Influence of digitalization on company value in retail

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Abstract

These days, it is essential to understand digitalization to grow your business and keep your business alive. One must know how to use digitalization to create value, especially in the field of retail. There is much existing literature on digitalization, but most of it only describes a single technology or gives a small hint on using it to create company value. Most literature concentrates on the technical part of digitalization or picks one technology and shows how it can be useful for your business. This thesis combines the different digitalization aspects and technologies and shows the influence digitalization has on retail company value.

This thesis collects a broad spectrum of literature with a technical background and a business background on digitalization and combines them. It also gives practical proof that digitalization has a positive influence on the company value in retail using statistics and stock prices.

In the end, this thesis demonstrates a process of how to change your business with the use of digitalization to create company value.

Even if digitalization is a broad area and implementation can be a lot of work, it is critical to stay competitive long term.

Contents

1 Introduction

Everyone talks about digitalization, and many companies are willing to implement it in the company and the business processes. In literature, you can find many definitions of what digitalization is and what it is not. There is also much literature that advises on implementing digitization in the right way and what you can do wrong.
Digitalization is a wide-ranging field, but there is little literature on the influence of digitalization on the company value, especially in retail. Digitalization can have a positive influence on the company value if implemented properly. This thesis aims to show the positive influence of digitalization on the company value in retail. It also shows the influence digitalization has on every part of the company, from the business model, strategies, and processes, influencing the company value. This thesis also proves the positive influence of digitalization on the company value via statistics and stock prices.
This thesis's scope is to collect information and give a good overview of digitalization and its influence on the company value. It also shows a process of how to make use of digitalization to increase the company value. It is a descriptive research and concentrates on how what, when, and where digitalization influences the company value. This thesis will not look closely at the question of why digitalization influences the company value.
Digitalization is a broad field because every industry and service provider uses it. That is why this thesis focuses on retail only. Another factor that focuses on retail is the big influence of digitalization on the company value in

this sector.
This thesis is divided into three main parts. The first part is about digitalization, the essential technologies behind digitalization, and what changes digitalization causes. The second part shows how digitalization changes business models and explains how essential technologies can have a positive influence on the company value creation process. The second part also shows statistics and stocks that prove the positive influence of digitalization. The third part shows a process that helps to deal with digitalization and shows how to implement digitization to create company value.

2 Digitalization

First, it will be defined what digitalization is. After that, the essential technologies for digitalization will be explained. Then the changes that come with digitalization will be shown. After that, it will be discussed what opportunities and threads that changes bring. At the end of this chapter, strategies for using these opportunities and preventing the threads will be revealed.

2.1 What is digitalization?

First we start by defining digitalization since the term digitalization is everywhere. You can read it in the newspaper, hear it in business talk or read it in business journals. Even renowned consulting companies such as BCG (Boston Consulting Group) or McKindsey write blogs and provide their knowledge about digitalization. But what is the definition and general meaning behind that term? Before we look at different definitions of digitalization it is important to distinguish between the term digitalization and digitisation. These two terms are often mixed in journals and other literature. The term digitisation according to Brennen[1] means the "material process of converting analog streams of information into digital bits". In this thesis we also define digitisation as the process of converting analog information into digital data. Now what does

[1] BRENNEN, J.; KREISS, D., (2016), pp. 1 sqq.

the term digitalization mean? The term digitalization has various definitions and they are more conceptual then the term digitisation. According to Kane[2] digitalization includes technologies such as analytic (predictive, based on big data), the Internet of Things, cloud and mobile technology, social media, additive manufacturing, virtual (augmented) reality, cognitive technology and security. In this thesis we define digitalization according to Hagberg[3] where he defines digitalization from the retailing perspective as: "digitalization refers broadly to the integration of digital technologies into retailing". Since this thesis concentrates on the retail branch we focus on Internet based technologies and digital technologies that build an interface between retailers and consumers. So digitalization is the integration of digital technologies.

Now the term Industry 4.0 will be defined. In the literature the term Industry 4.0 occurs also frequently but what is Industry 4.0 and what is the difference between Industry 4.0 and digitalization? Industry 4.0, referred to as the "Fourth Industrial Revolution", also known as "smart manufacturing", "industrial internet" or "integrated industry."[4] The major difference is that Industry 4.0 takes the concepts of digitalization and uses these technologies in the manufacturing and supply-chain area. It also adds new technologies which are specified for Industry such as 3D printing, human-computer interaction, intelligent agents and autonomous robots[5]. Several authors such as Hofmann[6] add also technologies such as block chain and distributed ledger systems to the term Industry 4.0. Other definitions of Industry 4.0 are that it is a concept that seems to be driven by integrated information-technology systems and the rendering of manufacturing systems more autonomous, flexible and

[2] KANE, G. et al., (2016), pp. 8 sqq.
[3] HAGBERG, J.; SUNDSTROM, M.; EGELS-ZANDÉN, N., (2016), pp. 694 sqq.
[4] ERIK, H.; MARCO, R., (2017), pp. 23 sqq.
[5] SRAI, J. S.; LORENTZ, H., (2019), pp. 1 sqq.
[6] ERIK, H.; MARCO, R., (2017), pp. 23 sqq.

configurable[7]. Or according to Lasi[8] it comprises concepts such as the smart factory, cyber-physical systems, self-organisation, new systems in distribution and procurement, and in product and service development, adaptation to human needs, and corporate social responsibility as an outcome of a greater degree of resource efficiency. So Industry 4.0 is a set of technologies which are used especially for Industrial purpose. Some of these technologies are derived from digitalization technologies and that is also the definition of what we use in this thesis.

2.2 The essential technologies

In this section, the main technologies that are important in digitalization will be discussed. As shown in figure 2.1 there are 8 main technologies which at the moment are the state of the art technologies to use[9].

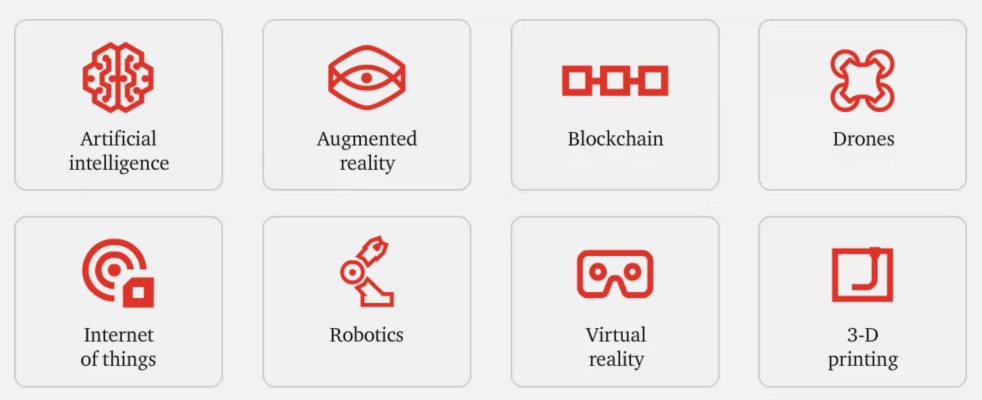

Figure 2.1: The essential technologies[10]

[7] MARTINA, F.; ANDREAS, R., (2016), pp. 1 sqq.
[8] HEINER, L. et al., (2014), pp. 239 sqq.
[9] https://www.pwc.com . (30-10-2020).
[10] https://www.pwc.com/gx/en/issues/technology/essential-eight-technologies.html

2.2.1 Artificial intelligence (AI) and big data

Artificial intelligence (AI)—"Intelligent systems created to use data, analyzis, and observations to perform certain tasks without needing to be programmed to do so"[11]. According to Boitnott[12] this technologies represents the most important technological development and it disrupts industries and companies when companies use it to create innovative new business models.
According to Lee[13] there are 2 types of AI technologies symbolic and neural.

According to Artur[14] symbolic AI had been the predominant paradigm among AI development approaches. It assumes that high-level representation of knowledge (symbol) and combinations of symbols can achieve human-like AI by performing reasoning in a manner similar to how humans express their thoughts and draw conclusions from deductive reasoning. Iwata[15] stated that symbolic AI includes any programming methods and systems that use symbols such as letters and numbers to encode a human's knowledge, rule-based operations, and determining policy. Symbolic AI can provide companies with competitive advantages by producing results that humans can interpret, predict, and use quickly. Although the degree of success they achieve as AI is controversial, expert systems represent the most well-known and widespread AI systems.

According to Schalkoff[16] a huge part of AI's explosive growth has been made possible with the contribution of machine learning. Technically, machine learning approaches involve using algorithms to improve learning performance on a specific task by relying on patterns generated from practice or sample

[11] ANTONESCU, M., (2018), pp. 15 sqq.
[12] https://www.inc.com/ . (30-10-2020).
[13] LEE, J. et al., (2019), pp. 44 sqq.
[14] ARTUR, S. et al., (2008), pp. 198 sqq.
[15] IWATA, K., (1988), pp. 23 sqq.
[16] SCHALKOFF, R. J., (1990), pp. 1 sqq.

data. Neural AI relies on an artificial neural network (ANN) or an aggregate of machine learning algorithms that work in sync to mimic the human brain to solve more complex problems and learn like neurons in a human brain. It enables computers to learn from data without being given explicit knowledge. Technically, machine learning approaches can be classified into three areas:

1 Supervised learning, that involves learning from correct answers (labeled data)
2 Unsupervised learning, defined as finding knowledge or information when given some raw data (unlabeled data)
3 Reinforcement learning that entails how agents in an environment take action to maximize their rewards

According to Oracle[17] big data contains greater variety arriving in increasing volumes and with ever-higher velocity. This is known as the three Vs. Put simply, big data is larger, more complex data sets, especially from new data sources. These data sets are so voluminous that traditional data processing software just can't manage them. However, these massive volumes of data can be used to address business problems you would not have been able to tackle before. Demir[18] mentioned that in today's world, big data is arguably important and often exploited for two main reasons. First, big data is utilized by companies for analytic purposes such as deriving useful insights about their businesses and supporting their higher-level decision making. Second, big data enables the development of applications and real-time services that leverage massive amounts of electronic data in order to present customers with value (e.g., intelligent services, efficiency, and entertainment) that would not be possible without the availability of such data. All big data applications have to be equipped with several capabilities such as visualizing and personalizing

[17] http://www.oracle.com . (30-10-2020).
[18] F.MUHTAROĞLU, et al., (2013), pp. 32 sqq.

data, integrating different sets of data, and exploring and analyzing data promptly. With big data, many innovative and value-added applications have become possible that were unlikely to be imagined using traditional data paradigms. Demir[19] also stated a few services that big data can provide:

- **Location-Based Services:** The large availability of location data due to GPS enabled devices such as smartphones has made many innovative applications possible. Smart routing applications use big amounts of data from vehicles en route and other sources to estimate the traffic conditions and direct their users accordingly. This service can be used in the retail area when the company wants to open a new store and looks for the best place, it can use the data to see where the most traffic is or the most people meet.
- **Price comparison services:** Innovative big data applications offer pricing information on products from different retailers. For example, RedLaser (www.redlaser.com) allows customers to scan the bar code of a product using their smartphones and obtain price comparisons for the product, together with other product information.
- **Recommender Systems and the communities:** An application in the retail industry may recommend products a user may be interested in based on the user's previous purchases. In some applications, companies co-create value with the community of customers. For example, community ratings for local businesses. The communities provide the basis for these applications. At the same time, individual customers also benefit from the community's infromation that would not be possible without the formation of such a community.

[19] F.MUHTAROĞLU, et al., (2013), pp. 32 sqq.

2.2.2 Augmented reality (AR)

Augmented reality can be used in various ways in retail. Here a few ways will be shown, and it will also be discussed what AR is. Kleff[20] defines Augmented reality (AR) as a technique that combines a live view in real-time with virtual computer-generated images, creating a real-time 'augmented' experience of reality. According to Azuma[21] Augmented reality can be thought of as the "middle ground" between Virtual Environments (completely synthetic) and Telepresence (completely real). More formally, augmented reality is considered to include the following three characteristics:

- Combines real and virtual
- Is interactive in real-time
- Registers in 3-D

Hayes[22] stated that it is possible to use Augmented Reality on devices like:

- Mobile devices with inbuilt cameras such as iPhone, DS Lite, PSP or Android
- A head-mounted display HMDs (eg., glasses or futuristic contact lenses) attached to a wearable networked computer
- A PC or Mac with a webcam
- A games console with a camera accessory
- A large TV screen with advanced Set Top box and Webcam

After you see that Augmented Reality can be used on various Devices the question is how can you use Augmented Reality in retail. Gurd[23] found 4 main areas where this technology can be used:

[20] KLEEF, N.; SPOEL, J. N., (2010), pp. 1 sqq.
[21] AZUMA, R. T., (1997), pp. 355 sqq.
[22] HAYES, G., (10-09-2020), pp. 2017 sqq.
[23] http://econsultancy.com/ . (30-10-2020).

- A store item-finder app overlay on a store's map
- Advertisements on mobile phones based on a person's location (which also raises the question of whether this is Augmented Reality or not, see the question raised above)
- Customer reviews on shop items shown in stores
- Getting reviews on shop items by scanning a bar code in-store with a mobile phone. Modeling of clothes by people at home, making internet purchasing of clothes easier. Generation of 3D models of rooms and furniture enabling a.o. stylists to style the room

2.2.3 Blockchain

In this section blockchain blockchain and how it works will be expained. According to Zhi[24] blockchain is a novel decentralized infrastructure and distributed computing paradigm that takes chained data structure for verification and storage and uses distributed consensus algorithms to generate and update data. It adapts cryptology methods to protect data transmission and access, it applies automated script-based smart contract to operate rules and data. Coinmama[25] explains that blockchain provides a decentralized digital database of transactions, also known as a distributed ledger, which is maintained and updated by a network of computers that verify a transaction before it is approved and added to the ledger. It allows transacting parties to exchange ownership of digitally represented assets in a real-time and immutable peer-to-peer system without the use of intermediaries. Figure 2.2 illustrates the six steps of asset exchange between two economic actors using blockchain technology. When a transaction between two parties is about to take place (Step 1), it is first converted into a hashed transaction proposal and

[24] ZHI, L. et al., (2018), pp. 1 sqq.
[25] https://www.coinmama.com . (30-10-2020).

stored as a candidate to be printed on the ledger. This proposed transaction includes basic information such as date/time, sender, receiver, asset type, and quantity. The proposed transaction is provided with a unique cryptography signature that ensures the integrity and authenticity of the record (Step 2) and then broadcast to a network of distributed computers for processing and authentication (Step 3). These computers process and authenticate the transaction (Step 4) and, once authenticated, the transaction is added to the digital ledger (Step 5), which completes the asset transfer between the two parties (Step 6). Each new transaction is linked to those recorded previously, providing a complete, irreversible, and verifiable history of all transactions ever made on this blockchain.

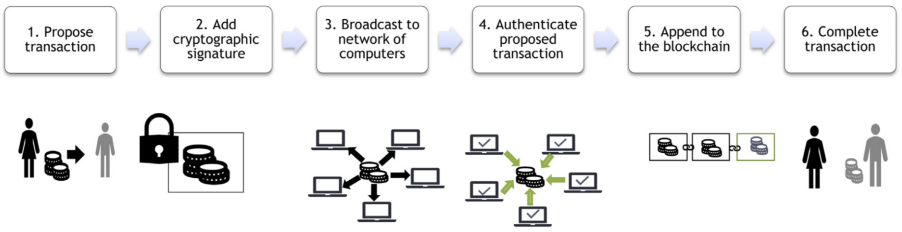

Figure 2.2: What is blockchain[26]

[26]https://doi.org/10.1016/j.bushor.2019.01.009

2.2.4 Drones and other unmanned aerial system (UAS)

This section shows drones and other unmanned aerial system and what is the state of the art use. It also shows how the delivery process is working and where drones already in use in the retail section. Pleass[27] describes drones also known as an "unmanned aerial vehicle" (UAV), a drone is an unpiloted aircraft or spacecraft. Drones can be operated remotely by a person or they can be controlled intelligently by computers, or in most cases, a combination of both. Retailers worldwide are intensely pursuing approaches to enable faster last-mile delivery. Delivery drones represent arguably the most encouraging technological innovation towards this goal. Emerging technologies such as drone delivery services enable retailers to cost-effectively offer unprecedented delivery speed and adaptable delivery lead times using dedicated aerial vehicles for individual orders. On the one hand, the ability to reach customers faster than through traditional means argues for more centralization of delivery services. On the other hand, more decentralization can allow the retailer to offer hitherto unheard-of delivery lead times and thereby spur demand.
Current state-of-the-art delivery systems are already fast and adaptable. A good example is Amazon Prime Now, with its one-hour delivery guarantee in select markets. With drones, deliveries are expected to be even faster; e.g., in less than 30 minutes. Other drone delivery projects, including parcel delivery systems by Swiss Post, Deutsche Post DHL (DHL Parcelcopter), China's JD.com, Japan's Rakuten, and Canada's Drone Delivery Canada (DDC) are not far behind the leaders[28].
Balaban[29] explains a possible delivery drone process. Figure 2.3 shows the process where a product is loaded onto a drone after a customer places an order and a business prepares the order. This can take different amounts of

[27] https://supplychaingamechanger.com . (30-10-2020).
[28] http://www.dronezon.com . (30-10-2020).
[29] BALABAN, M.; MASTAGLIO, T.; LYNCH, C., (2016), pp. 1595 sqq.

time depending on the availability of business resources and the availability of drones. A loaded drone ascends to a prescribed altitude and flies to the customer along a route. Upon arrival at a customer's location, the drone descends and sends a notification to the customer. When the customer is ready to receive the product at the landing location, the drone lands and releases the product. Next, the drone ascends to the designated altitude and flies back to its business's location where it descends again. Then, depending on the type of drone, the drone is recharged or its batteries are swapped.

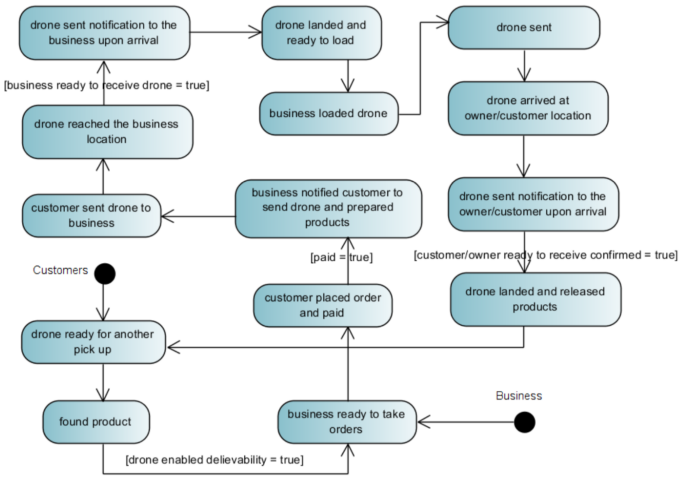

Figure 2.3: Drone delivery process[30]

Now we know what drones are and how the delivery process works. The next important technology which will be explained is Internet of things.

[30]https://doi.org/10.1109/WSC.2016.7822209

2.2.5 Internet of things (IoT)

Another big area in digitalization is Internet of things which will be explained now. Abdmeziem[31] stated that the internet of Things (IoT) is an integrated part of Future Internet. According to the agreed protocol, any article can be connected and talk to each other. This can be achieved through a vast number of methods and technologies, including radio frequency identification (RFID), near field communication (NFC), infrared (IR) sensors, and many more. The IoT paradigm is a result of the convergence of three main visions: internet-oriented (middle- ware), things oriented (sensors) and semantic-oriented (knowledge) Another definition by Yoo[32] is that physical objects gain characteristics of digital technology with the addition of a digital aspect. As such, physical objects are then capable of being programmable, addressable, communicable, and sensible. According to Hui[33] firms are not only selling goods to buyers, but also providing platforms upon which users can add value upon. In a connected world, products are no longer one-and-done. New features and functionality can be pushed to the customer on a regular basis. Customer behavior can be tracked, and products can now be connected with other products, leading to new analytic and new services for more effective forecasting, process optimization, and customer service experiences. The second part of this master thesis showns how company value can be created with the Internet of things.
Now you know more about the possibilities of IoT. The next topic will be robotics which is a very important topic in retail.

[31] ABDMEZIEMAND, R.; TANDJAOUI, D., (2014), pp. 1 sqq.
[32] YOO, Y.; LYYTINEN, K.; BOLAND, R., (2010), pp. 1 sqq.
[33] https://hbr.org/ . (30-10-2020).

2.2.6 Robotics

According to Britannica[34] robotics is the design, construction, and use of machines (robots) to perform tasks done traditionally by human beings. Robots are widely used in such industries as automobile manufacture to perform simple repetitive tasks, and in industries where work must be performed in environments hazardous to humans. Many aspects of robotics involve artificial intelligence; robots may be equipped with the equivalent of human senses such as vision, touch, and the ability to sense temperature. Some are even capable of simple decision making, and current robotics research is geared toward devising robots with a degree of self-sufficiency that will permit mobility and decision-making in an unstructured environment.

Underwood[35] figured out three main areas of use for robotics in retail:

- In-Store Customer Service
- Using Robots to Manage Stores like Warehouses
- Bringing the Store to the Customer

In-Store Customer Service

One way retailers plan to test robots in stores is to help customers find goods they are searching for, like a rolling kiosk to look up products and other information. Home improvement retailer Lowe's introduced the LoweBot in 2016 at its stores in San Francisco. Customers can ask LoweBot—by speaking or using a touch screen—where to find items they need inside the store. Shoppers can also ask the robot some basic customer service questions that would otherwise need to be addressed to a human worker. The robot also performs real-time inventory tracking as it cruises down the aisles. The information

[34]https://www.britannica.com/ . (30-10-2020).
[35]https://emerj.com . (30-10-2020).

LoweBot gathers as it works is supposed to help identify shopping patterns at the location, so that way the retailer can not only resupply its shelves but also get more understanding of which merchandise moves more quickly, and during which days of the week or seasons.

Using Robots to Manage Stores like Warehouses

Chloe, the roboter from retailer Best buy, has a robotic arm built on a chassis that moves among shelves in an area set behind a clear partition. Customers can use touch screens in the store to pick out merchandise they want, such as earbuds, movies, video games, or other accessories. Shoppers can then watch the arm navigate the shelves to retrieve their products. The Chloe system lets customers make purchases without the need for an employee (as long as it functions properly.) Also, by shelving merchandise vertically, this system opens up about 1,000 sq. ft. of floor space in the store, according to PaR Systems. Like other robotic systems, Chloe tracks shopping trends, which can be used to refresh inventory.

Bringing the Store to the Customer

Dominos announced plans to introduce a driverless vehicle, the Domino's Robotic Unit (DRU), in Australia to deliver its pizzas. The idea is to use GPS data Domino's gathered over the years from its human drivers, and combine that with an automated vehicle to make delivery rounds.

2.2.7 Virtual reality (VR)

This section descripes what virtual reality is, how it functions and how you can use this technology in retail. According to Biocca[36] Virtual Reality (VR) allows for the reconstruction of physical objects and spaces through their digital

[36] BIOCCA, F., (1992), pp. 334 sqq.

representation Wolfinbarger[37] stated that individuals are usually immersed in the digital environment through a headset, with the relevant implication that they need not physically share the same space with the objects or the environment reconstructed through VR.

How VR Improves Online Shopping Experiencesr

Antiycip[38] shows the improvements with VR in retail. First VR lets customers take their shopping experience outside of the store. It's an extension of online shopping, though this leap allows shoppers to experience the products, not just see them. Second with more people using the internet to do their shopping online, it's important to still give customers a reason to physically come into the store. For many, shopping can be dull and more like a chore than a fun, personal experience. VR can change this point of view. It lets customers engage with brand and products in a whole new way. It's especially convenient when the product in question is large or cumbersome, like a car. Lexus is one of many car manufacturers using VR let potential buyers to test drive the car without even leaving the showroom. Third VR's presence in retail goes beyond its inclusion in-store; it can be used for research purposes before the general public are even involved in the process. Marketing psychology has a new tool in its repertoire with VR – planning stores doesn't have to be guesswork when you can trial potential layouts before you build them. Displaying various products and services through VR can let you understand whether your proposed ideas will be successful before they are released into physical stores. It lets you as a business owner understand what individuals expect and how they want to interact with your brand. BMI[39] found out that a well-established stream of literature has addressed escapism, enjoyment, and efficiency in terms of, respectively, hedonic and utilitarian shopping

[37] WOLFINBARGER, M.; MARY, G., (2001), pp. 34 sqq.
[38] https://steantycip.com/ . (30-10-2020).
[39] https://bmilab.com/ . (30-10-2020).

orientations, which have been conceptualized as the experiential and the goal-oriented sides of Virtual Reality (VR) and it is also largely associated with a positive potential in terms of both higher efficiency and higher escapism for the consumer. Whereas previous research demonstrated the importance of consumers' hedonic and utilitarian shopping orientations in traditional channels, studies also examinens the potential of a VR store to elicit hedonism and utilitarianism. Combining literature on VR, shopping orientation, and retailing, we develop a multiple moderated mediation model. Then, in a quasi-experimental between-subjects design, we measure levels of hedonism, utilitarianism, store satisfaction, and perceived assortment size. Participants were exposed to the same shelf in a VR based and a physical store. We found that VR has a negative influence on satisfaction that is moderated by perceived assortment size, and that VR elicits both utilitarianism and hedonism, which mediate the influence of the channel on store satisfaction differently but equally. Overall, consumers reported high levels of all measured outcome variables after being exposed to the VR experience. In addition, behaviors in the VR-based and physical stores compare quite well.

2.2.8 3D Printing

This section explains the process of 3D printing and show four key ways to use it in retail. According to BMI[40] 3D printing, or additive manufacturing, is a process where a three-dimensional object is manufactured by adding layers of a material under computer control. Objects are produced using digital model data from a 3D or CAD model or another electronic data source file. The computer controls an inject printer, which deposits a binder material into a powder bed, layer by layer.

Diamandis[41] found 4 ways to use 3D printing that will reshape retail

1. The End of the Supply Chain: With 3D printing, retailers can now purchase raw materials and print inventory themselves, either at warehouses or in the retail outlet. This means the end of suppliers, manufacturers, and distributors.
2. The End of Waste: Okay, maybe not the complete end of waste, but as consumers increasingly prefer eco-friendly products and retailers look to minimize materials cost, the exactitude of 3D printing is a ready-made solution.
3. The End of the Spare Parts Market: If you're a farmer in Iowa and your tractor breaks during harvest time, waiting a few days for a spare part could jeopardize the entire season. A 3D printer solves this problem. And it'll solve the same problem for everything from coffee makers to skateboard wheels. This doesn't just mean an end to the spare parts business, it also means a new level of longevity for the products we purchase.

[40] https://bmilab.com/ . (30-10-2020).
[41] https://singularityhub.com . (30-10-2020).

4. The Rise of User-Designed Products: Sure, there will always be some version of Apple in the market—an uber design-centric company pushing out products so slick they always find a buyer. Yet, for everything from fashion to furniture, 'customer-designed' will replace 'designer-designed' as the new standard

After describing the essential technology, the influence these technologies have on the company value and its changes will be shown. The second part of this thesis it shows how these technologies can be used to create company value.

2.3 Changes with digitalization

This section discusses what will change with digitalization. This section explains first the different changes retail has to handle and than explains each change in detail. These changes have a positive influence on the company value because they ensure that factors that increase company value like sales, revenue increase or customer satisfaction rate improve. The next section shows the opportunities and threats which the changes provide.

2.3.1 Retail

In this section the major changes in retail are listed. Integrating digital technologies into retailing means that previously existing activities, processes, actores will be slightly transformed and also new types of products and services will be introduced. It is also important to know that digital transformation is on-going. That means that it has no clear beginning or end and

it will evolve in time. What Moisander[42] once said about the information society is equally applicable to digitalization: it is "not merely something that is imposed on people and organizations but something that people and organizations "do" and produce themselves through everyday practice and social interaction". In retailing digitalization is not a new phenomenon. Since the 1970s digital systems such as electronic cash systems, barcodes, point of sale date, EDI with suppliers were implemented but these changes were relatively invisible for the consumer. Today digitalization also means that the consumer is seriously involved and has changed consumer behaviour. Hagbergs[43] Integration of digitalization in the retail branch can change everything from processes to the behaviour of people.

2.3.2 Competition

In this section the change with digitalization in competition are specified. Mckinsey shows seven trends (seven forces at work) that could redefine competition: According to McKinsey[44] there are seven forces that change competition and give life to new sets of competitors.

1. New pressure on prices and margins

Digital technologies create near-perfect transparency, making it easy to compare prices, service levels, and product performance: consumers can switch among digital retailers, brands, and services with just a few clicks or finger swipes. This dynamic can commoditize products and services as consumers demand comparable features and simple interactions. Third parties have jumped into this fray, disintermediating relationships between companies and

[42] JOHANNA, M.; PÄIVI, E., (2006), pp. 257 sqq.
[43] HAGBERG, J.; SUNDSTROM, M.; EGELS-ZANDÉN, N., (2016), pp. 694 sqq.
[44] https://www.mckinsey.com . (30-10-2020).

their customers. The rise of price-comparison sites that aggregate information across vendors and allow consumers to compare prices and service offerings easily is a testament to this trend. In Europe, chain retailers, which traditionally dominate fast-moving consumer goods, have seen their revenues fall as customers flock to discounters after comparing prices even for staples like milk and bread. These dynamics create downward pressure on returns across consumer-facing industries, and the disruptive currents are now rippling out to B2B businesses.

2. Competitors emerge from unexpected places

Digital dynamics often undermine barriers to entry and long-standing sources of product differentiation. At the same time, the expense of building brands online and the degree of consumer attention focused on a relatively small number of brands are redrawing battle lines in many markets e.g. the japanese web retailer Rakuten is using its network to offer financial services. New competitors can often be smaller companies that will never reach scale but still do a lot of damage to incumbents. In the retailing industry, for instance, entrepreneurs are cherry-picking subcategories of products and severely undercutting pricing on small volumes, forcing bigger companies to do the same.

3. Winner-takes-all dynamics

Digital businesses reduce transaction and labor costs, increase returns to scale from aggregated data, and enjoy increases in the quality of digital talent and intellectual property as network effects kick in. The cost advantages can be significant: online retailers may generate three times the level of revenue per employee as even the top-performing discounters.

4. Plug-and-play business models

As digital forces reduce transaction costs, value chains disaggregate. Third-party products and services—digital Lego blocks, in effect—can be quickly integrated into the gaps. Amazon, for instance, offers businesses logistics, online retail "storefronts," and IT services. For many businesses, it may not pay to build out those functions at competitive levels of performance, so they simply plug an existing offering into their value chains.

5. Growing talent mismatches

Software replaces labor in digital businesses and computers increasingly performing complex tasks as well. Even knowledge-intensive areas are susceptible to challenge by machines. Digitization will encroach on a growing number of knowledge roles within companies as they automate many frontline and middle-management jobs based upon synthesizing information for C-level executives. At the same time, companies are struggling to find the right talent in areas that can't be automated. Such areas include digital skills like those of artificial-intelligence programmers or data scientists and of people who lead digital strategies and think creatively about new business designs. A key challenge for senior managers will be sensitively reallocating the savings from automation to the talent needed to forge digital businesses.

6. Converging global supply and demand

Digital technologies know no borders, and the customer's demand for a unified experience is raising pressure on global companies to standardize offerings. In B2B markets from banking to telecommunications, corporate purchasers are raising pressure on their suppliers to offer services that are standardized across borders, integrate with other offerings, and can be plugged into the purchasing companies' global business processes easily.

7. Relentlessly evolving business models—at higher velocity

Digitization isn't a one-stop journey. It continuously needs to evolve and may shift from one strategy to a total different strategy. The velocity of adapting strategies is much faster in the digital age.

Now that we know the seven forces that could redefine competition the company needs to make decisions which consider this seven forces. Mckinsey gives a good overview over six strategic decisions which have to be considered. This 6 strategic descision will be discoused in the Opportunities an Thread section 2.4.1 .

2.3.3 Communication, transaction and distribution

The changes in the three main channels: communication, transaction and distribution are: Communication is the access and exchange of information while transaction includes the transfer of ownership and the monetary transaction. Distribution is the physical and tangible exchange of products.

Communication channel

This paragraph shows how communication has changed. According to Hagberg[45] many retail chains established e-commerce sites in addition to the fixed stores since the rise of the Internet. This was so-called multi-channel retailing. At the moment the focus is more on omni-channels which means that the focus is on customers and on providing them with the ability to move between channels seamlessly during one integrated purchasing process. In the communication between the consumer and the retailer there are several forms of changes. In direct communication, examples are loyalty programmes and digital coupons. The more important changes are in the communication

[45] HAGBERG, J.; SUNDSTROM, M.; EGELS-ZANDÉN, N., (2016), pp. 694 sqq.

through social media or various forms of third-parties. Third-parties allow the consumer to access information of price and so it is easy for the consumer to compare prices among different retailers. The consumer not only have access to price information there are also third parties which provide information about quality, ethical considerations and environmental impacts.

Tansactions

This paragraph shows how the ordering process and the paying process has changed. Hagberg[46] discovered that these days the ordering process can be conducted fully online instead of order by mail or phone and also purchased in a fixed store. With digitalization there are tools that help the consumer navigate through stores. Digital technologies for payment has also increased in the last few years. Now you can not just pay online or in store with a credit and debit card. It is also possible to pay with your mobile phone.

Distribution

In the distribution area a severe change happened with music and movies. While originally you had to buy a physical product in store, now all music and movies are digitized and you can either buy it online and download it as mp3s or you can stream it directly through the internet. Also a new way of distribution is the "click-and collect" or also called "click-and-drive" system. In this system you order online e.g. groceries and the store collects it for you and then you can pick it up at a collection point[47].

[46] HAGBERG, J.; SUNDSTROM, M.; EGELS-ZANDÉN, N., (2016), pp. 694 sqq.
[47] HAGBERG, J.; SUNDSTROM, M.; EGELS-ZANDÉN, N., (2016), pp. 694 sqq.

2.3.4 Settings

This section shows the different settings a customer use to buy goods. Before the digital area the customer had to go to a fixed store to buy goods and most of the time the customer had to deliver this goods home by himself. At the beginning of the digital area there was the proliferation of online stores which was possible because of the increased use of PCs in consumer homes. The use of digital technologies at home has increased dramatically in the last few years. We now use innovations such as television technology, mobile devices, smartphones and tables. These new devices provide an increase of communicative capabilities. One influence in retailing on the company value is e.g. home automation and the ability of devices at home, such as refrigerators, that "talk" to grocery retailers or to populate the consumer's shopping list. After the change from the fixed store to an online store used from the home computer there are two new settings for retailing at the moment. The first setting change is, with the help of mobile devices, where the consumer can order goods, search for information or make payments everywhere he wants e.g at the bus or tram when commuting. The second setting change emerged with multi- or omni-channel retailing which brought new retail locations in addition to the fixed store or home delivery. Such changes are secure lockers, collection points, pick-up stations and delivery points[48]. According to Dengri[49] another new concept in settings that digitalization enabled is "digital virtual places" and "digital virtual consumption", such as online auctions and game worlds, spaces that combine both material and imaginary elements.

[48] HAGBERG, J.; SUNDSTROM, M.; EGELS-ZANDÉN, N., (2016), pp. 694 sqq.
[49] DENEGRI, J. K.; MOLESWORTH, M., (2010), pp. 56 sqq.

2.3.5 Products and services

This section shows how the product changes and what new products are available. Till now many products have been digitized, such as music or movies. The digitisation will continue to expand in the next few years. That means more and more products are available digital. And also the devices get more functionality and a connection to a network. Although many products will be digital, the material aspects remain also an important part of retailing. E.g. If you want to listen to music you need a mobile device that has mp3 files on it or streams the music, and you also need earphones. Since the material aspect remains and the virtual aspect grows, digitalization helps to use the virtual aspect as an opportunity[50].

2.3.6 Customer behaviour

This section shows how digitalization changed customer behaviours. According to Hagberg[51] digitalization not only changes the behaviour of the customer but it also blurs boundaries between retailing and consumption. "Digitalization entails transformation in the various ways in which production and consumption interrelate."The blurring of the boundaries takes place because digitalization opens new opportunities to connect businesses, employees and consumers. In retailing there are examples of activities where the consumer takes actions which before were performed by the retailer so the consumer can become co-producer and co-creator. Examples where the consumer becomes co-producer in an retail environment are banking(e.g. Internet banking) and grocery shopping (e.g. self-scanning and self-checkout). An Example of

[50] HAGBERG, J.; SUNDSTROM, M.; EGELS-ZANDÉN, N., (2016), pp. 694 sqq.
[51] HAGBERG, J.; SUNDSTROM, M.; EGELS-ZANDÉN, N., (2016), pp. 694 sqq.

co-creator is mass customization[52].
Customers also expect the same smooth experience in a retail store as they do when shopping online, and vice versa. Moreover, they are less accepting of bad experiences; one survey found that 89 percent of consumers began doing business with a competitor following a poor customer experience. On the flip side, 86 percent said they were willing to pay more for a better customer experience[53]. This mindset is what enables companies to go beyond what's normal and into the extraordinary. E.g. if online retailer Zappos is out of stock on a product, it will help you find the item from a competitor. Little wonder that 75 percent of its orders come from repeat customers[54]. With digitalization the customer satisfaction can be improved and complaints from customers can be handled faster. But why is customer satisfaction in days of digitalization so important? Oracle[55] conducted a study about the relation between customers and brands.The study reveals facts about what consumers are looking for from a brand, how quickly they will dump a favorite brand, and their tendency to seek retribution after a breakup.

The study shows 4 very important facts about the customer behaviour: 86 percent of consumers will pay more for a better customer experience. 89 percent of consumers began doing business with a competitor following a poor customer experience 79 percent of consumers who shared complaints about poor customer experience online had their complaints ignored. 50 percent of consumers give a brand only one week to respond to a question before they stop doing business with them.

[52] SORESCU, A. et al., (2011), pp. 3 sqq.
[53] http://www.oracle.com . (30-10-2020).
[54] https://www.mckinsey.com/ . (30-10-2020).
[55] http://www.oracle.com . (30-10-2020).

2.3.7 Pricing and marketing

This section shows the major changes in pricing and promotion that comes with digitalization. According to Hiagberg[56] prices and pricing are parts of the offering that may change considerably with digitalization. Digitalization offers different opportunities in pricing. The price can still be based on a single unit or there can be a model that provides subscription or dynamic pricing. In the previous section we discussed the change of the customer behaviour and with that change marketing needs to be adopted. With digital marketing operations you can close the gap between what the customer expects and what they get. These days it is hard to keep the pace of business with the evolving consumer behaviour and the marketing landscape. With digital marketing operation it should be possible that the brands not just connect with the customer but also shape their interaction. According to McKinsey[57] marketing effectiveness can improve 15 to 25 percent, measured by return on investment and customer-engagement metrics. To achieve an improvement McKinsey developed five steps to bring marketing operations into the digital age.We will discuss these five steps in the Marketing opportunities section 2.4.2. But before we need some basic knowledge about digital marketing operations. "It involves the application of capabilities, processes, structures, and technologies to cost-effectively exploit and scale the interactivity, targeting, personalization, and optimization of digital channels. As the example of the consumer-products company shows, marketing operations have a critical role in driving bottom-line growth. That capability directly enables the speed, agility, iterative development, experimentation, and responsiveness that successful companies need to react to and shape the marketplace."

[56] HAGBERG, J.; SUNDSTROM, M.; EGELS-ZANDÉN, N., (2016), pp. 694 sqq.
[57] https://www.mckinsey.com/ . (30-10-2020).

2.4 Opportunities and Threads

This section discusses the opportunities and threats that digitalization offers to have a posiviv influence on the company value. The second part of this thesis discusses how company value can be created using this opportunities.

2.4.1 Competition

In the section change in competition 2.3.2 seven forces that redefines competion by McKinseys was shown. This section will discuss six reactions and decisions which can be made to the change of the competition[58].

Decision 1: Buy or sell businesses in your portfolio

The growth and profitability of some businesses become less attractive in a digital world, and the capabilities needed to compete change as well. Consequently, the portfolio of businesses within a company may have to be altered if it is to achieve its desired financial profile or to assemble needed talent and systems. Beauty-product and fragrance retailer Sephora recently acquired Scentsa, a specialist in digital technologies that improve the in-store shopping experience. (Scentsa touch screens access product videos, link to databases on skin care and fragrance types, and make product recommendations.) Sephora officials said they bought the company to keep its technology out of competitors' reach and to help develop in-store products more rapidly. On the other hand companies that lack sufficient scale or expect a significant digital downside should consider divesting businesses.

[58] https://www.mckinsey.com/ . (30-10-2020).

Decision 2: Lead your customers or follow them

Digital efforts risk cannibalizing products and services and could erode margins. Yet inaction is equally risky. In-house data on existing buyers can help incumbents with large customer bases develop insights (for example, in pricing and channel management) that are keener than those of small attackers. Brand advantages too can help traditional players outflank digital newbies.

Decision 3: Cooperate or compete with new attackers

A large incumbent in an industry that's undergoing digital disruption can feel like a whale attacked by piranhas. While in the past, there may have been one or two new entrants entering your space, there may be dozens now—each causing pain, with none individually fatal. PayPal, for example, is taking slices of payment businesses, and Amazon is eating into small-business lending. Companies can neutralize attacks by rapidly building copycat propositions or even acquiring attackers. However, it's not feasible to defend all fronts simultaneously, so cooperation with some attackers can make more sense than competing. Digital technologies themselves are opening pathways to collaborative forms of innovation.

Decision 4: Diversify or double down on digital initiatives

As digital opportunities and challenges proliferate, deciding where to place new bets is a growing headache for leaders. Diversification reduces risks, so many companies are tempted to let a thousand flowers bloom. But often these small initiatives, however innovative, don't get enough funding to endure or are easily replicated by competitors. One answer is to think like a private-equity fund, seeding multiple initiatives but being disciplined enough to kill off those that don't quickly gain momentum and to bankroll those with genuinely disruptive potential. The alternative is to double down in one area,

which may be the right strategy in industries with massive company value at stake.

Decision 5: Keep digital businesses separate or integrate them with current non digital ones

Integrating digital operations directly into physical businesses can create additional company value—for example, by providing multichannel capabilities for customers or by helping companies share infrastructure, such as supply-chain networks. However, it can be hard to attract and retain digital talent in a traditional culture, and turf wars between the leaders of the digital and the main business are commonplace.

Decision 6: Delegate or own the digital agenda

Advancing the digital agenda takes lots of senior-management time and attention. Customer behavior and competitive situations are evolving quickly, and an effective digital strategy calls for extensive cross-functional orchestration that may require CEO involvement. Faced with the need to sort through functional and regional issues related to digitization, some companies are creating a new role: chief digital officer (or the equivalent), a common way to introduce outside talent with a digital mind set to provide a focus for the digital agenda. Walgreens, a well-performing US pharmacy and retail chain, hired its president of digital and chief marketing officer (who reports directly to the CEO) from a top technology company six years ago. Her efforts have included leading the acquisition of drugstore.com, which still operates as a pure play. The acquisition upped Walgreens' skill set, and drugstore.com increasingly shares its digital infrastructure with the company's existing site: walgreens.com.

Alternatively, CEOs can choose to "own" and direct the digital agenda personally, top down. That may be necessary if digitization is a top-three agenda

item for a company or group, if digital businesses need substantial resources from the organization as a whole, or if pursuing new digital priorities requires navigating political minefields in business units or functions.

2.4.2 Pricing and marketing

This section shows the opportunities pricing and marketing can have if used properly. According to Gewal[59] there are a lot of changes and opportunities in pricing and promotion. They focused on the opportunity digitalization can have on the price. As shown in Figure 2.4 they group the innovations based on their relevance to three questions:

- **whom** to target?
- **what** promotions and pricing models to use?
- **how** design elements can increase the effectiveness of these promotions?

These three questions use different activities and digital technologies.

Research Area 1: Whom to Target?

Retailers normally have loyalty programs in which they collect and mine data of the buying behaviour of the customers. With this data they can use online analytic tools to provide special discounts and promotion for every customer. Another way to offer special discounts and customized promotions is to use the purchase history data of a customer in the online store. Since mobile internet users are growing rapidly mobile marketing is becoming increasingly important in retailing. Shankar[61] define mobile marketing as " the two-way or

[59] GREWAL, D. et al., (2011), pp. 43 sqq.
[60] https://doi.org/10.1016/j.jretai.2011.04.008
[61] SHANKAR, V.; et al. VENKATESH, A. et al., (2010), pp. 111 sqq.

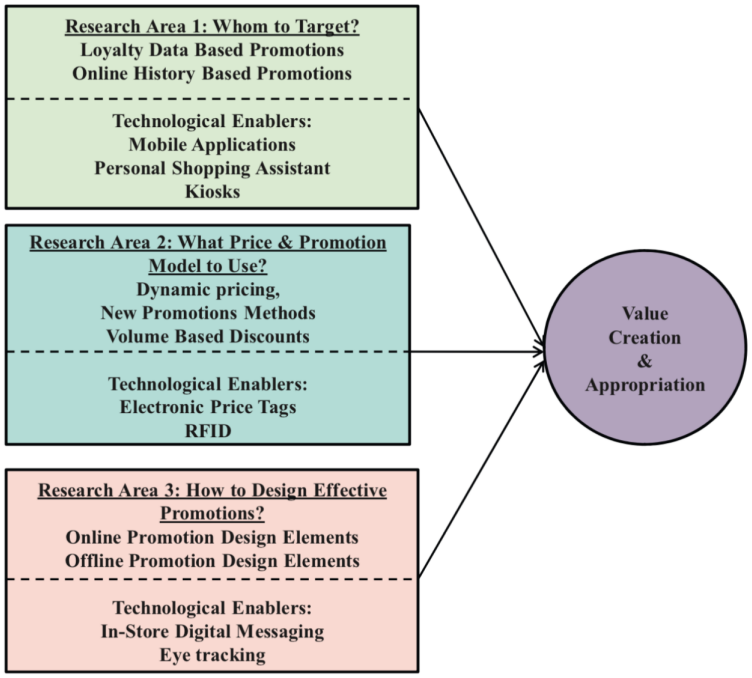

Figure 2.4: Organisation framework[60]

multi-way communication and promotion of an offer between a firm and its customers using a mobile medium, device or technology.

Research Area 2: price and promotion models

This area is about new models such as dynamic pricing, and new types of promotions. Traditionally, retailers take the costs as the primary criterion to calculate the price. Computer and software has improved and also the training for senior managers in quantitative analyzis has more importance, so the price is now determined with the help of software. One of the most recent method to calculate the price are dynamic pricing models which takes user data from Internet purchases or from company enterprise resource planning systems to

set the price[62]. Nagle[63] mentioned that there are dynamic pricing models that update the prices frequently, based on changing supply or demand characteristics. There are three main reasons why dynamic pricing is used today more frequently than in the past. The first reason is that today much more data is available and managers use software such as Oracle and SAP to collect and store data. The second reason is that the price analytic software can be customized to a particular market. And the third reason is that with the growth of the Internet as a distribution channel, the use of dynamic pricing models has also grown[64]. Since these models are based on historical data, in some cases it can not be representative for the future. Kopalle[65] suggests to keep in mind the inter- and intra-category optimization, market expansion and contraction effects, modeling frameworks, model performance, the psychological aspects of pricing, objective functions, optimization, parameter estimation, product relationship, and scalability. Technologies that make dynamic pricing feasible, besides a good software and algorithm, are also radio frequency identification (RFID), wireless networks and global positioning (GPS). With this technology companies are able to see the location of the customer and with RFID the system can exchange data throughout the store. In the future there could be long-range RFID readers which would allow simplified payments, and greater product history data collections. Consumer items could be traceable which allows a better analyzis of shopping habits. An important new technology are electronic shelf labels (ESL) which makes dynamic pricing easier and more cost efficient because dynamic pricing involves many rapid price changes. Another new pricing model that often occurs in big cities are websites such as Groupon.com and LivingSocial.com. While the volume discounts are nothing new in pricing, Groupon.com and LivingSocial.com uses the concept of

[62] GREWAL, D. et al., (2011), pp. 43 sqq.
[63] T, N. T.; HOGAN, J. E.; ZALE, J., (2010), pp. 1 sqq.
[64] GREWAL, D. et al., (2011), pp. 43 sqq.
[65] KOPALLE, P., (2010), pp. 117 sqq.

volume-based pricing. The website offers a given product or service for a certain time period and only if a predetermined number of consumers agree to purchase it then the deal is valid[66].

Research area 3: promotional design elements

According to Compeau[67] in promotional flyers and offers in offline marketing often the advertised reference price and the regular prices is communicated. However in online marketing the consumer have the possibility to check prices and verify the veracity of the advertised reference price[68]. Research of Shankar[69] has demonstrated the importance of in-store marketing. New technologies such as in-store digital messaging, interactive kiosks and personal shopping assistants can help the retailers to target their customers in a better way[70]. Kaylanam[71] describes the personal shopping assistants as a touch screen equipped table PC, like a tablet which can be mounted on top of a shopping cart. This mobile device provides the consumer a "personal assistant" as and when needed. Kalyanam, Lal, and Wolfram (2006) also describes an interactive kiosk as a web based interactive information terminal. The customer can use this kiosk to get more information about a product such as product description, nutrition information and high quality images which can also be printed. Another way to make use of digitalization for targeting the customers is eye tracking. Studies such as Huddleston[72] shows the importance of the design of the signs. They used a portable eye-tracking technology to assess the role of visual attention to price and non-price information on signs for merchandised products in displays. With this eye tracking device they were

[66] GREWAL, D. et al., (2011), pp. 43 sqq.
[67] COMPEAU, L. D.; GREWAL, D., (1998), pp. 257 sqq.
[68] GREWAL, D. et al., (2011), pp. 43 sqq.
[69] SHANKAR, V.; et al. INMAN, J. J. et al., (2011), pp. 29 sqq.
[70] GREWAL, D. et al., (2011), pp. 43 sqq.
[71] KALYANAM, K.; LAL, R.; WOLFRAM, G., (2010), pp. 141 sqq.
[72] HUDDLESTON, P. et al., (2015), pp. 561 sqq.

capable to see the retail environment with a "shoppers eye view". For retailers displays are silent salespeople and they rely on them to draw consumers into the store and motivate them to touch, evaluate and purchase products. So how does eye tracking works? According to Holmqvist[73] eye movement is the fastest movement the human body can make and it consists of series of stops (fixations) and moves or jumps (saccades). Eye fixation direct attention and attention increases the mental processing of the meaning of the object. The study of Huddleston[74] used different designs of displays with different information about the price and the product. The result of this study is that product information on a sign, in the absence of price appears to be more influential and the likelihood to buy is bigger. So price should be a secondary point-of-purchase message. With eye tracking we can see the environment of the shoppers eve view and therefore we can do a lot of research on different display designs.

As mention in the change of price and marketing section2.3.7 McKinsey[75] developed five steps to bring marketing operations into the digital age. These 5 steps are shown in figure 2.5

Truly understanding customers

Like any meaningful relationship, getting to know your customers well is a commitment. Tracking, analyzing, and interpreting customer behavior and attitudes should be an ongoing, often moment-to-moment undertaking that is critical not only to targeting and shaping relevant content and experiences but also to optimizing how they're delivered. This requires a wide range of data and sophisticated tools to analyze specific customer segments and their

[73] HOLMQVIST, K. et al., (2011), pp. 1 sqq.

[74] HUDDLESTON, P. et al., (2015), pp. 561 sqq.

[75] https://www.mckinsey.com . (30-10-2020).

[76] https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/how-digital-marketing-operations-can-transform-business

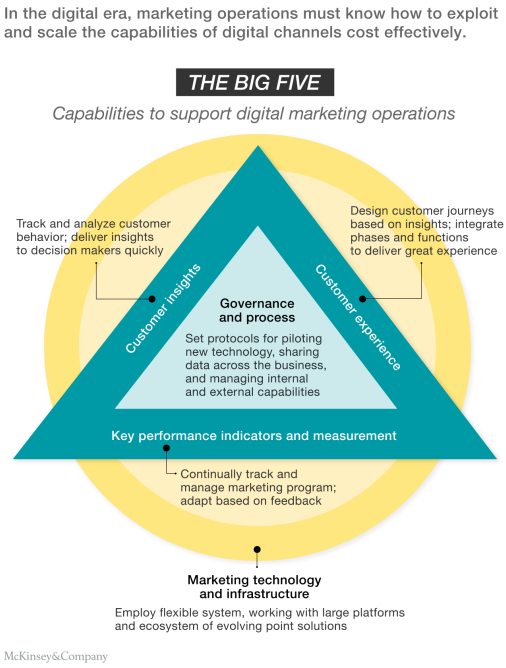

Figure 2.5: The Big Five[76]

behavior to spot opportunities and predict future actions. Companies should map detailed customer decision journeys for their most valuable segments, using technologies such as ClickFox, which track customers across channels to not only determine their cross-channel behavior but also isolate those moments where companies can influence the journey.

Delivering a superior experience

What happens when customers have a bad experience? They stop doing business with a company. And a souring of the customer experience can take place at any point, which is why getting the consumer journey right requires getting everything right. Marketing, sales, support, service, and operations play key roles in many customer journeys, of course. But there are other

functions that are critical as well, such as order management and fulfillment. As an experience is delivered to the customer, there needs to be a system to capture how that shopper responds and feeds that information back into the organization, which then adjusts its offer or message accordingly. And this feedback loop is not just about optimizing the customer experience. It also helps decision makers adjust campaign spending based on trends and opportunities.

Selecting the right marketing technology

Delivering on omnichannel customer experiences requires marketing technology that can automate processes, personalize interactions, and coordinate actions. An important element of managing a capable marketing-operations function is building a system that has the flexibility to work with large platforms that are becoming more dominant, such as Adobe or Oracle, as well as point solutions that are constantly introducing innovations. That requires developing a thoughtful application-programming-interface strategy to make sure your system has enough flexibility to hook into both current and emerging technologies, which will only become more important as the Internet of Things moves mainstream.

Implementing processes and governance

Technology enables the customer experience, but it requires people, processes, and governance to ensure technology does what it's supposed to do. The failure to establish guidelines for how business units might pilot new technologies, how data will be shared across the organization, or which capabilities will be managed in-house versus by external agencies and partners could result in a patchwork of efforts across the enterprise that sow confusion and hamper attempts to scale.

Using the best metrics to drive success

Technology is now catching up to the holy grail of marketing: the ability to monitor, track, and manage the effectiveness of marketing investments. Measures of marketing effectiveness need to move beyond what has often been limited to a narrow set of metrics. As companies become more customer-centric, for example, metrics should focus on customer activity rather than simply product or regional activity, as is often the case. Metrics should also reinforce new behaviors and processes, such as how fast a product is launched or how quickly lessons from the field can successfully be integrated into the next marketing offer. To be most effective, however, metrics need to deliver insights quickly—often in real time—so the business can actually act. They need to be delivered in a way that is easy for decision makers to understand, and they need to be forward looking to identify future opportunities rather than focus on reporting what has already happened.

2.4.3 Customers

This section discusses options to give the customer the best treatment and experience. Today, consumers call the shots.With globalization and the internet providing nearly unlimited choices, power has shifted from corporations to consumers. This shift makes it nearly impossible for companies to sustain differentiation based solely on price or product. The only option that remains is the customer experience. Consumers want personal and engaging experiences that develop into relationships. Much like the trials and rewards of personal relationships, when done right, brand relationships can grow into lifetime commitments. When done wrong,they can lead to painful breakups.

Oracle[77] engaged in the question: What makes a memorable experience that

[77]http://www.oracle.com ORACLE, O., (07-09-2020).

causes consumers to stick with a brand?

- Friendly employees or customer service representatives
- The ability to easily find the information or help they need
- Personalized experiences
- Brands with a good reputation

How can digitalization help to make a memorable experience that causes consumers to stick with your brand? The key factors to memorable experiences are hiring and empowering the right staff , brands must ensure easy access to information and support. Brands also need to create personalized experiences; this includes knowing what customers have bought in the past and service issues they are raised, as well as sending appropriate,timely,and useful updates. With digitalization easy access to information and support can be achieved with a homepage where frequently asking questions are answered and if the customer can't find the answer there you can offer an email support service. With the help of big data analyzis it is easy to know more about the customers and you can send on time information that is tailored to the customers need. What happens if the company can't meet the expectations? If a consumer has bad experience with a brand or a company the consumer not only begins doing business with a competitor but 26 per cent of the consumers are posting a negative comment on social media networks which will be seen by all their friends and followers.

2.5 Strategies to implement digitalization

This section shows what chances at existing business strategies and which new strategies should be added to make the most use of digitalization and also have a positive influence on the company value. It also includes other

strategies which occur with digitalization such as a new style of leadership where new challenges and tasks in the leadership level will be discussed. In this chapter also digital costing, digital processes, product and services will be discussed. The change in business models and how to create company value will be discussed in the second part of this thesis.

Bharadwaj[78] describes that over the last decades the information technology strategy has been a functional-level strategy that must be aligned with the firm's chosen business strategy. With increasing interconnections among products, processes and services in the last decade the business infrastructure has changed and has become more digital. Digital technologies such as communication, connectivity and information are transforming the business strategies and it is now time to rethink the role of IT strategy from a functional-level strategy, to a fusion between IT and business strategy.

2.5.1 Digital business strategy

This section discusses the four key parts in digital business strategy according to Bharadwaj[79] these four key parts are the scope of digital business strategy, the scale of digital business strategy, the speed of digital business strategy and the source of business value creation and capture in digital business strategy.

The scope of digital business strategy

The first key part of the scope of digital business strategy is about the corporate scope question, "which defines the portfolio of products and business as well as activities that are carried out within a company's direct control and

[78] BHARADWAJ, A. et al., (2013), pp. 471 sqq.
[79] BHARADWAJ, A. et al., (2013), pp. 471 sqq.

ownership." How can we draw the boundaries of digital business strategy and how can we best characterize its scope so that it can be more effective in a variety of settings? To answer that question we first have to look at how business scope is influenced by digital technologies and how, when and why the scope of digital business strategy is influenced by digital technologies. Comparing digital business strategy with traditional IT strategy it turns out that digital business strategy is more a cross-functional strategy and it transcends. Which means that it is more than just traditional functions such as marketing, procurement, logistics,operations and it is also more than just IT-enabled business processes such as order management, customer service and others. Therefore, digital business strategy can be seen as inherently trans functional. Rai[80] discovered that "digital business strategy relies on rich information exchanges through digital platforms inside and outside organizations that allow multi functional strategies and processes to be tightly interconnected with the aid of inter firm IT capabilities." Bharadwaj et al. came to the conclusion that digital business strategy should not be positioned below business strategy but treated as business strategy itself for the digital era because firms and industries become more digital and rely on information, communication and connectivity. One important factor for the scope in digital business strategy is digitization of products and services and the information around them. According to Rai[81] the design of products and services and their interoperability with other complementary platforms, and their deployment as products and services by taking advantage of digital resources is essential and many firms are taking advantage to create new strategies around new products and services. The best example is Amazon's Web Services on the cloud which expand the strategy of a typical online retailer by encompassing cloud computing services as a key digital resource. With normal business

[80] RAI, A. et al., (2012), pp. 1 sqq.
[81] RAI, A. et al., (2012), pp. 1 sqq.

strategy one would consider it as an unrelated portfolio because of the distance between these two business lines but "Recognizing and mapping the underlying connections among e- retailing, the role of hardware (Kindle) and web services (AWS) requires a more nuanced understanding of the effect of digital technologies than simply computing distances based on SIC-codes and industry classifications. Therefore, Amazon's corporate portfolio may be wrongly characterized as unrelated while we can easily see the related linkages between the constituent parts." Another important factor for the scope in digital business strategy is that it extends the scope beyond firm boundaries and supply chains to dynamic ecosystems that cross traditional industry boundaries. With the use of digital platforms firms can break traditional industry boundaries and can operate in new spaces and niches. Two examples are apple which has redefined the mobile entertainment ecosystem and Amazon which has redefined the book-selling ecosystem.

The scale of digital business strategy

Scale has been a primary driver of profitability in the industrial age. Scale confers benefits of lower unit cost of products and helps enhance profitability. When infrastructure becomes increasingly digital, rather than thinking of scale only in terms of physical factors of production, supply chains, or geographic coverage, we need to think of scale in both physical and digital terms.
Bharadwaj[82] have identified at least four ways that the scale of digital business strategy is distinct and qualitatively different.
The first way is the increased availability and reliance on cloud computing services provides a strategic dynamic capability for firms to scale up or down its infrastructure. A cloud computing infrastructure enables on-demand network access to a shared pool of configurable computing resources.
The second way is that network effects exist when the value of a good or

[82] BHARADWAJ, A. et al., (2013), pp. 471 sqq.

a service increases as more consumers use them or as more supply-side partners augment the service. As more products and services become digital and connected, network effects become the key differentiator and driver of value creation.
The third way is that we are also in a world of amplified networks with an abundance of data, information, and knowledge. This combination of digital intensity, connectivity, and big data provides a context of networked abundance. This is being further amplified by the growth of what has been called the "Internet of Things" which includes not only an interconnection of things, but also an exploding digital network of people and data. Thus scaling with digital business strategy will require understanding how to develop the organizational capabilities to harness the huge quantities of heterogeneous data, information, and knowledge that is generated on a continuous basis.
The fourth key is the alliances and partnerships through shared digital assets with other firms in the business ecosystem across different traditional industry boundaries. While we already see such scaling strategies in settings such as travel and hospitality as they share reservation systems, loyalty programs, and online cross-selling (e.g., Star Alliance, OneWorld), we will increasingly see companies rely on different firms to pull together the requisite scale in areas where they do not see competitive advantage.

The speed of digital business strategy

Since time has been recognized as an important driver of competitive advantage for firms for quite some time it takes on a more central role in digital business settings. Pervasive connectivity challenges companies to think about time (or more specifically, speed) in important ways. Bharadwaj[83] suggest that speed be thought of through the four dimensions.
The first dimension is that digital business strategy accelerates the speed of

[83] BHARADWAJ, A. et al., (2013), pp. 471 sqq.

product launches. Pure-play digital companies such as Facebook, Google, and Amazon appreciate the importance of developing and launching a timed series of products that take advantage of improvements in computer hardware, software, and connectivity. The speed of product launches set by these companies now compels companies that are in the hybrid (digital + physical) space to also accelerate their product introductions.
The second dimension is that there is general consensus that technology has allowed firms to speed up decisions that otherwise might be slowed due to information flows up and down the hierarchy through multiple layers of management. Leading companies such as P&G, GE, and Cisco have invested significantly to provide management with the capability to access diverse streams of information from within the focal firm and extend it to key partners and allies. It also becomes important in the context of responding to customer service requests in real-time through Twitter, Facebook and other social media platforms.
The third dimension is that according to Klein[84] End-to-end visibility and ERP deployments have allowed companies to be more efficient than before thanks to developments in software from companies such as SAP and Oracle. This, coupled with outsourcing of non-core activities to a network of partners, has allowed companies to optimize their supply chains in extended interfirm networks and enhance efficiency
The fourth dimension is that the pace of network formation is rapidly increasing in every firm. One of the key requirements of digital business strategy is new organizational capability to design, structure, and manage networks that provide complementary capabilities to what firms have inside their own hierarchies. Digital business ecosystems in areas such as mobile apps provide useful insights into the new strategic capability of orchestrating networks.

[84] KLEIN, R.; RAI, A., (2009), pp. 735 sqq.

The sources of business value creation and capture in digital business strategy

According to Bharadwaj[85] company value creation and capture in traditional business models are relatively well understood but digital business strategy brings in additional dimensions that alter the nature of company value creation and capture. They give four key factors which will be listed here and further information about company value creation with digitalization will be discussed in the second part of the thesis.

The first key is that the digital business context brings new opportunities to create company value from information. As magazines abandon their physical formats (e.g., Newsweek), they need to fundamentally rethink their unique source of company value through curating content and assess the balance between subscription and advertising. Google, Facebook, and eBay are just few examples of new company value created from information that go beyond niche areas such as financial services whose business models rely on accurate, timely information.

The second key is that digital business strategy brings into sharp focus the importance of multi-sided revenue models not just in software. Going beyond software pricing such as Adobe Reader and browsers, we now find that a wide range of companies are examining multi-sided business models.

The third key is that the logical extension of multi-sided business models is a recognition that company value creation and capture in digital settings often involve complex and dynamic coordination across multiple companies. In the case of video games, console manufacturers, game developers, publishing, and other content owners coordinate and time their respective offerings to be able to co-create company value in networks and share their respective pieces of value.

The fourth key is that we need to think more about the role of digital tech-

[85] BHARADWAJ, A. et al., (2013), pp. 471 sqq.

nologies in influencing not only the business strategies of individual firms but also the nature of the industry and the sources of company value creation and location of company value capture. In doing so, we will be in a better position to identify the key metrics that should be tracked and followed in different industries.

This chapter explained the essential technologies and changes that digitalization brings. It also explained opportunities, threads and strategies. The next chapter shows how to create company value with digitalization.

3 Company value creation

3.1 Company value and its calculation

This section describe what company value is, give a short overview of the most common method to calculate company value. Further, it will discuss the change in business models and show new business models that evolve because of digitalization. Then it will explain how to create company value using the essential technologies described in the first part of this thesis in section 2.2.

According to Fernandes[1] a company's value is different for different buyers, and it may also be different for the buyer and the seller and he also stated that company value should not be confused with price, which is the quantity agreed between the seller and the buyer in the sale of a company. This difference in a specific company's value may be due to a multitude of reasons. Fernandes[2] also gives a good example of what company value can be. Imagine a large and technologically highly advanced foreign company wishes to buy a well-known national company in order to gain entry into the local market, using the reputation of the local brand. In this case, the foreign buyer will only value the brand but not the plant, machinery, etc. as it has more advanced assets of its own. However, the seller will give a very high value to its material

[1] FERNANDEZ, P., (2002), pp. 1 sqq.
[2] FERNANDEZ, P., (2002), pp. 1 sqq.

resources, as they are able to continue producing. From the buyer's viewpoint, the basic aim is to determine the maximum value it should be prepared to pay for what the company it wishes to buy is able to contribute. From the seller's viewpoint, the aim is to ascertain the minimum value at which it should accept the operation. These two figures face each other across the table in a negotiation until a price is finally agreed on, which is usually somewhere between the two extremes.

Company valuation methods

Fernandes[3] describe the four main groups, as shown in figure 3.1 comprising the most widely used company valuation methods: balance sheet-based methods, income statement-based methods, mixed methods, and cash flow discounting-based methods. The methods that are conceptually "correct" are those based on cash flow discounting. This thesis will briefly comment on other methods since, they are conceptually "incorrect"- they continue to be used frequently.

MAIN VALUATION METHODS					
BALANCE SHEET	**INCOME STATEMENT**	**MIXED (GOODWILL)**	**CASH FLOW DISCOUNTING**	**VALUE CREATION**	**OPTIONS**
Book value Adjusted book value Liquidation value Substantial value	Multiples PER Sales P/EBITDA Other multiples	Classic Union of European Accounting Experts Abbreviated income Others	**Equity cash flow** **Dividends** **Free cash flow** **Capital cash flow** **APV**	EVA Economic profit Cash value added CFROI	Black and Scholes Investment option Expand the project Delay the investment Alternative uses

Figure 3.1: The main Valuation methods[4]

The most common methods are the Cash flow discounting-based methods, which will be described here. These methods seek to determine the company's value by estimating the cash flows it will generate in the future and then discounting them at a discount rate matched to the flows' risk. The cash

[3] FERNANDEZ, P., (2002), pp. 1 sqq.

[4] http://www.iese.edu/research/pdfs/DI-0449-E.pdf

flow discounting method is generally used because it is the only conceptually correct valuation method. In these methods, the company is viewed as a cash flow generator and the company's value is obtained by calculating these flows' present company value using a suitable discount rate. Cash flow discounting methods are based on the detailed, careful forecast, for each period, of each of the financial items related to the generation of the cash flows corresponding to the company's operations, such as, for example, collection of sales, personnel, raw materials, administrative, sales, etc. expenses, loan repayments.

In cash flow discounting-based valuations, a suitable discount rate is determined for each type of cash flow. Determining the discount rate is one of the most important tasks and takes into account the risk, historic volatilities; in practice, the minimum discount rate is often set by the interested parties (the buyers or sellers are not prepared to invest or sell for less than a certain return, etc.). The different cash flow discounting-based methods start with the following expression shown in figure 3.2:

$$V = \frac{CF_1}{1+k} + \frac{CF_2}{(1+k)^2} + \frac{CF_3}{(1+k)^3} + \ldots + \frac{CF_n + VR_n}{(1+k)^n}$$

where: CF_i = cash flow generated by the company in the period i

V_n = residual value of the company in the year n

k = appropriate discount rate for the cash flows' risk .

Figure 3.2: Cash flow discounting-based methods[5]

At first sight, it may appear that the above formula is considering a temporary duration of the flows. This is not necessarily so as the company's residual value in the year n (Vn) can be calculated by discounting the future flows after that period. A simplified procedure for considering an indefinite duration of future flows after the year n is to assume a constant growth rate (g) of

[5]http://www.iese.edu/research/pdfs/DI-0449-E.pdf

flows after that period. Then the residual value in year n is VRn = CFn (1+g) / (k-g). Although the flows may have an indefinite duration, it may be acceptable to ignore their value after a certain period, as their present value decreases progressively with longer time horizons. Furthermore, the competitive advantage of many businesses tends to disappear after a few years.

Before looking in more detail at the different cash flow discounting-based valuation methods, we must first define the different types of cash flow used in a valuation. In order to understand what are the basic cash flows that can be considered in valuation, the following figure 3.3 shows the different cash streams generated by a company and the appropriate discount rates for each flow.

CASH FLOWS	APPROPRIATE DISCOUNT RATE
FCF. Free cash flow	**WACC.** Weighted average cost of capital
ECF. Equity cash flow	**Ke.** Required return to equity
CFd. Debt cash flow	**Kd.** Required return to debt

Figure 3.3: The different cash flows[6]

The easiest to understand is the debt cash flow, which is the sum of the interest to be paid on the debt plus principal repayments. To determine the present market value of the existing debt, this flow must be discounted at the required rate of return to debt (cost of the debt). In many cases, the debt's market value shall be equivalent to its book value, which is why its book value is often taken as a sufficient approximation to the market value. The free cash flow (FCF) enables the company's total value12 (debt and equity: D + E) to be obtained. The equity cash flow (ECF) enables the obtaining the value of the equity, which combined with the debt value, will also enable the company's

[6]http://www.iese.edu/research/pdfs/DI-0449-E.pdf

Earnings before interest and tax (EBIT)
-Tax paid on EBIT

Net income without debt
+Depreciation
- Increase in fixed assets
- Increase in WCR

Free cash flow

Figure 3.4: Calculation of the free cash flow[8]

total value to be determined[7].

Free cash flow calculation

As we can see, the company value depends on the free cash flow. Figure 3.4 shows how to calculate the free cash flow.

According to Fernandes[9] for calculating the free cash flow, the basic number is the EBIT (Earnings before Interest and debt). Figure 3.5 shows how to calculate the EBIT.

Sales
-Cost of goods sold
-General expenses
-Depreciation

Earnings before interest and tax (EBIT)

Figure 3.5: Calculation of EBIT[10]

[7] FERNANDEZ, P., (2002), pp. 1 sqq.
[8] http://www.iese.edu/research/pdfs/DI-0449-E.pdf
[9] FERNANDEZ, P., (2002), pp. 1 sqq.
[10] http://www.iese.edu/research/pdfs/DI-0449-E.pdf

Figure 3.5 also shows that it is important how much we sell and what are the costs for selling. Digitalization can help to improve sales and reduce costs and general expenses.

How can company value be created

AMIT, R.; ZOTT, C., (2001) stated that a business model depicts the design of transaction content, structure, and governance so as to create company value through the exploitation of business opportunities. Companies which can adapt their businesses well have significant advantages over those that lag this capability. The next section explains what a business model is, how business models changed with digitalization and what new business models evolved with digitalization.

3.2 Business model

The last section explained that company value could be created through business models. This section explains what a business model is and show how business models are changed with digitalization. The change with digitalization has a positive influence on the company value by increasing sales, revenues or customer behaviour. This section also shows new business models that were invented because of the possibilities digitalization provides.

Muhtarouglu[11] defined a business model as an institutionally constructed measure, is an aggregation of a set of underlying principles comprising an organization's overall strategy that defines the extent to which the enterprise creates, delivers, sustains and even enhances different forms of value including, but not limited to, economic, social, cultural, technological, environmental

[11] MUHTAROGLU, P. et al., (2013), pp. 32 sqq.

or other forms of value. The term is used for a broad range of depictions, both informal and formal, to represent an enterprise's main characteristics, including its purpose, products and services, strategies, infrastructure, structures, practices, and processes and policies. Mueller[12] stated that business models show how companies (a) provide value to their customers, (b) how they interact with their suppliers, partners, and customers, and (c) how customers compensate them.

Why use a business model

Business model tools can be used to support sustainability through outside-in or inside-out approaches[13]. An outside-in approach involves exploring opportunities for innovation by looking at an organization through different types of idealized business models, or business model archetypes[14]. This allows firms to explore innovations that may result from adapting their current business model towards a particular archetype. As an outside-in approach, Business model archetypes allow users a relatively easy way to explore the potential influence on the company value by innovating towards different types of business models[15].

3.3 Business model canvas

This section shows the most common business model from Osterwald, which is called canvas. Muhtarouglu[16] explains the canvas business model, as shown in figure 3.6. The business model canvas describes nine essential components

[12] MUELLER, J. M.; DASCHLE, S., (2018), pp. 260 sqq.
[13] FULLER, C. B., (1995), pp. 3 sqq.
[14] BOCKEN, N. et al., (2014), pp. 42 sqq.
[15] JOYCE, A.; PAQUIN, R., (2016), pp. 1474 sqq.
[16] MUHTAROGLU, P. et al., (2013), pp. 32 sqq.

of a business where the overall layout outlines how these pieces fit together. Since its introduction, the template and the underlying idea have quickly spread worldwide and leading companies like P&G and Nestle have started using the canvas to create new strategies for earning money.

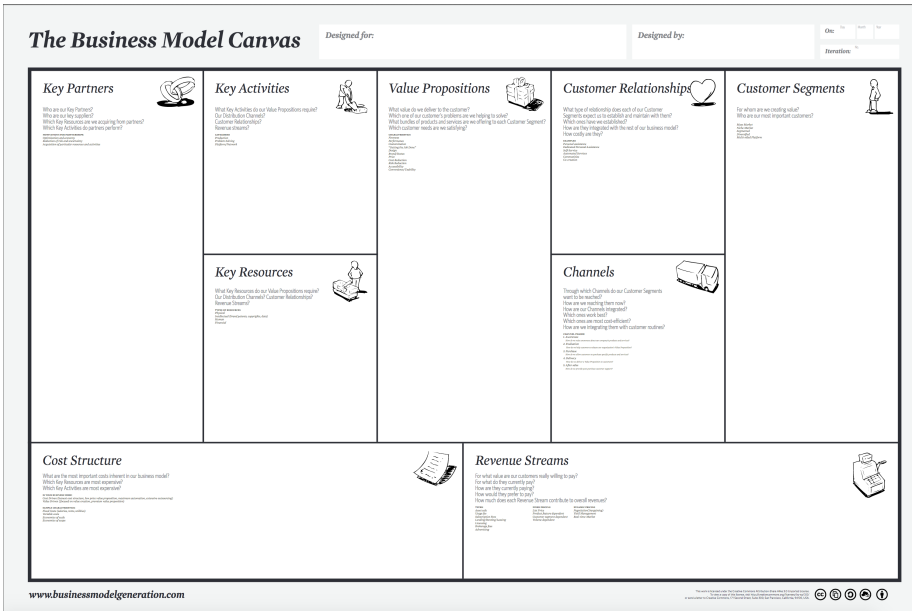

Figure 3.6: Business model canvas[17]

The First component is **value propositions**, which can be described as products and value-added services delivered by a company to fulfill customer needs and are of value to customers. The second component is **customer segments** and it defines the type of customers that a company wants to address and attract by offering value propositions. The third component is **channels** that describes how a company gets in touch with its customers and delivers value propositions to them. With digitalization there are new channels e.g.,web-based platforms or mobile-based applications. The fourth

[17]https://www.startplatz.de/startup-wiki/business-model-canvas/

component is **Customer relationships**, which refers to the relationship that a company builds and maintains with its customers. This can be considered as the lifeblood of a company's business activity. The fifth component **revenue streams** describe the incoming money stream of a company by offering value propositions. It outlines the activities and pricing of the offered values with which a company improves its revenues. The sixth component **Key resources** describes inputs and capabilities that a company needs to deliver value to its customers. Tangibles, intangibles, and people-based skills are particular kinds of resources required for creating value propositions. The seventh component **Key activities** describe the actions that a company performs to create, market, and deliver value propositions to its customers and make a profit out of them. The eighth component **Key partners** refer to the voluntarily initiated cooperative agreement of a company with other companies in order to carry out activities related to value propositions. The ninth and last component **Cost structure** describes the costs incurred by a company for delivering value propositions to its customers and doing all other business activities such as building partner relationships and marketing.

3.4 Business model innovation BMI

With digitalization, the original business model changed, especially with industry 4.0. This section shows the change from a normal business model to business model innovation.

Business model innovations through industry 4.0 represent both an opportunity and a challenge for companies. On the one hand, they can solve customer problems even more effectively, create new revenue models, and address entirely new customer segments. On the other hand, an increasing number of companies express concerns about the threat to their existing business models.

This also includes the danger of cannibalizing one's own well-functioning business model[18].

The situation in the field of digitalization and business model innovation (BMI) is interesting because the influence of digitalization on the business model (BM) is fuzzy, and the exploitation of technological opportunities – also from a strategic viewpoint – is challenging. The business model, as such, is understood as the "architecture of the value creation. Delivery and capture mechanisms a firm employs. As a result of this new embedded usage of digital technologies, companies can achieve success in terms of experiencing optimized resource utilization, reduced costs, increased employee productivity and work efficiency, optimized supply chains, increased customer loyalty and satisfaction, to name but a few[19]. According to Lusch[20] the growth of IT makes it possible to spread entire service provider networks. The authors give seven reasons for this:

- As IT evolves, microprocessors and intelligence are embedded in goods, transforming them into improved platforms for service delivery.
- The further development of IT increases self-service capability
- IT increases the ability to serve others
- The need for transport is reduced by improving the ability to communicate
- Improving communication skills, the ability to know customers and suppliers better increases
- Communicate at low cost, coordination between companies becomes more efficient and accessible

Dynamic capabilities and BMI

[18] MUELLER, J.; BULIGA, O.; VOIGT, K. I., (2018), pp. 2 sqq.
[19] KAGERMANN, H., (2015), pp. 23 sqq.
[20] LUSCH, R.; VARGO, S.; TANNIRU, M., (2010), pp. 19 sqq.

According to Schweizer[21] companies can be successful over time if they can adapt to their environment. The dynamic capability is a suitable perspective that explains this phenomenon and is even more important in volatile environments. However, what are dynamic capabilities? Schweizer[22] defines that a "dynamic capability can be considered as the ability to seize new opportunities and to change the existing business model by reconfiguring the value chain constellation and protecting knowledge assets, competences and (the access to) complementary assets and technologies in order to achieve sustainable competitive advantage".Thus, companies can remain competitive if they can change their BMs. Teece[23] states that not only the internal capacities are central to the BM. The assessment of the BM is bound to the environmental context. In this context, the business environment is seen as a variable that can be selected and shaped by the company, and vice versa. To increase the success of the designed BM on the market, the company must analyze various alternatives, have a good understanding of customer requirements, a precise understanding of the value chain to deliver what customers need as cost-effectively as possible and on time and should also have a neutral perspective on outsourcing.

Figure 3.7 shows how dynamic capabilities and strategy combine to create and refine a defensible business model, guiding organizational transformation. Ideally, this leads to a level of profits that allow the enterprise to sustain and enhance its capabilities and resources[25]. Business models are enabled by dynamic capabilities in the sense that a dynamically capable organization will rapidly implement, test, and refine new and revised business models. Successful implementation draws on management's architectural design, asset

[21] SCHWEIZER, L., (2005), pp. 315 sqq.
[22] SCHWEIZER, L., (2005), pp. 315 sqq.
[23] TEECE, D., (2018), pp. 40 sqq.
[24]https://doi.org/10.1016/j.lrp.2017.06.007
[25] TEECE, D., (2018), pp. 40 sqq.

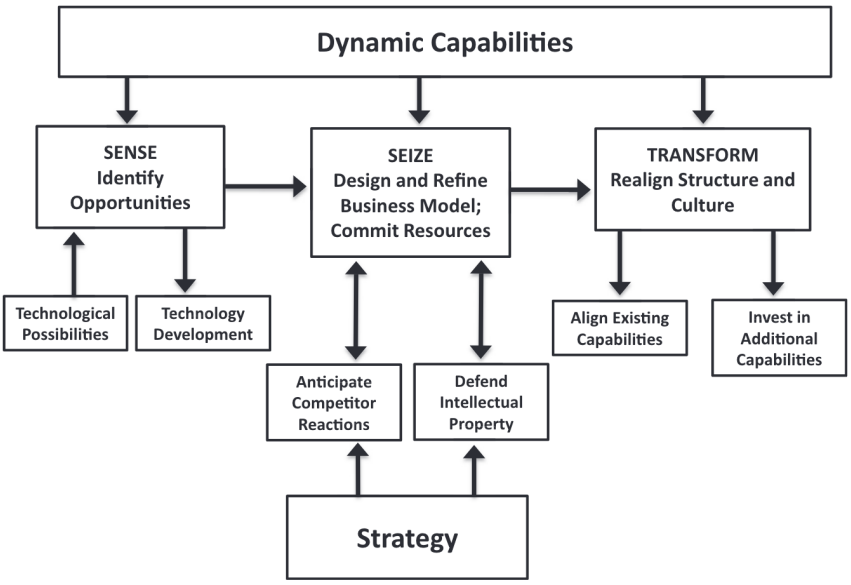

Figure 3.7: Simplified schema of dynmic capabilities, business models, and strategy[24]

orchestration, and learning functions, which are core dynamic capabilities. At the same time, dynamic capabilities depend on the organizational flexibility allowed or denied by business model choices such as whether to outsource the manufacture of a new product or build a factory. Another important factor for dynamic capabilities is the learning-driven approach of sensing, seizing and reconfiguring in particular, which provides the business with the opportunity to adapt and meet changing requirements in alignment with the business strategy[26].

Rachinger[27] combined the normal business model BM with the business model innovation BMI and added dynamic capabilities to the BMI. This combination is shown in figure 3.8.

[26] TEECE, D., (2018), pp. 40 sqq.
[27] RACHINGER, M. et al., (2019), pp. 1 sqq.

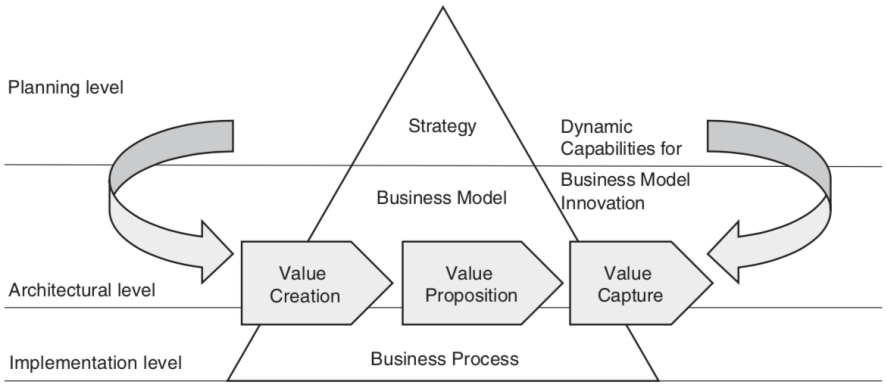

Figure 3.8: Simplified schema of dynmic capabilities, business models, and strategy[28]

These perspectives on digitalization and BMI took together – in the context of dynamic capabilities – framed the conceptual setting for this empirical study. Herein, the business logic triangle Osterwalder[29] offered the perspective to differentiate between the business processes on the bottom and the strategic planning level on the top, in between lies the architectural level, which has been understood to be the BM that represents the company's reason for creating and capturing value by offering specific value propositions to existing and potential future customers. As such, the BM links the planning with the implementation level. The dynamic capabilities perspective offers an explorative view on the topic of BMI and has allowed researchers to argue that the design and operation of BM are dependent on a firm's capabilities[30].

[28] https://doi.org/10.1108/JMTM-01-2018-0020
[29] OSTERWALDER, A.; PIGNEUR, Y., (2002), pp. 2 sqq.
[30] TEECE, D., (2018), pp. 40 sqq.

3.5 10 new business models

This section explains 10 brand new business models that have evolved in the last few years because of the opportunities digitalization provides.

3.5.1 Freemium

The first new model which will be explained is the freemium model, which is widely spread nowadays. Freemium business models are increasingly prevalent in the digital economy, yet very little is known about how freemium affects consumers' perceptions of product value and their willingness-to-pay. In this article, Rietveid[31] study how the freemium business model competes with the premium business model in the market for digital PC games. Results show that freemium games are played less and generate fewer revenues than premium games and that greater variety in games' menus of paid items is associated with higher revenues. This implies that in order to achieve competitive parity with firms operating the premium business model, firms operating the freemium business model need to create more value (e.g., through improved product quality, income from advertisements, or unlocking network externalities) or operate at lower costs. Erland[32] found out that it is only possible to gain revenue if the production and distribution costs of the free service are near zero. In the digital economy, the price of processing speed, storage and bandwidth are steadily dropping, so once something has been developed in a digital form, the cost of producing ten or a million copies is practically the same. Not only do the production costs have to be low or near zero, but so do the distribution costs and any other costs the company

[31] RIETVELD, J., (2018), pp. 171 sqq.
[32] REIME, E. V., (2011), pp. 230 sqq.

needs to cover in order to deliver value to the customer. Services delivered over the Internet are, therefore ideal candidates for the Freemium model.

The threat of free services

The Internet offers an abundance of services and offers to its users, and most of this is available for free. The Internet has evolved through free content and services, and consumers have gotten used to this and expect free services delivered online. Psychological studies show that people link a price on a product or service to a consideration of cost, no matter how small[33]. A person can very well spend hours searching to find the best price or the best product, though the amount saved does not cover the time spent gathering information and making the decision. When something is free, the consideration of costs is often bypassed, even whenusing the product or service requires an investment of both time and money. The abundance of information and offers has also taught us that there are always other alternative services out there, either at a lower price or completely free. We have gotten used to free online newspapers, free email services, free search-engines, free software, and free videos, to mention a few services.[34]

3.5.2 Subscription revenue model

The second new model is the subscription model which is commonly used on the internet. A subscription revenue model helps you capitalize on the compounding value of customer relationships. That means that as long as your customers continually see the value your company provides for them, they will continue to pay you for it.

[33] ANDERSON, C., (2009), pp. 1 sqq.
[34] REIME, E. V., (2011), pp. 230 sqq.

The state and the future of subscription business models

The subscription model continues to grow in popularity. According to our research of Campbell[35], customer acquisition costs (CAC) are up more than 50% and willingness to pay for software has declined steadily for the past five years. There is never been a better time to start capitalizing on your customer relationships through subscription.

According to a survey by McKinsey[36], 46% of customers already pay for an online streaming service and 15% have subscribed to an e-commerce service within one year of the survey as shown in figure 3.9.

The subscription e-commerce market has grown by more than 100 percent a year over the past five years. The largest such retailers generated more than $2.6 billion in sales in 2016, up from a mere $57.0 million in 2011. These numbers reflects revenue for subscription e-commerce companies on Internet Retailer's Top 500 list.

This strong growth has attracted established consumer brand manufacturers and retailers, which have also entered the space; for example, P&G (Gillette on Demand), Sephora (Play!), and Walmart (Beauty Box) have all launched new subscription businesses. The market has also seen significant M&A activity—in particular, Unilever's $1 billion acquisition of Dollar Shave Club (2016) and the $200 million-plus deal that the grocery chain Albertsons did for meal-kit company Plated.

The survey aimed to show the overall penetration of e-commerce subscription services and the demographics and buying behavior of their consumers. We also wanted to understand why consumers subscribe and why they cancel their subscriptions, an overriding worry for players in this space.

[35]https://www.priceintelligently.com . (30-10-2020).
[36]https://www.mckinsey.com . (30-10-2020).

They find that 46 percent of consumers in our survey subscribed to an online streaming-media service, such as Netflix—shoppers are now also turning to subscriptions for consumer goods. The research indicates that 15 percent of online shoppers have subscribed to an e-commerce service over the past year. Most e-commerce subscribers have streaming-media subscriptions as well.

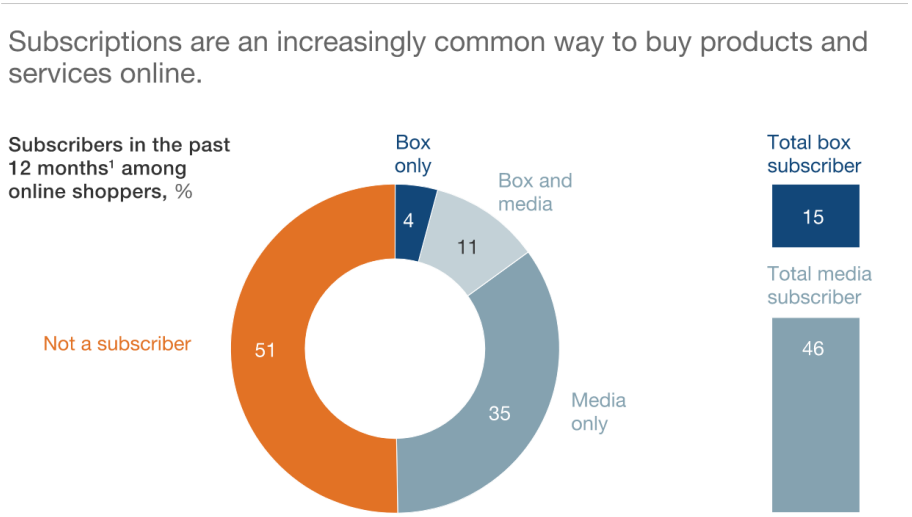

Figure 3.9: Subscription model growth[37]

Other findings for the subscription model of the survey of McKindey[38] are:

- E-commerce subscribers tend to be younger urbanites with money.
- The median number of subscriptions an active subscriber holds is two, but nearly 35 percent have three or more.
- There are three broad types of subscriptions: replenishment, curation, and access. Replenishment subscriptions allow consumers to automate

[37]https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/thinking-inside-the-subscription-box-new-research-on-ecommerce-consumers

[38]https://www.mckinsey.com . (30-10-2020).

the purchase of commodity items, such as razors or diapers. Curation subscriptions seek to surprise and delight by providing new items or highly personalized experiences in categories such as apparel, beauty, and food. Last, access subscribers pay a monthly fee to obtain lower prices or members-only perks, primarily in the apparel and food categories.

- Consumers do not have an inherent love of subscriptions, they want a great end-to-end experience and are willing to subscribe only where automated purchasing gives them tangible benefits, such as lower costs or increased personalization,
- A recommendation, including word of mouth and positive online reviews, is a key trigger for consumers to sign up with a subscription service
- Subscribers to both also want something new and innovative
- To continue subscribing, consumers expect personalized subscriptions to become more tailored over time
- A key challenge for all subscription e-commerce providers is matching supply and demand

3.5.3 Experience selling model

This section explains what selling experience to a customer could look like and why you should do it. Larock[39] experienced that people all over the world are telling themselves a story about your product or service. Without a brand or an active message to support it, you can not control the story they tell. Products are 25% of what you sell. The rest is an intangible feeling tied to the product. It is an active story that fits into the busy product-filled lives of your customers. All you have to do is decide on how you will make your

[39]https://mention.com . (30-10-2020).

customer's life better. Not with your product, but with the story they tell about it. The impact your product has in their life. Here are a few ways to connect with your customers and be more than a sale:

- Make a promise and delivering
- Tell stories
- Share a lifestyle
- Make a connection
- Share moments

With the selling experience model you can gain a lot of attention from customers and bind them to your brand.

3.5.4 Fractionalized ownership model

This section explains how the fractionalized ownership model works and why you should use it in your company. Bizshift[40] discovered that hidden revenue streams are patterns for revenue generation that keeps users out of the equation, so they do not pay for the service or product offered, e.g., Google users do not pay for searches. Instead, Google gets its revenue from advertising money spent by business bidding on keywords. The traditional business logic that users are the source of revenue, but now that is abandoned. Instead, third parties main source of revenue is that cross-finances whatever free or low-priced offering attracts the users. This model's common case is when companies finance through advertising, i.e.; where the customer is the 'value' to the advertisers who fund the offering. This concept facilitates the idea of 'separation between revenue and customer'. A hidden revenue generation business model works if a value proposition is appealing to several

[40] https://bizshifts-trends.com . (30-10-2020).

stakeholders. Several large internet platforms, e.g., Google, Facebook, Tweeter, LinkedIn... have created a sustainable business model based on hidden revenue generation. They have created a compelling value proposition for businesses and publishers. The former can bid on keywords and generate sales through targeted ads. The latter can effectively monetize their content. However, the hidden revenue model does carry flaws, e.g., it is asymmetry toward users, i.g., a proposition that users give their data and business makes money. Indeed, users do not pay, but in the process, they do give valuable data. Some argue whether that data should be given back to the same users in some ways.

3.5.5 Pay per use model

This section shows what the pay-per-use model is and when and why you should use it. Fast Spring[41] stated that when pay-per-use licensing is applied, and pricing is based on the actual amount of use of the software, measured in units of use such as the number of users or the number of transactions. Usage-based pricing models, like pay-per-use, certainly have their place. Many customers appreciate the affordability and flexibility pay-per-use provides, particularly when they do not need to use the software more than a few times per month. Pay-per-use is also useful for SaaS companies interested in getting truly accurate feedback on their pricing strategy. Let's say on your pricing page. You are offering a wide variety of services across different pricing tiers. Nevertheless, despite the broad breadth of choices, you are still finding that only a few customers use a handful of the services. From this behavior alone, your SaaS business can maybe infer that:

[41] https://fastspring.com . (30-10-2020).

- Your pricing plans are priced too high.
- The value proposition between the plans may not be enticing enough to get users to upgrade between tiers.
- Your target customers prefer an a la carte model and would rather stay at their current tier and just pay for additional add-ons or services.
- Some buyer personas prefer certain services over others.

3.5.6 Solution provider model

This section explains what the solution provider model is and what challenge the models have to face. Solution providers not only offer products but complete solutions in which products and services are integrated. The services and consulting are adapted to the respective customer needs. Comprehensive solutions that are tailored to customers can strengthen the company's position vis-à-vis competitors and provide insights into customer needs and usage habits Rennung[42] and Mueller[43]. The development of solutions should be driven by the focus on the customers processes and finances and not only be based on technological innovations. Solution providers are more likely to develop benefits in long-term partnerships with customers rather than developing purely in-house solutions for customers. This connection with customers brings a higher level of cost and risk compared to the sale of products. Cross-departmental multidimensional interfaces are also very important in the solutions business in order to create a balance between commercialization (e.g., business unit and customer understanding) and industrialization (e.g., standardization and modularization) of the solutions Gassmann[44], Stor-

[42] TUDOR LUMINOSU, F. R.; DRAGHICI, A., (2016), pp. 372 sqq.
[43] MUELLER, J. M.; DASCHLE, S., (2018), pp. 260 sqq.
[44] GASSMANN, O.; FRANKENBERGER, K.; CSIK, M., (2014), pp. 1 sqq.

backa[45] and Leseure[46]. There are several problems that Industry 4.0 solution providers have to face explicitly. Starting with the solutions functionalities, care should be taken to ensure that the solutions only contain functions for which customers are willing to pay. Too long waiting to bring the solutions onto the market can also be a mistake. Competitors can already conquer market shares and new competitors can emerge. A further challenge is the high complexity of product development in the context of IT integration into products, which can be very time-consuming and resource-intensive. Besides IT integration into traditional products can cause high costs of Bjorkdahl[47]. Another challenge posed by the fact that customer benefits are not always tangible is how the solution provider can capture some of the benefits gained. A change in the business model can be meaningful, because, e.g., traditional billing mechanisms may no longer be advantageous[48].

3.5.7 Individualized and personalized products model

This section explains the importance of the individualized and personalized products business model. In addition to the possibility of linking intelligent products with intelligent services, individualized and personalized products can be established. The prerequisite for a personalized product produced individually in series is a high degree of flexibility in production. Important are the integration of all relevant processes and a high degree of automation. Furthermore, simulations play a decisive role in the feasibility of personalized products. Advantages for providers of this concept can be an extended

[45] STORBACKA, K., (2011), pp. 699 sqq.
[46] LESEURE, M. et al., (2010), pp. 1 sqq.
[47] BJORKDAHL, J., (2009), pp. 1469 sqq.
[48] MUELLER, J.; BULIGA, O.; VOIGT, K. I., (2018), pp. 2 sqq.

customer spectrum, higher customer loyalty, and higher product prices[49][50].

3.5.8 Platforms and cloud services

This section explains what cloud computing and platforms are and how it can be used best in retail. There are two different ways to use cloud services. On the one hand, you can use it as an e-marketplace and provider for the retailer's product and services. On the other hand, you can use the cloud to use it as an internal management system that e.g., saves customer/employee data or handles the inventory. This has the advantages of accessing the data everywhere and saving costs for the local server.

A virtual marketplace or "e-marketplace", e.g., for production capacities, analyzes, and applications, can be realized via a cloud. Here, IT companies come into focus and cooperation between IT and product companies seem to make sense to develop Internet of Things platforms. The involvement of all market participants is important in order to map value-adding processes through uniform data. This makes it possible for the various participants to work together within the market in real time to create company value jointly. Such a marketplace can also be seen as an exchange of services[51].

According to Ojala[52] Cloud computing refers to the provision of computing capacity and applications as a service across the Internet. There are three service layers:

[49] MUELLER, J.; BULIGA, O.; VOIGT, K. I., (2018), pp. 2 sqq.
[50] HENNING, K., (2013), pp. 1 sqq.
[51] STANDING, S.; STANDING, C., (2015), pp. 723 sqq.
[52] OJALA, A.; TYRVAINEN, P., (2011), pp. 42 sqq.

- Infrastructure as a service (IaaS) provides computation and storage capacity.
- Platform as a service (PaaS) pro- vides software development tools and an application execution environment.
- Software as a service (SaaS) pro- vides applications on top of PaaS, IaaS, or a private data center.

SaaS promises software firms more customers because applications become available via the Internet and are no longer limited by the need to package and deliver CDs or DVDs. Moreover, the service is executed in a single virtual environment that removes the need to develop, test, and maintain software variants for multiple OSs, databases, and middleware systems. Estimating future demand for capacity is no longer a problem because the software executes on top of third-party PaaS or IaaS with virtually unlimited capacity in terms of on-demand processing power and storage. The core value of SaaS lies in providing online access to a software product that the provider manages and maintains[53]. Cloud Computing also aims to provide scalable and inexpensive on-demand computing infrastructures with good quality of service (QoS) levels. More specifically, this involves a set of network-enabled services that can be accessed in a simple and pervasive way[54].

Chang[55] classify cloud computing business models into eight types: (1) Service Provider and Service Orientation; (2) Support and Services Contracts; (3) In-House Private Clouds; (4) All-In-One Enterprise Cloud; (5) One-Stop Resources and Services; (6) Government Funding; (7) Venture Capitals; and (8) Entertainment and Social Networking.

[53] OJALA, A.; TYRVAINEN, P., (2011), pp. 42 sqq.
[54] WANG, L. et al., (2010), pp. 137 sqq.
[55] CHANG, V.; WILLS, G.; ROURE, D., (2010), pp. 43 sqq.

Cloud based management system

This paragraph shows existing systems that can be used as a cloud-based management system in retail. The first system is lightspeed cloud it is a complete point of sale system. It offers a range of complete retail solutions for retailers. Among other things, it offers access to the system from both web and mobile browsers. It also handles inventory, customers/employee management and report generation[56]. The second system is epicor Cloud Retail Software is a SaaS retail solution from Epicor Solutions. It serves small to mid-sized retailers who want to leverage their insufficient IT resources. Epicor delivers a model that significantly reduces capital investment, implementation challenges, and on-going requirements of managing IT. With Epicor, retailers are able to integrate their sales channels, order management, POS systems, inventory, and other operations for access to right information at the appropriate time[57].

[56]https://www.lightspeedhq.com . (30-10-2020).
[57]https://www.epicor.com . (30-10-2020).

Adewumi[58] shows in his thesis the drawbacks in the existing systems and intend to realize a retail management solution that is cloud-based; platform independent; able to run on Web and mobile browsers and also easy to customize by any retail organization. In figure 3.10 you can see the framework of the retail managment system.

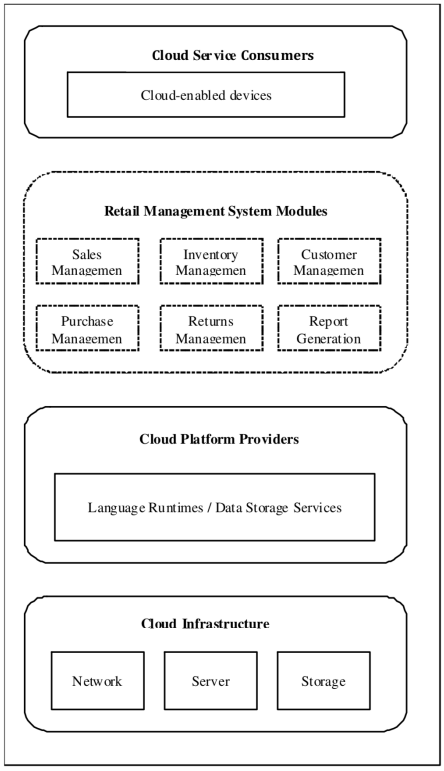

Figure 3.10: Framework of a retail managment system[59]

[58] ADEWUMI, A.; OGBUCHI, S.; MISRA, S., (2015), pp. 446 sqq.
[59] https://doi.org/10.1007/978-3-662-46742-8_41

3.6 Company value creation with essential technologies

In the first part of the master thesis, the essential technologies and how they work were explained. This section explains how company value can be created using these essential technologies.

3.6.1 Artificial intelligence

This section shows how artificial intelligence can be used to create company value. Lee[60] developed a five-step process shown in figure 3.11 to make companies AI-ready. I will explain this process shortly.

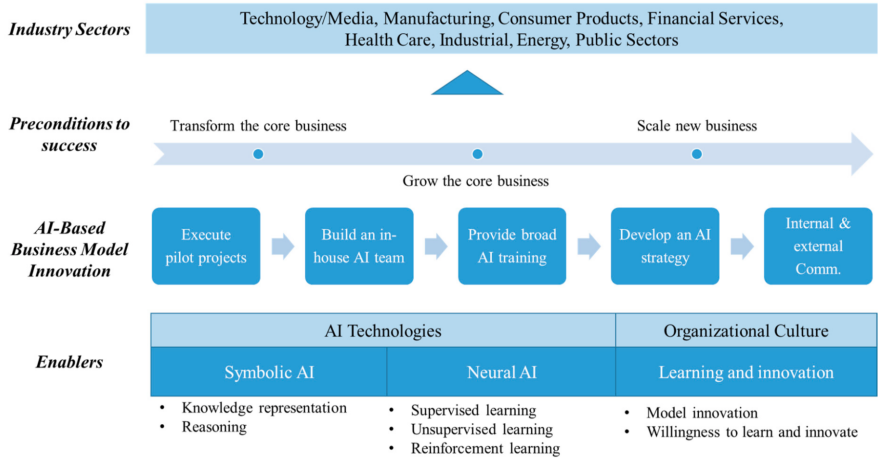

Figure 3.11: Developing an Artificial intelligence (AI)-Based Business Model[61]

Execute Pilot Projects to Gain Momentum

[60] LEE, J. et al., (2019), pp. 44 sq.
[61] https://doi.org/10.3390/joitmc5030044

The first step is that early in the use of AI, a company needs to have pilot projects that succeed to build momentum toward business model innovations. Successful small-scale pilot projects allow employees to become familiar with AI technology, recognize that it does not mean the loss of their jobs, and generate enthusiasm for AI use.

Build an in-House AI Team

The second step is to build an in-house AI team to execute projects efficiently. This is natural if companies want to build a unique competitive advantage or have tremendous confidential data such as a customer usage log. Small and medium-sized companies or new startups often cannot afford to hire a significant number of AI researchers and data scientists, so they will need to consider alternative strategies. They may need to outsource AI to another company or form a joint venture with an AI company to acquire the necessary expertise. This reliance on "outside" experts will have to be managed carefully so competitors do not gain access to the company's activities.

Provide Broad AI Training

The third step is that most companies do not have enough AI researchers and experts, and companies find it difficult to hire them due to a shortage in the AI field. Thus, Andrew Ng suggested educating employees—all the way from training business executives down to AI researchers by utilizing digital content such as MOOCs. Digital content is relatively affordable and allows a more personalized experience to be applied in small and medium-sized companies. Companies may want to help develop additional content for AI education since it not only solves the current issue—the insufficiency of AI researchers—but it also fuels lasting AI business model innovation.

Develop an AI Strategy

The fourth step is that the key to an AI strategy is to create the virtuous cycle of AI shown in Figure 3.12. For instance, Google has tremendous data so that it can build an accurate search engine as a product (A). This product enables Google to acquire more users (B), creating more data on Google (C). The key factor in AI is to have good quality and sufficient quantity of data. Companies too often attempt to drive AI without appropriate data like building a palace on quicksand. Data acquisition and data infrastructure are vital to transforming the business model.

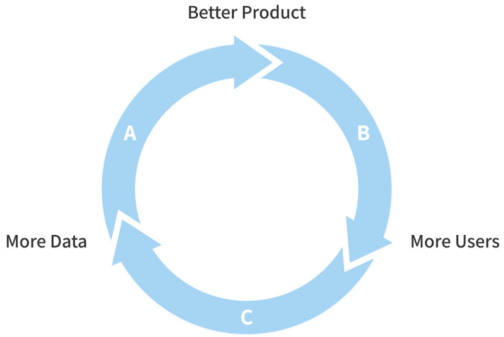

Figure 3.12: The virtuous cycle of AI[62]

Develop Internal and External Communications

The fifth and last step is the company's stakeholders need to be informed about how AI is transforming the business model and the consequences this has for them. Protecting the privacy of customers' and employee's data has become a major issue for companies and ensures that their actions and decisions comply with laws, regulations and ethical standards, and the use of AI to process data and make decisions will create bigger challenges in

[62]https://doi.org/10.3390/joitmc5030044

these areas. Business model innovations developed through AI will increase the company's value to stockholders and provide opportunities to enhance value for customers. Innovations often arise from communications with a company's customers who suggest ideas and highlight what they do not like about current offerings and processes, so two-way communication may lead to greater business model innovations. AI technologies are changing very rapidly, companies will need to inform and educate all of their stakeholders as to how they use AI, the benefits of its use, and potential drawbacks or limitations of AI.

3.6.2 Augmented reality (AR)

This section show hows company value can be created with augmented reality. The main costs for an AR application are staff, developing the application itself, and possibly Internet hosting, for delivering the application to the company's customers. The revenues can either be advertisements or fees customers pay for the application[63]. Hayes[64] provides 16 Augmented reality business model shown in figure 3.13

In this part the the most important models for retail will be explained. The first one is IN SITU: Aiding sale by seeing projects and products placed in the environment before completion. The benefit of a customer or client seeing a finished project before it is complete. For example, Customers who want to see what the clothes look like on them. The second one is SOCIAL GAMING: Both connotations of the word, pay-per-play mixed reality games in physical space. The potential to run pay per play (e.g: virtual paintball style) games in a physical location and live connected betting on sports or other competitive

[63] KLEEF, N.; SPOEL, J. N., (2010), pp. 1 sqq.
[64] HAYES, G., (10-09-2020), pp. 2017 sqq.
[65] https://www.personalizemedia.com/16-top-augmented-reality-business-models/

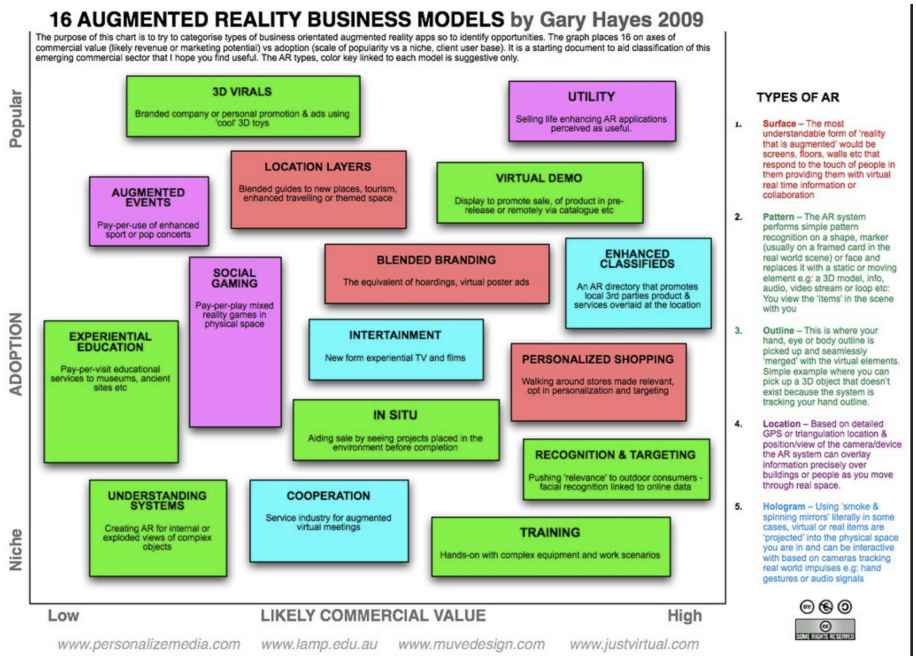

Figure 3.13: 16 augmented reality business models[65]

play – e.g: You point your iPhone at the horse and wirelessly place a bet – mid race! (odds adjusted of course) or using basic surface AR you play with others in a new kind of 'games' room! The third one is VIRTUAL DEMO: Display to promote the sale, of product in pre-release or remotely via catalog etc, To promote advance sales before the consumer gismo hits the stores, an AR display or the device/s so potential customers can manipulate it, see it from all sides, even customize the order. We may see future stores displaying most items on the shop floor as AR while the item is shipped to your house before you get home! The fourth one is 3D VIRALS: Branded company or personal promotion and ads using 'cool' 3D toys. Pattern based 3D model that entertains and is spread virally. The YouTube moment as a million links to cool '3D stuff' takes place next to you. Already we see some AR apps that allow

you to record scenes of you interacting with said '3D viral' and passed those around too, titillation, quirky giveaways– JibJab-type, put 'you' in the cartoon but revered, they are with you in 3D space. The fifth one is PERSONALIZED SHOPPING: Walking around stores made relevant, opt-in personalization and targeting. The oft mentioned Minority Report example. However, in the pulled model, you can deliver information to potential customers scanning stores, streets, or shelves for discounted or personally relevant products.

3.6.3 Blockchain

This section explains how blockchain can be used to create company value. Blockchain helps retailers to better track the origin of stock, gives them better control over what they sell and provides assurances for food safety, among other applications. Blockchain can also be useful for controlling supply chains as changes to data such as manufacturing dates and locations can be tracked. This could help eradicate the use of unreliable suppliers, poor quality ingredients and child labour.Blockchain could also help prevent counterfeiting, especially of luxury branded goods, and secondary ticketing, as well as minimising the chance of insider threats and improve customer loyalty programmes[66]. Provenance[67] which is a platform and consultancy for transparency leverages the power of blockchain technology to bring transparency to supply chains, enabling businesses to build trust with customers. Blockchain is also removing obstacles and increasing visibility in consumer products and retail business transactions. Greater transparency through a shared, immutable ledger enables businesses to establish a climate of trust across areas like invoicing and payments, the consumer supply chain and global shipping[68]. Another

[66]https://www.retail-insight-network.com . (30-10-2020).
[67]https://www.provenance.org/ . (30-10-2020).
[68]https://www.ibm.com . (30-10-2020).

application for blockchain in the retail that is commonly used is supply chain and inventory management. Knowing where an item is at any given time drastically reduces the chance of theft or property loss. Experts also point to the potential for cryptocurrency payment systems to expand customer bases. When businesses adopt crypto-friendly payment gateways for physical and digital storefronts, they attract a new customer class[69].

Mire[70] also pointed out five cases where blockchain can be helpfull in retail:

- One of its best use cases is for improving transparency. From reducing counterfeit goods (LMVH), to supporting emerging markets (Onda Origins), to engaging with consumers beyond the point of sale, private blockchain offers meaningful transparency for manufacturers, the shopping public, and retailers
- Improved measurement of campaign performance and a new channel for direct one-to-one engagement before, during and after making a purchase.
- The five key benefits of blockchain are immutability, accessibility, encryption, transparency and governance, the most important benefit for retail is transparency
- The biggest benefit from application of blockchain technology in the retail space is that supply chain applications not only reduce illness and injuries from defective foods and products given the enhanced speed of identifying and locating those defective foods/products, but also help retail businesses save costs and increase efficiencies as only truly affected goods/products would have to be recalled rather than a more generalized recall. Further, supply chain blockchains give businesses using them a competitive advantage not only in terms of lower costs

[69]https://www.disruptordaily.com . (30-10-2020).
[70]https://www.disruptordaily.com . (30-10-2020).

for recalls, but also in terms of better public image arising from the transparency created in their supply lines.

- The privacy of blockchain is backed by hard math and not by proprietary code and systems that have not been reviewed. Blockchain puts the consumer in control of his data assets and cuts out the middleman. This maximizes the value of data for both the companies as well as the consumer.

3.6.4 Drones and other unmanned aerial system (UAS)

This section describes how it is possible to create company value using drones and other unmanned aerial systems. With the rise of e-commerce, consumer preferences have grown increasingly important in the formerly business-oriented parcel-delivery market. Large e-commerce players, as well as various startups, have identified last-mile services as a key differentiator. In fact, the variety of delivery options and the perceived quality of the delivery service are major decision-making criteria for online customers and hence directly affect e-commerce players' success in the marketplace. With this in mind, vendors are working hard to offer the best customer experience possible, especially by improving delivery times. To gain a better understanding of what customers actually prefer,McKinsey[71] conducted a survey of more than 4,700 respondents in China, Germany, and the United States. They used conjoint analyzis to better understand consumers' relative preferences for different delivery options, including their willingness to pay shown in figure 3.14. Nearly 25 percent of consumers are willing to pay significant premiums for the privilege of same-day or instant delivery. This share is likely to increase, given that younger consumers are more inclined (just over 30 percent) to choose same-day and instant delivery over regular delivery.

[71] https://www.mckinsey.com . (30-10-2020).

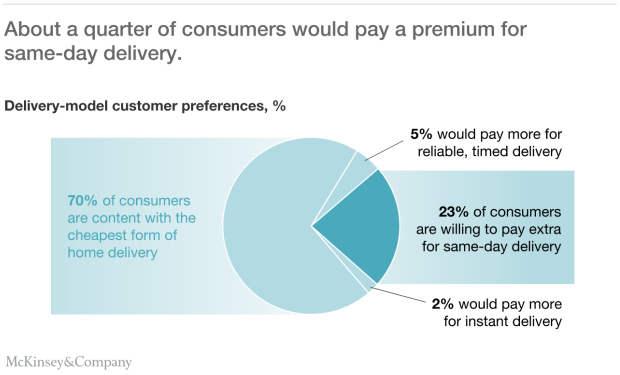

Figure 3.14: Same day premium delivery[72]

Another study of McKinsey[73] shows in figure 3.15 he significant portion of same-day delivery suggests that e-commerce players would be unwise to neglect this segment, especially given that up to 27 percent of respondents claim that they preferred not to buy items online due to the long delivery times. Fast delivery is most relevant for groceries and medication. For most retailers, such delivery times are unprecedented and are certain to be embraced by delivery-time-sensitive customers.

It is also evident that realizing such low delivery times would necessitate employing dedicated drones for individual orders. In other words, the pooling of orders across different customers is unlikely to be a viable option. Together, the capability of high speed and dedicated delivery allows retailers to further lower delivery times via increased decentralization. Thus, while the ability to reach customers faster than through traditional means argues for a move towards centralization of delivery services, more decentralization can allow

[72]https://www.mckinsey.com/ /media/mckinsey/industries/travel%20transport%20and%20logistics/our%20insights/
[73]https://www.mckinsey.com MCKINSEY, (22-09-2020).
[74]https://www.mckinsey.com/ /media/mckinsey/industries/travel%20transport%20and%20logistics/our%20insights/

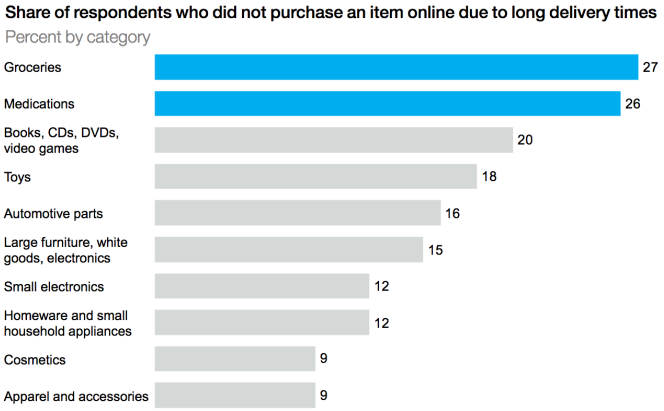

Figure 3.15: No purchase because of to long delivery times[74]

the retailer to offer hitherto unheard-of delivery lead times and thereby spur demand. However, achieving near-perfect delivery customization via the combination of faster speeds and more customer-facing delivery centers (last-mile warehouses) is unlikely to be cost-effective. Most retailers, therefore, would need to develop realistic delivery strategies keeping in mind their respective operational challenges. For instance, in physically-congested metropolitan markets, retailers may not have the flexibility to freely increase the number of delivery centers[75].

Sandun[76] stated that a cheaper and faster DDS can cost-effectively exploit customers' sensitivity to delivery times, resulting in both the optimal delivery speed and the optimal number of delivery centers to increase. As drone delivery systems mature and become increasingly cost-effective, retailers' logistics networks will progressively become more decentralized (i.e., use more last-mile warehouses), with drones operating at progressively faster speeds. Further, Perera et al. show that while finer customization of delivery-

[75] https://www.mckinsey.com . (30-10-2020).
[76] SANDUN, P. et al., (2020), pp. 2019 sqq.

time guarantees is more profitable, retailers can capture a sizable portion of the profit under perfect customization by partitioning their market into a few zones and offering zone-specific delivery guarantees.

3.6.5 Internet of Things

This section shows how company value can be created using internet of things. Due to the nature of the IoT ecosystem in which firms must collaborate with competitors and across industries, it is easy to see why traditional business models are not adequate. Moreover, fast changing market environments in technology-related industries implies that companies must quickly adjust to market challenges in order to succeed. As a result, business model innovations are becoming "new routes to competitive advantage"[77]. According to Mejtoft[78] value creation in IoT can be classified into three layers: manufacturing, supporting, and value creation. Manufacturing layer means that manufacturers or retailers can provide items such as sensors and terminal devices. Supporting layer collects data which can be utilized in the value creation processes, while the third layer uses IoT as a co-creative partner, because the network of Things can think for itself. In contrast to Mejtoft[79], Chen[80] presents a more detail four-layer architecture for Internet of Things (IoT) as shown in Figure 3.16:

[77] SUN, Y. et al., (2012), pp. 4 sq.
[78] MEJTOFT, T., (2011), pp. 672 sqq.
[79] MEJTOFT, T., (2011), pp. 672 sqq.
[80] CHEN, M., (2013), pp. 167 sqq.
[81] https://doi.org/10.1007/s11042-012-1013-4

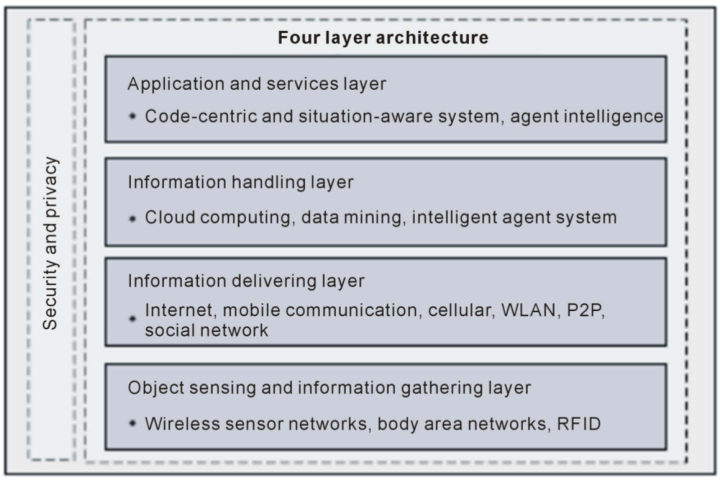

Figure 3.16: Architecture for Internet of Things[81]

- Object sensing and information gathering: The first step of enabling smart services is to collect contextual information about the environment, "things" and objects of interest.
- Information delivering: Various wireless technologies such as wireless sensor networks (WSNs), body area networks (BANs), WiFi, Bluetooth, Zigbee, GPRS, GSM, cellular and 3G, etc. can be used for delivering the information.
- Information processing: Pervasive and autonomic services are provided through ubiquitous machines in both "autonomic" and "smart" way.
- Application and smart services: Heterogeneous network performance in terms of bandwidth utilization, computing capability and energy efficiency are improved according to different users' requirements, and application-specific design.

Each company can participate into more than one layer, and create its own business model.

In contrast to the four layer model Sun[82] posited a DNA model addressing the "How, What, and Why" elements of IoT business model. There are three blocks: D-design, N-needs, and A-aspirations. Design consists of the various elements of the system such as key partners, resources, and activities. This deals with the "How" question of business mod- els. Needs refer to parties in the "external environment" such as customer segments and relationships, dealing with "What". Aspirations are desired results such as revenue, and deals with "Why". The authors used smart lo- gistic as an illustration: In Design, the key partners are those enterprises that produce food, books, e-products, clothes and so on. The data processing center and the transport fleet are the key resources; In Needs, there are many channels to reach customers such as the Internet, a mobile network, or just through the retail stores. Customer relationships can be long term or just temporary. Customers (individuals or companies) can become participants or recipients; In Aspiration, the value proposition is to achieve better meet customer demand. The DNA model is a linear fractal showing the cause-and-effect or input-processing-output relationship.

Kindstrom[83] found out that the focus shifts to other business model parameters as the service content increases particularly in IoT markets. He outlined the key aspects of a service based business model together with associated key issues as shown in figure 3.17. In addition to "What" (value proposition), "Why" (revenue mechanism), "How" (value Chain), and "Who" (target market), there are two elements, namely the "Value network", and "Competitive Strategy". This aligns with the emphasis of a network-centric view in the IoT business model.

[82] SUN, Y. et al., (2012), pp. 4 sq.
[83] KINDSTROEM, D., (2010), pp. 479 sqq.
[84] https://doi.org/10.1016/j.emj.2010.07.002

Business model parameter	Key issues
Value proposition	• Articulated offering • Visualization • Closer customer interaction • A dynamic offering portfolio
Revenue mechanisms	• New revenue model
Value chain	• Dedicated roles for service development • A structured service development process • A new reward system • Extending the resource base
Value network	• Finding partners that can add value to the new offerings
Competitive strategy	• Branding • Differentiation
Target market	• New customer segmentation

Figure 3.17: Service based business model parameters[84]

3.6.6 Robotics

This section shows 5 ways how to create company value with robotics. According to Underwood[85] cration value with robots can be archived in this 5 ways: The first way is to draw customer attention: Because retail robots are a new innovation, customers are curious to see them in action. The second way is to Improving use of storage space: In the warehouse robots permit the use of narrow aisles, and on the shop floor, they allow use of vertical space which is out of reach for human sales personnel. The third way is to keep track of inventory: Robots can quickly locate items that have been misplaced, so that sales are not lost. The fourth way is to guide customers on premises: From airports to hotels to warehouses and beyond, customers will always need help finding the product or location they're headed to. The fifth way is to retrieve products for customers: Robots can quickly access goods that are store behind glass so the customer does not have to wait for a free member of staff

[85]https://emerj.com . (30-10-2020).

3.6.7 3D printing

This section shows how 3d printing can be used to create company value. Berman[86] sad: "The 3D printing industry has become one of the most promising technologies to underpin the evolution of current manufacturing systems and related supply chains." And he was right. Walmart for example uses 3D printing and they came to the conclusion that digital 3D printing can reduce the upfront cost typically required with mass manufacturing and eliminate packaging, logistics, and inventory. The list of printable products that can be digitally manufactured increases daily, but there is no indication that 3D printing will eliminate mass manufacturing in the near future. There will, however, be more options for consumers: purchase online for manufacture in-store, or manufacture online and ship your product. Many products will continue to be mass-manufactured, although 3D printing will begin to factor into their production[87].

But why using 3D printing? First of all, 3D printing technologies lead to product and service innovation, enabling mass-customization. As the result of a co-creating process between customers and companies, the value of the resulting product will be higher than mass-produced products. Thus, customers become more important than ever, enabling more value creation and higher value capturing. 3D printing also allows us to target new market segments, regardless of how small they are. On-demand production enables the production of few products without having to consider the high costs of mass-production. In a way, it allows us to monetize the "long tail". But what about the obstacles? There are many, but probably the most challenging component for 3D printing will be capturing value, since prices can be sometimes higher than expected by customers. New revenue models need to be created in

[86] BERMAN, B., (2012), pp. 155 sqq.

[87] https://www.architectmagazine.com/ . (30-10-2020).

order to overcome this obstacle. In contrast, access to 3D printing technologies enables the experimentation of various new business models at a much lower cost. Prototyping and testing are far cheaper and, thus, companies can easily build and test product prototypes, even functional ones, at a low cost[88].

3.6.8 Big Data

The first part of this thesis described what AI and Big data is in one section because the technologies behind are very similar. This thesis gives big data a separate chapter because it is used differend to create company value compared with AI. This section will now explain how big data can be used to create company value. Demir[89] surveyed a range of big data applications focusing on their activities from the business model canvas perspective. The canvas business model was descriped in section 3.3. Now I will show the most important facts about the survey of Demir[90]. It shows for every canvas building block how big data can be used. The first block is **value propositions**: Innovative big data applications are also emerging in the retail industry. One type of application is price comparison services which offer pricing information on products from different retailers. Studies have shown that consumers can save an average of 10 % when they shop using such services. The second block is **customer segments** and it can be used for location based big data applications target mass markets. Smart routing applications target users of GPS enabled devices such as smart phones. It is expected that the use of smart routing is likely to grow as the pene- tration of smart phones and the use of free navigation applications in these devices increase. The third block is **channels** and it can be used as Big data applications may reach their

[88] https://www.bmilab.com/ LAB, B., (15-09-2020).
[89] F.MUHTAROĞLU, et al., (2013), pp. 32 sqq.
[90] F.MUHTAROĞLU, et al., (2013), pp. 32 sqq.

customers through different channels. Web-based applications can be accessed through the product website whereas mobile applications are usually offered via one or more application stores. It is expected that many big data applications will be developed by entrepreneurs because application store model lowers the barriers to entry for innovative new players by providing ready sales and marketing channels. The fourth block is **Customer Relationships** and it can be used as automated services may recognize the characteristics of individual customers and offer information related to transactions. For example, an application in the retail industry may recommend products a user may be interested in based on the previous purchases of the user. In some applications, companies co-create value with the community of customers. Examples include maps created by the community, community ratings for local businesses. The fifth block is **Revenue Streams** Some big data applications, especially the ones targeting the community, are free for consumers. These services mostly rely on advertising revenues. Other sources of revenue include the provision of big data as a service to third parties. The sixth block is **Key Resources** and Big data applications require scalable infrastructures and distributed platforms. They also need to adapt to the increasing usage requests. Applications may use in-house or cloud- based infrastructures. Middle class servers are increasingly used together with distributed computing platforms such as Hadoop (hadoop.apache.org). Applications also need to be developed in a distributed manner usually with real time processing capabilities. Data analyzis and machine learning techniques are largely utilized in big data applications. The seventh block is **Key Activities** and Businesses of big data applications need to continually develop and maintain their infrastructure, platforms, and applications. This is especially the case when the number of their users drastically increases and the underlying data gets much bigger along with increased access rates. Businesses need to continually improve their services with innovation; that is, they need to find new solutions to customer

problems and create value in their lives as new competitors enter the market. The eighth block is **Key Partners** and Big data application companies may need to develop partnerships for the acquisition of data. In some cases, the data is co-created with online communities. However, in some cases, partnerships might be necessary to obtain supplementary data (e.g., partnerships with map companies and governments). Many big data application companies work with appli- cation stores for marketing and sales support. They may also need to work with companies providing infrastructures and platforms. The ninth and last block is **Cost Structure** and Big data applications usually have variable costs for infrastructure. The infrastructure costs increase as the applications get increasingly used (i.e., the data size and the number of requests per time units increase). These costs include costs of building and maintaining data centers (e.g., costs of servers, electricity, cooling, and the use of cloud services) and developing and maintaining the platforms and applications. In some cases, there may be costs for acquiring data required by the applications

Now you can see that big data can be used in different ways and in all areas of the standard business model canvas.

3.7 Cost of digitalization

This section explains what implementation of digitalization costs and how you can reduce the costs. At the beginning implementing digitalization is expensive you need to gain or buy know-how, you may restructure the whole firm or processes and you may also need to buy new companies to create new areas to sale new content e.g. Tesco, the UK grocery retailer, made three significant digital acquisitions over a two-year span: blinkbox, a video-streaming service; We7, a digital music store; and Mobcast, an e-book platform. The acquisitions

enabled Tesco to quickly build up the skills it needed to move into digital media[91].

Reducing the cost

McKinsey[92] described some key points to reduce costs. Many organizations focus their digital investments on customer-facing solutions. But they can extract just as much value, if not more, from investing in back-office functions that drive operational efficiencies. A digital transformation is more than just finding new revenue streams; it's also about creating value by reducing the costs of doing business. Often, great value is found in optimizing back-office functions. At Starbucks, one of the leaders in customer-experience innovation, just 35 of 100 active IT projects in 2013 were focused on customer- or partner-facing initiatives. One-third of these projects were devoted to improving efficiency and productivity away from the retail stores, and one-third focused on improving resilience and security.McKinsey[93] also found out that Digital businesses reduce transaction and labor costs, increase returns to scale from aggregated data, and enjoy increases in the quality of digital talent and intellectual property as network effects kick in. The cost advantages can be significant: online retailers may generate three times the level of revenue per employee as even the top-performing discounters. Another aspect which is controversial is that with digitalization computers can do work faster, better and automatically and because of that ability when changing to digitalization a few jobs which now humans performa can be done by computer. Because human labour is expensive, companies can save a lot of money by changing from human labour to computer work. At the same time the company needs new employees who service the computers.

[91]https://www.mckinsey.com/ . (30-10-2020).
[92]https://www.mckinsey.com/ . (30-10-2020).
[93]https://www.mckinsey.com/ . (30-10-2020).

3.8 Growth

After explaining in the last section the costs of implementing digitalization, now the three main concepts to evaluate the proper price and grow with SaaS (Software as a Service) products will be discuss. This are the value metric, the monthly recurring revenue and the sales metric. According to Campbell[94] in its basic form, a value metric is essentially what and how you're charging. E.g.if you're selling MacBook Airs, it's each MacBook Air one time up front. If you're Wistia, you're charging for number of videos hosted and the amount of bandwidth those videos take up each month (a dual value metric). That sound simple but coming up with the right value metric is where things get complicated.

Evaluation of a value metric

Campbell[95] consider a three step strategy to evaluate a value metric. The first step is to check if your value metric align to your customers need. You need to make sure the way you're charging aligns with the value someone is actually getting from your product. Figure out what your customers value at the center of your product and then back out to a way that you can charge for that value. The second step is to check if the value metric is easy to understand for the customer. Figure 3.18 shows a value metric from HubSpot[96] which is intuitive. The customer can choose between three price options. The third step to evaluate a value metric is to check if your value metric grow with the customer. You need to make sure your value metric grows properly with your customer to ensure you're increasing your MRR in a predictable manner.

[94]https://www.priceintelligently.com . (30-10-2020).
[95]https://www.priceintelligently.com CAMPBELL, P., (18-09-2020).
[96]https://www.hubspot.com . (30-10-2020).
[97]https://www.hubspot.com

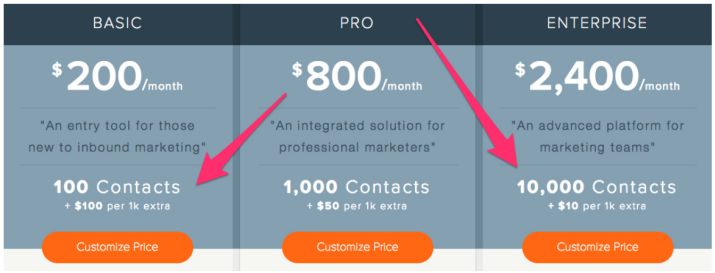

Figure 3.18: HubSpot value metric[97]

Process for identifying your value metric

To identify your value metric first, you start by running a list of all the axes you could charge along (not feature differentiation, but actual axes). Next, send a survey or conduct some interviews to determine where your customer ascribes value to your product. Make sure the options they've chosen align with the three principles shown in the evalation of a value metric paragraph. At the end test, implement, and iterate.

The second concept is monthly recurring revenue (MRR) which describes a reliable monthly income a company can have. E.g. monthly income from a subscription. According to Dawson[98] aligning your positioning, packaging, and pricing with your target customers is not only important for reducing customer acquisition cost (CAC) and churn, it's also the key to monetizing those customers and generating the monthly cash flow needed to grow successfully. As such, let's begin by exploring the importance of monthly recurring revenue (MRR) before we look at how a value based pricing strategy ties into improving MRR and monetizing customers more effectively.

[98]https://www.priceintelligently.com . (30-10-2020).

Why is MRR important?

You can boost the numbers by providing clients the option to purchase annual contracts, but let's be clear, SaaS is generally a recurring revenue business based on smaller cash payments made in monthly increments. Calculating and studying your MRR shows you just how well your SaaS business is actually operating and may help you discover what areas need improvement before you attempt to accelerate growth. Improving your MRR stream has everything to do with better pricing, from upselling customers using add-ons and bundling to proper value metrics and customer segmentation. If your MRR isn't enough to sustain operations or further growth, then there's a good chance your value proposition and services aren't aligned with customer value perception[99].

Calculating MRR

Dawson[100] shows that calculating your company's monthly recurring revenue is fairly simple. To determine your MRR, you multiply the total number of paying customers by the average amount they pay you every month, otherwise known as the average revenue per user (ARPU).
MRR = Total # of Paying Customers x Average Revenue Per User (ARPU)
You can see from this basic calculation that increasing your company's average deal size is crucial to increasing your monthly revenue, but ensuring you can earn more cash from each of your customers is a lot harder than simply acknowledging more money would improve the numbers. You need to be able to monetize those customers effectively while ensuring they don't churn out and look for other services, and one of the best ways to do this is pricing customer fit. Charging each customer segment for every unit of value they

[99]https://www.priceintelligently.com . (30-10-2020).
[100]https://www.priceintelligently.com DAWSON, T., (24-09-2020).

receive is one of the biggest components of a complete pricing strategy that puts value at the forefront, and most importantly, brings in more money.

Boosting MRR

Dawson[101] also show four key points to improve your MRR:

1 Positioning: customers churn out when they can't find value in what they're buying. Part of preventing this is developing the right product, but the other half of the battle is ensuring you're working to acquire the right customers. To charge customers a profitable price that represents all of the value they're receiving requires you to match up your customer segments to the appropriate services that relieve their pain points, so knowing your customers is essential. Your products also need to be priced along value metrics so customers who receive more value from your product are charged more for each unit of value. Customers will convert to paid tiers and upgrade to premium services if you can justify price changes from one plan to the next and convey easily how much value they're getting for the money.
2 Information delivering: Various wireless technologies such as wireless sensor networks (WSNs), body area networks (BANs), WiFi, Bluetooth, Zigbee, GPRS, GSM, cellular and 3G, etc. can be used for delivering the information.
3 Packaging: determining the right packaging and presentation for your services is critical to using differential pricing to your advantage. Develop premium services, bundles, and add-ons that will enable you to upsell/cross-sell customers so that you can persuade them to move into product tiers that bring in more cash every month. This falls in line with pricing along a value metric, but using the right packaging for

[101] https://www.priceintelligently.com . (30-10-2020).

your product is all about having an attractive product mix with scalable pricing that appeals to bigger clients who are willing to pay more to obtain more value as well as price sensitive consumers who need less of your service. If your company offers a free plan or free trial, packaging and its relationship to pricing becomes even more crucial. Free users are pointless unless they're eventually willing to convert, so it's important to use a proper set of plans and continual engagement to give these customers the incentive to upgrade to paid tiers and profitable services. Uncover what features and product options your customers actually care about so you can increase their willingness to pay and factor them into your MRR.

4 Pricing: The most important part of a value based pricing strategy is determining the price sensitivity of your target customers. You can increase the customer's willingness to pay with a great service and superb value alignment, but understanding price sensitivity is the key to knowing which direction to go in and what needs to be redeveloped as your business moves forward. Customer data is the best indicator of whether your pricing is justified by your offerings. You can't raise more monthly revenue before discovering how your target segments perceive the value of what your building. Price sensitivity data also tells you if your prices may be too low, and after you cull this precious data from your customers you may find that you can raise prices on certain plans without increasing churn.

The third concept is the sales metric which is defined according to Frost[102] as "data points that represent an individual's, team's, or company's performance. They help track progress toward goals, prepare for future growth, adjust sales compensation, award incentives and bonuses, and identify any strategic

[102]https://blog.hubspot.com . (30-10-2020).

issues." Frost[103] also show the most important metrics to keep track of:

1. Total revenue
2. Revenue by product or product line
3. Market penetration
4. Percentage of revenue from new business
5. Percentage of revenue from existing customers (cross-selling, upselling, repeat orders, expanded contracts, etc.)
6. Year-over-year growth
7. Average lifetime value (LTV) of user or customer
8. Net Promoter Score (NPS)
9. Number of deals lost to competition
10. Percentage of sales reps attaining 100% quota
11. Revenue by territory
12. Revenue by market
13. Cost of selling as a percentage of revenue generated

[103] https://blog.hubspot.com . (30-10-2020).

3.9 Practical proof of the influence of digitalization

This section shows the practical influence that digitalization has on the company value. First, statistics are shown that with digitalization the sales in retail are growing. Then stock prices prove that retail companies who implement digitization increase.

Proof of influence of digitalization with Statistics

The first statistic 3.19 shows that retail e-commerce sales constantly grow and will continue to grow in the next few years.

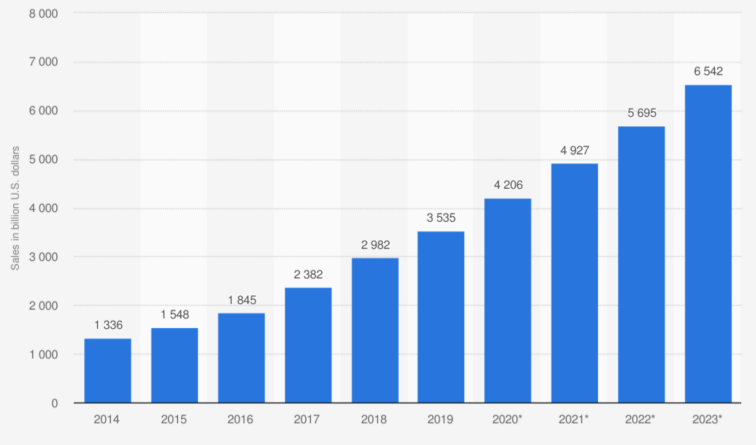

Figure 3.19: Retail e-commerce sales worldwide from 2014 to 2023[104]

[104]https://www.statista.com/

The second statistic 3.20 shows that the number of digital buyers also grow constantly and will continue to grow in the next few years.

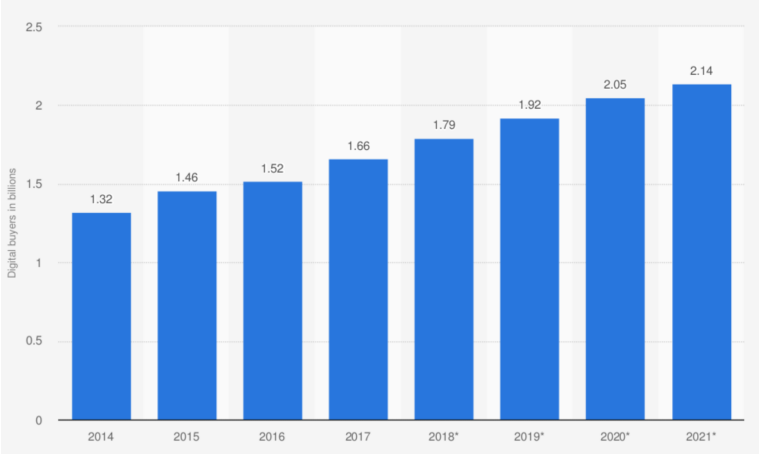

Figure 3.20: Number of digital buyers wordlwide from 2014 to 2021 (in billions)[105]

Statistic number three 3.21 shows that the growth rate of online pure-play and multi-channel retail grew strong and will continue to grow.

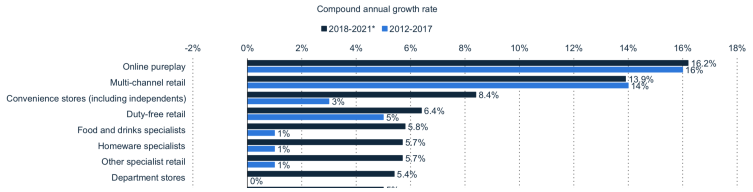

Figure 3.21: Retail sales growth rate worldwide from 2012 to 2017, with a forecast for 2018 to 2021, by industry[106]

[105]https://www.statista.com/
[106]https://www.statista.com/

The last statistic 3.22 shows that in-store sales are still strong but stay steady while the online sales continue to grow.

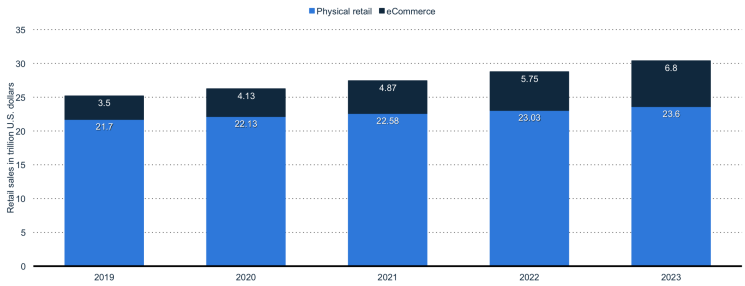

Figure 3.22: In-store and e-commerce retail sales worldwide from 2019 to 2023 (in trillion U.S. dollars)[107]

[107]https://www.statista.com/

Proof of influence of digitalization with Stock prices

This section shows the stock price of the last 5 years of two big U.S. retailers, two big European retailers, and Amazon as an international online shop. All of them do a lot in digitalization, and they also have their own department for digitalization. Because of the growth, This should prove that digitalization has a positive influence on the company value. Of course, there is much other influence on the stock price, but these stocks are growing continuously in the last 5 years except for this year because of the Covid-19 crisis.

The first stock 3.23 is from Walmart, a U.S. retailer which invests a lot in digitalization and tries out new things in that area. Walmart became the biggest retailer in the world[108].

Figure 3.23: Walmart stock price last 5 years.[109]

[108]https://nrf.com/blog/2020-top-50-global-retailers
[109]https://www.nyse.com/

The second stock 3.24 is from Costco, which is also a U.S. retailer and invests since 2017 a lot in digitalization, which the article[110] stated and since that, time the stock price is increasing.

Figure 3.24: Costco stock price last 5 years.[111]

The third stock 3.25 is from Amazon, which operates internationally only via online-shop and is the fastest growing retailer globally. Because of the positive influence of digitalization, Amazon became the biggest online retailer in the world[112].

[110]https://digital.hbs.edu/
[111]https://www.nasdaq.com/
[112]https://axiomq.com/blog/8-largest-e-commerce-companies-in-the-world/

Figure 3.25: Amazon stock price last 5 years.[113]

The fourth stock 3.26 is the REWE Group, a retail group in Europe where companies like Billa, Biba, and Merkur belong. They also do a lot in digitalization e.g., Billa offers a click and collect system. In 2018 REWE Group invested 2 Billion Euro in digitalizaiton[114]. This group is also growing strongly in the last five years.

Figure 3.26: Rewe group stock price last 5 years.[115]

[113]https://www.nasdaq.com/
[114]https://digital-magazin.de/rewe-investiert-zwei-milliarden-in-digitalisierung/
[115]https://www.finanzen.net/

The five and last stock 3.27 is the Schwarz Group, also a retail group in Europe where companies like Lidl and Kaufland belong. They also do a lot in digitalization and can also increase the company value. In 2016 the invested millions of euros in digitalization[116].

Figure 3.27: Schwarz group stock price last 5 years.[117]

[116]https://www.cio.de/a/lidl-macht-filialen-zu-abholstationen,3325772
[117]https://www.finanzen.net/

4 Results

This chapter describes the discoveries during the research of this thesis. The first step was to search for all kinds of information available for the topic of digitalization and value creation with digitalization.
The goal was to collect all information and process this information to give a good overview of digitalization and how digitalization can help create value. After creating a good structure, a process was explored in which digitalization can help increase value. Through the structure of this thesis, the process was discovered. Figure 4.1 shows that process, which is called the digitalization influence value creation process. This process consists of five steps. The first step is to monitor new technologies, how advanced they are and how viral they become. In this example, it is the emergence of big data. First big data was just a niche technology, but it became more useful over time, e.g. with big data platforms where developers compare prices among competitors. Therefore you need to monitor all available technologies as long as they become useful for your business. The second step is to analyze the changes this new technology brings. e.g., with the occurrence of comparison platforms, customer behavior changed. After you know the changes the technology brings you to think about the opportunities and threads this technology can bring to your business. E.g., With the change of customer behaviour you can win or keep your customers if you have a lower price and on the other hand, if you have a much higher price than your competitor, you will lose your customers. The next step is to develop a strategy to use new technology to

your advantage. E.g., To keep your customers and acquire new customers, you have to lower the price. Maybe this can be done using other technologies. Furthermore, the last step is the increase/decrease in company value. E.g., If you have developed a good strategy, you will acquire new customers, which can create value.

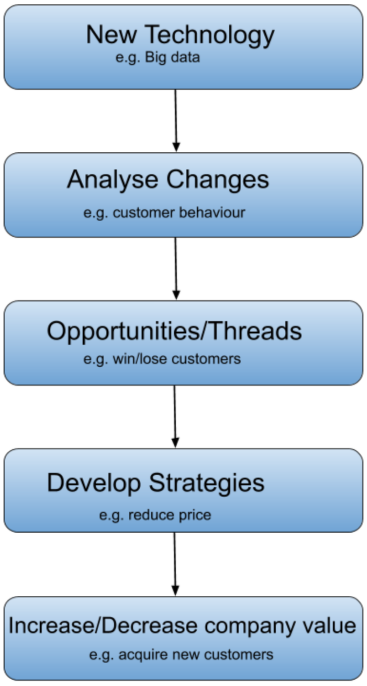

Figure 4.1: The digitalization influence value creation process

The second thing which was discovered is that digitalization is tremendous, and it has influence in every single part of business, business model, business strategies, and business processes. As a retailer, if you decide that you give digitalization no chance and do nothing, this will have fatal consequences. Because in the future, digitalization will be used more, and more and for analogous companies, it will be hard to keep up.

Another discovery was that you don't have to use every technology and digitalization strategy to keep up. You have to choose what is best for your business.
Also, world clouds were created to visualize the major changes in retail and every affected area of retail. Figure 4.2 shows the major changes in retail. It is easy to see that all major areas in a business process are infected by digitalization: E.g. products, marketing, and customers.

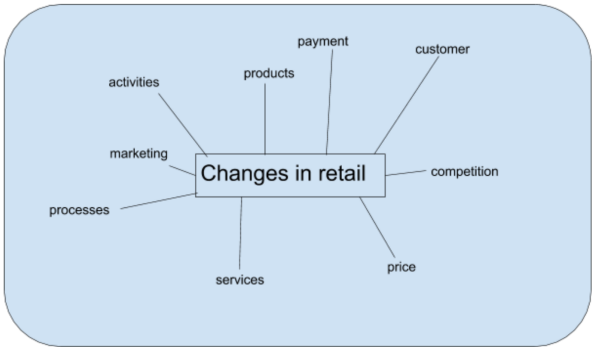

Figure 4.2: Major changes in retail

After showing the major changes in retail, figure 4.3 visualizes that in retail there will be new ways in communication, transaction and distribution. E.g. communication is now online through social media, transactions take place through digital payment, and products such as music are distributed online.

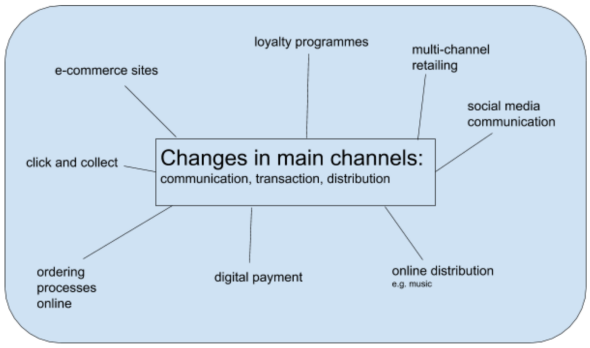

Figure 4.3: Major changes in channels

Figure 4.4 visualizes that in retail competition will be harder because competitors which use digitalization have advantages. E.g., competitors replace labor with software or can provide new services through the internet. Using digitalization can also lead to competitors that emerge from unexpected places.

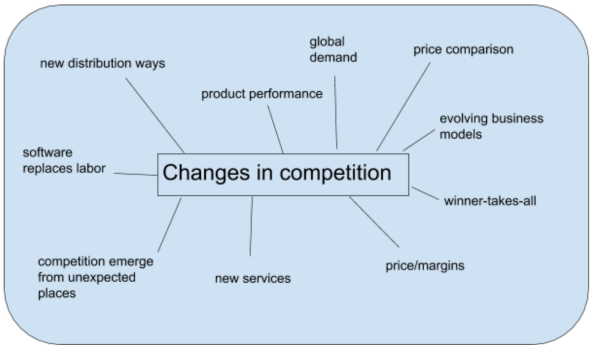

Figure 4.4: Major changes in competition

Figure 4.5 visualize that in retail there will be new customer behavior and new ways to address the customers. E.g., The customer's satisfaction is very important because customers change to the competitor faster if they are not satisfied. Another big change is that through the internet customers compare

prices, and they are better informed.

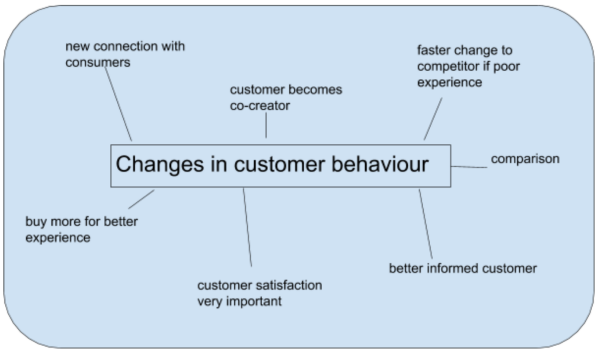

Figure 4.5: Major changes in customer behaviour

Figure 4.6 visualizes that in retail there are new ways of pricing and marketing. E.g., using the subscription model to get revenue every month. Then using social media for marketing is very popular. And also remarketing which, shows the product later is again is common.

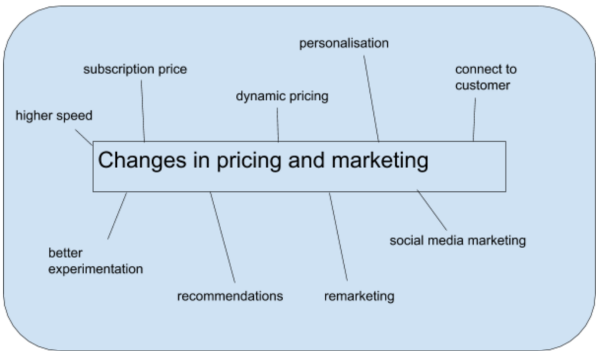

Figure 4.6: Major changes in pricing and marketing

Figure 4.7 visualizes that in retail there will be changes to product and price. E.g., a better experience for the product before paying can be archived with virtual reality or aáugmentet reality. Some products such as music, film are

now available online without buying the product but the service to listen or watch.

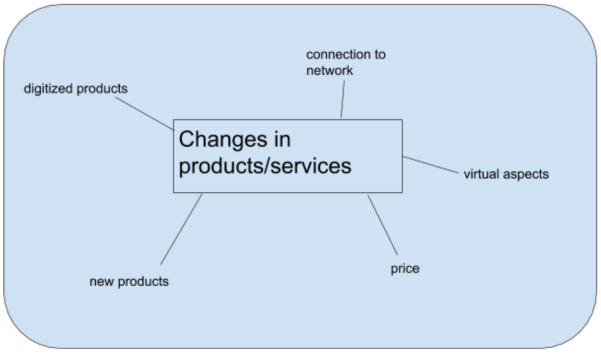

Figure 4.7: Major changes in products

5 Conclusion

The research of this thesis suggests that for implementing digitization in retail, there are much potentials. This thesis shows a good overview of digitalization in general. It also gives a good collection of what other literature suggests on how to create company value using digitalization. Further, this thesis shows a process that may be used to implement digitalization with the purpose of value creation.
To give a good overview of what changes in retail also word clouds were created to visualize the major areas and the major changes.
One limitation of the current research is that digitalization is changing rapidly. It can be possible that if you implement digitalization according to how it is described in this thesis, it can be obsolete in a few years because of evolving technologies.
Future research might also explore new technologies and new influences of digitalization on company value creation. Further, the process of implementing digitalization might be adjusted if new technologies occur.

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