation and its outputs remained at a very good level, and many factors identified as good had already been incorporated into day-to-day innovation. However, partly on the basis of the results, it seems that there is very little co-operation outside the company, and therefore thinking about innovation is limited to the ability of one's own company and staff. In the absence of predictability, it would be particularly important to consider how the risk associated with the release of new innovations could be shared, while still making the potential profit fair. One way to increase co-operation would be to take advantage of so-called open innovation and the benefits it brings. Open innovation is typically defined as “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively”. (Chesbrough, 2006)

Open innovation has a number of benefits that many researchers have identified in terms of organizational, knowledge management, and legal aspects. Organizational benefits include decentralization of R&D investments, easier market access, and ease of resource acquisition. Knowledge management involves the broader ideas for product and service development that open innovation brings, the development of internal capabilities through practices and external knowledge brought in by new partners, and the benefits of technological synergies. The benefits in legal side include the use of intellectual capital as a strategic asset. (Chesbrough et al., 2006; Lee et al., 2010; Veer et al., 2010) The advantages as well as disadvantages of the use of open innovation are presented in Table 6. The advantages and disadvantages of open innovation

Table 6. The advantages and disadvantages of open innovation

Advantages	**Disadvantages**
Decentralization of R&D investments	Increased costs in coordinating activities with the parties
Easier access to markets	Set-up costs
Ease of resource acquisition	Loss of control in terms key knowledge
Broader ideas for innovation development	Decrease in the level of creativity
The development of internal capabilities	
Technological synergies	
The use of intellectual capital as a strategic asset	

One good option to start exploiting open innovation would be to start a collaboration between a company and a university where innovation activities would gain advantage from the above benefits. It has been said that cooperation with universities achieves efficiency and effectiveness in terms of a company’s innovation performance. According to Dahlander and Wallin (2020) open innovation is something that’s worth pursuing whether or not the industry, market or company is in a crisis. They also mention that traditional concerns about intellectual property misuse should be put aside and the focus should be on embracing new partners and committing to the projects they pursue together.

As innovation activities change to a more open “network model” and utilize the expertise of external partners, the company's innovation activities will improve significantly. As collaboration with external actors improved, more and more companies reported finding added value by leveraging the ideas of an open innovation network community. As Figure 9 presents different models it’s vital to mention that one’s own company can also benefit and profit from others using one’s own technology through open innovation. (Chesbrough 2003, 189)

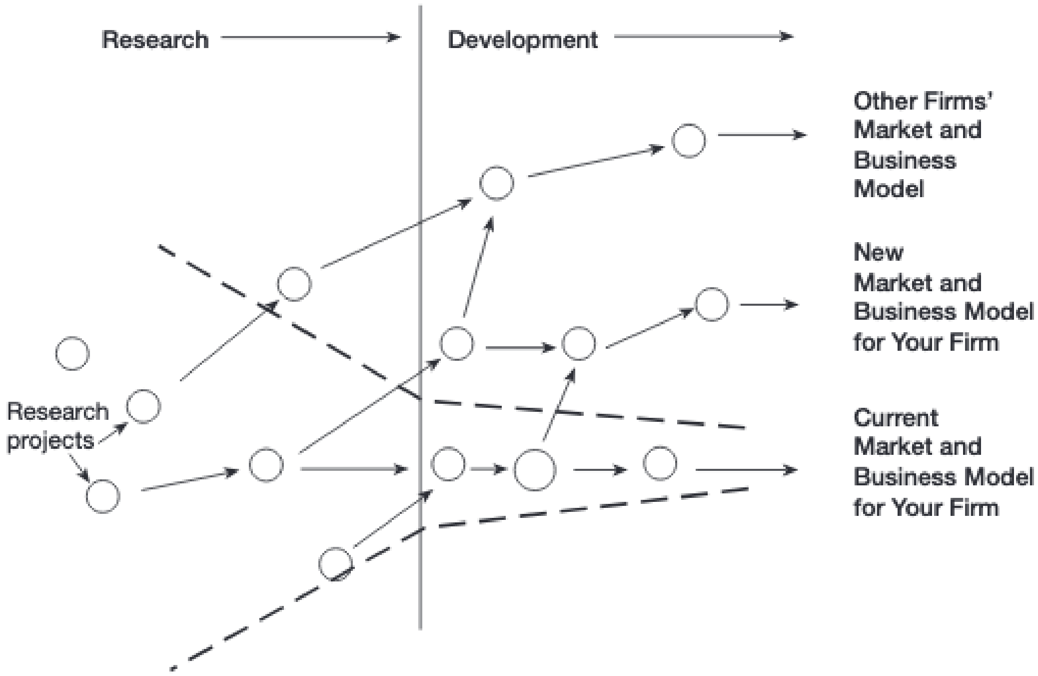

Figure 9. Open innovation business models (Chesbrough 2003, 189)

7.3 Adoption of innovations in a market failing environment

One of the goals of this master's thesis was to find out how customers adopt new innovations in a market-failing environment. This information provides the company with researched information to support decision-making for those customers to whom new product and service innovations are offered first. The results can also be used to target actions to the right functions to make customer adoption as efficient as possible.

Based on the data collected, it can be said that there were not very significant changes in customer adoption, but they were in line with the changes in the company's innovation activities. Despite the fact that no changes were made to the number of innovations to be published, the company felt it necessary to support the launch of new innovations by enhancing marketing communications (digitally) by emphasizing the cost-effectiveness. The company saw that it was important to emphasize the interaction between the price paid by customers and the added value offered by the solutions due to the intensified competitive situation, but also to accelerate the focus of customers' investments on larger entities.

The main customer adoption in terms of innovations concerned incremental products, ie improvements from the previous version, in an exceptional market situation. From the customer's point of view, the adoption of improved products was quite risk-free: the added value of the products in relation to the price of the product is well in line, and in general the same operating principle also applies to newer product variations. Customers' rapid adoption of incremental products was seen as accelerating if the customer had been cooperating with Company X for a long time and if efficiency of operations was felt to be important in the customer's own company. In addition to the factors mentioned above, customer acquisition’s (manager) technology orientation was seen to have a positive effect on rapid adoption.

Based on the findings of the semi-structured interviews, those customers who are first offered product and service innovations were divided into two groups in terms of adoption: at one extreme were customers who adopted innovations quickly and at the other end, customers did not adopt innovations at all due to market failure. Figure 10 represents the relationship between the speed of adoption and the effects of market failure.

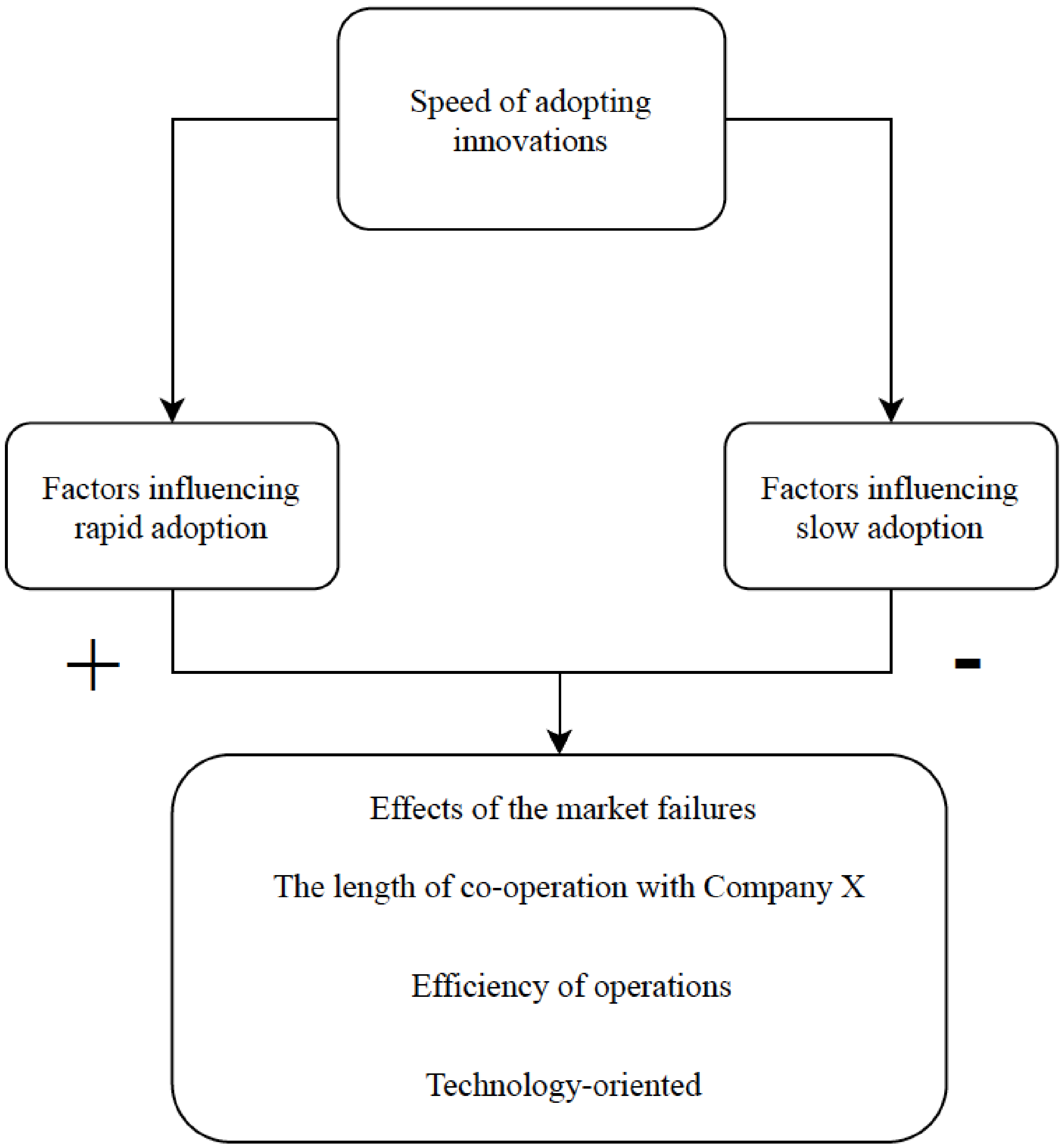

Figure 10. Speed of adopting innovations

7.4 Changes in customers' buying behaviour due to market failures

The second goal of this master's thesis was to form a picture for Company X of how changes in the company's business environment affect customers' buying behaviour and thus also the market position of Company X. By understanding the relationship between market failure and customer buying behavior, Company X is better able to respond to changing needs and allocate company resources to all the most relevant factors that support business.

Based on the data collected in the study, the changes in customers' purchasing behaviour are likely to be directly proportional to the way in which the effects of market failures have been reflected in the customer's own business. If the customer's business suffered as a result of the market failure, it was also very likely that purchases in the direction of Company X would start to decline. In these situations, customers also often tried to avoid binding and long-term contracts: when there is no certainty about the continuity of their own business, the trend is quite understandable.

Another clearly noticeable change in customers' purchasing behaviour was reflected in protracted decision-making processes and the shift of purchases to products required to conduct business. The so-called impulse purchases clearly decreased, although according to the interviews some customers saw that the market disruption was more psychologically influential, even if in reality the company's position was on a financially strong footing.

The industry in which Company X operates is very traditional in terms of sales and often customer meetings are physically carried out on site. However, due to the ongoing market failure in COVID-19 at the time of writing, Company X also had to make changes to its sales channels and operations, with a focus on digital channels. Larger business entities will continue to be handled physically by meeting, but remote meetings for smaller and geographically more distant customers are likely to remain as a practice. As the focus shifts to digital and less interactive activities, it is important that the company responds to the trend by allocating sufficient resources to marketing: it's also a good idea to analyze the time customers spend on the website and possibly new marketing tools that lead to impulse purchases to maintain a high level of customer engagement.

In the future, Company X could also consider ways to respond to the shift in larger investments, for instance how, in an unusual business environment the most commercially significant business activities could be maintained and put into practice. One viable option could be to take advantage of public organizations that support companies through various innovation and business development grants and, together with these organizations, run a campaign to make customer business more efficient with solutions provided by Company X and reciprocally lower the customer threshold to catch up larger investments. Such public organizations that provide support for business development include, for example, Business Finland and Center for Economic Development, Transport and the Environment.

Tailoring products and services could also aim to make it easier for customers to make decisions: larger packages offered by Company X could be broken down into smaller solutions, in which case the required initial capital would not be as large. The customer would be able to see the benefits of the solutions in their own operations and at the same time Company X would be able to “market” its solutions so that the customer would see what additional features or benefits they would get when switching to the “Full” version instead of using the “Light” version.

Gradually moving to a one-size-fits-all business model would no longer mean a customer-centric organization focusing on the market but upgrading its understanding to a model where each customer has their own market: each customer deserves exactly the parts of services (or products) they are willing to pay for and Company X’s job is to fulfill the customer's wish. Another fundamental factor that is critical to understand is related to timing: each customer wants a different offering at different times due to a different market situation. In the production of products or services, there should be an increasing shift towards modularity, and on the basis of these smaller areas, a solution that is best for the customer at the moment and in the market situation could be put together, which could be expanded later if needed. (Pine, 2011) There are numerous successful examples of modularity, and the simplest ones have been implemented using a product or service configurator found on the company’s website, where the customer can see what features and possible implementation options would be available.

7.5 Suggestions: how to diffuse innovations and secure business on times of market failure

In a market-distorting environment, it is extremely important to continue investing in innovation and thus in developing new products and services. The company's strategic choices and the seamless cooperation of the various functions must aim to lower the customer's purchase threshold, and thereby accelerate the spread and wider uptake of innovations.

In terms of new innovations, in the light of the results collected from the interviews, Company X had focused on publishing incremental product innovations at the time of the market failure. Despite this, the company had also recognized the emphasized importance of service innovations, and I would also like to highlight the impact of improved or new services on the sustainable engagement of customers. In a market-failing environment, services should be targeted primarily at those customers who have experienced the greatest losses in their business: in these companies, improving productivity in many areas could ultimately lead to increased profitability, which ultimately determines the company's life cycle. For service innovations, the required initial capital should be cut as small as possible or switch entirely to the so-called pay-as-you-go model.

Seamless collaboration of the company's internal functions would ensure the timeliness and modularity of the solutions offered to customers. Products or services need to better meet customer challenges, and here the collaboration between sales and marketing supports customer engagement in the long run. Based on the changes observed in customers' purchasing behavior, marketing should shift the focus to the promotion of so-called “consumer products”, as this will allow both parties to the business to secure their business. For larger entities, it would also be important to ensure continuity of sales, and here cooperation with public support organizations and company marketing would certainly work. The focus should be on those customers who have experience of working with Company X even before the market failure.

Based on research conducted in this master’s thesis, more and more customers transferred their purchases to the online store due to the COVID-19 pandemic, so in the future, the utilization of customer data will play a significant role as a basis for long-term cooperation. Data collected from customers should be used primarily to better target marketing, but also to promote new product and service innovations. By identifying trends in customers' purchasing behaviour, such as time spent on the website or products viewed there, it is possible, within the limits set by the GDPR, to make leads for sales staff to develop the business even further.

By developing the company's personnel and paying attention to the efficiency of the company's own processes, it is also possible to partially secure operating in an environment following a market disruption. Enhanced operations, combined with developed personnel and a strong product and service portfolio in terms of innovation, will certainly guarantee a sustainable market position, and thus also business success.

8 SUMMARY

The last chapter of this master’s thesis summarizes the results found in the literature and the research conducted. The primary objective of the work was to analyze how the adoption and buying behaviour of the most important customers of the company changes as a result of market failures. The section also discusses the limitations of the research conducted, as well as proposals for future research. Following Table 7 presents the answers to the research questions presented in the beginning of the study.

Table 7. Answers to the research questions

Research question	**Answer**
RQ 1: How market failures affect the adoption of product and service innovations?	- The effects of the market disruption on the adoption of product and service innovations largely depended on the effects experienced by the customer's own business - In addition, faster uptake of innovations occurred among customers who had a long customer relationship with Company X. - The main shift shifted to the adoption of incremental product innovations
RQ 2: How the buying behavior of customers change during market failures?	- Decision-making processes were lengthened, and larger and longer-term investments were avoided - Impulse purchases decreased, especially for customers whose own business had suffered
RQ 3: How do companies manage the innovation process during a market failure?	- Many companies continued to invest in innovation normally despite market failures - Uninterrupted innovation has a clear impact on success in a post-market failure business environment
RQ 4: How does the number of innovation change as a result of market failures?	- The number of innovations remained the same, but the main shift shifted to the development of incremental product innovations

The impact of innovation on a company's success can be enormous. This study showed that innovation in a market-distorted environment is a very complex phenomenon and the interactions between them can be challenging to identify. Based on the findings found in the literature, those companies that continued to invest fully in innovation even in a market failure situation fared well above the market average. Because the effects of market failures on the business of many companies are multidimensional, some companies reduced their investment in innovation, while some continued to do so normally (e.g., Company X covered by the study). For the company covered by the study, the number of innovations published remained at the same level as before the market failure, but the main focus shifted to the development of incremental product innovations. Part of the reason for the shift in focus was seen as a change in customers ’purchasing behaviour, where customers did not want to start learning new ways of operating daily business.

There were also clear changes in customers' purchasing behaviour due to the impact of market disruptions. Larger investments were postponed, and long-term and binding contracts were avoided, and purchases were targeted at products required to conduct business, with the share of services remaining smaller. The way customers bought changed to e-commerce, and as a result, company had to allocate more resources than before to develop a more interactive digital channel. The study also addressed the frequency of customers' purchases and thus sales to Company X, and the changes identified two customer groups as well as the adoption of innovations: if the customer's own business had suffered market failures, it was very likely that adoption slowed, and the frequency decreased.

Market failures tend to cause holistic changes in companies, and especially in innovative companies the role of change management is often only emphasized. Keeping staff up to date and securing jobs is probably the main responsibility of every business leader as the company is piloted forward in an unpredictable environment. Only by securing the company's personnel and business will it be possible to continue innovation on a sustainable and profitable basis also in the future.

Limitations and topics for further research

This master’s thesis deals with only a very small aspect of innovation management, and the adoption of innovation. When reading this master’s thesis, it is important to understand the limitations of thesis and generalizability: the thesis covered only one company, in one industry, and in the studies, four people were interviewed. By dealing with several companies in the same industry, the results of the thesis would certainly have been different as well.

With regard to future research, it would be interesting to look more closely at the factors influencing customer adoption, and it would be a good idea to include more companies in the same industry. Future research must combine both qualitative and quantitative research methods in order to study, for example, the rate of customer adoption in the light of actual figures. Based on the company's top management and possible customer and subcontractor interviews, the organization would gain a broader understanding of how the market failure and the company's operations in a market failure situation were perceived by customers. By interviewing customers who meet certain qualitative or quantitative criteria, a company could also get ideas for developing new product or service innovations.

It would also be valuable to study the measures taken by companies and their effects on lowering the purchase threshold for customers and accelerating the uptake of innovations. In this way, companies would be able to analyze and mirror the effectiveness of their own measures on the data studied. As said earlier, the topic of the work is very broad and multidimensional, and there are several possible ways of implementing future research: the complexity of the purchasing behaviour and industry as well as the adoption of the innovations brings its own challenges. The thesis also dealt with the effects of market failures in a very broad way, so in the future it would be important to address market failures by dividing them into specific categories (economic, social, etc.).

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Appendix 1. The themes and key questions of the interview.

First section – Introduction - 5 – 10 min

1. Experience with the company and academic background (if any)
2. What positions have you had with the company?

Second section – Markets during a crisis – 30 min

1. How would you describe the market your company is operating has changed during the times of crisis?
2. What changes you made within your company compared to normal situation?
3. How did your company manage to get over the crises?

Third section – Adoption of product and service innovations – 20 min

1. How many new product or service innovations do your company publish yearly?
2. Did the market failure affect on the number of new innovations? If, how?
3. Did you do some changes to the style you published the products?

Fourth section – Buying behaviour of customers during market failure – 20 min

1. Did you see any changes in the buying behaviour of customers during the crises? If, what?
2. How did your company adopt to those changes, if there were any?