The Impact of Digitization on Future Business Models

Master’s Thesis
to confer the academic degree of
Master of Science
In the Master’s Program
General Management
Sworn Declaration

I hereby declare under oath that the submitted Master’s Thesis has been written solely by me without any third-party assistance, information other than provided sources or aids have not been used and those used have been fully documented. Sources for literal, paraphrased and cited quotes have been accurately credited.

The submitted document here present is identical to the electronically submitted text document.

Linz, November 2017
Acknowledgement

I highly appreciate the support of my parents Brigitte and Franz who ultimately made my university studies possible. Their efforts to provide me with this chance are not to be taken self-evidently. I deeply thank you!

Moreover, I want to hereby thank Assoz. Univ.-Prof. Mag. Dr. Regina Gattringer for her professional support and supervision over the course of the creation of this master’s thesis. She was always willing to provide help and useful input regarding numerous questions and issues.
Executive Summary

This thesis addresses the influence of digitization on future business models. Although, it is generally agreed-on that digitization has a significant influence on business models, it appears that the detailed and concrete impacts remain mostly ignored in favor of making shallow statements à la “digitization changes everything”. Additionally, the business model\(^1\) as well as the megatrend digitization\(^2\) face a relatively ambiguous state of scientific discussion in terms of their respective definitions and contents. This master thesis is aiming to overcome those mentioned obstacles by conducting a comprehensive literature review and provide detailed, concrete and methodologically soundly derived answers to the question: How might future developments of digitization shape future business models?

Since the concept of the business model and digitization face divergent conceptions in regard to their respective meanings, it is vital to provide a common definitional ground to be able to address this question. Therefore, definitions of key terms of this thesis are clearly stated to exclude potential misconceptions of this work’s results.

Digitization and the related term of digitalization are understood differently in public as well as in scientific publications. While digitization describes the technical process of converting information into binary code (1s and 0s)\(^3\), digitalization is mostly referred to as the public application of such digital technology in society.\(^4\) For this thesis’ purpose, digitization and digitalization are used interchangeably with the broad societal meaning of digitalization. Historically, digitalization has its roots in the early 1990s, caused a major stock market bubble due to the overestimation of its economic potential in 2000 and is an essential part of human life today in the form of the collective use of mobile devices and digital technology in general.\(^5\) Moreover, assuming that digitization is one single trend with coherent attributes appears to be illegitimate. Instead, it is a collective term for numerous specific digital technologies which naturally face different respective peculiarities. Therefore, after reviewing recent literature, this thesis provides a catalogue of currently relevant digital technology trends. Due to their respective complex contents, the author chooses four important trends to represent digitization for this thesis: big data, crowdsourcing, distributed ledgers and multisided platforms.

Although the business model’s definitional background is ambiguous, an agreed-on basic meaning appears derivable and serves as the understanding of the key word for this paper’s purpose. Therefore, for this thesis, the business model represents a firm’s basic logic, mechanics or blueprints which describe the functionality of a business. To add a clear framework for concretely answering the main research question, one of five discussed business model structures including respective elements is chosen as the further basis of discussion. Due to the context of the publication it is part of and the elements’ suitability to reflect peculiarities of digitization, the business model by Baden-Fuller, et al. is chosen.

\(^2\) Cf. Vogelsang, 2010, p. 3; Gartner Inc., 2015; Gray & Rumpe, 2015, p. 1319
\(^3\) Cf. Vogelsang, 2010, p. 3
\(^4\) Cf. Gray & Rumpe, 2015, p. 1319
\(^5\) Cf. Lemke & Brenner, 2015, pp. 18ff.
According to this structure, a business model consists of four elements: customer identification, customer engagement, value chain linkages and monetization.\(^6\)

A field of research which is closely related to the business model and this thesis’ main research question is business model innovation. Generally, it can be stated that changing an existing business model and designing a wholly new business model are the topics of interest in this field.\(^7\) Successfully, innovating business models strongly depends on an organization’s ability to continuously experiment with ideas and perceive trial-and-error learning.\(^8\) A further insight into business practice of business innovation is the fact that new business model ideas are normally spun off into separate autonomous entities.\(^9\) In this isolated state, their financial performance is constantly observed in financial performance models. If a model proves to be successful it is scaled up and eventually reintegrated in an existing business model.\(^10\)

Combining insights from the literature review about digitization and the business model, this thesis provides a best practice and a bad practice example of business models reacting to digitization effects. Valve Corp. originated from a pure video game developer towards being one of the largest video game distribution platforms by utilizing opportunities in data transmission and online platforms. Blockbuster Inc., a video rental chain with physical stores to the contrary, relied on inferior assets in its business model and got outperformed by rivals such as Netflix and their modern streaming services.

Addressing the main research question using the four chosen digitization trends, it becomes apparent that trends’ influences on the chosen business model framework of Baden-Fuller, et al. are highly specific based on the respective trend. This thesis offers a detailed catalogue of potential impacts. For example, the distributed ledger has the potential to make any intermediary service business model practically obsolete because validating transaction is no longer necessary.\(^11\) Furthermore, consulting the public via crowdsourcing practices can improve the quality of innovation processes and lead to better value propositions.\(^12\) Big Data analysis can allow organizations to utilize hidden insights from large and unstructured data sets for improvements in any element. Exemplarily, social media data can be used to accurately predict box office sales of new cinema movies.\(^13\) Online multisided platform markets changed the competitive landscape in many industries. This trend leads to extreme potentials for upscaling of specific business models and already resulted in giant industry-dominating companies such as Uber or Alibaba.\(^14\)

Beyond those examples, all found effects are comprehensively discussed on a business model element level. Analyzing the results, it becomes apparent that although the trends’ effects on business models are highly specific on their own, they share one commonality. All of the chosen trends require the organization to increasingly open up its internal processes to the external environment.

\(^9\) Cf. Chesbrough, 2008, p. 23
\(^12\) Cf. Poetz & Schreier, 2012, pp. 245ff.
\(^14\) Cf. van Alstyne, Parker, & Choudary, 2016, p. 56
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<th>Description</th>
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<tbody>
<tr>
<td>AI</td>
<td>Artificial Intelligence</td>
</tr>
<tr>
<td>CD</td>
<td>Compact Disc</td>
</tr>
<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
</tr>
<tr>
<td>Cf.</td>
<td>confer</td>
</tr>
<tr>
<td>CVP</td>
<td>Customer Value Proposition</td>
</tr>
<tr>
<td>DAX</td>
<td>Deutscher Aktienindex</td>
</tr>
<tr>
<td>ECN</td>
<td>Electronic Communications Networks</td>
</tr>
<tr>
<td>EUR</td>
<td>Euro</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GNP</td>
<td>Gross National Product</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communications Technology</td>
</tr>
<tr>
<td>IoT</td>
<td>Internet of Things</td>
</tr>
<tr>
<td>IPO</td>
<td>Initial Public Offering</td>
</tr>
<tr>
<td>ISI</td>
<td>Institute for Scientific Information</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>NASDAQ</td>
<td>National Association of Securities Dealers Automated Quotations</td>
</tr>
<tr>
<td>NYSE</td>
<td>New York Stock Exchange</td>
</tr>
<tr>
<td>PC</td>
<td>Personal Computer</td>
</tr>
<tr>
<td>PFSP</td>
<td>Premium Full Service Provider</td>
</tr>
<tr>
<td>SAP</td>
<td>Systeme, Anwendungen und Produkte in der Datenverarbeitung</td>
</tr>
<tr>
<td>UMTS</td>
<td>Universal Mobile Telecommunications System</td>
</tr>
<tr>
<td>US</td>
<td>United States</td>
</tr>
<tr>
<td>USD</td>
<td>United States Dollar</td>
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1. Introduction

Digitization is shaping the world like it never did before. It appears as if digital technology advancements take place at an ever-increasing pace. However, the consequences of the unfolding of digitization do not exclusively confine a purely technical sphere. Today, the phenomenon of digitization is affecting almost every aspect of living. By 2020, the first human generation will have grown up entirely in a digitally dominated environment.\textsuperscript{15} Taking this into consideration, ongoing constant digital innovation will lead to a constantly changing nature of social coexistence for virtually every person on the planet. Ultimately, one major aspect of human society which experiences intensive change is the area of business. Companies must be aware of business-related developments in the field of digitization. Moreover, respective insights need to be transformed into organizational and strategic reconfiguration.

Over the last decades, the way how firms create profit has changed drastically due to digital achievements such as the internet, personal computers and others.\textsuperscript{16} Building businesses on a digital foundation has already led to the ascension of extremely large and successful technology firms. By the end of July 2016, the five most valuable stock-listed companies in terms of market capitalization were all highly digitally focused technology businesses.\textsuperscript{17} Apparently, the stock-market agrees on the further future potential of digital innovation. Many of the successful digital organizations created or adapted highly innovative and completely new business blueprints to create and deliver value.

The requirements of digitization for a company’s business structure are highly complex and manifold. It is practically impossible to grasp the entirety of existing influence relations. The concept of the business model enables a systematic and abstracted analysis of this interrelation.\textsuperscript{18} Using such a structured approach allows observers to effectively assess how and why digitization caused specific successful business models or changes in business models. The business potential of digitization and its complex business utilization in combination with the possibility to resolve this complexity with the use of a business model view leads to the purpose of this thesis.

This thesis aims to condense existing literature about digitization, the business model concept and business model innovation towards gaining a structured insight about how digitalization affects and might affect business models in the future. Obviously, predicting the future entails an inherent degree of uncertainty. Nonetheless, this work tries to give profound predictions by logically linking current literature insights.

\textsuperscript{15} Cf. PwC, 2016
\textsuperscript{17} Cf. Oremus, 2016
\textsuperscript{18} Cf. Seddon, Lewis, Freeman, & Shankes, 2004, p. 440
1.1. Background of the Thesis & Problem Statement

The configuration of business models – the mechanic blueprint of a business – based on the external stimulus of digitization is the main interest of this thesis. Undoubtedly, digitization nowadays is a strong determinant of most firm’s business models. Neglecting or misaddressing the crucial challenges of digitization may lead to severe drawbacks:

“History provides many examples of market leaders who suffered the dire consequences of failing to foresee the shift to digital business models.”19

Although the importance of successful adaption of business models to digitization is intuitively obvious, currently, the explicit link between the two terms is elaborated relatively sparsely and disorganized. Additionally, the academic discourse of the key terms “digitization” and the “business model” remains relatively diffusive and partially in disagreement. In the light of those difficult preconditions, it will be obligatory to make suitable clarifying assumptions to be able to address the proposed link digitization-business models.

Moreover, this thesis tries to address the influence of digitization on business models beyond overexaggerating phrases à la “digitization changes everything.” The goal is to derive concrete influences based on pertinent literature. As of today, the concept of the business model has been discussed in application to many specific business and branches. Nonetheless, this work will discuss tendencies on a general level.

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19 Cf. Noronha, Moriarty, O’Connell, & Villa, 2014, p. 3
1.2. Research Objectives

The omnipresent rapid evolution of digital technology imposes significant changes on the way business is done and society in general. Considering technological advancement as enablers for new ways of business value creation, it is of crucial importance to ultimately transform this theoretical possibility into actual outcome. The concept of business models is a fitting approach of describing and analyzing the process of capturing value from innovation.

In the light of this connection, the main aim of this thesis is to review and condense current scientific literature of business models, business model innovation and digitization towards finding implications about how digitization trends might influence future business model structures. In order to reach this thesis´ main goal, this paper consists of three areas of associated discussion:

The first area of discussion is aimed towards providing a comprehensive overview of the phenomenon of digitization. The keyword “digitization” is an extremely comprehensive and widely used buzzword. For the sake of reaching the main aim of the thesis, the following research questions are answered:

- How can digitization be defined for the paper´s purpose? What is the difference between digitization & digitalization?
- How did digitization unfold over the past decades?
- How will the phenomenon likely evolve in the future?

The second area of discussion will revolve around the concept of the business model. This chapter is including a selection of a business model conceptualization for further elaborations in the following chapter. The research questions for this part are:

- How can a business model be defined for the sake of this thesis?
- What are separable elements of a business model and how do they interrelate?
- How are business models/business model elements adapting to changing stimuli?

The third area of discussion is aiming towards revealing the explicit impact of digitization on business models. Using the selected business model structure, the main goal of this part is discussing how digitization trends influence the respective business model elements. In this chapter, the following research questions are answered:

- Practical Input: How did recent digital innovations impact firms´ business models? Which adaptions were successful and which were not?
- How might future developments of digitization shape future business models?

The last research question of this section is simultaneously the main research question of this paper.

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20 Cf. Zhu, Song, Ni, Ren, & Li, 2016, p. xix
1.3. Scope & Structure of this Thesis

The scope of this thesis is mainly focused on the two extremely widely and comprehensively used terms of “digitization” and “business model”. Both of those keywords face inconsistent use in academia and public society. By reviewing and condensing relevant literature thoroughly, a distinct and legitimately understandable path through the thicket of partially diffusive literature should be uncovered to reach this thesis’ goal. The structure of this path is shaped as follows:

Figure 1: Simplified Structure of this Thesis – created by the author

1) In the first chapter, the author is explaining this work’s aims, problem definition and objectives of this thesis.

2) The second chapter is reviewing literature regarding the meaning and content of digitization, past development and likely future evolvement for the purpose of this thesis.

3) The third chapter is reviewing literature regarding the meaning and content of the business model, business model elements and business model innovation for the purpose of this thesis.

4) The chapters two and three are prerequisites for this chapter. The previous sections are connected to explore the influence of digitization trends on business models.

5) The fifth chapter includes the author’s conclusion and reflection.
2. The Phenomenon of Digitization

Rigidly described for the introduction to this chapter, the term digitization refers to the technical process of changing from analog to digital.\textsuperscript{22} The switch towards increased digitality “[…] is inevitable, irreversible, tremendously fast, and ubiquitous”\textsuperscript{23}. This switch is no homogenous process but a collective term. It consists of numerous respective technical innovations, whereas the internet can be seen as the central and most important advancement.\textsuperscript{24} Furthermore, in a wider sense, digitization is considered as a “megatrend” which affects human society and therefore business to a strong extent. Clearly, taking this into consideration, digitization does affect business models as well:

“Digitization as a megatrend is impacting all areas of corporate business models. Companies are adapting their strategies and business models to cope with challenges and opportunities arising from the digital age.”\textsuperscript{25}

Table 1 represents a short summary of the phenomenon of digitization in regard to three dimensions: drivers, objects and impacts of digitization:

<table>
<thead>
<tr>
<th>Digitization</th>
<th>Drivers</th>
<th>Objects</th>
<th>Impacts</th>
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<tbody>
<tr>
<td></td>
<td>digital technology breakthroughs</td>
<td>processes and work</td>
<td>strong impacts on the economy as a whole</td>
</tr>
<tr>
<td></td>
<td>changes in people’s behavior, attitude and expectations</td>
<td>products and services</td>
<td>extraordinary opportunities for businesses</td>
</tr>
<tr>
<td></td>
<td>low entry-barriers</td>
<td>business models</td>
<td>significant challenges for businesses</td>
</tr>
<tr>
<td></td>
<td>huge amounts of venture capital</td>
<td></td>
<td></td>
</tr>
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</table>

Table 1: Digitization - Drivers, Objects & Impacts – modified after Schreckling & Steiger, 2017, p. 3

The challenges posed by digitization are highly complex and revolutionary. Scholars in the late 90s and early 2000s already recognized that the information technology advancements have the potential to completely reshape aspects of strategy and business. For example, it was argued anticipatory that advancements in information technology will have a considerable impact on the strategic resource of information\textsuperscript{26} and the industry structure of a firm.\textsuperscript{27} From a more current point-of-view, it can be clearly stated that digitization affects the entirety of human living, including economy, culture and society.

Digitization is a worldwide development. Despite this global scale, the development stage of digital technology is different per country. Therefore, the effects of digitization might differ on a geographical level. Generally, it appears that regions such as North America and Europe have expanded information technology most extensively, while Africa and parts of Asia face a relatively weak status of digital technology implementation.\textsuperscript{28}

\textsuperscript{22} Cf. Schreckling & Steiger, 2017, p. 3
\textsuperscript{23} Schreckling & Steiger, 2017, p. 3
\textsuperscript{24} Cf. Zhu et al., 2016, p. xxiii
\textsuperscript{25} Gulati & Soni, 2015, pp. 60f.
\textsuperscript{26} Cf. Sampler, 1998, pp. 343 ff.
2.1. Digitization & Digitalization

In today’s society, it appears as if the terms “digitization” and “digitalization” share a common meaning and can be used interchangeably.29 In scientific discourse, the keywords face inconsistency in their use and diffusion of meanings. Some scholars propose a clear distinction while others do not attribute attention to the terminology. Considering a distinction, rigidly stated, digitization refers to a technical process, whereas digitalization describes a societal trend of an increasing use of information technology. Hereinafter, the respective content of the terms is elaborated in close detail. For a clearly understandable proceeding of the thesis, this chapter will ultimately decide on the definitions of the terms for this thesis’ purpose.

2.1.1. Digitization

The term digitization has been defined in various publications and seems to have found mainly congruent definitions. The reason for the resulting relatively clear definition seems to be caused by the fact that the term refers to a distinct technical process. Therefore, there is little variance in those technical descriptions. Subsequently, some selected definitions of digitization are included.

The term of digitization is referred to as making information electronically available. When digitized, information is no longer existent physically or as a combination of atoms. Instead, it is transformed from such a physical state to an electronic state in bits and bytes. Generally, digitization does involve every possibility of performing this transformation, which might also include physical products with this respective ability.30

“[…] digitization which means the expression of information in strings of 0 and 1, called binary or digital strings.”31

The Oxford English Dictionary describes digitization as “[…] the conversion of text, pictures, or sound into a digital form that can be processed by a computer.”32

Although specialized scholars appear to have found an agreed-on definition of the term, digitization is often used out of a purely technical context. Especially in social and business sciences, the term is used mainly in a wider, societal context. Concluding, the term has two different meanings depending on the context it is used in. Exemplarily for an alternative meaning, the world economic forum views digitization as “[…] the mass adoption of connected digital technologies and applications by consumers, enterprises, and government”.33 Other scholars describe digitization as “[…] the increasing creation, support, use, and consumption of digital representation of information […]”.34 Still, other scholars do not provide an explicit definition, yet use the word digitization with a different meaning than technical scholars do. Those authors regularly treat digitization in the way the world

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29 Cf. Kreiss & Brennen, 2014
31 Vogelsang, 2010, p. 3
32 Oxford University Press, 2017
33 Dutta & Bilbao-Osorio, 2012, p. 121
34 Greenstein, Lerner, & Stern, 2013, p. 110
economic forum does: as a mass adoption of digital technology in society.\textsuperscript{35} It appears, that many scholars include the impact of the application of digitization into the term’s definition.

2.1.2. Digitalization

The term “digitalization” faces a slightly different fate than digitization. Apparently, it is not used to describe the technical process of changing from analog to digital per se. Instead, it revolves around the adaption of technology in society:

“[…] the emerging trend of “digitalization,” which represents the integration of multiple technologies into all aspects of daily life that can be digitized. A few examples of digitalization include smart homes (for entertainment, security, childcare, electrical, and heating), e-healthcare, smart mobility, and smart cities.”\textsuperscript{36}

The definition of Gartner Research even explicitly links digitalization to business models. This appears specifically interesting, since it implicitly supports the importance of the digital technology as a business model determinant:

“Digitalization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business.”\textsuperscript{37}

Interestingly, in terms of frequency of use, digitalization appears to be used less often than digitization. A google search for the term “digitization” leads to about 8 million hits whereas “digitalization” only delivers about 4.5 million.\textsuperscript{38} The Oxford English Dictionary surprisingly offers no explicit definition of the term. It just refers to the given definition of digitization.

2.1.3. Further Terminology

Adapting a clear distinction for each of the terms based on narrow and accurate definitions of specialist scholars does not seem to be a viable option for proceeding this thesis. This paper aims to question how digital technology advancements affect business models of firms. Undoubtedly, business is influenced by more than technological processes alone. Instead, business is strongly affected by the actual implementation and any impact of its use. Therefore, in the light of this thesis’ purpose, the terms digitization and digitalization are used interchangeably and in a wider societal context. The terms should be defined by the following broad definition for this thesis’ further elaborations:

“In a broader societal context, digitization is defined as the economic and social transformation triggered by the massive adoption of digital technologies to generate, process, share and transact information.”\textsuperscript{39}

This description was selected because it fits the purpose of this paper. It recognizes the impact on a societal and therefore economic level, while it respects digitization as a transformational process. Furthermore, it places special emphasis on information as

\textsuperscript{35} Cf. Gulati & Soni, 2015, p. 60
\textsuperscript{36} Gray & Rumpe, 2015, p. 1319
\textsuperscript{37} Gartner Inc., 2015
\textsuperscript{38} Note: Google-Search was conducted by the author on 22.04.2017 using the terms „digitization“ and „digitalization“.
\textsuperscript{39} Katz et al., 2014, p. 32
important key element of the phenomenon. Through this comprehensive scope, the
definition includes virtually any published understanding of digitization by other scholars and
keeps any literature viable. Although this may partially disrespect the narrow, technical
definition of digitization in specific cases, it serves the purpose of eliminating potential
uncertainty regarding wording. The author believes that a clear distinction does not add
additional value to this paper. Instead, a clear distinction might create unnecessary
complexity.

Concluding and for further clarification, Figure 2 illustrates how the outlined definitions of
scholars and this thesis’ understanding of the terms interrelate. The narrow definition of
digitization is a purely technical process, which does not include any impact in its meaning.
Therefore, it is a compact term with a technical (blue) context. Digitalization is representing
this impact dimension and is therefore a “larger”, more comprehensive term. It extends the
purely technical context by a societal (economic, cultural, etc.) context represented by its
green color. Still the wider definition implicitly contains the technical description of the
respective technical digitization process. As discussed above, this thesis will use both terms
interchangeably in the wider sense of digitalization. At this point it becomes visible that only
the wider definition can be used as a shared meaning for both terms. Attributing the narrow
technical descriptions to both terms would be illogical. It would further blur the applicability
of specific literature.
2.2. Development of Digitization

To fully understand digitization beyond the sheer definition of the word, the author believes that it is necessary to further describe major milestones of its past development. Digitization is shaped by specific technological innovations which require to be respected to grasp the whole relevance and scope of the phenomenon. A possible way to systematically assess the evolution of digitization is a four-step approach based on the visualization of Figure 3.

![Figure 3: Evolution of the Digital Age – modified after Lemke & Brenner, 2015, p. 19](image-url)

The first evolution phase, which lasted from about 1990 to 2000, was characterized by the interconnection of computers. In this era, the development of the World Wide Web allowed the first Internet-based offers and content to be accessed by the public.\(^40\) For example, in 1994 the first Pizza was ordered online from Pizza Hut and digital storage of data became more economic than paper storage.\(^41\) This phase was further coined by increasingly rising expectations regarding the business impact of digital networks and technology. After realization that profit expectations were highly overrated and technological limitations were present, this phase ended in the burst of the Dotcom Bubble.\(^42\) Nonetheless, although digitization crashed the financial markets, its real economy impact just began to unfold.

The second phase of the digital age, which is argued to have lasted from 2000 to 2015, built on the potential of information technology detected in the first phase. In this stage, numerous digital services and products became established in the global market. The global use of mobile devices such as laptops, tablet computers or smart phones disconnected internet usage from a static location.\(^43\) In the year 2016, the worldwide shipments of mobile devices already surpassed the shipments of PCs to a major extent and are projected to

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\(^40\) Cf. Lemke & Brenner, 2015, pp. 18f.
\(^41\) Cf. Press, 2015, p. 4
\(^42\) Cf. Lemke & Brenner, 2015, p. 20
\(^43\) Cf. Lemke & Brenner, 2015, pp. 20f.
extend their lead. Gartner, Inc. provides a forecast of sales of mentioned devices up to 2019 as shown in Table 2.

<table>
<thead>
<tr>
<th>Device Type</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional PCS (Desktop-based and notebooks)</td>
<td>291</td>
<td>205</td>
<td>198</td>
<td>193</td>
</tr>
<tr>
<td>Ultramobiles</td>
<td>49</td>
<td>61</td>
<td>74</td>
<td>85</td>
</tr>
<tr>
<td>PC Market</td>
<td>268</td>
<td>266</td>
<td>272</td>
<td>278</td>
</tr>
<tr>
<td>Ultramobiles</td>
<td>168</td>
<td>165</td>
<td>166</td>
<td>166</td>
</tr>
<tr>
<td>Computing Devices Market</td>
<td>436</td>
<td>432</td>
<td>438</td>
<td>444</td>
</tr>
<tr>
<td>Mobile Phones</td>
<td>1.888</td>
<td>1.893</td>
<td>1.920</td>
<td>1.937</td>
</tr>
<tr>
<td>Total Devices Market</td>
<td>2.324</td>
<td>2.324</td>
<td>2.357</td>
<td>2.380</td>
</tr>
</tbody>
</table>

Table 2: Sales and Projected Sales in the Devices Market from 2016 to 2019 – modified after Gartner Inc., 2017

The third phase of the digital age, which is anticipated to be completed by 2030, is argued to revolve around the buzzword of “Internet of Things (IoT)” and a general state of maturity of digital technology advancement. Therefore, digitization is already established as a major determinant of human existence.44 The IoT can be described as “[…] the networked interconnection of everyday objects, which are often equipped with ubiquitous intelligence. IoT will increase the ubiquity of the Internet by integrating every object for interaction via embedded systems, which leads to a highly distributed network of devices communicating with human beings as well as other devices.”45 It is said that IoT will improve quality of human living significantly.46

The fourth and final phase of the digital age, is claimed to begin around 2030 and will lead to a complete fusion of the real and the digital world. Digital technology has become an integral part of human existence. The use of robotics, connected objects and software is as usual as using streets or water supply.47

Different experts might view phases of digitization differently. Nonetheless, it appears as if the main development throughout any understanding of a phase division is the increasing interconnectivity between every-day objects and their intelligent alignment and communication.48

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44 Cf. Lemke & Brenner, 2015, p. 21
45 Xia, Yang, Wang, & Vinel, 2012, p. 1101
46 Cf. Xia et al., 2012, p. 1101
48 Cf. Köderitz, 2013, p. 86
The trend of digitization, over the course of its history has always created new technologies which threatened the legitimacy of established ones. Table 3 contains a compilation of specific technologies which were established in the past and are being replaced over the course of digitization unfolding. Firms with their business focus on technologies in the left column will need to defend against the attacks of firms which are utilizing disruptive innovations.49

<table>
<thead>
<tr>
<th>Established Technology</th>
<th>Disruptive Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver halide photographic film</td>
<td>Digital photography</td>
</tr>
<tr>
<td>Wireline telephony</td>
<td>Mobile telephony</td>
</tr>
<tr>
<td>Notebook computers</td>
<td>Hand-held digital appliances</td>
</tr>
<tr>
<td>Desktop personal computers</td>
<td>Sony Playstation II, Internet appliances</td>
</tr>
<tr>
<td>NYSE &amp; NASDAQ stock exchanges</td>
<td>Electronic Communications Networks (ECNs)</td>
</tr>
<tr>
<td>Full-fee underwriting of new equity and debt issues</td>
<td>Dutch auctions of new equity and debt issues, conducted on the Internet</td>
</tr>
<tr>
<td>Credit decisions based upon the personal judgment of bank lending officers</td>
<td>Automated lending decisions based upon credit scoring systems</td>
</tr>
<tr>
<td>Bricks &amp; mortar retailing</td>
<td>Online retailing</td>
</tr>
<tr>
<td>Industrial materials distributor</td>
<td>Internet-based sites such as Chemdex and E-steel</td>
</tr>
<tr>
<td>Printed greeting cards</td>
<td>Free greeting cards, downloadable over the internet</td>
</tr>
<tr>
<td>Classroom and campus-based instruction</td>
<td>Distance education, typically enabled by the internet</td>
</tr>
<tr>
<td>Standard textbooks</td>
<td>Custom-assembled, modular digital textbooks</td>
</tr>
<tr>
<td>Offset printing</td>
<td>Digital printing</td>
</tr>
<tr>
<td>Manned fighter and bomber aircraft</td>
<td>Unmanned aircraft</td>
</tr>
<tr>
<td>Open surgery</td>
<td>Arthroscopic and endoscopic surgery</td>
</tr>
</tbody>
</table>

Table 3: Disruptive Digital Innovations – modified after Christensen, 2013, p. xxix

49 Cf. Christensen, 2013, p. xxx
2.3. Current and Future Trends of Digital Technology

The goal of this chapter is to detect current digitization trends and rigidly describe them to provide an overview of trends. At the end of this chapter, the author will select specific trends to include in the discussion of the main research question already outlined in chapter 1.2.

The future phases of the digital age have already outlined the main direction digitization will develop towards in the future. Nonetheless, at this part of the thesis, a quick glimpse in likely future developments should be given based in current up-to-date trends. SAP, currently the most valuable DAX 30 company\(^{50}\) is a business software developer and published five major trends which will most likely shape the future of digital technology as outlined in Figure 4.\(^{51}\)

![Figure 4: Five Technology Trends Changing Everything – taken from SAP, 2015, p. 8](image)

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\(^{51}\) Note: For more information about the “circular economy” confer Ellen MacArthur Foundation, 2015.
In 2015 Ernst & Young conducted a survey with 1.025 firms in twelve countries about digitization and its relevance for business. One question revolved around those digitization trends, which currently affect the companies the most. Ranking the trends regarding their importance descending (most relevant first), the most important trends were mobile technologies, social networks, analytical/prediction tools for more robust forecasts, 3-D printing, sensors for machine-to-machine communication, augmented reality, robot technologies and the use of smart materials.52

Morabito is addressing digitization trends in the light of business model innovation. In his book he identified five important digital trends: machine intelligence, wearable technologies, digital currencies and distributed ledgers, data visualization and digital security.53 At this point, a short description of the terms should follow:

**Machine Intelligence:** This technological trend refers to programs and machines being able to learn and simulate human intelligence. It can also be called artificial intelligence (AI).54 As an example for AI utilization, computer learning can optimize energy consumption of Google’s data centers based on the workload of the system.55

**Wearable Technologies:** The term acts as an umbrella term for technology which is intended to be worn on the body. Examples for wearable technologies are headsets, smart watches or fitness devices. They allow to track body- and movement-related data in real-time.56

**Digital Currencies and Distributed Ledgers:** With the use of so called distributed ledgers, a special kind of database, it is possible to use so-called digital currencies or cryptocurrencies in business. This is a decentralized way of payment without any special authority controlling transactions.57 Some scholars argue that the distributed ledger technology, more commonly known as the blockchain, will be the most influential trend on society in the next decade beyond its applications in the world of finance.58 Boldly stated, this technology could make any intermediary or central ledger, including respective firms and jobs, obsolete.59

**Data Visualization:** Any decision maker nowadays faces large, complex and comprehensive amounts of data. Therefore, it will become increasingly difficult to make reasonable sense out of data and provide useful decisions. Data visualization improves this situation by making data visible in different forms as needed by the user. Visualizations are suggested to provide a deeper understanding of data for executives and improve decision making quality.60

52 Cf. EY, 2015, p. 32
54 Cf. Morabito, 2016, p. 3
58 Cf. Tapscott & Tapscott, 2016b, pp. 2ff.; Swan, 2015, p. vii
60 Cf. Morabito, 2016, pp. 61ff.
**Digital Security:** The trend of digital security is the logical consequence of digital crime. Malware and virus attacks pose a significant threat for business organizations. Such attacks can cause damage to a firm in the form of losing revenue, losing brand reputation, losing data and high costs for recovery from damage.⁶¹

Zhu, et al. offer additional digitization trends such as big data, platform markets, mobile internet, crowdsourcing, the long-tail market, digital finance and online solutions being increasingly connected to offline solutions.⁶² As with Morabito’s trends, at this point, a brief explanation to the respective trends should be included:

**Big Data:** The trend refers to making sense out of huge amounts of data which cannot be processed traditionally due to their sheer size. New ways of analysis are needed.⁶³ The trend consists of four key elements which are volume, variety, value and velocity.

> "Volume refers to the size of big data, measured not in terabytes but in petabytes. Variety refers to the many types of data. [...] video clips, pictures, and geographical information can all be incorporated into the category of big data. Value refers to identifying the data of high business value. For example, we might analyze vast amounts of video data to identify a useful clip that is only one or two seconds long. Velocity refers to the speed of information processing."⁶⁴

Today, especially on the internet, sheer endless amounts of data are available to firms. Big data’s potential lies in the utilization of this seemingly random accumulation of data by finding patterns in it. For example, Baidu, a Chinese search engine company, analyzed comprehensive data of 37,000 soccer matches of 987 teams (national teams and clubs) and managed to predict the outcome of 93.7% of all matches of the 2015 FIFA World Cup.⁶⁵

**Multisided platforms:** The so called multisided platform markets, also including the two-sided markets, are defined by one party providing a platform for arranging the interaction of other two or more parties. The internet enabled firms to connect parties via online platforms which created wholly new potentials for platform concepts. It is argued that platform concepts are only as viable as they are today because of the internet as the main enabler of their potential.⁶⁶ The best practice case study in chapter 4.1.1. revolves around a platform solution of Valve Corporation called Steam and represents a good example for utilizing a platform concept.

**Increasing transition towards mobile internet:** Currently, a switch between PC-based internet and mobile internet is taking place. Mobile devices such as the smart phone do not only enable firms to create new related products and services but also change the role of the consumer in transactions. It is now possible to reach the consumer virtually 24/7 and involve the consumer in many business functions.⁶⁷

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⁶² Cf. Zhu et al., 2016, pp. 1ff.
⁶⁴ Zhu et al., 2016, p. 2
⁶⁵ Cf. Zhu et al., 2016, pp. 1ff.
Crowdsourcing: The crowdsourcing trend refers to firms utilizing the broad public to perform specific tasks. This way, it is possible to profit from the creativity and power of a large base of contributors. Main enablers for this trend are digital technology, active users and open innovation.\textsuperscript{68} Crowdsourcing can be viewed as a mode of open innovation, which alleges a successful innovation process to be open to and collaborative with the respective organization’s external environment.\textsuperscript{69}

Long tail market: Zhu et al. further state the digital technology advancements now enable firms to operate in previously unprofitable fields. Today it is possible to base a business on serving the so called long tail market.\textsuperscript{70} The long tail market can be explained understandably by analyzing the download distribution per music track of Rhapsody, an online music streaming service. It is visualized in Figure 5.

![Figure 5: Number of Music Downloads Based on Download Rank – taken from Anderson, 2008, p. 19](image)

It becomes apparent that only a small portion of tracks contributes a large portion to the whole download respectively sales volume. Nonetheless, there is demand for lots of other tracks, although those demand numbers are significantly lower. This part of the curve is called the long tail. Figure 5 only reaches to rank 25,000 but even rank 900,000 of Rhapsody’s tracks gets at least streamed once per month.\textsuperscript{71} A company such as Wal-Mart offers not more than 4,500 CDs in their stores, simply because shelf-space is limited in a physical store.

\textsuperscript{68} Cf. Kohler, 2015, p. 63
\textsuperscript{69} Cf. Chesbrough & Appleyard, 2007, pp. 57ff.
\textsuperscript{70} Cf. Zhu et al., 2016, pp. 143ff.
\textsuperscript{71} Cf. Anderson, 2008, p. 22
To the contrary, an online company such as Rhapsody or others are able to offer all those tracks, which are not in primary demand because their content can be downloaded and does not require any minimum download numbers.\textsuperscript{72} Therefore, a new chance of digitization is the ability to offer a large variety of digital products which face only minimal demand. The combined volume of this demand is still of significant size as shown in Figure 6. In comparison, the respective product variety of traditional resellers with physical stores such as Wal-Mart remains vanishingly low.

![Digital Finance: The term refers to performing financial services with the help of the internet. Generally, the trend of digital finance consists of three parts: non-financial institutions that operate in the financial industry using the internet, traditional financial institutions that perform financial services using the internet and the establishment of institutions which are completely based on internet solutions for finance initially.\textsuperscript{73} Apparently, the possible potentials of digital finance include boosting the efficiency of financial transaction, providing access to financial services for persons formerly ignored by the financial system and generally providing GDP growth especially for emerging countries.\textsuperscript{74}

![Connecting Online and Offline Solutions: One trend of digitization refers to adding an online aspect to an offline product/service. It is argued that the offline aspect of business will never get fully replaced by the internet. Instead, the trend favors the inclusion of aspects of digitization, for example the internet, in providing the offline product/service.\textsuperscript{75}]

\textsuperscript{73} Cf. Zhu et al., 2016, pp. 161ff.
\textsuperscript{74} Cf. Manyika, Lund, Singer, White, & Berry, 2016, p. viii
\textsuperscript{75} Cf. Zhu et al., 2016, pp. 191ff.
Another trend of digital technology with potential for a strong impact on business is the **Internet of Things (IoT)**. The IoT is already defined in chapter 2.2. McKinsey attributes interconnected machines and hardware the ability to contribute additional USD 3.9 trillion – USD 11.1 trillion to the world GDP by 2025. Specific applications in the global economy can be monitoring and managing of illness in the health sector as well as optimization of operations and inventory and predictive maintenance in factories. Also, cities can profit from interconnected hardware by improving public safety and traffic flows.\(^{76}\)

In yet another publication, a former Apple executive identifies the **interconnection of data capital** as a major trend in the upcoming years. He alleges this trend to have the largest potential of any digitization trends for business. In short, the value of this trend is grounded in the assumption that digital technology allows firms to intelligently screen information and offer personally adapted products/services to customers. It adds the perspective of the customer individuum to the value proposition.\(^{77}\)

At this point, it becomes obvious that current digitization trends are manifold and offer sheer endless potential for further discussion in combination with their influence on a business model. Therefore, to provide accurate answers for this thesis’ research question, specific trends which promise considerable and important business model impacts are selected by the author.

The first trend for further discussion should be the technology of **distributed ledgers**. The reasons for selecting it are its groundbreaking possible impacts in business, its interdependence with the trend of digital finance (Bitcoin) and possible resulting significant impacts on business models. Especially the potential for affecting business models with value propositions based on intermediary services might result in significant pressure on their current models.

The next selected trend is the trend towards using **digital platforms** as main vehicle of value creation. The author has chosen this trend because platform-based internet firms are increasingly conquering the market. Examples for platform utilization are Netflix, Amazon, Uber, Airbnb, Valve (see chapter 4.1.1) and others. Discussing business models which involve platforms promises to reveal valuable insights for business model design. A discussion of those businesses will involve aspects of the **long-tail market**.

**Big Data**, its relation to the trend of interconnection of data capital and their potential for creating additional value purely out of existing information led to the choice of the trend for further discussion. The value of resulting insights for businesses might have a considerable impact on business model setups with considerable differences to and impacts on currently viable business models.

**Crowdsourcing** appears to be specifically promising for providing new viable constellations of business models since it cracks open the boundaries of the traditional organization. Processes can be assigned to the broad public. Arguably, the online-world is full of enthusiasts and professionals which appreciate the chance to be involved in business activity. Due to this potential shift in the way work is provided to firms, the phenomenon of crowdsourcing should be included in this works main research question.

\(^{76}\) Cf. McKinsey, 2015, pp. 6ff
\(^{77}\) Cf. Geier, 2013, pp. 233ff.
2.4. Summary

This chapter has shed light on the topic of digitization, its development and current technological trends based on digitization. At this point, the chapter should be summarized by answering the chapter-related research questions in brief.

- **How can digitization be defined for the paper’s purpose? What is the difference between digitization & digitalization?**

Digitization and digitalization, in their most narrow sense do not mean the same. Basically, digitization refers to a technical process of converting information into digital form (0s and 1s). The term digitalization, based on its use in relevant literature, refers to the application of such technology in society and therefore also business. For this paper’s purpose, digitization and digitalization are used interchangeably as the application of digital technology in society. The reason for this decision is the fact that this definition does include the technological aspect as well as the societal aspect of digital technology.

- **How did digitization unfold over the past decades?**

Generally, the phenomenon of digitization is claimed to be developing in four consecutive specific phases. Two of those phases, diffusion of digital technology and the public adaption and (mobile) use, have already taken place. In those phases, the internet as digitization’s most influential technology arose and started to be applied in its first services. In digitization’s history, the internet also led to the famous dotcom bubble which burst in the early 2000s. Until today, a further main development was the collective public and daily use of digital technology as well as the advancement of mobile devices.

- **How will the phenomenon likely evolve in the future?**

Two of the four evolution phases of digitization are still to come as of today. They will include maturation of digital technology advancement and the Internet of Things as main influence factor. The Internet of Things revolves around the connection and communication of hardware using the internet. The final stage of digitization is argued to be the fusion between digital technology and human existence. To provide a more detailed perspective beyond broad megatrends, specific current trends of digitization have been identified and briefly described.

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78 Cf. Vogelsang, 2010, p. 3
79 Cf. Gray & Rumpe, 2015, p. 1319; Gartner Inc., 2015
80 Cf. Lemke & Brenner, 2015, pp. 18ff.
The following digitization trends are likely to shape the technological future of the phenomenon:

- Augmented Reality
- Big Data\textsuperscript{82} 
- Cloudcomputing
- Connecting Online and Offline Solutions
- Crowdsourcing\textsuperscript{83} 
- Cyber Security
- Data Visualization
- Digital Finance
- Distributed Ledgers/Digital Currencies\textsuperscript{84} 
- Hyperconnectivity
- Interconnection of Data Capital
- Internet of Things
- Long-Tail Market
- Machine Intelligence/Artificial Intelligence
- Mobile Technologies
- Multisided Platforms\textsuperscript{85} 
- Social Networks
- Supercomputing
- Wearable Technologies

Since there are numerous complex technology trends, specific trends have been chosen which should represent the future evolvement of digitization. The chosen trends for further consideration in this thesis are marked with a black arrow: big data, crowdsourcing, distributed ledgers/digital currencies and platform markets.

\textsuperscript{82} Cf. Djemaie et al., 2014, pp. 1f.
\textsuperscript{83} Cf. Kohler, 2015, pp. 63ff.
\textsuperscript{84} Cf. Tapscott & Tapscott, 2016b, pp. 2ff.
\textsuperscript{85} Cf. Zhu et al., 2016, pp. 45ff.
3. Business Models

For the sake of purposely linking business models to digitization, it is obligatory to understand this keyword’s meaning and content. Apparently, establishing a clear definition remains difficult, since perceptions of the term are relatively diffuse:

“The ubiquity of the term and the plethora of its uses suggest that business models are profoundly important to the world of work - yet management academics rarely put the concept centre stage, preferring their established stresses on such concepts as competitive advantage, core capabilities, routines and resources. Public perception of its usefulness seems to fly against this academic reluctance (in mainstream journals and texts) to acknowledge the term, its uses and its consequences.” 86

Although there appears to be a tendency of numerous scholars to neglect the concept of the business model in favor of traditional strategic concepts, there is still a considerable group of scientific authors who dedicate their efforts towards expanding and discussing the concept. Interestingly, it appears that the business model is getting more traction by academics lately. In 2010 the Journal “Long Range Planning” released a special issue only featuring business model articles. By 2013 this issue faced 150,000 downloads, 3,500 Google Scholar citations and 500 ISI citations. 87 In this chapter, the content of business model associated publications is used to provide further elaborations on the concept for the sake of this thesis’ purpose. Therefore, in this third chapter, the “Business Model” represents the center of attention in a wider array of aspects.

The concept of the business model became popular in public while the new economy was ascending in the late 1990s and early 2000s. In the middle of the dotcom bubble, e-business was booming and, by the time, seemed to make classic economics theories irrelevant. The “business model” became a buzzword at the time for almost anything business-related, new economy-related or not. 88 Interestingly, today, more than ten years after the dotcom bubble, the concept of the business model has kept its relative prominence. Furthermore, the business model appears to be intertwined with digitization and information technology in its development history.

The following chapter will first shed light on the evolution of business models in academic research. Especially in the light of the above stated special situation of the term in scientific discussion, a clear explanation of past developments and the status quo of the business model appears to inevitable for a complete comprehension. Additionally, the distinction of the terms “strategy” and “business model” is unclear and requires explicit further discussion. Therefore, the initial focus will lie on a review of existing definitions, an explanation of the difference to strategy, important milestones in past development and current proceedings in the field. Secondly, the technical structure of several selected business model concepts is described. The intention for the further purpose of this work is to recognize the respective models’ specific elements and their interconnections. Thirdly, this chapter will explore how business models evolve and renew themselves over time. This business model innovation

86 Baden-Fuller & Morgan, 2010, p. 156
87 Cf. Baden-Fuller & Haeflinger, 2013, p. 419
88 Cf. Osterwalder, 2004, p. 1
is of crucial importance for understanding the impact of changing external stimuli on business models. Arguably, digitization and its ongoing evolvement poses such a stimulus for modern firm’s business models.

Ultimately, for reaching the goal of this paper of revealing the effect of digitization on business models, it will be a necessity to choose one of the proposed business models to provide a coherent basis for discussion. Thus, to conclude this chapter, one particular conceptualization is chosen for the further progression of this thesis. The selection will be based on the suitability of the model to visualize the impact of digitization aspects on the respective elements. The reasons for the final selection will be described in detail.

### 3.1. Definition, Development & Current Proceedings

#### 3.1.1. Definition

As a starting point, the term business model should be described in detail. Apparently, existing definitions are relatively heterogeneous and do not offer one agreed-on meaning for the keyword. The diffusion of the term seems to have reached an extent to which scholars allege the business model an identity crisis. A conducted literature review of field-related publications within the release period of 1998 – 2002 came to an according result. They included 12 different, partially diverging definitions of business models and 42 different elements of the respective business model structures. Furthermore, there are several ways of describing business models, which are outlined in Figure 7. They reach from a simple definition to comprehensive descriptions of elements of business models and specific firms’ business models.

![Classification of Business Model Definitions](image)

Figure 7: Classification of Business Model Definitions – taken from Osterwalder, Pigneur, & Tucci, 2005, p. 5

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89 Cf. Weill et al., 2011, p. 17; Casadesus-Masanell & Ricart, 2010, p. 197; Zott et al., 2011, p. 2
90 Cf. Shafer, Smith, & Linder, 2005, p. 200
The first type of definitions (1) describes the business model conceptualization as an overarching concept which can be applied to all real-world businesses. Those descriptions state what a generally applicable business model is. Some authors additionally offer elements of such general business models. Definitions of this kind are being placed on the most comprehensive and general level of definitions.91

Table 4 consists of a compilation of various selected business model definitions. Descriptions of business model elements on a meta-level are discussed in chapter 3.3. Arguably, although the business model definitions are mostly different, it can be observed that most of them share a key attribute: they explicitly or at least implicitly contain a firm´s business logic, mechanics or architecture. The table further includes the context of the publication the definition was drawn from. The considerable amount of publications which address the business model in relation with the internet or e-business support the business models´ inherent bond with those areas.92

The second type of definitions (2), the taxonomies, “[…] consists of several types or meta-model types of business models that are generic but contain common characteristics.”93 Those taxonomic descriptions of business models are often derived from observations of single industries. Business model types in this category are divided based on common characteristics of similar firms. The sub-(meta)-models describe the elements of the respective business model types.94

For example, Michael Rappa published a compilation of business model types for web-based business activities such as brokerage, advertising, infomediary, merchant, manufacturer, affiliate and others. The types are described using their basic way of functioning and common business model features.95 In a different publication a group of scholars elaborated common business model elements specifically for kinds of product-service system firms.96 The mentioned examples should show that the focus and depth of discussion can vary. Among the mentioned examples, there are numerous other publications with similar scope about many different industries, groups of firms or specific types of business models.

The third type of definitions (3), the instance level definitions, are based on existing, real-world businesses. Some authors explicitly analyzed single companies by applying a business model conceptualization. There appears to be a wide range of applied conceptualizations used to represent specific firms´ business models.97

Exemplarily, for the instance level, the business model configuration of Xerox, a printing and document management company, and some of its spin-offs is included in Figure 8. It clearly underlines the specificity of business model descriptions on the firm level. Every description is different and respects every company as a separated object of discussion.

91 Cf. Osterwalder, Pigneur, & Tucci, 2005, pp. 5f.
92 Cf. Fielt, 2013, p. 86
93 Osterwalder et al., 2005, p. 6
94 Cf. Osterwalder et al., 2005, pp. 5f.
95 Cf. Rappa, 2001
97 Cf. Osterwalder et al., 2005, pp. 5f.
The analysis of the respective business model in Figure 8 is based on a common business model element configuration.

<table>
<thead>
<tr>
<th>Identified market segment</th>
<th>Clear value proposition</th>
<th>Elements of value chain</th>
<th>Defined cost and profit</th>
<th>Positioned in value network</th>
<th>Formulated competitive strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xerox</td>
<td>Corporate and government market</td>
<td>High-quality copies at a low monthly lease rate</td>
<td>High volume, low unit cost, modest profit on equipment, high profit on supplies, or per ‘click’</td>
<td>First mover in ‘dry’ copy process, did not require or pursue partners</td>
<td></td>
</tr>
<tr>
<td>3Com</td>
<td>Corporate PC market</td>
<td>establishes file and printer sharing between IBM PCs</td>
<td>very high fixed cost</td>
<td>set the IEEE 802 standard, utilized PC distribution channel</td>
<td></td>
</tr>
<tr>
<td>Adobe</td>
<td>PC, Mac and laserprinter market</td>
<td>focused on developing Ethernet protocol, and add-on boards</td>
<td>very low variable cost</td>
<td>defined the PostScript standard for scalable fonts</td>
<td></td>
</tr>
<tr>
<td>SynOptics</td>
<td>IBM-installed token ring segment</td>
<td>developed focus on supplying fonts to laserprinter mfgs, and software firms</td>
<td>high fixed costs, high margin, low unit volume</td>
<td>Prolonged life and value of IBM token ring copper wire; utilized VARS</td>
<td></td>
</tr>
<tr>
<td>Metaphor</td>
<td>Knowledge workers in corporations</td>
<td>developed and sold entire systems, from hardware to software to distribution</td>
<td>high fixed costs, high margin, low unit volume</td>
<td>no third parties or competitors utilized</td>
<td></td>
</tr>
<tr>
<td>LiveWorks</td>
<td>Workgroups in corporations</td>
<td>developed and sold entire systems, from hardware to software to distribution</td>
<td>high costs, high margins, low volume</td>
<td>no third parties or competitors utilized</td>
<td></td>
</tr>
<tr>
<td>Documentum</td>
<td>Project teams in corporations</td>
<td>developed and sold entire systems, from hardware to software to distribution</td>
<td>high costs, high margins, low volume</td>
<td>leveraged Xerox sales, customer’s installed equipment</td>
<td></td>
</tr>
</tbody>
</table>

Figure 8: Summary Evaluation of Xerox and Selected Spin-Offs on Key Business Model Attributes – taken from Chesbrough & Rosenbloom, 2002, p. 539
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Definition of a Business Model</th>
<th>Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slywotzky, 1996, p. 4</td>
<td>“[…] The totality of how a company selects its customers, defines and differentiates its offerings (or response), defines the tasks it will perform itself and those it will outsource, configures its resources, goes to market, creates utility for customers, and captures profits. It is the entire system for delivering utility to customers and earning a profit from that activity.”</td>
<td>Strategy Monography before the term business model ascended</td>
</tr>
<tr>
<td>Timmers, 1998, p. 3</td>
<td>“An architecture for the product, service and information flows, including a description of the various business actors and their roles; and a description of the potential benefits for the various business actors; and a description of the sources of revenues.”</td>
<td>E-commerce &amp; internet</td>
</tr>
<tr>
<td>Linder &amp; Cantrell, 2000, p. 1</td>
<td>&quot;A business model, strictly speaking, is the organization’s core logic for creating value.”</td>
<td>Consulting - created in the Accenture Institute for Strategic Change</td>
</tr>
<tr>
<td>Mahadevan, 2000, p. 59</td>
<td>“A business model is a unique blend of three streams that are critical to the business. These include the value stream for the business partners and the buyers, the revenue stream, and the logistical stream.”</td>
<td>Understanding the business model in an internet context</td>
</tr>
<tr>
<td>Citation</td>
<td>Quote</td>
<td>Topic</td>
</tr>
<tr>
<td>----------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Stewart &amp; Zhao, 2000, p. 290</td>
<td>“Simply defined, a business model is a statement of how a firm will make money and sustain its profit stream over time.”</td>
<td>E-commerce</td>
</tr>
<tr>
<td>Tapscott, Ticoll, &amp; Lowy, 2000, p. 17</td>
<td>„Business webs (Note: referred to in the sense of business models) are inventing new value propositions, transforming the rules of competition, and mobilizing people and resources to unprecedented levels of performance. […] a b-web is a distinct system of suppliers, distributors, commerce services providers, infrastructure providers, and customers that use the Internet for their primary business communications and transactions.“</td>
<td>Business model innovation in digital technology companies such as IBM</td>
</tr>
<tr>
<td>Rappa, 2001</td>
<td>“In the most basic sense, a business model is the method of doing business by which a company can sustain itself -- that is, generate revenue. The business model spells-out how a company makes money by specifying where it is positioned in the value chain.”</td>
<td>Describing different specific internet-related business model types</td>
</tr>
<tr>
<td>Afuah &amp; Tucci, 2001, pp. 3f.</td>
<td>“A business model is the method by which a firm builds and uses its resources to offer its customers better value than its competitors and make money doing so. It details how a firm makes money now and how it plans to do so in the long-term. The model is what enables a firm to have a sustainable competitive advantage, to perform better than its rivals in the long term.”</td>
<td>Text &amp; case book regarding internet-related business (models)</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Elliot, 2002, p. 7</td>
<td>“Business models specify the relationships between different participants in a commercial venture, the benefits and costs to each and the flows of revenue.”</td>
<td>E-commerce &amp; B2C strategy</td>
</tr>
<tr>
<td>Magretta, 2002, p. 4</td>
<td>“They are, at heart, stories – stories that explain how enterprises work. A good business model answers Peter Drucker’s age-old questions: Who is the customer? And what does the customer value? It also answers the fundamental questions every manager must ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?”</td>
<td>Business models after the dotcom bubble</td>
</tr>
<tr>
<td>Author(s) and Year</td>
<td>Definition/Concept</td>
<td>Additional Information</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Shafer, Smith, &amp; Linder, 2005, p. 202</td>
<td>&quot;We define a business model as a representation of a firm’s underlying core logic and strategic choices for creating and capturing value within a value network.”</td>
<td>A dynamic view on the business model, which explores business model change</td>
</tr>
<tr>
<td>Zott &amp; Amit, 2010, p. 222</td>
<td>&quot;A business model can be viewed as a template of how a firm conducts business, how it delivers value to stakeholders (e.g., the focal firms, customers, partners, etc.), and how it links factor and product markets.”</td>
<td>Applying an activity system perspective to the business model concept</td>
</tr>
<tr>
<td>Casadesus-Masanell &amp; Ricart, 2010, p. 196</td>
<td>&quot;[…] Business Model refers to the logic of the firm, the way it operates and how it creates value for its stakeholders […]&quot;</td>
<td>Distinction between strategy and the business model</td>
</tr>
<tr>
<td>Gambardella &amp; McGahan, 2010, p. 263</td>
<td>&quot;A business model is an organization’s approach to generating revenue at a reasonable cost, and incorporates assumptions about how it will both create and capture value.”</td>
<td>Technology Firms This publication further describes implications for business model design for in the industry of general-purpose technologies, which can be seen as an instance-level definition itself.</td>
</tr>
<tr>
<td>Teece, 2010, p. 173</td>
<td>&quot;A business model articulates the logic and provides data and other evidence that demonstrates how a business creates and delivers value to customers.”</td>
<td>Understanding the significance of business models &amp; the connection to strategy</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Definition/Context</td>
<td>Category</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Yunus, Moingeon, &amp; Lehmann-Ortega, 2010, p. 312</td>
<td>“The business model concept offers a consistent and integrated picture of a company and the way it generates revenues and profit.”</td>
<td>Social business models</td>
</tr>
<tr>
<td>George &amp; Bock, 2011, p. 99</td>
<td>“[...] a business model is the design of organizational structures to enact a commercial opportunity. [...] three dimensions to the organizational structures noted in our definition: resource structure, transactive structure, and value structure.”</td>
<td>Business Model utilization for entrepreneurs</td>
</tr>
<tr>
<td>Keen &amp; Williams, 2013, p. 645</td>
<td>“Very roughly, digital business models aim at spotting opportunities and are customer-led in their views of innovation.”</td>
<td>Digital Businesses</td>
</tr>
<tr>
<td>Osterwalder &amp; Pigneur, 2013, p. 14</td>
<td>“A business model describes the rationale of how an organization creates, delivers, and captures value.”</td>
<td>The Business Model Canvas</td>
</tr>
</tbody>
</table>

Table 4: Compilation of Business Model Definitions & Context of the Respective Publication – compiled by the author
3.1.2. Past Development of the Business Model

Technically, the term “business model” was already mentioned once in the text of an academic article in 1957 by Bellmann, et al. and in the title and abstract of a publication by Jones in 1960. Furthermore, publications from the early 2000s, which already dealt with the business model in today’s sense, attributed Peter Drucker to have addressed cornerstones of the concept in his older publications back in the 1950s. Nonetheless, the term did barely face any specific interest originally and remained without noticeable discussion.

Finally, the business model concept began to gain considerable traction in the late 1990s. Since then, it was closely related to digitization respectively the new economy because, by the time, information technology prices sank to affordable prices, performance increased and made many new business model configurations possible. Yip even states that “The term business model has been widely used to explain how an Internet company operates.” Another close link was grounded in the new economy boom and bold statements about strategy becoming obsolete. Amidst the hype of the still intact dotcom Bubble, the term became a buzzword:

“One could often hear that traditional business models were dead and that new business models were emerging. The term became a buzzword and was used by managers, academics and journalists for everything and nothing related to the “new economy”, an economy driven by ICTs (Note: Information and Communications Technology).”

Ovans further argues that business models received increasing attention in times of digital technology advancement because PCs and spreadsheets finally allowed to simulate the performance of systems of interdependencies such as the business model. Using computational power allowed firms to put their business model to the test before implementing them into practice. Business models could be designed and tested before being launched.

Interestingly, the business model appears to be used wildly and without a clear understanding of the term in most non-academic papers. Apparently, only academic research papers address the business model concept from an in-depth point of view. This is true especially for the time after the burst of the dotcom bubble.

Figure 9 illustrates how the concept received increasing attention from researchers and the public. It was created by a group of scholars by using the search engine results in the EBSCOhost database and grouping those results by years. As visualized, the academic interest for the concept has significantly increased since the late 1990s. Furthermore, the use of the term in non-academic journals was increasing stronger than in academic use. Arguably, contributors to this trend might be not only a larger number of non-academic journals but also a buzzword-related inaccurate use of the words. Furthermore, it seems like the burst of the
The dotcom bubble has not had a negative impact on the discussion of the business model although the hype before its burst was closely related to the concepts ascension.

Soon after the dotcom bubble deflated, the concept of the business model reached a new phase regarding its development:

“Since 2003, the classification of the different concepts and the development of a generic approach have been increasingly sought. This can be referred to as the differentiation phase of the business model concept.”

In this currently ongoing phase, beyond the search for generic business model approaches, the shaping trends are an increasing number of publications in the context of strategic orientation and publications of several books about business models. Especially in the last years the concept reached increasing clarity. The understanding of the business model is increasingly converging into a more unified understanding. Additionally, definitions and elements of business models have reached a state of maturity.

Although, as mentioned above, the concept evolved towards a more mature state over time, criticism on the business model concept and its general usefulness did accompany this development. For example, Porter attested the arising business model concept that the “[...] business model approach to management becomes an invitation for faulty thinking and self-

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105 Wirtz, 2016, p. 40
107 Cf. Wirtz, Pistoia, Ullrich, & Göttel, 2016, p. 50
Arguably, considering the time this statement was made, this point-of-view most likely found support in management practice. Over time scholars continuously criticized the concept for being highly ambiguous in regard to definitions\(^{109}\) and that scientific publications develop “[…] in silos, according to the phenomena of interest of the respective researchers.”\(^{110}\)

### 3.1.3. Current Proceedings in the Field and Future Research

In 2011, roughly a decade after the first academic discussions of the business model concept, current research foci and possible future developments in the field are useful indications to understand how the concept might further evolve.

Zott, Amit & Massa argue that research about the business model needs to be divided into more precise concepts. This would clarify what the business model in a respective publication is intended to be used and not to be used for. For example, it would make sense to divide academic discussion into e-business archetypes, the business model as an activity system and the business model as cost/revenue architecture.\(^{111}\)

Currently, it appears that the extensive effort of clearly defining the business model seems to be unrewarding since there is no one single meaning:

> „We need – not one – but more – definitions building on a shared understanding. The current and shared convention may be sufficient for the general understanding; in many cases a more explicit definition is needed, important determinants being the audience and the purpose. As such, it may be argued that the real value of the business model construct lies not in the precision of its definition, but in its role as a boundary object between different disciplines and between academia and practice.”\(^{112}\)

Additionally, what remains noticeable after reviewing recent literature is that this view seems to have been incorporated by scholars. Generally, most articles revolve around specific aspects of a business model in a specific context (industry, technology, specific situation, …) which is clearly outlined. It appears as if scholars have moved beyond trying to further define the concept but instead focus on adding value by applying the concept to problem sets.\(^{113}\)

Generally, a current proceeding in the field is the insight that definitional ambiguity – to a degree – is obvious and natural in management sciences. Diverse perspectives within management sciences are argued to create value for practice.\(^{114}\) Nonetheless, overstating the concepts potential and ignoring “[…] the fact that management concepts are usually embedded in larger research streams with rigorous research designs, which make them generally valid […]”\(^{115}\) does not contribute to valuable publications. Therefore, useful publications appear to need to face such validation.

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\(^{108}\) Porter, 2001, p. 73


\(^{110}\) Zott et al., 2011, p. 1019

\(^{111}\) Cf. Zott et al., 2011, pp. 1034ff.

\(^{112}\) Jensen, 2013, p. 78

\(^{113}\) Note: This conclusion was drawn by the author after reviewing the research focus of recent publications (2015, 2016, 2017) by using the EBSCOhost database.


\(^{115}\) Klang et al., 2014, p. 473
Regarding future direction of research in the business model concept, in 2016 Wirtz, et al. conducted a survey among researchers and experts in the field to reveal potential research directions. Their questionnaire contained four specific sections of interest. At this point, selected results of this questionnaire should serve as the indicator for future research direction.

One result of the survey was revolving around which of the following research areas about business models are most important: interactions within the business models, components of business models and definitions of the concept. The results showed that the experts view the interactions within the business model as most important followed by the components and definitions.116

Another area addressed the procedural view of developing and managing business models. The research areas in question and the respective results of this questionnaire are as shown in Table 5. Those results indicate that the aspects which were rated as most important were those which are shaping a business model: change & evolution, innovation and design. In accordance with above mentioned results, the scholars could make the following statement:

“[…] it is clear that the operative, procedural business model areas are awarded greater significance for future research by the experts. Thus, first implications can be drawn, that research areas focusing strongly on application-oriented research are preferred.”117

<table>
<thead>
<tr>
<th>Rank</th>
<th>Research area</th>
<th>Mean value</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Change &amp; evolution</td>
<td>4.68</td>
<td>0.58</td>
</tr>
<tr>
<td>2</td>
<td>Innovation</td>
<td>4.21</td>
<td>0.92</td>
</tr>
<tr>
<td>3</td>
<td>Design</td>
<td>4.02</td>
<td>1.08</td>
</tr>
<tr>
<td>4</td>
<td>Implementation</td>
<td>3.73</td>
<td>0.87</td>
</tr>
<tr>
<td>5</td>
<td>Controlling</td>
<td>3.71</td>
<td>1.04</td>
</tr>
<tr>
<td>6</td>
<td>Operation</td>
<td>3.26</td>
<td>1.10</td>
</tr>
</tbody>
</table>

Table 5: Relevance of Research on Individual Elements of the Business Model Process - taken from Wirtz, Pistoia, Ullrich, & Göttel, 2016, p. 50

Beyond the mentioned survey, the scholars also suggest a future research direction for the business model similar to the outlined difference between strategy and the business model (see chapter 3.2). They state that even though it became agreed-on that a business model and strategy are not the same, research lacks a discussion about the intersection of the business model with other business management concepts.118 Exemplary questions can be the following:

“For example, the question arises about the development of a new business model to what extent do business model approaches and methodology differ from established entrepreneurship or organizational design literature? Or, can change concepts of classic business management be applied to the change of an existing business model? What are the similarities and differences of the various currents of literature?”119

116 Cf. Wirtz et al., 2016, pp. 48f.
117 Wirtz et al., 2016, p. 49
118 Cf. Wirtz et al., 2016, p. 50
119 Wirtz et al., 2016, p. 51
3.2. The Relationship of “Business Model” & “Strategy”

Interestingly, the distinction between strategy and the business model faces further ambiguity and inconsistent interpretation. The wide range of definitions results from the fact that authors appear to simply have strongly differing opinions.\footnote{Cf. Osterwalder et al., 2005, p. 13} As a group of scholars questioned this issue, they came to the conclusion that they \textit{”[...] have to admit that we don’t clearly understand the differences between these terms.”}\footnote{Seddon et al., 2004, p. 428} They further carried out a literature review to summarize how other scholars handle a distinction and came to the following result:

![Possible Overlap Between the Concepts „Strategy” and „Business Model” - taken from Seddon, Lewis, Freeman, & Shankes, 2004, p. 428](image)

Considering this visualization, it becomes apparent that the relationship between the terms’ meanings has a wide range of interpretation in academic discourse. There might even be completely contradictory interpretations of their interrelation. Firstly, strategy and business model concepts can be considered as similar and overlapping in their meaning (A & B). The literature review further found that the wider strategy might entail the business model and vice versa (D & E). Some scholars even interpret the concepts as interchangeable (C). Subsequently, some interpretations and peculiarities of the terms’ meanings should be included in more detail.

A possible distinction of the terms is based on the assumption that strategy deals with competition while the business model neglects the competitive sphere. Therefore, a business model describes how a system of pieces is organized and how those pieces relate functionally, while strategy tries to establish a superior position in comparison to other competitors.\footnote{Cf. Magretta, 2002, pp. 6f.} This principle is supported by the following example:

\textit{“The logic is straightforward: When all companies offer the same products and services to the same customers by performing the same kinds of activities, no company will prosper. […] Too many fledgling companies rushed to market with identical business models and no strategies to differentiate themselves in terms of which customers and markets to serve, what products and services to offer, and what kinds of value to create.”}\footnote{Magretta, 2002, pp. 6f.}

What remains noticeable is that the elements of customer-, market- and value creation selection are not missing in every published business model concept. For example, the
Business Model Canvas (see chapter 3.3.3) explicitly includes the choice of customer segments and value propositions. Therefore, the outlined statement remains only partially applicable, what appears to be exemplarily for the ambiguity of this whole discussion.

A different point-of-view sees strategy as the selection of a business model which is then practically adapted by a firm and the assumptions behind this choice. In this regard, a business model represents one of several functional setups how a firm can operate and create value, whereas strategy is making the decision of which of the business model setups should be applied. In the light of this thought, a distinction of the two terms does not bring additional value when no occurring contingency – no change in assumptions and requirements for the business – is involved in the choice of a business model. Strategy and business model simply coincide and remain perfectly congruent. There is no observable difference between the terms, when a situation remains forever stable. Arguably, business environments change and regularly face contingency. Therefore, this case appears to be not resembling reality.

Nonetheless, separating the terms becomes useful when particular contingencies take place, which cause a change of the applied business model. At this point, the difference between the terms becomes visible, because a business model is suiting only one specific situation. Observing this current business model does not give implications how a preceding business model might look like when a contingency becomes relevant. In this case, strategy represents the force of respective guidance which exceeds the content of a business model.

“To summarize, strategy is much more than the mere selection of a business model; it is a contingent plan as to how the business model should be configured, depending on contingencies that might occur. An organization’s business model is the reflection of its realized strategy. In simple situations (when there are no contingencies on which to base strategy choices, but merely competitive adjustments that can be handled via tactics (Note: tactics refer to actions which can be taken within a current business model), strategy may ‘coincide’ with the organization’s business model and little is gained from separating the two notions.”

A related approach is taken by Yip, who clearly alleges the business model a different meaning and scope than strategy. Simplified, he views a business model as a description of the static position a company wants to be in. To the contrary, strategy refers to dynamic activities which, for example, change the market position or the business model.

However, alternatively, strategy can also be viewed as being more deeply intertwined with business model design than in the view above. In this case, the meaning of the business model remains as the architecture of a business which ensures operation and value creation, but strategy faces a different role. Business models are mostly easily observed and easily replicated. It is argued that simply putting a new and creative business model into practice will lead to competitors copying it within a short period. In this context, a business strategy is a

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126 Casadesus-Masanell & Ricart, 2010, p. 205
factor which ensures the sustainable success of a business model in aiding its design with competitive considerations such as imitability and capability of competitors:

“A business model is more generic than a business strategy. Coupling strategy and business model analysis is needed to protect competitive advantage resulting from new business model design.”

Another simple difference between strategy and business models is that every company needs a business model, since it represents the architecture of its function, while a firm does not necessarily need a strategy, which prepares it for eventuality.

After reviewing the publications of numerous strategy-related academic publications, Wirtz et al. also addressed the tension field between strategy and the business model. The key insight is that both concepts partially intercept but they are not the same. Additionally, it became apparent that there is a growing consensus between researchers about the terms meanings recently. The scholars further derived their own division of the terms:

“In our formulation, strategy and business model, though related, are different concepts: a business model is the direct result of strategy but is not, itself, strategy.”

Other scholars see a difference between strategy and the business model in the aspect of financing operations for value creation. While business models implicitly include financing of value creation, strategy is addressing this financing explicitly due to the assumption of shareholder value creation.

Furthermore, another possible distinction of the terms can be based on the quality and extent of knowledge involved in operating the concepts:

“Business models explicitly assume limited or distorted information and knowledge, whereas strategies are built on analysis and refinements in knowledge, thereby assuming the existence of reliable and plentiful information to be transformed into knowledge.”

Concluding, it can be stated that there are numerous and diverse publications which treat the concept of the business model differently to the concept of strategy. This appears to be evidence for the business model as being a legitimate field of research on its own with substance to develop and add insights into business.

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129 Teece, 2010, p. 179
131 Cf. Wirtz et al., 2016, p. 6
132 Wirtz et al., 2016, p. 6
133 Cf. Mäkinen & Seppänen, 2007, p. 737
134 Mäkinen & Seppänen, 2007, p. 738
3.3. Elements of a Business Model

Different business model concepts include different sets of separable parts. This chapter will include selected conceptualizations of how a business model can be structured and how respective elements are connected within such structures. The selection of the following business models is based on the intention to provide a broad image of possible structures.

The business model of Johnson, Christensen & Kagermann has a strong practical context with intuitively understandable elements and therefore acts as a suitable introduction to this topic. Yunus, Moingeon & Lehmann-Ortega provide a more recent model with a simple three-element-structure and should show that many models mostly overlap content-wise while the formal structures of models can differ. The Business Model Canvas is included due to its strong importance in creative practice and its unique complex structure. The business model by Alt & Zimmermann should represent the older models, which emerged around the beginning of the 2000s and includes more specific elements such as legal issues and technology which appear to be included in other elements in more recent business model structures. The business model of Baden-Fuller, et al. should serve as the key concept for this further thesis due to its clear focus on technological innovation and suitable elements for digitization-relevant interconnections.

3.3.1. The Business Model by Johnson, Christensen & Kagermann

This business model concept basically consists of four interconnected elements as visualized in Figure 11. Therefore, every business consists of a customer value proposition (CVP), a profit formula, key resources and key processes. In comparison to other blueprints of business models, this is a relatively simple architecture. This simple framework nonetheless enables the model to reconstruct even complex interconnection of elements, because every change of one element will affect all other elements and the system as a whole.\(^\text{135}\) This business model configuration has been chosen due to its relative detail and spectrum of practical implications for real businesses and the intuitively easily understandable concept. Therefore, it is used as the introductory setup of business model elements.

The customer value proposition is the most important of the four elements. It outlines how customer needs can be satisfied. The general idea is that customers face a problem which can be solved by the firm. The more important the problem is and the better it can be solved, the higher is the provided customer value.\(^\text{136}\)

The profit formula represents the financial perspective of a business. Respecting this element should make sure that the firm creates financial value for itself, while providing value to customers. Important considerations in this area include models for revenue, costs and profit margins.\(^\text{137}\)

\(^{135}\) Cf. Johnson, Christensen, & Kagermann, 2008, p. 53
\(^{136}\) Cf. Johnson et al., 2008, p. 52
\(^{137}\) Cf. Johnson et al., 2008, p. 53
The element of **key resources** refers to a company’s assets “[…] such as the people, technology, products, facilities, equipment, channels, and brand required to deliver the value proposition to the targeted customer.” Key elements are those assets which create most value for customers and the firm itself.

The **key processes** include the way of how value is created and the extent to which they can be repeated and scaled up in size. This element contains training, development, manufacturing, budgeting, planning, sales, service as well as company rules, norms and metrics.

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**3.3.2. The Business Model by Yunus, Moingeon & Lehmann-Ortega**

This group of scholars discussed a business model conceptualization with the focus on socially oriented businesses. A social business has two main objectives: social profit maximization and financial profit maximization. Although their work has this social focus, they still base their further elaborations on a generic business model structure. They suggest a structure as described in Figure 12 which consists of value proposition, value constellation and a profit equation. This business model configuration has been chosen due to its relatively simple structure and to outline that elements of different scholars’ models appear to be relatively different at first glance but mostly share common content. In comparison to the business model of Johnson, Christensen & Kagerman (see chapter 3.3.1), the model appears to lack a fourth

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138 Johnson et al., 2008, p. 53
139 Cf. Johnson et al., 2008, p. 53
140 Cf. Yunus, Moingeon, & Lehmann-Ortega, 2010, p. 310
element, but at closer analysis it becomes apparent that the content of the two models’ elements remains relatively similar.

The **value proposition** is the part of a business model which focusses on customers and value creation for those customers. It determines a target customer group and the way this group gets delivered value (via product or service).\(^{141}\)

The **value constellation** focusses on the internal and external value chains. This involves the respective firm’s internal process capabilities as well as the network to external partners.\(^{142}\) Arguably, this element appears to have significant similarity to the theory of supply chains.

The **profit equation** represents the financial aspect of doing business. It “[…] is the financial translation of the other two, and includes how value is captured from the revenues generated through the value proposition, and how costs are structured and capital employed in the value constellation.”\(^{143}\)

### 3.3.3. The Business Model Canvas

The practically widely used business model canvas is a relatively detailed way of structuring and describing a business model. It consists of nine interrelated building blocks which are arranged as shown in Figure 13. This approach is said to be the most comprehensive framework for business model design.\(^{144}\) Furthermore, the concept received widespread attention since it is the topic of a best-selling book by Osterwalder & Pigneur.\(^{145}\)

![Figure 12: The Three Components of a Conventional Business Model – modified after Yunus, Moingeon, & Lehmann-Ortega, 2010, p. 312](image)

The reason it is called a canvas is grounded in its suggested use. The creators argue that it should be printed out on a large scale and groups of people should discuss the canvas and sketch on it. The canvas is supposed to be a hands-on and creative management tool.\(^{146}\) In the following chapter, the elements and their interconnection are described in detail. This business model concept was chosen due to its relative prominence, highly detailed elements and creative approach.

The **customer segments** refer to groups of target customer who share a common behavior, common needs or other distinctive attributes. Separate customer segments may be legitimated

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\(^{141}\) Cf. Yunus et al., 2010, p. 312  
\(^{142}\) Cf. Yunus et al., 2010, p. 312  
\(^{143}\) Yunus et al., 2010, p. 312  
\(^{144}\) Cf. Ovans, 2015  
\(^{145}\) Cf. Klang et al., 2014, p. 2  
\(^{146}\) Cf. Osterwalder & Pigneur, 2013, p. 42
by customers who require a distinct offer, customers underlying different distribution channels, customers who require different types of relationships, customers who contribute substantially different to profitability or customers who are willing to pay for different aspects of products/services.\textsuperscript{147}

The \textbf{value propositions} building block contains the portfolio of offered products or services. It represents how value is provided to customers. Value propositions can be divided into categories of which customer needs are satisfied by products and services. Sources of customer value can be newness, performance, customization, design, branding, price, cost reduction, risk reduction, accessibility and usability.\textsuperscript{148}

The \textbf{channels} building block explains the ways how a firm communicates and delivers its value propositions to its respective customer segments. Those channels can be communication, distribution and sales channels. Channels represent interaction points with customers and contribute to the customer relationship with the company. The functions of interactions are raising awareness of the firm’s service and product portfolio, providing information about the value propositions, enabling customers to ultimately buy products and services, delivery and providing after-sales services.\textsuperscript{149}

\textbf{Customer relationships} is the building block which represents the kinds of relationships a company has with its customers. Those relationships’ underlying intentions can be customer acquisition, customer retention, boosting sales and others. The quality of relationships directly affects the customer experience, since relations are direct point of contact between the parties. The actual modes of shaping these relations can be manifold. Possible measures are personal assistance, self-service, automated services, creating online communities and even letting the customer create value via co-creation.\textsuperscript{150}

The \textbf{revenue streams} portray a financial aspect of a business model. In more detail, they represent the incoming revenues: the monetary arteries of a firm. A main question related to this building block is if a customer segment is willing to pay for a specific value proposition. Revenue streams can include one-time and continuously reoccurring payments. Revenue can be created by asset sales, usage fees, subscription fees, lending, renting, leasing, licensing, brokerage fees and advertising. It is important to find a suitable pricing strategy for each of the company’s revenue streams.\textsuperscript{151}

The building block \textbf{key resources} refers to the essential assets which enable a company’s business model. The term “asset” goes beyond its financial meaning. Assets can be physical, financial, intellectual or human.\textsuperscript{152} Which assets are most important depends on types of businesses: “A microchip manufacturer requires capital-intensive production facilities, whereas a microchip designer focuses more on human resources.”\textsuperscript{153}

A business model’s processual point-of-view is contained in the \textbf{key activities} building block. Key activities are the most important actions a firm needs to perform to be successful. They regularly

\begin{footnotesize}
\begin{enumerate}
\item[147] Cf. Osterwalder & Pigneur, 2013, p. 20f.
\item[149] Cf. Osterwalder & Pigneur, 2013, pp. 26f.
\item[150] Cf. Osterwalder & Pigneur, 2013, pp. 28f.
\item[152] Cf. Osterwalder & Pigneur, 2013, pp. 34f.
\item[153] Osterwalder & Pigneur, 2013, p. 34
\end{enumerate}
\end{footnotesize}
contribute to value creation by creating and providing a value proposition, access markets, earning revenues and customer relationship quality. For example, Dell’s key activities revolve around managing its complex supply chain, while McKinsey builds on its superior problem-solving capabilities. Other key activities can be grounded in production competencies or superior networks.  

**Key Partnerships** refer to the building block which contains the business partners and networks a company needs to make its business model work. Partnerships may optimize business models, spread specific risks or combine assets. Possible kinds of partnerships involve strategic alliances, coopetition, joint ventures or buyer-supplier relationships.

The final building block is the company’s **cost structure**. Operating a business model inevitably leads to costs to be incurred. Generally, some business models are more sensitive to costs than others. So-called cost-driven firms tie their success to maintain low-cost structures in their business model (e.g. budget airlines). To the contrary, value-driven organizations emphasize a premium value proposition and are less vulnerable to increases in costs (e.g. luxury hotels). Overseeing a business model’s cost structure includes understanding fixed and variable costs, economies of scale and economies of scope. Naturally, costs should be kept at minimum in every business model.

Apparently, although the Canvas is the most comprehensive basis to develop a business model, the processual approach of brainstorming on elements of a business model appears to be not fully agreed on by other scholars. Euchner & Ganguly state that there is a limited number of known business model setups which are coherent, provide a competitive positioning and quantify economic leverage points. They argue that business models cannot be created from scratch just by brainstorming the respective elements based on the canvas. Such models would lack the bigger functional picture. They clearly state the following:

“The business model canvas misses the key dynamic elements of working business models.”

Nonetheless, by other scholars the business model canvas is considered to be a useful tool for practitioners which is able to create more understanding of a firm’s business logic and accurately alter it:

“The Canvas business model was applied and tested in many organizations (e.g. IBM and Ericsson), being successfully used to easily describe and manipulate business models to create new strategic alternatives.”

In Figure 13, a business model canvas is exemplarily filled for the case of the LEGO factory. This business model revolves around providing custom-designed LEGO sets for enthusiasts. Those user-designed sets pose different requirements and challenges for a business model than the company’s traditional mass market approach.

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158 Euchner & Ganguly, 2014, p. 36
159 Barquet et al., 2011, p. 333
**LEGO Factory: Customer-Designed Kits**

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<tr>
<th>KP</th>
<th>KA</th>
<th>VP</th>
<th>CR</th>
<th>CS</th>
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<tbody>
<tr>
<td>Customers who build new LEGO designs and post them online become key partners generating content and value</td>
<td>LEGO has to provide and manage the platform and logistics that allow packaging and delivery of custom-made LEGO sets</td>
<td>LEGO Factory substantially expands the scope of the off-the-shelf kit offering by giving LEGO fans the tools to build, showcase, and sell their own customized kits</td>
<td>LEGO Factory builds a Long Tail community around customers who are truly interested in niche content and want to go beyond off-the-shelf retail kits</td>
<td>Thousands of new, customer-designed kits perfectly complement LEGO's standard sets of blocks. LEGO Factory connects customers who create customized designs with other customers, thus becoming a customer matchmaking platform and increasing sales</td>
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<tr>
<td>LEGO Factory's existence depends heavily on the Web channel</td>
<td>Thousands of new, customer-designed kits perfectly complement LEGO's standard sets of blocks. LEGO Factory connects customers who create customized designs with other customers, thus becoming a customer matchmaking platform and increasing sales</td>
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<tr>
<td>LEGO Factory leverages production and logistics costs already incurred by its traditional retail model</td>
<td>LEGO Factory aims to generate small revenues from a large number of customer-designed items. This represents a valuable addition to traditional high-volume retail revenues</td>
</tr>
</tbody>
</table>

Figure 13: Business Model Canvas: LEGO Factory – taken from Osterwalder & Pigneur, 2013, p. 73
3.3.4. The Business Model by Alt & Zimmermann

This early configuration of a generic business model was published in 2001, when the discussion of the business model was still relatively young. Their work was embedded in the context of successful ascending e-businesses. By the time, Alt & Zimmermann integrated early other publications about business model definitions and configurations in their concept.\(^{161}\) Basically, the resulting model consists of six elements as shown in Figure 14, whereas four basic dimensions, which are coloured in blue, are collectively influenced by two general influence factors which are represented in green colour. This business model conceptualization is chosen because it was created in the earlier days of the business model concept and its elements, among others, include technology and legal issues as specific relevant parts.

![Figure 14: Generic Elements of Business Models - taken from Alt & Zimmermann, 2001, p. 7](image)

The **mission** of a business model remains one of its most crucial parts to fully understand and develop. It refers to basic strategic awareness of what a company wants to achieve. This element contains the strategic vision, strategic goals, the value proposition and fundamental cornerstones of the respective product and/or service features.\(^{162}\)

The **structure** of a business model refers to the composition of actors and roles of a business as well as their alignment. In this regard, it further contains competitive aspects such as the choice of industry, customers and a more detailed competitive product/service description.\(^{163}\)

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\(^{161}\) Cf. Alt & Zimmermann, 2001, p. 5 – Note: Influences were the business model publications of Timmers, 1998, p. 4; Tapscott, Ticoll, & Lowy, 2000, p. 17; Kraemer, Dedrick, & Yamashiro, 2000 & Viscio & Pasternack, 1996

\(^{162}\) Cf. Alt & Zimmermann, 2001, pp. 5f.

\(^{163}\) Cf. Alt & Zimmermann, 2001, p. 6
The processes provide a detailed explanation of the mission and the structure of the business model. It breaks down the assumptions of those two elements to the practice-level and contributes the selection of to-be-used practices and processes. They represent the functional steps of the value creation process. Exemplarily outlining the level of detail, the processes element of a technology company might entail the configuration of the product as value creation step which can be further concretized by using the specific “reverse-engineering” approach.

The revenues refer to the financial foundations of the firm. It contains assumptions about sources of revenue and the investment needs of the firm.¹⁶⁴ As a negative example, in the times of ecstasy before the burst of the dotcom bubble, many businesses simply had no plausible financial basis and were therefore doomed to failure.¹⁶⁵ Arguably, the emphasis on revenue and required investment volumes alone appears to oversimplification, since revenue is no reliable indicator when ensuring financial survival of an organization. Therefore, an emphasis on costs, profit and liquidity as it is described in the other models seems to be more viable.

Legal issues refer to the legal restrictions which affect the four main dimensions. For example, the banking sector underlies regulatory restriction which might influence other dimensions through privacy laws and others.¹⁶⁶

Technology as part of this framework refers to technical advancements as enablers as well as constraints for businesses. As an example, back in 2001, Alt & Zimmermann stated that third generation mobile technology (UMTS) might change business models fundamentally.¹⁶⁷ It is argued that technological advancements “[…] affect all aspects of business models, the overall mission, as well as structures, processes, and revenue models.”¹⁶⁸

### 3.3.5. The Business Model by Baden-Fuller, et al.

This approach to a business model configuration was used in the context of technological innovation as a business model influence factor. The model claims that business models can be classified described using four main dimensions. Figure 15 lists the four main dimensions on the left side of the figure and offers exemplarily application of the dimension on five specific business models. Additionally, in comparison to other selected models, the paper was released relatively recently. Hereinafter, this concept is explained in more detail.

The customer identification dimension generally identifies target customers and target customer groups. This also involves the situation when new customers are acquired.¹⁶⁹ What appears relatively simple at first glance, might become an interesting area of business model design. Especially regarding the possibilities digitization offers, the user of a product or service is not necessarily paying the respective compensation. For example, an

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¹⁶⁴ Cf. Alt & Zimmermann, 2001, p. 6
¹⁶⁵ Cf. Vickers, 2000
¹⁶⁶ Cf. Alt & Zimmermann, 2001, p. 6
¹⁶⁸ Alt & Zimmermann, 2001, p. 7
¹⁶⁹ Cf. Baden-Fuller & Mangematin, 2013, p. 421
advertiser may be paying the product or service for a user. In Figure 15, the outlined search engine business model uses exactly this principle. For example, people do not pay for using the Google search function. The advertising companies pay to be shown to the users.

<table>
<thead>
<tr>
<th>Fast food chain – franchised BM</th>
<th>Boutique strategy consultant BM</th>
<th>Defense contractor BM</th>
<th>Newspaper (1990s) BM</th>
<th>Search Engine BM</th>
</tr>
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<tbody>
<tr>
<td>CUSTOMER IDENTIFICATION</td>
<td></td>
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<td>Are users paying and</td>
<td>User pays with franchise as an</td>
<td>User pays</td>
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<td>if not who are the</td>
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<td>CUSTOMER ENGAGEMENT “Taxi” or</td>
<td>BUS Scale based</td>
<td>TAXI Bespoke projects</td>
<td>TAXI Usually project</td>
<td>BUS for users</td>
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<tr>
<td>“Bus”</td>
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<td>based</td>
<td>for taxi</td>
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<tr>
<td>VALUE CHAIN LINKAGES</td>
<td>Highly tiered system of suppliers</td>
<td>Almost all value is</td>
<td>Complex system of</td>
<td>Complex tightly</td>
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<tr>
<td>Integrated,</td>
<td>and franchisees, who are linked</td>
<td>delivered by the firm,</td>
<td>arrangements among</td>
<td>controlled</td>
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<tr>
<td>hierarchy or networked</td>
<td>hierarchically</td>
<td>little outsourcing</td>
<td>many partners</td>
<td>linkages</td>
</tr>
<tr>
<td>MONETIZATION</td>
<td>COMPLEMENTARY ASSETS</td>
<td>VALUE</td>
<td>COST</td>
<td>TWO-SIDED</td>
</tr>
<tr>
<td>When, What and How is money</td>
<td>franchisee collects money from</td>
<td>Often priced on the</td>
<td>Staged payments and</td>
<td>Advertisers pay</td>
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<td>raised</td>
<td>consumer and fees</td>
<td>basis of fee plus share</td>
<td>often cost plus</td>
<td>after service is</td>
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<td></td>
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<td>of the value created</td>
<td>contract</td>
<td>delivered</td>
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Figure 15: Examples of Business Model Configurations – taken from Baden-Fuller & Haeflinger, 2013, p. 421

The dimension of customer engagement, also called the value proposition, refers to describing the value which should be provided to every target customer. In their concept, the authors divided value propositions in the “taxi” or “bus” types. On the one hand, taxi type firms, also so-called project-based organizations, deliver value to specific customers based on their specific needs. Examples for such firms are consulting firms à la McKinsey or movie production companies. On the other hand, bus type companies, also called pre-designed (scale) based organizations provide one-fits-all standardized, mass-produced products and services to any customer. For example, this approach is represented by fast-food chains or automobile assemblers.

The value chain linkages “[…] are the mechanisms the firm uses to deliver its product or service to the customer […].” This does include information about the way how supplier relationships are shaped and how elements in the value-creation process are linked. In their examples for this dimension, Fuller & Haeflinger include criteria such as degree of integration, forms of hierarchy or the shaping of a network.

The last dimension, monetization, refers to capturing monetary value from business activity. In this regard, possible business model design options might revolve around pricing, timing of collecting payments, methods of collecting payments and others. Arguably, the design options regarding monetization are becoming even more manifold as digital advancements in payment progress.

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170 Cf. Baden-Fuller & Haeflinger, 2013, p. 420
171 Note: For a more detailed explanation of the types confer Nightingale, Baden-Fuller, & Hopkins, 2011, pp. 215ff.
172 Cf. Baden-Fuller & Haeflinger, 2013, p. 421
173 Baden-Fuller & Mangematin, 2013, p. 421
174 Cf. Baden-Fuller & Haeflinger, 2013, p. 421
This element apparently lacks the focus on other financial aspects of a business such as the cost structure, profits and other important financial aspects. Since, the element is also referred to as value-capturing it seems that a revenue measure appears to be misplaced in this context because it is unable to ultimately state if value was captured. The author suggests that only after considering the expenses of an organization to create its revenues, it is possible to make a statement if the firm was able to capture value.

3.3.6. Selection of a Model for further Consideration

For the sake of providing a legitimate basis for progressing this thesis, the influence of digitization on future business models, a business model configuration including respective elements should be chosen. The chosen model is then used to provide a structured framework to elaborate on the thesis main research question. In this chapter, the described business model configurations should be analyzed regarding their appropriability for this thesis.

The author has chosen to base the answering of this thesis’ main research question on the business model by Baden-Fuller, et al. (see chapter 3.3.5). The main reason for this choice is the context the model was created for: technological innovation-related business models. The author views the elements of the respective conceptualization and the suggested options within them as highly suitable for digitization innovation. Other concepts might include those thoughts implicitly, but the model by Baden-Fuller, et al. addresses important questions explicitly.

Therefore, in the customer identification element, the explicit question asked is who the customer is and who is paying for the product or service. Especially in internet-related services, this seems to be an important question, since e-businesses brought a lot of free-to-use services for users while another party actually pays for an associated service. Arguably, there are a lot of constellations in this element which can be realized. The author recognizes this question as crucial for many digitalization-related business models and therefore attributes the model strong appropriateness to answering this thesis’ research question.

Customer engagement suggests the main options of individualized or generalized offers and seems to be a topic with great impact for digital business models as well. Arguably, the boundaries between services and products for individual problems or needs and the ones for a general public’s problems or needs appear to get blurred more and more by digital systems being able to individualize content on a large scale. This dimension seems to be of strong interest and legitimacy in the context of digitization.

Monetization and value-chain linkages are obvious aspects of any business model, whereas especially the explicit questions about when, how and what money is raised as compensation for services or products appear another important factor when analyzing digital business models. Nonetheless, in the authors opinion this element is the only element which appears to be lacking other financial aspects beyond the revenue focus. Therefore, the monetization aspect should be understood as outlined in the description of the element and additionally extended with any financially relevant information. Especially,
influences on the cost structure of a business model seem to be important to observe when analyzing digitization trends.

Concluding, in the author´s opinion, the concept´s elements fit this thesis´ research question exceptionally well. It explicitly and accurately addresses many attributes of digital business models which will most likely require deeper analysis. Additionally, in comparison to the other covered business model concepts, the model by Baden-Fuller, et al. appears to contain all basic building blocks of an up-to-date business model. As a result, this concept promises a fertile soil for reaching this thesis´ goal.
3.4. Business Model Innovation

This chapter is revolving around innovating, respectively changing the business model of a company. Achieving the main goal of this paper is deeply grounded in the area of business model innovation, since adaption to digitization is nothing more than innovating a business model to utilize a changing environment. In comparison to the discussion of the business model as static way of the functioning of a firm, the dynamic perspective of innovation and change has received considerably less attention and was incorporated just in the late 2000s into research.\(^{176}\)

Business model innovation is receiving an increased focus of discussion. The reason for this attention is threefold. Scholars see the increasing speed of everything, inter-industry competition and increasing importance of customer experience as main drivers of interest. There are barely any industries which do not face any considerable pressure to innovate their business models.\(^{177}\)

A comprehensive discussion of the business model inevitably involves the factors of change and innovation. A firm’s business architecture should be able to adapt to a dynamic environment to remain profitable.\(^{178}\) Beyond sheer adaption, the business model is alleged to fulfil two main roles in further fostering active innovation. Therefore, the first purpose of a business model is to enable companies to turn innovative ideas into actual commercial value. The second innovative use of business models is their ability to be a source of innovation and competitive advantage themselves.\(^{179}\) The ability of business models to cope with changing environments and the ability to commercialize and create innovation has already proven to be highly relevant:

> "Business model innovations have reshaped entire industries and redistributed billions of dollars of value. […] Fully 11 of the 27 companies born in the last quarter century that grew their way into the Fortune 500 in the past 10 years did so through business model innovation."\(^{180}\)

The extent of change a business model requires to cope with innovation commercialization or environmental change is an important factor when considering business model innovation. A change of a business model is not to be taken lightly. It is not necessary to design a completely new business model due to any occurring change. For example, Procter & Gamble was able to commercialize innovative household products such as Swiffer and Febreze with the use of their traditional business model. Nonetheless, there might be situations which require an entirely new business model design.\(^{181}\)

Rigidly stated, a fundamental change to a current business model is only needed when innovations have a considerable impact on every aspect of a business model.\(^{182}\) Moreover, changing an existing business model is difficult, because numerous dispositions have

\(^{176}\) Cf. Sosna, Trevinyo-Rodríguez, & Velamuri, 2010, p. 385
\(^{178}\) Cf. Linder & Cantrell, 2000, pp. 2f.
\(^{179}\) Cf. Massa & Tucci, 2014, p. 424
\(^{180}\) Johnson et al., 2008, p. 52
\(^{181}\) Cf. Johnson et al., 2008, pp. 57f.
\(^{182}\) Cf. Johnson et al., 2008, p. 24
already been made and forces of inertia and change resistance need to be overcome.\footnote{Cf.\,Zott &\,Amit, 2010, p. 217} Taking this complexity into consideration, academic approaches to business model innovation should be introduced.

### 3.4.1. Definition

Defining business model innovation faces a similar fate as describing the business model concept: definitions are heterogenous and unstructured. Generally, definitions refer to a change in the structure of a business model. The necessary extent of change to legitimate the presence of business model innovation remains controversial. A possible attribute for considering a business model change as innovation should at least be "[…] some degree of novelty and uniqueness."\footnote{Massa & Tucci, 2014, p. 425} Other authors view the creation of a new market or the disruption of the competitive advantage of key competitors as main criteria for business model innovation.\footnote{Cf.\,Euchner &\,Ganguly, 2014, p. 33} Furthermore, explicitly focusing on defining business model innovation as central topic is neglected by most publications. Most definitions are to be considered as a simple add-on to an article with a different focus.\footnote{Cf.\,Wirtz,\,Göttel, &\,Daiser, 2016, p. 3} Examples for definitions read as follows:

"Business-model innovation is the discovery of a fundamentally different business model in an existing business."\footnote{Markides, 2006, p. 20}

"Business model innovation describes the design process for giving birth to a fairly new business model on the market, which is accompanied by an adjustment of the value proposition and/or the value constellation and aims at generating or securing a sustainable competitive advantage."\footnote{Wirtz, 2016, p. 189}

"At root, business model innovation refers to the search for new logics of the firm and new ways to create and capture value for its stakeholders; it focuses primarily on finding new ways to generate revenues and define value propositions for customers, suppliers, and partners."\footnote{Casadesus-Masanell &\,Zhu, 2013, p. 464}

Business model innovation addresses not only the alteration of existing business models but also its initial configuration. Therefore, the process of business model innovation may face different challenges based on it being applied in initial business model design or in reconfiguration. Modifying existing business models faces obstacles such as "[…]\,organizational inertia, management processes, modes of organizational learning, modes of change, and path dependent constraints in general."\footnote{Massa & Tucci, 2014, p. 425} Designing a completely new business model faces challenges based on different types of uncertainty and untested structures.\footnote{Cf. Massa & Tucci, 2014, p. 425}
3.4.2. Approaches to Business Model Innovation

A literature review by Foss & Saebi analyzed 150 relevant articles listed in the EBSCOhost database regarding their content to identify the main foci of business model innovation research. Generally, research streams of business model innovation can currently be divided into four major groups.\(^{192}\) Subsequently, the found research streams should explained briefly and selected key insights from every stream should be provided.

The first stream addresses fundamental conceptualization and classification of business model innovation. Therefore, publications of this stream emphasize giving meaningful definitions and try to establish schemes for classification of business model innovation.\(^{193}\) The chosen business model concept of Johnson, Christensen & Kagermann (chapter 3.3.1) represents a publication which can be classified as belonging to this stream of research.\(^{194}\) Another insightful publication of this area comes from Amit & Zott. They propose six questions managers of all businesses should ask themselves before innovating business as shown in Figure 16. Therefore, this article is to be rated as classificatory and part of the first research stream. They argue that adopting this holistic view of a business helps executives to improve decision-making regarding their respective business model:

"When you innovate, look at the forest, not the trees — and get the overall design of your activity system right before optimizing the details."\(^{195}\)

The second stream understands business model innovation as a process of organizational change and specifically addresses "[...] the capabilities, leadership, and learning mechanisms [...]"\(^{196}\) which are important in the process. Exemplarily, capabilities found by Achtenhagen, Melin & Naldi should be included which are crucial for sustaining competitive

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\(^{193}\) Cf. Foss & Saebi, 2017, p. 208
\(^{194}\) Cf. Foss & Saebi, 2017, p. 207
\(^{195}\) Amit & Zott, 2012, p. 49
\(^{196}\) Cf. Foss & Saebi, 2017, p. 208
advantage by constant adaption and renewal. They argue that there are three main capabilities which enhance this process: identifying, experimenting with and exploiting business opportunities (1), using resources in a balanced way (2) and achieving coherence between active and clear leadership, a strong organizational culture and employee commitment (3).\textsuperscript{197} An important capability of an organization which maintains a value-creating business model over time is revolving around an entrepreneurial mindset. Such firms are built around “[…] identifying, experimenting with and exploiting of new business opportunities.”\textsuperscript{198} A different author explicitly rates the ability to experiment with new business models as an additional source of differentiation. Respective experience in experimentation may lead to superior capabilities in utilizing new business models.\textsuperscript{199}

The third stream discusses business model innovation from an outcome perspective. Respective scholars analyze innovative business models which were the result of an innovation process. Publications of this stream often focus on specific industries and specific innovations of respective business models.\textsuperscript{200} Exemplarily for resulting innovative models, Abdelkhafi, Makhotin & Posselt describe which kinds of traditional automotive business models are applicable for the electric mobility industry. They provide a considerable number of possibilities how the new technology trend can be utilized using existing models.\textsuperscript{201} For example, a licensing business model can be put in place to monetize the provision of special technology, processes and know-how to.\textsuperscript{202} Furthermore, due to relatively scarce supply of a specifically trained workforce in the sector, a brokerage model for personnel is argued to be useful. Those human resource brokers might find a strong viability in the niche of mediating between highly and specifically trained persons and electric mobility firms.\textsuperscript{203} They further argue that a razor/blade business model might be applied as the mode of selling electric cars. The cars would represent a long-lasting base (razor), which requires continuous purchases of batteries (blades) to stay operative. This would create constant flows of revenues.\textsuperscript{204} Interestingly, this appears to stem against the currently ongoing trend of rechargeable Batteries of Tesla and others.

The fourth stream of research questions firm performance implications of business model innovation.\textsuperscript{205} As representor of this research stream, a publication of Aspara, Hietanen & Tikkanen should be mentioned. They questioned the firm performance gap between innovating new business models and replicating business models. In this context, replication stands for taking measures of refining a current business model and making sure the business model is repeatable in other geographical locations. It does not stand for imitating another firm’s business model. The financial performance was measured in revenue growth and profit growth. The used method was surveying 545 CEO’s and marketing managers of small and large firms in the consumer products and services and business-to-business products and services industries.\textsuperscript{206}

\textsuperscript{197} Cf. Achtenhagen et al., 2013, pp. 427ff.
\textsuperscript{198} Achtenhagen et al., 2013, p. 438
\textsuperscript{199} Cf. McGrath, 2010, p. 210
\textsuperscript{200} Cf. Foss & Saebi, 2017, p. 208
\textsuperscript{201} Cf. Abdelkafi, Makhotin, & Posselt, 2013, pp. 24ff.
\textsuperscript{202} Cf. Abdelkafi et al., 2013, p. 31
\textsuperscript{203} Cf. Abdelkafi et al., 2013, p. 29
\textsuperscript{204} Cf. Abdelkafi et al., 2013, p. 25
\textsuperscript{205} Cf. Foss & Saebi, 2017, p. 209
\textsuperscript{206} Cf. Aspara, Hietanen, & Tikkanen, 2010, pp. 46ff.
Although innovative business models appear to be highly crucial for an organization’s success, findings of this study, which are visualized in Figure 17, have shown that a firm’s emphasis on business model innovation does not automatically result in superior financial performance. Firstly, large firms which have a high emphasis on business model innovation and a low emphasis on business model replication face lower profitable growth than large firms which have a low emphasis on business model innovation and business model replication. Furthermore, large companies have shown the highest profitable growth when having a high emphasis on both innovation and replication of business models. Secondly, smaller firms tend to differ from large ones regarding the study’s results. All situations in which organizations had a high strategic emphasis on business model innovation led to similarly strong financial performance. Only the case of a small firm with low emphasis on business model innovation and business model replication performed inferior.\textsuperscript{207} The replication of successful business models appears to be of comparable impact to financial performance as business model innovation. Further evidence has shown that innovative business models have to be disposed of internal complexity to enable utilization in several contexts and regions. This can unlock superior profitable growth.\textsuperscript{208}

\textsuperscript{207}Cf. Aspara et al., 2010, pp. 48ff.
\textsuperscript{208}Cf. Zook & Allen, 2011, p. 114
3.4.3. Implementing Business Model Innovation Measures

Naturally, building a business model innovation concept on a theoretical level is significantly different to the challenge of putting it into practice within an existing organization. Practical implementation faces its own issues:

“Business model innovation is often the key to capturing value from innovation within corporations. Developing and implementing new business models in practice, however, is difficult and fraught with risk.”

Arguably, there are numerous options to practically innovate and implement a new business model or business model elements. For example, in the case of Xerox and the firm’s technological innovation projects it became apparent that spinning them out into separate businesses results in considerable additional value. While Xerox found that the projects will not add any significant value to the firm’s specific current business model, some projects led to highly profitable new firms with each of them having entirely specific business models. As a result, the combined market value of the spin-off companies reached twice the market value of Xerox itself. Arguably, this allows to draw the implication that innovations mostly require a specific business model to contribute value. Euchner & Ganguly established a concrete framework for the tire company Goodyear as visualized in Figure 18. This model should be used to give an example for utilizing business model innovation in a business. The business model innovation framework is aiming to “[…] reduce the risks through learning through targeted experiments with customers and partners before incubating the business in the market.”

![Figure 18: Goodyear’s Business Model Innovation Process – taken from Euchner & Ganguly, 2014, p. 34](image-url)

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209 Cf. Euchner & Ganguly, 2014, p. 39
210 Cf. Chesbrough, 2008, p. 23
211 Cf. Euchner & Ganguly, 2014, p. 34
The whole pyramid is built on a customer value creation (1), which accurately addresses customers’ needs. Due to the crucial importance of the value proposition, the formulation of the proposition should be performed completely isolated from business model design. Linking those two areas might lead to flawed value propositions, which might satisfy business model requirements but not the more essential customer needs. In practice, deciding on a concrete value proposition usually involves creative methods such as brainstorming, building prototypes and customer trials and feedback. Especially, tacit customer needs are easier to be identified and explored with the use of (physical) prototypes. In this phase, it will be necessary to quantify the effects of an innovation. For Goodyear, the focus was on numbers like “[…] tire life, reduced roadside failures, reduced administrative costs, and improved fuel economy.” Osterwalder, et al. suggest that value proposition design generally consists of three main dimensions: knowing customers and customer needs, the product or service portfolio of a firm and their respective fit. A value proposition is a strong fit when products or services clearly address issues of customers or add valuable gains for customers.

In the second step, suitable business models for an innovation should be chosen (2). Interestingly, the business model will not be designed from scratch at Goodyear but selected from an existing portfolio of archetypes of established models. By doing so, the firm can be sure that the respective models are coherent, contribute to a competitive advantage and provide economic leverage. Coherence stands for the productive interrelation between the elements. The business model is contributing to a competitive advantage when it builds on a unique asset at its core which enables competitive differentiation. Economic leverage refers to the scalability of profits with growing size of the business. The work of Slywotzki works as a suitable selection of proven appropriate business model setups and their peculiarities which includes 23 business model archetypes. Ultimately, applicable business models for a respective innovation should be chosen, often times with prior visits of other firms which employ the models in consideration. The choices are normally refined to fit the specific needs of the situation with the respective archetype always remaining as the core. This approach appears to dissent with the approach of Osterwalder & Pigneur who imply that new business models can be created by using the Business Model Canvas and creative thinking.

Next, associated risks of the chosen business model options should be assessed (3). For this risk analysis, Goodyear focusses on the main risks described by Adner: interdependence risk, initiative risk, integration risk, co-innovation risks and risks associated with the innovation adoption chain. The initiative risk results from the inherent uncertainty of any project of not being finished with proper results or off schedule. The interdependence risk origins from the fact that many innovations’ success requires other developments of the project to unfold as planned. Unforeseen developments endanger success. Therefore, interdependence risk describes the degree of dependence on other developments within a project. The integration risk is based on the need of most innovations to have some kind of intermediary to enable its functionality. For example, Michelin, one of Goodyear’s competitors, developed the innovate run-flat tire which

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212 Cf. Euchner & Ganguly, 2014, p. 34
214 Euchner & Ganguly, 2014, p. 35
217 Cf. Slywotzky, 2002
219 Cf. Osterwalder & Pigneur, 2013
can be used to drive 50 or more kilometers after the event of a puncture. Nonetheless, it could not be used for years because it required to have a suitable connection to the vehicle’s electronic system, which was only update every three to four years per car producer. Co-innovation risks and risks associated with the innovation adoption chain, unlike the three prior described risks, cannot be influenced by the firm itself. They are ecosystem risks. The co-innovation risk results from the risk when other parties have to create innovation to make the focal firm’s business model work. The risk associated with the innovation adoption chain are based on the uncertainties of alignment of all stakeholders to make an innovation work. The assessment of those described risks at Goodyear is carried out in a financial model, which resembles the logic of the business model. The model is then run using thousands of times with different variables to view the effect of changing eventualities. Figure 19 shows an exemplary summary of such results with the dark bars representing profitable scenarios. Shi offers another way of classifying business model risk divided into risks for single business model elements, risks for the interrelation between elements and risks of the whole system. On those levels, the three main risks are decreasing value of a market, decreasing market share in a firm’s market and risks in regard to the sustainability of a competitive position.

In the following phase, prioritizing risk (4), the variables with the strongest effect on the profitability of the business model are identified. Using the financial model, it is possible to determine which factors of the business model contribute most to economic success or failure.

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221 Cf. Euchner & Ganguly, 2014, p. 36
222 Cf. Shi & Manning, 2009, pp. 54ff.
Those factors with high influence are most crucial to control and understand. Those insights also give hints to area where a business model might need to be redesigned.\footnote{Cf. Euchner & Ganguly, 2014, pp. 36f.}

The next step will be experimenting with aspects of the business model in a real-world environment by using prototypes, customer trials or other options (5). This enables the firm to confirm the understanding of the basic assumptions of a business model and gain concrete quantitative financial data in an actual market context.\footnote{Cf. Euchner & Ganguly, 2014, pp. 37f.} The so called “lean startup approach” represents the theoretical basis for this step. The respective publications argue for two main practices which are important for successful businesses. The first practice is experimenting with real customers. Only interacting with customers will lead to the most accurate learnings. Secondly, and including the first practice at least partially, a general degree of experimenting with business model is crucial for the success of any business model. It is necessary to prove hypothesis about cause-effect relationships by ultimately testing them.\footnote{Cf. Euchner & Ganguly, 2014, p. 38} The goal of this step is to reducing risks associated with assumptions of a business model to an acceptable minimum. After achieving this, it should be possible to clearly evaluate the likely profitability of a business model.\footnote{Cf. Ries, 2011; Blank & Dorf, 2012} This methodology, can also be observed in the successful case of Naturhouse, a dietary-supplements retail firm, which tested customer behavior, products and processes in small stores to collect customer feedback and performance data before taking important decisions.\footnote{Cf. Sosna et al., 2010, pp. 387f.}

The final step of the model will be the incubation of the respective business model in a small scale to prove its potential performance in terms of profitability and scalability (6). Furthermore, it will be necessary to develop a strategy evolving the business model. At Goodyear, the funding and oversight of incubation projects is undertaken by the so called New Venture Board (NVB) which consists of a few of the company’s general managers. As already stated, research supports that innovations are ran in a separate organization.\footnote{Cf. Chesbrough, 2008, p. 23} The current practice at Goodyear respects this advice in the following way:

“[…] we have chosen to incubate new businesses as separate divisions with their own staff and general manager, although this may not apply as a general rule in all situations. The businesses leverage the resources of the core for support functions (such as legal and accounting), but have their own sales, operations, IT, and technology staff. They work closely with the core business to avoid unnecessary channel conflict or customer confusion and buy resources (like tires and services) from the core. The businesses report through the corporate innovation function and are accountable to the NVB, which provides oversight and guidance.”\footnote{Cf. Euchner & Ganguly, 2014, p. 38}

The final decision about regularly operationalizing an incubator project will be evaluated when it is decided that the project should be scaled up. This scaling can have different forms which depend on the circumstances.\footnote{Cf. Euchner & Ganguly, 2014, p. 38}
3.5. Summary

The concept of the business model has been discussed in detail. Numerous definitions of the ambiguously defined concept have been given. The history of the business model has been found to be strongly linked to the emergence of the new economy. Furthermore, business models can be described by several different setups of different elements. The topic of changing business models has been addressed by analyzing literature about business model innovation.

- **How can a business model be defined for the sake of this thesis?**

For this thesis, no specific definition should be chosen as the meaning of the term business model. This is due to the highly diverse and numerous definitions in relevant publications. Instead, the business model in this thesis should be understood as what most definitions agree on. The business model represents the core logic and mechanisms of business operations and respective value creation and capturing.

- **What are separable elements of a business model and how do the interrelate?**

This chapter presented and discussed several different business model conceptualizations which include business model elements and their interrelation. For the progression of this thesis, one of those concepts, the business model by Baden-Fuller et al., has been chosen. It consists of four major elements: customer identification, customer engagement, value chain linkages and monetization. The elements interrelation was not discussed explicitly but it appears obvious that the sum of the elements, the “big picture” has to result in a functioning system. The mentioned concept was chosen due to the purpose it was created for. It was used to explicitly to show how technological innovation can shape business models.

- **How are business models/business model elements adapting to changing stimuli?**

Generally, the increasing speed of everything challenges business models to change continuously. Technological innovations are an important reason for change as well. In this chapter, literature about business model innovation was discussed and a detailed practical example of business model innovation practices was given. Concluding, it can be said that the reaction to a new stimulus cannot be predicted accurately on a general level. Business models will need to be entrepreneurial and open to the experimentation with new technologies or ideas. Then, over the course of experimentation, useful learnings for adaption will be gained.
In practice, professional firms often spin off new (technological) innovations in completely autonomous new business models. Initially, based on a specific innovation, a value proposition and a fitting business model archetype are chosen. Next, the model faces continuous improvements based on financial modelling and concretization of assumptions through fields tests. As a new business model’s profitability and functionality can be predicted as highly likely, it will get started in practice and may eventually be rolled out on a larger scale. Therefore, it can be stated that firms react to new innovations by experimenting with respective stimuli and business models on a smaller scale and scale them up with increasing experience and knowledge.\textsuperscript{237}

\textsuperscript{237} Cf. Euchner & Ganguly, 2014, pp. 33ff.
4. The Influence of Digitization on Future Business Models

This chapter is representing the main focus of this paper. In the previous chapters, all necessary prerequisite elements for the following discussion – business models, business model innovation and digitization – have been developed to provide a solid foundation to answer this thesis’ main research question.

Digitization as a product of technical advancement obviously has an influence on human society and business. Interestingly, the interrelation between technology and society appears not to be described unilaterally. Instead, the connection between the terms has to be viewed as mutually influencing and can be understood as follows:

"Technology does not determine society: it embodies it. But nor does society determine technological innovation: it uses it." 238

This thesis puts emphasis on just a selected part of this interrelation. Namely, the focus of discussion will be the unilateral impact of digitization, an outcome of technology, on the business model, which is a part of business and therefore society. Figure 20 illustrates how the interest of this thesis, highlighted in red, is placed within the interaction between technology and society.

![Figure 20: The Mutual Interaction between Technology & Society: Simplified Visualization – modified after Castells, 2010, p. 5](image)

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238 Castells, 2010, p. 5
4.1. Adapting to Digitization – Practical Examples

Before this work’s main question will be addressed, this chapter should shed light on real company cases of adaption to digitization. As technological advancement unfolds, the requirements for a legitimate business model configuration can change significantly. Currently, appropriate models might lose their usefulness, while new configuration options might become more successful:

“Most business models are conceived within the boundaries of a particular set of constraints. As new technologies and other shifts relax constraints or impose different ones, the opportunities for new models (and the threats to existing ones) increase. Typically, new models emerge when a constraint is lifted, and old ones often come under pressure when one emerges.”

This insight appears to be of crucial importance, since sticking to an obsolete business model for too long might lead to an organizations failure. To the contrary, detecting and making use of new business model opportunities might grant firms an edge over their competitors. At this point, one best practice example and one bad practice example from real companies should be discussed. Using examples visualizes the importance of this issue isolated from a purely theoretical level. They will further outline how vital it is for organizations to reflect on digitization as a business model influencer.

4.1.1. Best Practice – Valve Corporation

The best practice example of adapting a business model to unfolding digitization should be covered by the development of the US video game developer and distributor “Valve Corporation”. It was established in 1996 by two former Microsoft employees.240 Since its beginnings, the company was closely connected to digital technology, but achieved its ultimate breakthrough by observing digitization and reacting and adapting in an innovative way. Although the firm does not disclose financial data due to it being a privately held entity, it is estimated to be worth around USD 2 – 4 billion, with yearly revenue estimates ranging from USD 600 – 800 million. The company is beating profit per employee metrics of tech giants such as Google or Apple. One employee represents more than USD 350,000 of profit.241 The company claims to be the 4th largest internet bandwidth consumer in the world.242 Those convincing numbers create an eagerness to screen the evolvement of the company’s business model over time. For the analysis, the selected business model framework of

239 McGrath, 2010, p. 253
240 Cf. Puranam & Häkonsson, 2015, p. 2
241 Cf. Chiang, 2011; Note: The estimations were made for the year 2010, when Valve’s CEO made a corresponding public statement. There are no more recent numbers publicly available.
242 Cf. blogphilofilms, 2013
Baden-Fuller, et al. (see chapter 3.3.5) will be applied. Although the evolution of the firm’s business model did not occur in one step but incrementally, for simplification, it is treated in a two-state approach: initial and current business model. Due to the firm being a privately held entity, no business information is explicitly disclosed. Nonetheless, the founders offer deep insights in their thoughts on the evolution of their firm’s business model. Additionally, observable digitization trends allow making logical conclusions about their impact on and reasoning behind the business model design.

Focusing on the customer identification element, the goal is to identify the target customers and target customer groups of a business. In its initial business model (1), the company was developing video games only. Ultimately, counting out retailers as intermediaries, the target customers were consumers with a personal computer. Therefore, there was only one customer group. As the company realized that distribution over a third party using physical data storage mediums was an unnecessary cost factor, the company established its own online platform with downloadable data called Steam. According to the company’s CEO, he observed that “There were structural changes that were affecting the relative value of business functions and that whole categories within typical corporations essentially were being made obsolete.” At first, the platform was meant to release patches to customers. As PC and internet performance improved, the platform was used to sell downloadable digital content to any subscribing customer. Over time, the platform convinced a lot of users to regularly use the platform since it became not only a distributions platform but also a social network for gaming enthusiasts.

Figure 22: Number of Fixed Broadband Subscriptions in the United States from 2000 to 2015 (in millions) – taken from statista, 2016

243 Cf. Dunn, 2013
244 Cf. blogphilofilms, 2013
245 Note: A patch is described by code which solves issues of the previously released software.
At any given time, Steam today has 8 – 12 million online users. This made the platform valuable to any game developer as a distribution solution. Thus, in the current business model (2), paying customer groups are classic video game players but also video game developers. Concluding, the firm converted a cost factor, intermediary retail store sales, to an additional customer group, other developers wanting to use Valve’s online distribution, by utilizing potentials of digitization. Growing internet bandwidth and usage (see Figure 22) increased the potential customer base beyond the addition of a new customer group by a large extent.

The customer engagement element contains the value propositions for specific target customers and customer groups. In the initial business model (1), the firm offered highest quality computer games, which due to their virtually endless reproducibility are to be rated as a one-fits-all “bus” product. Therefore, the provision of value to customers is basically scalable based on any given demand. The evolution towards the firm’s current form of customer engagement (2) requires a comprehensive analysis of the situation to be fully understood.

Firstly, the company does still code own video games. Thus, one customer engagement part is value in the form of self-coded software. Moreover, a main driver for the company’s success is the online distribution platform Steam. The platform provides value in numerous ways to numerous parties. For example, other developers can sell their software on the platform for a simple commission on their respective products’ sales. The amount of sales commission kept by Valve is not public. The developer will value this option due to a simple automated form of sales and a large customer base. Table 6 provides sales data from 2016 and shows the potential of the sales platform. Arguably, the numbers represent a convincing argument for game developers to utilize steam as a distribution platform.

Furthermore, no physical handling and boxing of copies is required and the developer can concentrate on their core competencies of programming. The end consumer receives value

<table>
<thead>
<tr>
<th>Month</th>
<th>Total sales</th>
<th>Total revenue</th>
<th>Median sales</th>
<th>Median revenue</th>
<th>Avg min price</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 2016</td>
<td>14,454,157</td>
<td>$132,221,415</td>
<td>1,449</td>
<td>$5,816</td>
<td>$6.26</td>
</tr>
<tr>
<td>February 2016</td>
<td>15,216,088</td>
<td>$126,161,337</td>
<td>886</td>
<td>$3,340</td>
<td>$7.07</td>
</tr>
<tr>
<td>March 2016</td>
<td>21,042,875</td>
<td>$226,422,654</td>
<td>1,621</td>
<td>$9,870</td>
<td>$9.93</td>
</tr>
<tr>
<td>April 2016</td>
<td>28,786,282</td>
<td>$334,240,215</td>
<td>2,153</td>
<td>$12,414</td>
<td>$10.19</td>
</tr>
<tr>
<td>May 2016</td>
<td>24,872,667</td>
<td>$339,628,195</td>
<td>1,796</td>
<td>$11,791</td>
<td>$9.89</td>
</tr>
<tr>
<td>June 2016</td>
<td>43,362,476</td>
<td>$299,276,763</td>
<td>2,114</td>
<td>$7,499</td>
<td>$6.05</td>
</tr>
<tr>
<td>August 2016</td>
<td>27,458,741</td>
<td>$375,568,452</td>
<td>1,681</td>
<td>$10,370</td>
<td>$8.94</td>
</tr>
<tr>
<td>September 2016</td>
<td>32,612,019</td>
<td>$320,002,608</td>
<td>1,973</td>
<td>$10,375</td>
<td>$9.73</td>
</tr>
<tr>
<td>October 2016</td>
<td>33,998,270</td>
<td>$393,246,237</td>
<td>1,690</td>
<td>$7,420</td>
<td>$8.42</td>
</tr>
<tr>
<td>November 2016</td>
<td>41,944,088</td>
<td>$324,901,740</td>
<td>1,847</td>
<td>$6,505</td>
<td>$6.25</td>
</tr>
<tr>
<td>December 2016</td>
<td>53,622,778</td>
<td>$373,562,956</td>
<td>2,345</td>
<td>$7,140</td>
<td>$5.82</td>
</tr>
</tbody>
</table>

**TOTAL** 369,886,548  $3,472,148,911  6,640  $25,245  $7.96

Table 6: Steam Sales in 2016 - taken from Galyonkin, 2017

Furthermore, no physical handling and boxing of copies is required and the developer can concentrate on their core competencies of programming. The end consumer receives value

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246 Cf. Valve Corporation, 2017b  
247 Cf. blogphilofilms, 2013  
248 Cf. Valve Corporation, 2017a  
249 Cf. Valve Corporation, 2007
in the form of an uncomplicated, on-demand possibility of acquiring software in digital form. As a result, Steam and also the developers face no shelf-space restrictions and eliminate the risk of excess production of games since they are virtually free for reproduction in the digital realm.\textsuperscript{250} Thirdly, the platform provides value to users as a social network for gaming enthusiasts. People can add friends, invite friends to play together, rate products, write recensions or buy presents for friends in the Steam store. Apparently, beyond increasing value for end consumers by utilizing social functions, those functions extend the platform’s subscriber base and therefore the value to any potential platform seller.\textsuperscript{251} Fourthly, the platform has become a valuable distribution option for small independent game developers. The Steam platform represents value for them by weakening entry barriers to the industry. Due to already outlined reasons distribution is no longer a costly and complicated task.

Basically, all of Valve’s products and services are to be rated as one-fits all “bus” products/services, since they are automated digital services or reproducible digital content. The extension of mentioned current value propositions can be attributed to digital technology. The trend towards building social ties over the internet made the platform a frequented tool beyond a sheer sales tool. The possibility to perform a whole sales process automatically for a third party, including reproduction of digital content and automated payment transaction handling, enabled the firm to engage virtually any developer as a client. The growing use of the internet and internet bandwidth reinforced the value propositions in terms of size.

Looking at the \textit{value chain linkages}, the early business model (1) was one-dimensional and simple. The firm coded software with internal capabilities and distributed the outcome in physical stores with the help of a software publisher. The current business model (2) is engaging numerous more parties into value creation. Today, the organization is a prototype of a flat hierarchy and wide-spread decision authority internally.\textsuperscript{252} Although the basis of the value chain is the in-house programmed Steam platform and self-coded games, a considerable value derives from utilizing third parties. A key insight is that the value for Valve increases with any digital content it can sell, since sales transaction are perfectly scalable. The firm’s CEO stated that Steam should not be an exclusive platform for big players but a usable tool for anyone who wants to offer digital content to the market.\textsuperscript{253} Therefore, a noticeable contributor to Valve’s value creation are third parties such as established game developers but also private persons who want to share content. Since Steam obstructs entry barriers to the market place, the amount of sellable content becomes increasingly larger. Arguably, the social network element of steam encourages people to add content to their favorite game, causing additional revenue. In this element, the linkages between the actors are mainly digital and mostly triggered by the third-party value providers. Nonetheless, the firm still reviews which content gets on Steam so no corrupted content will be spread. Commission gets collected automatically. Therefore, digital technology enables a value chain with barely any physical product flows and a considerable part of consumer/customer-created sources of revenue.

\textsuperscript{250} Cf. Walker, 2007
\textsuperscript{251} Cf. Ambrozy, 2011
\textsuperscript{252} Cf. Foss & Dobrjaška, 2015, pp. 12ff.
\textsuperscript{253} Cf. blogphilofilms, 2013
The ways of monetization in Valve’s initial business model was a simple transaction of selling a product to a customer using a retail store and a software publisher. Therefore, profit was restrained by the profit margins of the stores and the publisher. Also, physical boxing and transportation weighted on profits. In the current business model (2) the company uses its own distribution platform for its self-coded games in digital form. Therefore, the costs for publishers and stores become obsolete and replaced by the costs for the distribution platform. Further ways of monetization are gathering commission from any sold games and selling in-game content for self-coded games. The costs for the distribution platform get spread over not only their own game sales but any sold games. The user pays for content from Steam by converting money into steam credit using digital payment methods such as credit card, PayPal and others.

As a summary of above descriptions, Table 7 represents the change of valves business model as an overview.

<table>
<thead>
<tr>
<th>Business Model Elements</th>
<th>Valve Corporation Initial Situation</th>
<th>Moderating Digitization Factors</th>
<th>Valve Corporation Current Situation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customer Identification</strong></td>
<td>Consumer (user) pays for the software</td>
<td>• Growth of internet bandwidth&lt;br&gt;• Intensifying internet and computer use&lt;br&gt;• Social networks</td>
<td>• User plays for free, developer pays commission for related optional payments&lt;br&gt;• User buys third-party game, developer pays commission&lt;br&gt;• Users play for free &amp; pay for in-game benefits&lt;br&gt;• User pays for software developed by Valve</td>
</tr>
<tr>
<td><strong>Customer Engagement (Value Proposition)</strong></td>
<td>Scale-based (bus) product: video game</td>
<td>• Growth of internet bandwidth&lt;br&gt;• Social networks&lt;br&gt;• Automated online services</td>
<td>• Scale-based (bus) product: video game&lt;br&gt;• Scale-based (bus) service: online distribution&lt;br&gt;• Scale-based (bus) social network</td>
</tr>
<tr>
<td><strong>Value Chain Linkages</strong></td>
<td>In-house programming&lt;br&gt;• Distribution using publishers&lt;br&gt;• Sales over stores</td>
<td>• Growth of internet bandwidth&lt;br&gt;• Social networks&lt;br&gt;• Digital payment</td>
<td>• Steam online distributors/social network is the key value structure (sales, advertisement, payment, etc.)</td>
</tr>
<tr>
<td><strong>Monetization</strong></td>
<td>Sales of software in stores</td>
<td>• Social Networks&lt;br&gt;• Digital Payment&lt;br&gt;• Low cost of reproduction of digital content&lt;br&gt;• Possibility for user collaboration</td>
<td>• Collecting commission from sales of other developers&lt;br&gt;• Selling in-game content to users&lt;br&gt;• Selling self-developed games</td>
</tr>
</tbody>
</table>

Table 7: The Business Model of Valve Corporation: Digitization as Moderator of Business Model – created by the author

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254 Cf. Dunn, 2013
255 Cf. blogphilofilms, 2013
256 Cf. Valve Corporation, 2015
What remains particularly interesting is that the Valve CEO made an interesting point regarding future innovations and possible new ways to possibly identify new customers as well as widening the range of customer engagement. He argued that with the data collected about customer behavior and interest on Steam, he sees a tremendous chance of offering predictions about sales, customer preferences and other video game-related issues.257

4.1.2. Bad Practice

For the bad practice example, the company of interest should be Blockbuster Inc.. The company was a video rental firm which closed its doors in 2013. Euchner & Ganguly mention Blockbuster Inc. in the context of Netflix disrupting its competitive advantage using their innovative business model:

“Netflix’s mail-order DVD rental model disrupted the cost structure of Blockbuster Video (which had previously disrupted the cost structure of its smaller rivals).”258

In its beginnings in 1985, Blockbuster was as a video rental firm with a physical store. Customers would enter the store to lend VHS tapes respectively DVDs or other film or game mediums.259 In the following years the company grew rapidly. At its peak, it ran 10,000 stores and in 2002 its market capitalization reached about USD 5 billion.260 Nonetheless, advancements in digital technology threatened the firm’s business model which was based on its store network to become practically obsolete. As companies such as Netflix incorporated subscriber-based online streaming services, the fall of this company took its course. In the annual report (form 10-K) of the fiscal year 2010 – 2011, although already preparing for bankruptcy, the firm also mentions a description of its business model. They described their business model as providing “[…] customers with access to media entertainment, including movie and game entertainment delivered through multiple distribution channels such as stores, by-mail, vending kiosks and digital devices.”261 So arguably, the company failed although implementing digital business solutions. Subsequently, an analysis of the company’s downfall should be undertaken based on the business model elements of Baden-Fuller, et al. (see chapter 3.3.5). The focus of this analysis will lie on the impact of digitalization on the firm and how it undermined the firm’s business model. The case of Blockbuster appears to be specifically interesting for the sake of this thesis, since the company was mainly driven out of business by a start-up competitor, which seems to have just utilized potentials of digital technology more effectively than Blockbuster itself.

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257 Cf. blogphilofilms, 2013
258 Euchner & Ganguly, 2014, p. 34
259 Cf. Poggi, 2010
260 Cf. Downes & Nunes, p. 2
261 Cf. Blockbuster Inc., 2011
Therefore, implications of Netflix´ business model´s success should be used for providing a deeper understanding of the bankruptcy of Blockbuster. Figure 24 shows the development of revenues of Blockbuster and Netflix. Moreover, in 2016 Netflix was able to create USD 8.83 billion in revenue\(^{262}\) while reaching a current market capitalization of more than 75 billion USD.\(^{263}\) The following analysis includes Blockbuster´s business model in the last years of its business activity, critical digital success factors and respective reasons why Blockbuster´s business model did not fit those factors.

![Figure 24: Comparative Revenue Development of Blockbuster and Netflix from 2004 to 2010 – taken from Reiss, 2015](image)

The first element of the business model, **customer identification**, of Blockbuster Inc. appears to be relatively simple. The same people who rent mediums are paying a specific amount of money for this rental. This element is not particularly different to competitors and does not appear to have had a major influence on Blockbuster´s bankruptcy.

The second element of the firm´s business model, **customer engagement**, is generally shaped by using a bus-system. A general pool of movies, games and other entertainment mediums is available to any customer.

The third element of this business model, **value chain linkages**, is a crucial part of understanding why Blockbuster did fall to its competitors. In its most recent service portfolio, the company offered rental from stores, rental by mail, digital rental using downloads and even vending machines for its rentals.\(^{264}\) As a result, the processes and necessary physical assets such as the 10,000 stores of Blockbuster were arguably more diverse, more complex and getting partially obsolete by the time. In comparison, Netflix only operates DVD rental per mail and online streaming of content which did not require comparatively extensive physical assets.\(^{265}\) A big issue of Blockbuster was that while it operated its traditional

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\(^{262}\) Cf. Netflix, 2017, p. 19  
\(^{263}\) Cf. Yahoo Finance, 2017b – Market capitalization from 17.07.2017  
\(^{264}\) Cf. Blockbuster Inc., 2011  
\(^{265}\) Cf. Hern, 2014
business extremely efficiently on the one hand, it did not let in new information on the other. As time has shown, digital technology advancements apparently favored other value chain setups over Blockbuster’s.

The following quote reveals a major weakness of Blockbuster as well as a competitive advantage of Netflix as broadband subscription grew (see Figure 22):

“With the launch of its digital service, Netflix moved from a slightly less convenient but cheaper competitor to the realm of big bang disruption - an innovator offering better and cheaper goods than Blockbuster. For a monthly fee, Netflix customers can watch all the movies and television programs they want, whenever they want, and without ever leaving the house and without the need for physical media of any kind.”

When this point was reached, although Blockbuster already put its own online solution for video downloading and streaming in place, the firm faced the problem that a large portion of its assets became a cost factor which was hard to be laid off. The physical store as core part of the value provision to the company’s customers was made obsolete by the more convenient solution of digital transmission of multimedia content. As a result, the obsolete assets put cost pressure on the firm which competitors did not face. Netflix, for example, was able to offer cheaper prices and more variety to its customers. Since the digital rental market is considered as a winner-takes-all market, Blockbuster gradually lost due an imperfect value chain while Netflix committed to a digital solution and took all. Arguably, Blockbuster was not able to predict the potential of digital rental early enough.

The fourth element of Blockbuster’s business model, monetization, reveals another problematic peculiarity. The firm was strongly dependent on late fees which were charged from customers who did not return borrowed media on time:

“It earned an enormous amount of money by charging its customers late fees, which had become an important part of Blockbuster’s revenue model. The ugly truth—and the company’s achilles heel—was that the company’s profits were highly dependent on penalizing its patrons.”

To the contrary, Netflix’ revenue model was subscription-based and not reliant on late fees. Customers could watch as many movies as they want during their subscriptions period and did not have to face inconvenient late fees. Arguably, similar to the application of a digital rental solution, Blockbuster was only a reactor to the success of Netflix. In 2004 Blockbuster abandoned late fees as a try to retain consumers. Interestingly, in 2010 close to the firm’s bankruptcy, Blockbuster reinstalled late fees for additional revenue. It seems that a subscription and no late fees perfectly fit a digital rental system due to virtually no cost of accessing content. Apparently, Blockbuster wanted to imitate a competitor’s pricing strategy while having an incompatible cost structure in its own business model.

266 Cf. Satell, 2014
267 Downes & Nunes, p. 3
268 Cf. Downes & Nunes, p. 3
269 Satell, 2014
270 Cf. Satell, 2014
271 Cf. Teather, 2004
272 Cf. Heller, 2010
Another mentionable fact in regard to this bad practice example is the fact that Blockbuster turned down a possibility to acquire Netflix for USD 50 million in 2000.\textsuperscript{273} Considering this whole case, it seems that the firm did not observe technological innovations which had the potential to affect its business model. Table 8 provides a summary of the business model of Blockbuster, digital challenges for the company and reasoning why the firm’s business model was unable to utilize digital potential and got ultimately outperformed by competitors.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|}
\hline
\textbf{Business Model Elements} & \textbf{Blockbuster’s Business Model} & \textbf{Digital Challenges} & \textbf{Suitability and Effects} \\
\hline
\textbf{Customer Identification} & \begin{itemize} 
- The customers/users are 
paying for rentals
\end{itemize} & - & \begin{itemize} 
- This mode of customer identification is 
suitable and did not contribute to 
Blockbuster’s failure
\end{itemize} \\
\hline
\textbf{Customer Engagement} & \textbf{(Value Proposition)} & \begin{itemize} 
- Scale-based (but) rental of 
a pool of videos, games and 
more
\end{itemize} & - & \begin{itemize} 
- This mode of customer engagement is 
suitable and did not contribute to 
Blockbuster’s failure
\end{itemize} \\
\hline
\textbf{Value Chain Linkages} & \begin{itemize} 
- A variety of ways to provide 
customers with multimedia 
content:
  - Rental from stores
  - Rental by mail
  - Streaming/download from 
the internet
  - Video vending machines
- Highly efficient and tight 
value chain network with 
internal focus
\end{itemize} & \begin{itemize} 
- Rating numbers of 
broadband internet 
subscriptions
- Possibility to stream 
videos in an acceptable 
quality and time
- Physical data storage 
mediums are becoming 
obsolete
\end{itemize} & \begin{itemize} 
- Blockbuster was successful in the past 
by making enormous disposions in 
physical stores
- Digital rental became more convenient 
and cheaper than stores
- Blockbuster’s value chain was highly 
efficient but closed to new ideas and 
innovation
- Blockbuster’s value chain involved 
many assets which became 
unnecessary cost factors (stores, 
physical video copies)
\end{itemize} \\
\hline
\textbf{Monetization} & \begin{itemize} 
- Per-title rental fees
- Late fees
\end{itemize} & \begin{itemize} 
- Competitors such as 
Netflix committed purely 
to digital and mail rental
- They offer monthly 
subscriptions for better 
prices
- Unnecessary stores and 
physical copies are cost 
factors
\end{itemize} & \begin{itemize} 
- Blockbuster had an incompetitive price 
structure
- Late fees were essential for business 
success but became impossible to 
continue after cheaper subscriber-
based competitors entered the market
\end{itemize} \\
\hline
\end{tabular}
\caption{Table 8: Description of Blockbuster’s Business Model and Failure of Addressing Digital Influence Factor – created by the author}
\end{table}

\textsuperscript{273} Cf. Chong, 2015
4.2. The Influence of Digitization on Future Business Models

4.2.1. Framework for Answering the Main Research Question

The goal of this chapter is to make recommendations about how business models might be designed to properly fit and utilize digitization trends. Since as digitization as well as the business model are comprehensive concepts, it will be necessary to clearly outline how to analyze their interrelation. Therefore, before trying to answer the main research question, it will be necessary to develop a framework of how to approach this question.

The framework involves the selected business model configuration by Baden-Fuller, et al. (see chapter 3.3.5) and the above-mentioned approach of McGrath274, which views technological advancements as simultaneously imposing constraints on some business model elements while providing new opportunities for others. Thus, this paper should offer a comprehensive catalogue of potentially viable business model innovation options regarding specific digitization trends. Furthermore, a new business model design opportunity is also suggested to be opposed by a traditional option which might be endangered. No specific industry will face special attention and the discussion will be kept at an overall level.

Table 9 visualizes the created framework for addressing the main research question. The trends A, B and C represent specific possible aspects of digitization such as the possibility to use digital payment methods or others. The next step will be questioning how the respective trend will influence the four business model elements. What constraints and opportunities can be derived from a digitization trend? It is crucial to discuss not only how a trend might enable a specific business element’s design, but also how other traditional approaches might lose their viability. Arguably, being aware of a business model opportunity resulting from a specific trend is even more important when it simultaneously decreases the viability of a traditional approach. Not every digitization trend has an influence on every business model element. This is the reason why a division of elements makes sense to provide a precise discussion.

<table>
<thead>
<tr>
<th>Digitization Trend</th>
<th>Type of Effect</th>
<th>Customer Identification</th>
<th>Customer Engagement</th>
<th>Value Chain Linkages</th>
<th>Monetization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trend A</td>
<td>Imposing Constraints</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Creating Opportunities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trend B</td>
<td>Imposing Constraints</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Creating Opportunities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trend C</td>
<td>Imposing Constraints</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Creating Opportunities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 9: The Influence of Digitization on Future Business Models - Framework for Elaboration – created by the author

The choice and detection of business-relevant digitization trends are based on a comprehensive and detailed literature review regarding this topic. Digital technology advancement is an intensively discussed area in the academic discourse. Nonetheless,

274 Cf. McGrath, 2010, p. 253
explicit links to the outlined research question are scarce. Therefore, the author will mainly
draw logical conclusions from applicable digitization trend publications which do not
necessarily have a business model context. Still, recapturing what a business model
essentially is, namely the architecture and mechanics of a business, those publications still
add value if considered that way. This chapter will also derive conclusions from case
studies, since they represent a practical dimension of the influence of digitization on
business models.

4.2.2. Application of the Framework

In this chapter, the digitization trends should be discussed using the structure provided by
the elaborated framework. The relevant digitization trends selected in chapter 2.3 will face
an in-depth analysis followed by discussing their implications on business model design.
The goal in the following chapters is to understand the whole spectrum of possible impacts
of a digitization trend. It is necessary to dig beyond the simplified descriptions of chapter
2.3 by analyzing additional relevant literature in detail.

4.2.2.1. Distributed Legders

A few decades ago, Nobel Prize winner Douglass C. North identified transaction
intermediaries, in more detail institutions, as influencing the performance of the economy
as mediators of transaction costs. In our current economic system, institutions are
necessary to decrease transaction costs between exchanging parties. Moreover, it is
argued that transactions in modern society are complex and require numerous professions,
for example lawyers, bankers, accountants, etc. to be administered. Wallis & North further
found that transactional, respectively institutional services represent a considerable portion
of GNP. Arguably, this states that a large amount of economic performance is used only
for making transactions possible. This can be viewed as a considerable source of
inefficiency within the global economy.

A new digital technology advancement, although it is still in earliest development stages,
appears to have the potential to replace intermediaries completely. The technology is called
a distributed ledger or decentralized blockchain. Concluding from the publications
mentioned above, if the technology could live up to its potential, it might increase efficiency
of the world´s economy. Scholars argue that this trend might further significantly influence
the way of modern human living:

“Bitcoin (Note: A current use case which builds on distributed ledgers as
enabler among other technologies) and blockchain technology, as a
mode of decentralization, could be the next major disruptive technology
and worldwide computing paradigm (following the mainframe, PC,
Internet, and social networking/mobile phones), with the potential for
reconfiguring all human activity as pervasively as did the Web.”

277 Cf. Tapscott & Tapscott, 2016b, pp. 2ff.
278 Cf. Swan, 2015, p. vii
This is no information technology master’s thesis. Therefore, this discussion will not dig into technical details. Still, to understand the technology’s possible consequences, a brief description of the concept’s functionality should be provided hereinafter. Gupta offers an appropriate simplified definition of distributed ledger functionality using five main descriptive elements. The description should be included unchanged at this point, because it will provide the most understandable explanation in its original form. Therefore, the distributive ledger technology consists of:

“1. Distributed Database
Each party on a blockchain has access to the entire database and its complete history. No single party controls the data or the information. Every party can verify the records of its transaction partners directly, without an intermediary.

2. Peer-to-Peer Transmission
Communication occurs directly between peers instead of through a central node. Each node stores and forwards information to all other nodes.

3. Transparency with Pseudonymity
Every transaction and its associated value are visible to anyone with access to the system. Each node, or user, on a blockchain has a unique 30-plus-character alphanumeric address that identifies it. Users can choose to remain anonymous or provide proof of their identity to others. Transactions occur between blockchain addresses.

4. Irreversibility of Records
Once a transaction is entered in the database and the accounts are updated, the records cannot be altered, because they’re linked to every transaction record that came before them (hence the term “chain”). Various computational algorithms and approaches are deployed to ensure that the recording on the database is permanent, chronologically ordered, and available to all others on the network.

5. Computational Logic
The digital nature of the ledger means that blockchain transactions can be tied to computational logic and in essence programmed. So users can set up algorithms and rules that automatically trigger transactions between nodes.\footnote{Gupta, 2017, p. 3}

On a more simplified level, the blockchain can be understood as a spreadsheet which runs on millions of computers all over the world. Every user can see changes in the spreadsheet since everyone has free access to it. The distributed spreadsheet is immune to changes of past data and unhackable due to underlying decentralized computing logic. Since it is impossible to falsify entries, people can expect them to be true and therefore trustful.\footnote{Cf. Tapscott & Kirkland, 2016} For further clarification, an in-a-nutshell definition should be included at this point as well:

\footnote{Gupta, 2017, p. 3}
\footnote{Cf. Tapscott & Kirkland, 2016}
“This technology enables a collective bookkeeping system (ledger), which, by means of a mathematical function […], allows participants to reach an agreement on the approval of a transaction.”

Currently, distributed ledgers already face first business applications of the technology. Most of them are revolving around financial applications administering currency transactions and transactions of financial products such as bonds or loans. For the future, if blockchains lead to transaction costs declining to barely noticeable thresholds, existing business model will face severe impacts on their viability.

Nonetheless, it has to be kept in mind that the distributed ledger technology theoretically has a lot of potential uses, but it might not be the most practical solution in most cases. In a current Deloitte publication, three potentially practical – costs and benefit face legitimate relation – use cases for the blockchain were established: disintermediation, cross jurisdiction and compliance. Disintermediation refers to the already stated potential of the blockchain technology to substitute intermediary tasks. In cross jurisdiction a task which “[…] tracks assets, entitlements, and attestations across jurisdictions, and where there is no logical home for a central ledger, can use a distributed ledger to create a shared authoritative source of information.” For example, this is the case for in registering ownership and authenticity of diamonds. Compliance solutions revolve round providing a better tax and audit process with less time between consensus points.

In more detail, financial auditing and accounting is generally a use case of the blockchain technology with potentially one of the highest impacts on business. Basically, auditing requires auditors to review transactions within the books of firms to be true. For example, if all transactions between firms are listed in a distributed ledger, its content can be trusted without any third party reviewing it. Moreover, when transactions are saved decentralized and not kept redundantly in the records of every organization, time and cost savings would be significant.

The distributed ledger technology may further be able to reduce supply chain risks considerably. To illustrate the way this can work, an example should be used. In 2015, at Chipotle Mexican Grill, a fast food chain for Mexican food, 55 customers got ill due to them serving contaminated food which resulted in significant revenue loss and share price decline. The reason behind this mistake is based on the company having multiple suppliers embedded in a complicated supply chain which lacks accountability and transparency. It was barely possible for the firm to track the route of their supplies within a short time frame. The blockchain has the potential to improve this situation:

“...A shared, consensus-based and immutable ledger helps track the origin and the transformations undergone in the supply chain. The blockchain will create a formal registry enabling the identification and the tracking of

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281 Holotlik & Moormann, 2017, p. 914
282 Cf. Gupta, 2017a, p. 3
283 Evans-Greenwood, Hillard, Harper, & Williams, 2016, p. 39
284 Cf. Volpicelli, 2016; Evans-Greenwood et al., 2016, p. 39
285 Cf. Evans-Greenwood et al., 2016, p. 39
286 Cf. Brandon, 2016, p. 35
288 Cf. Casey, Michael, J. & Wong, 2017
possession of a good throughout the supply chain. One could also resort to connected objects installed in fishing boats, shipping trucks and storage coolers that will keep track of the environmental conditions, such as temperature or location, ensuring that a product was safely handled, complying with health and safety norms. Finally, because the blockchain ensures anonymity; promotions and discounts could be sent to users, without disclosing their personal information.²⁸⁹

The mentioned inclusion of connected objects or also specific credentials of suppliers in the value chain can further enable a completely new way of contracting in supplier relationships. For example, using the so called “smart contracting” technology based on a distributed ledger it can be possible to automatically settle contracts by dispositioning respective rights, obligations and payments based on contractual conditions. This is possible because as transactions are entered in the ledger, all participants in the network can expect them to be true.²⁹⁰

Therefore, a possible solution for the mentioned health scandal of Chipotle Mexican Grill can be the issuance of cryptographic permission to staff or supervisors. In combination with connected objects, the company can monitor what tasks those credential individuals are performing in real-time at its suppliers’ location.²⁹¹ Chipotle Mexican Grill would be able to “[…] see in real time whether a properly credentialed person in a facility owned by one of its beef suppliers is carrying out appropriate sterilization and disinfection procedures.”²⁹² Arguably, a logical conclusion by the author is that accreditation of supplier staff may also lead to the impossibility of employing illegal workforce such as children and respective positive consequences on customer reputation.

For more insights into business models which are based on the blockchain technology it is important for this thesis’ goal to question the structure of current respective business models. For this purpose, German scholars offer an important publication in which they contacted blockchain-related businesses and used a survey to find out their characteristics. Based on those characteristics, they derived five different business model types which are summarized in Figure 25. They should be briefly explained in at this point.

**Infrastructure providers** offer a database and decentralized storage space without providing additional functionalities to customers. The customers are not able to create applications in this system on their own. Therefore, they are passive customers. **Platform providers** offer infrastructure and additional simplified possibilities for the customers to create their own applications on the system without them needing to fully understand the technology. The customer acts as an active customer. **Integrators** are similar to platform providers with the difference that they additionally create applications based on customer needs themselves for their customers. **Application providers** offer ready-to-use blockchain solutions for customers without the possibility for the customer to alter them. **Providers of complimentary services or products** offer such services or products in

²⁸⁹ Pilkington, 2016, p. 244
²⁹⁰ Cf. Evans-Greenwood et al., 2016, pp. 20ff.
²⁹¹ Cf. Casey, Michael, J. & Wong, 2017
²⁹² Casey, Michael, J. & Wong, 2017
diverse forms. For example, it can be an explanatory website for teaching basics of the technology.\footnote{Cf. Rückeshäuser, Brenig, & Müller, 2017, pp. 494f.}

<table>
<thead>
<tr>
<th>1. Infrastructure Providers</th>
<th>2. Platform Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element</strong></td>
<td><strong>Characteristics</strong></td>
</tr>
<tr>
<td>Customer Identification</td>
<td>End-consumers (passive)</td>
</tr>
<tr>
<td>Customer Engagement</td>
<td>Providing infrastructure for a blockchain database</td>
</tr>
<tr>
<td>Value Chain Linkages</td>
<td>Internal focus on provision of access to IT infrastructure</td>
</tr>
<tr>
<td>Monetization</td>
<td>Money flows in after the service provision (subscription-based)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Integrators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element</strong></td>
</tr>
<tr>
<td>Customer Identification</td>
</tr>
<tr>
<td>Customer Engagement</td>
</tr>
<tr>
<td>Value Chain Linkages</td>
</tr>
<tr>
<td>Monetization</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Application Providers</th>
<th>5. Providers of Complementary Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element</strong></td>
<td><strong>Characteristics</strong></td>
</tr>
<tr>
<td>Customer Identification</td>
<td>End-consumers (passive), governmental bodies</td>
</tr>
<tr>
<td>Customer Engagement</td>
<td>Providing ready-to-use blockchain applications</td>
</tr>
<tr>
<td>Value Chain Linkages</td>
<td>Internal focus on software development and consulting skills</td>
</tr>
<tr>
<td>Monetization</td>
<td>Before, after or at service provision (licensing, subscription-based, revenue sharing, transaction-based, consulting fees)</td>
</tr>
</tbody>
</table>

Figure 25: Basic Business Models of Blockchain-Based Companies – modified after Rückeshäuser, Brenig, & Müller, 2017, pp. 494ff.

\footnote{Cf. Rückeshäuser, Brenig, & Müller, 2017, pp. 494f.}
Ultimately, that said, the discussion should now switch its focus towards implications for future business models. The mentioned examples and specific insights into the distributed ledger technology should serve as a basis for making logic implications in terms of future business model changes.

Making detailed predictions about a future **customer identification** element of blockchain-based business models appears to barely possible due to the diverse possible applications and their respective target customers. Arguably, as shown in Figure 25, when the blockchain technology begins to gain traction, new customer groups of blockchain implementation companies will likely be companies, individuals or governmental bodies which require the capabilities to operate a blockchain-based application with the help of specialized firms.

In the light of transaction validation, customer groups which profits from the blockchain technology are salesmen or owners of high-value goods such as diamonds or art. With the help of the blockchain they are able to prove the authenticity of respective assets and the legitimate status of ownership.

As discussed in this chapter, it might further become viable to use the blockchain technology in tax, audit and accounting. Therefore, since any private firm requires some form of accounting, the customer group of this use case is significant: virtually any business organization with the need to audit their books.

Furthermore, it is also argued that transaction costs can be reduced to almost zero by the blockchain. Therefore, the customer group can be extended to investors which buy securities on the capital markets. Arguably, anyone from institutional to private investors are affected by lower transaction costs and are therefore a potential customer group.  

Generally, customers of blockchain-based services seem to be those persons who profit from the validation of information without having to trust a specific party.  

Recapturing that the blockchain technology is capable of providing more certainty about the status of ownership and the authenticity of high-value goods, it can be argued that this certainty increases the potential customer base of such products. People who avoided products due to uncertainty of origin (blood diamonds, stolen art, …) might now become customers.

The influence on the **customer engagement** element of a business model appears to be dramatic for many businesses. Obviously, intermediaries of transactions might see their current core value propositions in danger of becoming completely substituted by a decentralized blockchain. The task of validating transactions is not becoming an obsolete task because the system performs it automatically. Instead, the underlying principle of the new technology does not require any explicit transaction validation since it is systematically inherent. Therefore, customer engagement by offering transaction intermediary services might become an obsolete design option. McKinsey published a report about disruptions to

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296 Cf. Tapscott & Tapscott, 2016a, p. 29
business models which explicitly mentions banks and clearinghouses as being threatened by the Bitcoin´s use of blockchain technology.\textsuperscript{297}

As shown in the case of Chipotle, a supplier can enhance their value proposition for their customers by increasing supply chain transparency through blockchain solutions. Beyond the offered product or service, the supplier adds value for customers by giving them the ability to track information about the internal processes at the supplier’s site. The customer is then able to be sure about the compliance of certain standards.

Value propositions, which revolve around sales of high-value goods might face the necessity of including blockchain-based evidence of their ownership status and authenticity in the future. Arguably, it appears possible that diamonds and other similar products which lack such credibility might face lower demand and lower respective market prices. Similarly, if smart contracts become a new standard, the inability to provide certain products or service in combination with them will likely weaken the respective related value proposition because contractual issues appear to be more likely to arise when not applying smart contracts.

Generally, the core value proposition of distributed ledgers and arguably their application in future business models appears to be the innovative possibility to be sure about transactions and states of different factors without the need to check them. Furthermore, as already stated, future business models’ value propositions will have to respect the fact that many issues can be solved by the blockchain but most can be solved better by a different technology.

Regarding \textit{value chain linkages}, the identified business models shown in Figure 25 have shown a strong focus on internal capabilities to be able to offer services to their customers. Arguably, at the beginning of the development of a new technology many firms will be needed which are specialized on specific asset-based or know-how-based processes to provide customers with the possibility to use the new technology.

In the author’s opinion, based on this chapter’s insights, other firms which do not necessarily have their business focus on blockchain-related services or products will still have to implement aspects of the technology in their value chains to be most efficient. As outlined in this chapter above, such parts of a value chain can be a decentralized accounting system or transaction systems for high-value goods to ensure legal compliance, authenticity and ownership status of goods.

Especially, the potential of the distributed ledger to reduce supply chain risks by increasing transparency, providing real-time information about supplier operations and being able to settle contracts automatically without delay appear to have the potential to increase efficiency of product-centered firms with complex supplier networks. Arguably, this trend will require supplier networks to be even more tightly intertwined and collaborative with their principals.

The ways of \textit{monetization} of blockchain-based business models appears to be mostly subscription-, licensing- or transaction-based. This seems to be obvious, since blockchain

\textsuperscript{297} Cf. Jong & van Dijk, 2015, p. 1
revolves around improving transactions and using a decentralized database. As a result, the time of monetization will most likely be real-time based on transactions or before the actual service provision by subscription fees or licensing fees.

In regard to the timing of payments of companies with products or services beyond blockchain-related value propositions, a development towards smart contracting may result in a timelier payment using automated settlement in complex supply chains.

A big trend in monetization which can already be observed today is revolving around cryptocurrencies such as Bitcoin replacing traditional currencies such as the dollar or the euro. This new currency is a topic with potential for a whole thesis itself. Thus, for the purpose of this chapter, Bitcoin should be understood as “a purely online virtual currency, unbacked by either physical commodities or sovereign obligation; instead, it relies on a combination of cryptographic protection and a peer-to-peer protocol for witnessing settlements.”

Due to this currency being global, it has an obvious use case in cross-border transactions of global supply chains and other global networks or the import/export sector. Traditional cross-border transactions are “[…] horribly expensive, very slow, extremely cumbersome and they have huge overheads and friction.” Bitcoin transactions promise to address those issues and may provide a lot cheaper transaction settlement costs to businesses.

When discussing the monetary sphere of future business models, it appears obvious that firms will generally face improved cost structures due to eliminating transaction intermediary costs as well as contractual enforcement costs from their income statement.

Additionally, at the moment, it is impossible to predict the exact effect of blockchain on society. Nonetheless, this is a valuable insight as well:

“In fact, it (note: blockchain) is more likely to do to the financial system and regulation what the internet has done to media companies and advertising firms. Such a fundamental restructuring of a core part of the economy is a big challenge to incumbent firms that make their living from it. Preparing for these changes means investing in research and experimentation. Those who do so will be well placed to thrive in the new, emerging financial system.”

Therefore, it can be suggested that future business models as well as any of their elements will need to be changed continuously with close control of respective outcomes. Experimentation and research will be key to bring a suitable blockchain-related business model into practice.

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298 Meiklejohn et al., 2016, p. 86
299 London Real, 2015
300 Cf. Luther, 2016, p. 401
301 Ito, Narula, & Robleh, 2017
4.2.2.2. Multisided Platform Markets

The internet today simplifies the process of companies to contact customers for their services or products. Today, formerly physical places of interaction such as stores get increasingly relocated to the digital realm. Expressed simplified, those digital meeting spots can be seen as online platforms. For the sake of clarifying the definition of a platform, it should be mentioned that a platform can as well be a physical place. Platforms are generally defined by the fact that they facilitate the interaction between of two or more groups which want to interact and need something from each other. Figure 26 visualizes how two groups move on a platform. Some As and Bs are looking for interaction and some have found an mutually beneficial exchange situation.

![Figure 26: Visualization of a Two-Sided Platform – taken from Evans & Schmalensee, 2016a, p. 17](image)

Generally, platforms can have exactly two or more sides. Such platforms are called multisided platforms. Although sometimes misunderstood in public, if only one group gets served by a business, it cannot be considered a platform in any case. Moving this description to a more practical level, the following statement gives examples for current large multisided platform businesses and some newcomers:

"Three of the five most highly valued companies in the world — Apple, Google, and Microsoft — use this business model. So do seven of the most valuable unicorns — startups worth more than $1 billion in their latest funding round — such as Uber, Airbnb, and Flipkart. And then many other companies that have IPO’d in the last decade, like Visa, which connects cardholders and merchants, and Facebook, which connects friends, advertisers, and developers."

Initially, most of today’s largest multisided platform businesses such as "[…] iPhone, Windows, Facebook, Skype, Amazon, eBay, Google, Firefox, and Dropbox […] started out

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302 Cf. Zhu et al., 2016, p. 44
303 Cf. Evans & Schmalensee, 2007, p. 38
304 Cf. Evans & Schmalensee, 2016a, pp. 16f.
305 Cf. Tiwana, 2014, p. 9
306 Evans & Schmalensee, 2016b, p. 3
not as platforms but as standalone products or services that were valuable to end-users. At first, most of those companies served only one group and did therefore not qualify as a platform, but as they acquired a huge number of one group, they introduced services or products to utilize a second group of persons by making use of the groups’ mutual interests.

Basically, multisided platforms are no new approach. Platforms based on physical assets such as malls or newspapers linked buyers and sellers respectively subscribers and advertisers for decades already. Nonetheless, the viability of platforms reached a new level when digitization allowed platforms to exist online without the need for extensive physical assets:

“IT makes building and scaling up platforms vastly simpler and cheaper, allows nearly frictionless participation that strengthens network effects, and enhances the ability to capture, analyze, and exchange huge amounts of data that increase the platform’s value to all. You don’t need to look far to see examples of platform businesses, from Uber to Alibaba to Airbnb, whose spectacular growth abruptly upended their industries.”

A critical insight in platform theory is that the value for the users of a platform increases with their respective number. The value for users even increases exponentially as shown in Figure 27 and may enter a self-reinforcing cycle. This is so-called network effect, which is also referred to in above quote, has some strategic implications. When a platform is able to create widespread networks with a large number of users of every participating group, high barriers to entry in the market are set up as a result. At the same time, the favorable position of a platform with many users is difficult to assail.

Figure 27: Network Effects Exponentially Increase the Platform’s Value – taken from Tiwana, 2014, p. 34

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307 Tiwana, 2014, p. 9  
308 Cf. Tiwana, 2014, pp. 8f.  
309 Cf. van Alstyne et al., 2016, p. 56  
310 van Alstyne et al., 2016, p. 56  
311 Cf. Cennamo & Santalo, 2013, p. 1331  
312 Cf. Tiwana, 2014, pp. 33f.
Platforms represent whole ecosystems. Since in today’s business practice most of them integrate other firms service and products or even other platforms they are able to offer unique products and service and leverage their success not only by using the firm’s resources but the whole ecosystem’s resources.\textsuperscript{313} Figure 28 contains the structure of current complex platform ecosystems. Such platform ecosystems normally compete with other ecosystems.\textsuperscript{314} In Figure 28 the smartphone operating systems iOS and Android can be regarded to as competing platform ecosystems. Arguably, app developers for smartphone will only provide software for platforms with many users. Tiwana explains this situation as follows:

“The more intense this competition, the more important a platform’s evolution becomes for surviving and thriving. A vibrant and dynamic ecosystem is therefore key to the survival of any software platform, and increasingly of products and services as they morph into platforms or become subservient complements of another platform.”\textsuperscript{315}

Operating a business as a multisided platform faces some peculiarities in regard to the most profitable ways of behavior in certain situations. For example, selling high-demand products on a large scale allows a reseller, a firm which sells products itself, to make use of economy of scale in terms of improved purchasing prices, utilization of infrastructure, delivery conditions or customer support. This is the reason why Amazon sells those high-demand products with large potential sales volume as an active seller and handles the long-tail market (see chapter 2.3) by providing a platform for buyers and sellers of those products. For a better understanding, it should be mentioned that the active seller option does not fulfill the definition of a multisided platform.

Business on multisided platforms can also be determined by so called aggregation effects. This basically means that products become more valuable to customers when they are sold together instead of being sold separately. At first glance, the impact of this effect on multisided platforms appears to be not intuitively obvious, but an example reveals the connection. Apple sold music content on its online platform, mostly songs, for relatively cheap prices because it boosted iPod sales which achieved high margins. Although the music sales generated relatively low profits, they acted as a sales catalyst for high-margin related product. In this case Apple had control over prices and content of the songs.\textsuperscript{316}

This leads to another insight about platforms. In most practical situations, it is not perfectly clear if a multisided platform is given or not. Therefore, it is hard to binarily rate the presence of a multisided platform. It appears more useful to question the degree to which an unhindered interaction between a buyer and a seller is made possible by the platform provider. Businesses can include elements of multisided platform and elements of being a simple reseller as visualized in Figure 29.

\textsuperscript{313} Cf. Lacy, Hagenmüller, & Ilsing, 2016, p. 2
\textsuperscript{314} Cf. Tiwana, 2014, p. 6
\textsuperscript{315} Tiwana, 2014, p. 6
\textsuperscript{316} Cf. Hagiu & Wright, 2013, p. 104
The companies’ business practice leading to the shown constellation in Figure 29 should be explained. Costco, Walmart and Zappos are almost pure resellers. They sell their products in their stores or in their online shops. Interestingly, even those companies have small elements of a multisided platforms, namely in the form of selling shelf space in their stores. Shelf layout and pricing can be moderated by product producers then. Amazon, as already stated, acts as pure reseller on selling high-demand products and acts as pure multisided platform in the long-tail market as does Rakuten to a different extent. eBay and Taobao can be considered as virtually pure multisided platforms since they mostly moderate interactions between buyers and sellers without interfering in any considerable way.\(^\text{317}\)

The appropriateness of multisided platforms may further depend on the importance of buyer and seller experience quality in an interaction. A platform might not be the optimal solution when, for example, buyers expect a highly professional retail experience. Exemplarily, Zappo, an online shoe retailer, initially started off as a multisided platform which acted just as a market place for buyers and sellers. Nonetheless, the firm experienced an interesting trend:

“[…] the company (Note: Zappo) soon discovered that buyers were more likely to complete transactions and come back for more if they were offered a great retail experience: guaranteed fast delivery, an extremely

\(^{317}\) Cf. Hagiu & Wright, 2013, p. 106
favorable and universal return policy, reliable and standardized information about product characteristics and availability, and so on.

Therefore, the previous practice of Zappo was just utilizing its platform to connect buyers with shoe producers. Since Zappo in this scenario was not able ensure a high-quality retail experience for buyers because of a lack of control over seller processes, the company then decided to move from a multisided platform business model towards a reseller model. Although not in every case a multisided platform automatically leads to worse buyer experiences, the importance of buyer and seller experiences has to be addressed in considering a respective business model.  

Generally, this external focus towards platform actors is another main difference of priorities in comparison to conventional businesses which are mostly focused on internal capabilities. In the last decades, the so-called pipeline businesses dominated the industry landscape. Those firms perform a chain of activities to turn input factors into output in the most efficient way. As the internet enhanced the viability of platforms, many industries got disrupted by platform-based firms with seemingly drastic outlooks:

„When a platform enters the market of a pure pipeline business, the platform virtually always wins.“

Platforms as a form of marketplaces face the possibility of a market collapse. Such collapses can be triggered by losing trust in the quality of the offered products or in the reliability of buyers and sellers on the platform. A simple and basic way to help ensuring those factors can be a ratings system for products and sellers and buyers. Further mechanism depends on peculiarities of a business. Airbnb for example achieves adequate behavior on its platform by doing the following:

“[…] it (Note: Airbnb) releases the renter's payment to the owner 24 hours after the renter has checked in and confirmed that the location is as described. And it returns the renter's deposit after the owner has retaken possession and confirmed that no serious damage occurred.”

At this point the focus should switch back to potential business model influences resulting from increasing importance of platform ecosystems.

The customer identification element of a business model based on multisided platforms faces a peculiar issue in comparison to traditional businesses when choosing their target customers. Apparently, platform operators need to have a target customer group in form of anticipated buyers and sellers on their platform and find ways to get a critical mass of such users on the platform. The more users it has, the more valuable a platform becomes. Generally, for platform operators it is a challenge to achieve a high user number but reaching a high number can work as a strong entry barrier for competitors.

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318 Hagiu & Wright, 2013, p. 105
320 Cf. van Alstyne et al., 2016, pp. 56f.
321 van Alstyne et al., 2016, p. 57
322 Hagiu & Wright, 2013, p. 105
Buyers and sellers can only be individuals which are active on the same platform. Moreover, buyers and sellers can further be active on several platforms at the same time which is called “multi-home”. Drawing a conclusion out if this, arguably, the most important customer identification element for businesses which buy or sell on a multisided platform is choosing on which platforms or platform ecosystems to be active. For example, as an app developer, it will be highly important to choose Google’s Android, Apple’s iOS or other operating systems to tailor an app to. Another customer group which is regularly paying for services of platform providers are advertisers. Those can accurately place advertisements on a platform with a highly specific basis of users.

Generally, the **customer engagement** element can contain any value proposition since a platform primarily only connects buyers and sellers. Nonetheless, recapturing that platforms are normally part of a larger platform ecosystem, the author argues that effects on a value proposition could be derived from the quality of the associated services within the ecosystem.

The base of the value proposition of platform operators will mostly lie in the number of active buyers and sellers on their platform. This is a hardly imitable value proposition which strongly determines the success of a platform. As a consequence, their main service is an intermediary service. Since the provision of potential interaction partners is the same for every participant, arguably, this is to be rated as a bus service. A value proposition which is based on a large number of actors on a platform is platform operators providing advertising space for advertisers. Arguably, the more users a platform has, the more valuable are such advertisement services.

As lined out in the example of Zappo, an important part of value propositions of sellers on multisided platforms is the quality of the customer experience. Since businesses can decide to only partially conduct business on multisided platforms and other parts as a simple reseller, firms need to employee those approaches based on offering the best experience to buyers.

Arguably, in the context of value propositions, the example of Amazon has shown that large multisided platforms enable utilization of the long-tail market. Arguably, large enough platforms will connect rare products and service as well as enough interested individuals in those products and services.

The peculiarities of **value chain linkages** resulting from multisided platform aspects appear to be limited. Arguably, it can be stated that for buyers or sellers on a platform, the platform performs the task of finding specific offers or customers which had to be performed by the company itself else. Arguably, the platform becomes an integrated part in the value chain as a sales tool. Moreover, recapturing that successful platforms such as Uber or Airbnb

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323 Cf. Rochet & Tirole, 2003, p. 992  
324 Cf. Tiwana, 2014, pp. 5ff.  
325 Cf. Huotari, 2017, p. 5276  
326 Cf. Evans & Schmalensee, 2016b  
327 Cf. Evans, 2003, p. 194
leverage the assets of their users (cars, apartments) while not owning assets themselves, their value chain seems to be strongly scalable in a short amount of time.

Moreover, it seems that multisided platform operators have to rely on their users’ contributions on the platform in the form of supply and demand. Arguably, this interaction activity is part of the platform’s value chain since it determines attractivity of the platform while it is not in full control of the platform operator. Therefore, the value chain of a platform operator partially relies on an uncontrollable factor which is the behavior of platform users. On the other and, also resulting from this, a big part of the value for users comes from the users themselves and not from the platform operator.

The monetization aspect of multisided platforms can be as diverse as the nature of all kinds of multisided platforms. Revenue of platform operators can be gathered using sales commissions, advertising fees or licensing. Sellers on multisided platforms will face a strong and simple sales tool which seems to create diminishing returns on an own sales force.

Generally, for both platform operators and sellers on platforms, revenue potential appears to be extreme since virtually endless number of potential buyers and sellers can be connected via internet. Furthermore, cost of sales of sellers seem to be potentially lower and better to plan since platform sales mostly get charged a transaction-based sales commission which can be considered as purely variable costs.
4.2.2.3. Big Data

Big Data as a part of business intelligence and analytics has become of comprehensive interest for scholars and businesses today.\textsuperscript{328} The term big data can be defined as follows:

“The concept big data has been defined as data that exceeds the capability of commonly used hardware environments and software tools to capture, manage, and process it within a tolerable elapsed time for its user population.” \textsuperscript{329}

The concept as is also often referred to as consisting of four major V-dimensions: volume, velocity, variety and value.\textsuperscript{330} Volume stands for the sheer size of data which is available today. For example, Facebook users add 650,000 pieces of content to the site every minute or Twitter users post about 175 million tweets per day.\textsuperscript{331} The velocity of data stands for the continuously decreasing time frame in which data has to be received and acted upon.\textsuperscript{332} The variety of data is the most defining aspect of big data. As more and more data gets stored, this stored data is becoming increasingly unstructured and therefore not effectively processable for traditional databanks.\textsuperscript{333} The value dimension of big data describes the additional commercial value the innovative manipulation of big data can provide for firms.\textsuperscript{334}

Based on the scientific descriptions of big data, it appears to be a relative abstract concept which does not draw a clear line of what specifically big data is and what it is not. Therefore, to add a more practically understandable content in combination with the business model,

\begin{itemize}
  \item \textsuperscript{328} Cf. Chen, Chiang, & Storey, 2012, p. 1165
  \item \textsuperscript{329} Djemaie et al., 2014, p. 1
  \item \textsuperscript{330} Cf. Zhu et al., 2016, p. 2
  \item \textsuperscript{331} Cf. Klein, Tran-Gia, & Hartmann, 2013, p. 320
  \item \textsuperscript{332} Cf. Djemaie et al., 2014, p. 1
  \item \textsuperscript{333} Cf. Klein et al., 2013, p. 320
  \item \textsuperscript{334} Cf. Djemaie et al., 2014, p. 1
\end{itemize}
the so-called Big Data Business Model Maturity Index should be included at this point. It describes specific levels of the intensity a firm emphasizes the principles of big data manipulation and its ability to create value from it. Figure 30 shows five different levels of adaption towards big data, whereas the higher states emphasize big data opportunities more than lower states.

Business Monitoring: This phase is the initial step of an organization to make use of data analysis. It can also be referred to as performance management since it mainly involves tracking performance of different business areas and automated alerts if critical numbers are reached. Basic analytics such as using trending to predict the future based on the past, comparisons to previous periods, benchmarks against various other parties, indicators such as customer satisfaction, brand development, market share and others are used to make sense out of data. Such analytics also involve identifying key business processes and respective key performance indicators (KPIs) which support them.

Business Insights: This phase goes beyond basic monitoring of selected indicators. It revolves around “[…] leveraging new unstructured data sources with advanced statistics, predictive analytics, and data mining, coupled with real-time data feeds, to identify material, significant, and actionable business insights that can be integrated into your key business processes.” Simplified, this stage of a firm goes beyond solely producing tables and numbers and trying to gain additional relevant insights from detailed data. This level of data handling can link detected issues with necessary action recommendations. A practical example can be the following:

“In customer support, uncovering observations that certain gold card members’ purchase and engagement activities have dropped below a certain threshold of normal activity, with a recommendation to e-mail them a discount coupon.”

Business Optimization: In this stage of big data maturity the data analytics system automatically optimizes business processes via analytics-powered applications. This is considered as the Holy Grail for many businesses. An example for such a business optimization using data are trading algorithms used in financial markets. Such autonomous automated analytical models for optimization still require human oversight to evaluate its effectiveness. Normally, over time the model will become more and more inaccurate due to a changing real-world environment and requires manual readjustment.

Data Monetization: At this stage, a company utilizes big data to create wholly new revenue opportunities. This can be performed for example by selling insights about customers, products or markets to other organizations. Another possibility can be implementing smart analytics directly into a product to make it an intelligent product. Insights about customers can also be utilized to provide a better customer experience by making personalized

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335 Cf. Schmarzo, 2013, pp. 6f.
336 Cf. Schmarzo, 2013, p. 7
337 Schmarzo, 2013, p. 7
338 Schmarzo, 2013, p. 7
339 Cf. Schmarzo, 2013, pp. 9f.
recommendations for the respective customers. There are numerous other possibilities, but the main step forward is that additional revenue results direct from the data insights as value proposition.³⁴⁰

**Business Metamorphosis:** This is the highest degree of big data utilization. Firms in this state of big data maturity "[…] leverage the insights they are capturing about their customers’ usage patterns, product performance behaviors, and overall market trends to transform their business models into new services in new markets."³⁴¹ This appears to be especially interesting for the sake of this paper’s main research question, since this kind of big data processing promises ideas and approaches for whole new business models.

At this point a comprehensive practical example should be included. Schmarzo provides an on-point example of how a business model can be innovated based on data insights and how comprehensive respective services and products can be. It is about an energy company which entered the home energy optimization business via valuable data insights it gained. The company was able to create services for customers based on their respective consumption patterns of energy. As a result, the firm was able to provide customers with time frames in which high-energy devices such as dishwashers and washing machines can be ran with the least energy costs. The company further extended their data insights to offer customers solutions for running those high-energy devices in the right time frame automatically. Furthermore, the utility provider could predict maintenance necessity of devices based on electric devices’ specific consumption peculiarities. Beyond that, the service portfolio was increased even more by recommending the best equipment for the customer’s specific energy consumption behavior and geographic location. Ultimately, the firm also sold this product performance metrics to manufacturers of equipment, who are then able to optimize their products based on those insights.³⁴² Arguably, all those services could be derived from detecting valuable specific information which is hidden in large amounts of already available data.

This example is a strong statement about the potential of big data utilization for respective companies. Nonetheless, since the big data concept and its possible ways of utilization in business are numerous and manifold, a more detailed practical example of implementing big data factors in a firm should be included. The author believes that understanding big data potentials requires understanding successful implementation cases. Interestingly, successful big data utilization examples appear to be harder to find than the general hype suggests. In a study published in 2016, 25 companies which are experimenting with or adopting big data in a business model were analyzed, whereas only one company managed to install a successful big data-enabled business model: Lufthansa.³⁴³ For the firm, IT innovation has always been a critical success factor providing solutions for "[…] cutting operation costs, providing excellent customer experience,

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³⁴⁰ Cf. Schmarzo, 2013, pp. 10f.
³⁴¹ Schmarzo, 2013, p. 12
³⁴² Cf. Schmarzo, 2013, p. 13
³⁴³ Cf. Chen, Schutz, Kazman, & Matthes, 2016, p. 5097
expanding ancillary revenues, delivering mobility and self-service solutions, differentiating from other PFSPs, and managing disruptions.\textsuperscript{344} Simplified, the company integrated unstructured data from numerous different sources to gain unknown information about their customers and the firm’s operations. Previously, the company relied more on structured, transactional data such as information about previous sales to customers. From cleaning and interpreting data, Lufthansa derived four specific use cases which found their way into practice.\textsuperscript{345}

Table 10 describes the four use cases which are implemented at Lufthansa. It practically shows how a firm can benefit from interpreting unstructured data and real-time processed data. Especially the game-changing ways to build an individual relationship with the customer appears to be a general capability of big data in any organization.

Wang argues that current business models face the need to shift from transactional systems to engagement systems to be ready for the future. Transactional systems such as ERP, accounting systems and others are rigid and techie. Engagement systems have easy usability and are intuitively accessible for people such as Facebook or Twitter.\textsuperscript{346} Big data appears to be able to act as a successful enabler for many aspects of an engagement system.\textsuperscript{347}

As stated above, Lufthansa has made use of analysis of unstructured data to gain insights which were “hidden” in it. A study by scholars of the Palo Alto Social Computing Lab empirically supports this value potential of unstructured data. Basically, the researchers wanted to find out if box office sales of new movies can be predicted more accurately than with usual methods by analyzing data from social media. They were able to forecast box office revenues more accurately than the Hollywood Stock Exchange (HSX) using Twitter tweets about movies in question. To make sense out of them, the researchers analyzed the sentiment, the amount and the timing of tweets.\textsuperscript{348} As a conclusion, they further stated the following:

“At a deeper level, this work shows how social media expresses a collective wisdom which, when properly tapped, can yield an extremely powerful and accurate indicator of future outcomes.”\textsuperscript{349}

Furthermore, it was found that the more attention, regardless of type, a movie gets from the social media crowd, the more likely are high box office revenues.\textsuperscript{350} Arguably, people tend to buy a product or service if it is visible enough in social media, regardless of good or bad public perceptions.

\textsuperscript{344} Chen et al., 2016, p. 5098
\textsuperscript{345} Cf. Chen et al., 2016, pp. 5099ff.
\textsuperscript{346} Cf. Wang, 2011
\textsuperscript{347} Note: For a detailed explanation of factors which determine an engagement system, confer Wang, 2011.
\textsuperscript{349} Asur & Huberman, 2010, p. 499
\textsuperscript{350} Cf. Asur & Huberman, 2010, p. 498
<table>
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<th>Use Case</th>
<th>Description</th>
<th>Big Data Utilization</th>
<th>Effects</th>
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| 1. Personalized customer experience          | • Providing customers with individual treatment on a level which is impossible to achieve with traditional IT systems  
• Providing relevant content to customers in the right moment, using the right channel and the most contextually suitable form | • Lufthansa uses internally available data from transactions or other traditional structured data bases and enhances this foundation with diverse external data such as social media (80% of the firm’s data is in unstructured form)  
• This system remembers any customer interactions (also not-sales events)  
• This system can recognize specific high value passengers and their respective treatment peculiarities (frequent flyers, first class flyers, brand influencers, ...)  
• This system can learn about travel needs of individuals  
• This system can proactively address learned customer preferences  
• This system is able to determine customers’ preferred communication channels and uses those channels to provide convenience  
• This system can create Lufthansa-presence to customers in real time when they need services of the firm | • Beyond traditional, simple ways of addressing individual customers (only contacting individuals with sales opportunities) this use of big data creates a real customer-relationship and trust  
• Expected outcomes are:  
  - Increasing customer loyalty  
  - Increased revenue per customer  
  - Increased marketing effectiveness  
  - Increased sales effectiveness  
  - Reduced costs to deliver services to customers |
| 2. Reacting to irregular situations (terror, natural disasters, ...) | • Providing almost real time reactions to unforeseeable events  
• Initiating measures to respond to such events | • Mostly, in irregular situations, every second of faster reaction counts  
• Traditional information processing in such cases is relatively slow  
• Real time observation and interpretation of social media (unstructured) data can save valuable time | • Faster reaction times for irregular situation handling can minimize the impact of those cases on business  
• May avoid the extent of rerouting of flights, cancellations of flights and delaying flights |
| 3. Predicting delays of flight departures and proactively managing recovery from irregular situations | • Generally, airlines are on time only in 73.9% of all flights  
• Recovering from delays and irregular situations effectively based on comprehensive data  
• Proactively addressing issues before an predictable event | • Lufthansa predicts network behavior and departure delays several times a day by analyzing and forecasting the weather situation, airport traffic delays and other factors  
• The system learns from past patterns and real-time information  
• Optimizing flight routes based on past flight data | • Decreasing costs through less delays  
• Increasing flight convenience for customers through less waiting time  
• Saving fuel  
• Decreasing work time for employees  
• Reducing pressure on the environment due to more efficient operations |
| 4. Predicting and preventing aircraft maintenance | • Safety for passengers and crew members is the single most important priority for airlines  
• Ensuring technically sufficient aircraft efficiently based on comprehensive data | • Collecting aircraft status data  
• Permanent connection of aircrafts to the ground  
• Real-time data interpretation of aircraft systems and searching for patterns which indicate technical failure  
• Scheduling predictive maintenance events and intelligently link aircrafts to destinations with spare parts in stock | • Decreasing aircraft downtime  
• Decreasing changes of flight schedules  
• Increased safety  
• Increased life spans of planes  
• Improved spare part handling and logistics  
• Decreasing delays for customers |

Table 10: Description of Lufthansa’s Big Data Use Cases – modified after Chen, Schutz, Kazman, & Matthes, 2016, pp. 509ff.
Generally, recapturing that strategy can be seen as the deciding force behind the decision for employing specific business models (see chapter 3.2), it should be mentioned that it is argued that utilization of data faces a currently changing relationship with strategy. Traditionally, management science was proposing that the chosen strategy of a firm would influence which metrics should be observed and which respective data should be gathered and interpreted. In Figure 31, this old perception of influence is represented by the curved arrow at the bottom. Innovative companies are now challenging this relationship. They let insights from data collection and interpretation influence their corporate strategy. “The uses for data are shifting as collected data helps to determine what markets to explore and how consumer trends are changing, and the data can drive these determinations in real time. We are seeing firms take on non-traditional markets, leveraging their data and analytic resources—in conjunction with massive amounts of human and financial capital—to upend traditional barriers to entry.” This new relationship is represented by the curved arrow on the top of Figure 31. Arguably, since strategy determines which business model should be operated under which contingencies, big data utilization can provide a significant impact not only on the setup of a business model and its elements but also on the need for employing a new business model respectively identifying when a business model is inappropriate based on current data.

A publication which appears to be of relevance for this thesis´ purpose was created by Hartman, et al. and has its focus on developing a “[…] taxonomy of business models relying on data as a key resource in the start-up world.” To reach their goal, they analyzed 100 start-ups by reviewing public information about those firms and found that their business models are divisible into six main archetypes. Arguable, start-ups often incorporate new ideas and are therefore a suitable indicator for future trends in big data.

As shown in Figure 32, data-reliant business models face a distinction based on their sources of data and the main activity they are performing based on this information. Every type should be explained in a brief manner to illustrate the possible business model design options in the market of big data.

352 Mazzei & Noble, 2017, p. 407
353 Hartmann, Zaki, Feldmann, & Neely, 2016, p. 1386
354 Cf. Hartmann et al., 2016, pp. 1385ff.
Type A, the “free data collectors and aggregators”, use mostly publicly free accessible data and simply aggregate it to provide more comprehensible data. In practice, for example, such firms collect data about restaurants and bars and provide them to customers. They use brokerage fees, subscription fees, advertisement fees and usage fees to create revenue.\textsuperscript{355}

Type B, the “analytics as a service” firms, perform data analytics tasks using data which is provided by their customers. Most of their customers are business which pay in the form of subscription- or usage fees.\textsuperscript{356}

Type C, “data generation and analysis” firms, create own data and perform analytics activities based on this data. For example, one firm offers a device which can be plugged in a car. It creates information by tracking driving data, offers analytics by analyzing the driving style and provides evaluations of its findings on the user’s smart phone. Customers can be firms and individuals. Revenue is often created through sales of physical devices or sales of created analytic outcomes.\textsuperscript{357}

Type D, “free data knowledge discovery” firms, carry out analytical tasks on data which is available for free. Examples for such companies are highly diverse. One recruiting company analyzes contributions of individuals in coding-boards and respective Q&A sections to identify hidden talents in coding. The modes of revenue collection are as diverse as the

\textsuperscript{355} Cf. Hartmann et al., 2016, p. 1394
\textsuperscript{356} Cf. Hartmann et al., 2016, p. 1394
\textsuperscript{357} Cf. Hartmann et al., 2016, p. 1398
practical activities of businesses. Many companies use subscription- or usage fees as well as advertisement- and brokerage fees. The customers are mostly firms.358

**Type E.** “data-aggregation-as-a-service” organizations, are aggregating internal data of their customers. They mainly aggregated data from various internal sources and make it available to their customers which are mostly other businesses. Normally, they create revenue using subscription fees.359

**Type F.** “multi-source data mash-up and analysis” companies, aggregate free available data with internal data of customers and analyze this data. Those models are generally aimed at business customers which normally pay a subscription fee.360

At this point, the paper should at this point proceed towards elaborating implications of managing big data for future business models.

The **customer identification** element of future business models in regard to big data utilization is a special issue to question. As it has already been shown in the example of Lufthansa, big data has the potential to individualize offers for customers to be contextually relevant to them and offered when needed in real-time. Therefore, as a conclusion by the author, this element is not addressed before business is carried out by management opinion or past market research data. Instead, it is addressed automatically based on available data. Therefore, the customers of a business may vary over time based in unfolding data insights. As further shown in this chapter, customers of mainly big data-reliant business models are individuals as well as business customers.

Furthermore, in regard to the identity of a user of a product or a service and the identity of a paying party, scholars also argue that many big data-based will provide services for consumers for free, while charging fees for advertising on their internet presence.361 Arguably, new big-data business models as outlined in this chapter will face growing new customer groups as the demand for big-data services increases.

The **customer engagement** element of big data-related business models faces several innovative possibilities to provide value. It is argued that a main source of value propositions of big data results from the provision of contextually relevant information to customers when they need it. As an example, big data can let a driver’s car communicate with a mobile maps app to provide gas prices and reachable gas stations when the car’s fuel level is low. Wang calls this the provision of peace of mind to customers of never running out of gas.362 Therefore, value results from in-depth analysis of already existing data and tracking eventualities to prevent unwanted outcomes.

As seen in the example of Lufthansa, such individual and contextually relevant communication and service provision for customers can facilitate a new depth of customer

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358 Cf. Hartmann et al., 2016, p. 1398
359 Cf. Hartmann et al., 2016, pp. 1398f.
360 Cf. Hartmann et al., 2016, p. 1399
361 Cf. Muhtaroglu, Demir, Obali, & Girgin, p. 35
362 Cf. Wang, 2012
relationship. In the light of the two main alternatives Baden-Fuller, et al. offer in their publications for general types of customer engagement modes, scale-based (bus) and project-based (taxi), systematic individual treatment of customers appears to be barely classifiable as one of the two. Instead, although most respective businesses offer bus services or products, they appear to make them seem as individually tailored to customers due to consideration of context via big data. Arguably, customers feel like receiving a taxi treatment while from a company point-of-view it is systematical and therefore bus.

Generally, the value propositions of future big data business models appear to be highly diverse and placed in many different sectors:

“[…] it is expected that many innovative applications will emerge with unforeseen benefits for their users and the community.”

The brief description of the six big data-reliant business model archetypes has revealed three fundamental value propositions of such firms: data aggregation, data analytics and data generation. Arguably, such propositions are legitimate since it requires IT experts to perform them.

The value chain linkages of a big-data-driven business model will be strongly reliant on information as a moderating force. Big data business models’ value chains are governed by interpretation of data outside of traditional data bases. As described in this chapter, value chain linkages seem to face the necessity of being oriented towards capturing and interpreting external and unstructured data such as information from social media platforms.

The example of Lufthansa, in which the firm tracked technical parameters of aircrafts in real-time to predict and prevent maintenance necessity, has shown that processes in a firm can be performed more efficiently than with traditional planning and predicting tools when utilizing big data.

The analysis of the six business model archetypes of big data-reliant businesses has lined out that value chains of such organizations can involve links to customer data, public data as well as specifically tracked and generated data in their value chains. As a result, data analytics might become a fixed part in other companies value chains.

Monetization in business models is not significantly impacted by the trend in traditional firms enhancing their current business with big-data solutions. As for upcoming big-data based business models, it can be said that they mostly provide knowledge and information to other firms mainly charging subscription- or usage fees. Moreover, big data might improve cost structures of firms by finding additional optimization potentials as it is shown in the example of Lufthansa predicting and optimizing aircraft maintenance.

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363 Muhtaroglu et al., p. 34
4.2.2.4. Crowdsourcing

The era of the internet, beyond having brought completely new technological tools, is claimed to have ultimately changed the relationship between individuals as well as between individuals and organizations. One specific respective development is the increasing utilization of collectives of people such as online communities or other third-party groups of people by organizations for organizational purposes.³⁶⁵ Crowdsourcing is based on this idea. The following selected definitions should provide an accurate understanding of the term as a starting point:

“[…] crowdsourcing as an online, distributed problem-solving and production model that leverages the collective intelligence of online communities to serve specific organizational goals.”³⁶⁶

“Crowdsourcing is the externalization by an organization, via an application using the Internet protocol, of an activity to a large number of individuals whose identities are most often anonymous.”³⁶⁷

Therefore, crowdsourcing makes use of organizationally external persons and their capabilities by using the internet. At this point the way value creation functions in crowdsourcing situations should be discussed in more detail. Basically, crowdsourcing can provide value to firms in three different ways as outlined in Figure 33.

![Figure 33: Sources of Value-Creation in Crowdsourcing – modified after Lebraty & Lobre-Lebraty, 2013, p. 34](image)

The first kind of value which can be contributed to an organization by the utilization of crowdsourcing is the potential to significantly reduce costs.³⁶⁸ This aspect can be illustrated using an example of Howe, who published the article in the WIRED magazine, which initially sparked interested in crowdsourcing. In the example, an image sharing website which sourced its images from amateur individuals became able to offer a large variety of photographs for about 1 USD per picture, while by the time comparable photographs of professionals ranged about several hundred USD per picture. In this case, crowdsourcing

³⁶⁵ Cf. Brabham, 2013, p. xvi
³⁶⁶ Brabham, 2013, p. xix
³⁶⁷ Lebraty & Lobre-Lebraty, 2013, p. 17
³⁶⁸ Cf. Lebraty & Lobre-Lebraty, 2013, p. 34
made the product photograph not scarce anymore. Arguably, this includes significant implications for both, respective buyers and sellers of crowdsourced products.

Crowdsourcing is further able to be a source of innovation for firms. Scholars state that crowds are able to outperform individual experts in solving almost any problem. Crowds have the potential of a high number of geographically dispersed persons working together. They are able to provide fresh outsider opinions and can make their work suitable for more persons since many persons are involved. The individual respectively groups of individuals appear to become more important for the innovation-capability of a company:

"[...] nowadays, it is not the companies but freelancers and individuals dispersed in the mass, who are the ones that can provide the best innovations, in order to improve each and all of the activities of the value chain of the firms."

One example for utilizing the capabilities of crowds is the “Fly your idea” challenge initiated by Airbus. The firm made use of ideas of groups of students by offering a 30.000 USD prize for the winners to find ways to increase eco-efficiency in the airline industry. Any group of students was allowed to participate which led to a lot of ideas for the company.

In the context of innovation, scholars performed a related study which aims to answer a highly relevant question regarding crowdsourcing: “Can users really compete with professionals in generating new product ideas?” The Bamed/MAM Group, a firm which produces food additives for babies, simultaneously instructed internal experts and the external customer community to generate ideas to make the firm’s products more convenient for both babies and parents. The crowd was incentivized with cash and other prices for the best ideas. This served as the basis for the study. After idea creation by the crowd and the internal experts, the ideas were then rated in three categories: novelty, customer benefit and feasibility. The ratings were determined by the company’s CEO and the head of R&D without them knowing the source of the ideas. The results of this study delivered supporting evidence for the effectiveness of crowdsourcing to find innovative ideas. Generally, the ideas of the crowd reached significantly higher scores in novelty and customer benefit than the experts’ solutions. The feasibility score of the crowd was lower than the one of the experts but remained on a high level. The company increased their focus onto crowdsourcing for innovation after this study.

Furthermore, crowdsourcing can create value for firms by offering an authentic value proposition. This results from the fact that firms which utilize external groups of persons are able to better understand markets, their environment or their clients. Ultimately, this understanding leads to respective companies being able to offer accurately adapted products or services which therefore provide additional value. For example, Lego gathers designs of their online community and sells them. The design fit the expectations of many

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369 Cf. Howe, 2006, p. 1
370 Cf. Brabham, 2013, p. 2
371 Garrigós-Simón & Narangajavana, 2015, p. 4
372 Cf. Busarovs, 2011, p. 56
373 Poetz & Schreier, 2012, p. 245
375 Cf. Lebraty & Lobre-Lebraty, 2013, p. 34
customers since they were designed by parts of the customer base. The community-made products sell extraordinarily strong.\textsuperscript{376}

While crowdsourcing offers potential for significant value creation, it remains vital for organizations to be able to capture enough value to sustain their business. In practice, crowdsourcing oriented businesses have already faced bankruptcies due to insufficient captured value.\textsuperscript{377} Scholars argue that in the context of crowdsourcing, a business model needs to have an especially sharp distinction and respective focus on value creation and value capturing. Normally, value is created by the community and value capturing needs to be ensured to sustain operations by the business model.\textsuperscript{378}

Undoubtedly, capturing value for the firm is of key importance to sustain a crowdsourcing business model. Nonetheless, monetizing ideas of the crowd and capturing value for the firm from the crowd’s ideas leads to a significant conflict of interests. Contributing individuals from the crowd will require a fair compensation for their work while the organizations wants to maximize its profits. Captured value will be needed to be shared fairly between the firm and the crowd to ensure sustainable fruitful collaboration.\textsuperscript{379} Figure 34 visualizes how value creation and capturing as well as respective sharing in crowdsourcing business models has evolved until today and how it should evolve in the future. Therefore, current crowdsourcing business models will need to evolve towards increasing the value share for contributors. Else, the collaboration with the crowd will not be sustainable.

![Figure 34: Business Models in Transition - taken from Kohler & Nickel, 2017, p. 30](image)

\textsuperscript{376} Cf. Kohler, 2015, p. 66  
\textsuperscript{378} Cf. Chanal & Caron-Fasan, 2008, p. 24  
Motivating the crowd to participate in crowdsourcing programs of an organization cannot be maintained only by offering enough monetary incentives. Additionally, to providing a fair share of captured value, a firm which relies on crowd contributions has to put measures in place which give participants the feeling of recognition for their effort and support a constructive culture of collaboration. Only then the crowd will be motivated to continuously contribute to a business.\footnote{Cf. Kohler & Nickel, 2017, pp. 28ff.}

There are several ways crowdsourcing can be carried out in practice depending on the intended goal. Lebraty & Lobre-Lebraty offer a description of ten different forms of crowdsourcing practices which should be summarized in Table 11. Apparently, the possibilities and potentials of crowdsourcing are highly versatile and comprehensive.

At this point, the implications of crowdsourcing on future business models and their respective elements should be discussed.

Looking at the **customer identification** element, which describes which groups of people should use and/or pay for products and services of a firm, crowdsourcing has limited influence on those aspects. Arguably, one derivable influence is crowdsourcing might be that customer bases might become larger and loyal as crowdsourcing practices let customer participate and create a more authentic image to firms.

Another influence on identifying customer groups which appears logical to the author is the possibility for the firm to validate or invalidate assumptions about customers which legitimates a customer group selection by “consulting” them directly. For example, this can be done by crowdwisdom projects as outlined in Table 11. Simplified, it should be stated that assuming a customer’s preference is not as good as getting it confirmed by the customer. What appears noteworthy is that the crowd contains both contributors and sellers. In some occasions, contributor and customer might be the same individual.

The **customer engagement** element is an aspect which faces strong potential impact from crowdsourcing aspects, especially in terms of innovating new value propositions. As shown in the study covering the crowdsourcing project of the Bamed/MAM Group, crowdsourcing ideas for value propositions has the potential to provide novel products and services which address customer needs more accurately than purely internally produced ideas. Moreover, crowdsourcing practices appear to be able to enhance value proposition by adding authenticity to a firm’s reputation.

Therefore, respective products and services of firms which rely on crowdsourcing in idea creation will arguably have much stronger propositions than traditional business because the crowd knows its preferences better than internal experts within a firm. Since crowdsourcing offers numerous ideas, it can be assumed that firms which are utilizing the crowd for product and service ideas will have a wider and stronger portfolio of value propositions.
The value chain linkage element of business models appears to face strong impacts by the crowdsourcing trend. There reason for this is that different kinds of crowdsourcing projects substitute tasks which were traditionally performed internally in an organization to the open crowd. For example, crowdjobbing can directly substitute simple tasks a traditional workforce will perform internally and crowdsourcing and innovation can substitute an innovation department. Moreover, there are even more possibilities to include the crowd in the value chain. It appears that with crowdsourcing practices gaining more traction, respective firms’ value chains will likely have many interconnections with external individuals.

A main challenge when relying on the crowd contributions is the ability of the value chain of the firm to handle large amounts of contributions while still being effective in deriving value from the right contributions and maintaining oversight over the contributions. At the same time, the company has to provide transparency and rewards to its contributors. Those requirements can be a serious challenge for crowdsourcing business models.381

The Monetization element in crowdsourcing business models faces the issue that received income by the firm needs to be given to crowd contributors to some extent. If the crowd feels financially underappreciated, contribution numbers will suffer. Moreover, simply receiving many contributions is not sufficient for sustainable success of a company. It is a main financial challenge to be able to capture enough value for the firm from crowd contributions, while simultaneously satisfying the contributors.

Additionally, the crowd will perform tasks for a firm at a cheaper price than internal resources. Therefore, it appears that handing specific tasks over to individuals will improve cost structures of firms which utilize crowdsourcing practices. Arguably, it is highly case-specific in which case the crowd can successfully perform tasks and create cost advantages. In the example of Bamed/MAM Group, research costs could be saved by utilizing the crowd while even getting better results.

<table>
<thead>
<tr>
<th>Form of Crowdsourcing</th>
<th>Description</th>
<th>Peculiarities</th>
<th>Limitations</th>
<th>Future Potential</th>
</tr>
</thead>
</table>
| Crowdjobbing         | • Offering jobs to the crowd  
                      • Work has to be broken down into simple and divisible tasks  
                      • Anonymous individuals from the crowd will perform those tasks  
                      • Digital and physical work | • Quick access to a workforce  
                      • High potential work capacity  
                      • Permanently available workforce  
                      • Cost arbitrage possibilities by utilizing foreign individuals | • Ethical issue: e.g. child performing cheap labour  
                      • Tasks have to be simple  
                      • Breaking down tasks is not always economic → splitting, reassembling and checking costs | • Using the crowd for cleaning big data  
                      • Using 3D printer owners to print designs  
                      • Many others are possible |
| Crowdwisdom          | • Gathering opinions and thoughts on a specific subject  
                      • Finding common conceptions  
                      • Example: Rating products with stars | • Basic assumption: commonly shared beliefs are right  
                      • Making opinions quantifiable | • Potential danger of intentionally false opinions on the internet  
                      • The crowd may lack competency to evaluate specific issues | Two developments can be foreseen today:  
                      • Generalization: everyone shares opinions about many things  
                      • Niche market: qualified experts contribute to specific issues |
| Crowdfunding         | • Sourcing financial resources from the crowd  
                      • Mainly carried out by specialized platforms (e.g. Kickstarter) | • Three parties: businesses in need of financing (1), the crowd (2), intermediary platforms (3)  
                      • Reasons for financing of the crowd are not only financial | • Ambiguous legal environment  
                      • Large financial volumes are barely achievable | • May become mandatory for any new businesses to start up  
                      • Financing of humanitarian projects – especially for emergency cases  
                      • Unknown companies are get a chance if they have an appealing product/service |
<table>
<thead>
<tr>
<th>Form of Crowdsourcing</th>
<th>Description</th>
<th>Peculiarities</th>
<th>Limitations</th>
<th>Future Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crowdsourcing and Forecasting</td>
<td>• Using the crowd as a prediction tool</td>
<td>• Known number of options</td>
<td>• Conflict between the crowd’s estimate and managers autonomy</td>
<td>• Potential for a new quality of predictions using social media behaviour of the crowd</td>
</tr>
<tr>
<td>Crowdsourcing and Innovation</td>
<td>• Engaging the crowd to provide innovative solutions or evaluate ideas</td>
<td>• Basic assumption: the crowd is full of specialists</td>
<td>• Publishing the problem set to the crowd is difficult: needs to be specific and yet vague enough to allow innovation</td>
<td>• Small scope</td>
</tr>
<tr>
<td></td>
<td>• Finding solutions which are new to the organization</td>
<td></td>
<td>• Making problem sets public can be a valuable information for competitors</td>
<td>• Limited number of involved stakeholders</td>
</tr>
<tr>
<td>Crowdsourcing and Authenticity</td>
<td>• Creating a bond with the crowd by understanding feelings towards (mostly) a firm’s brand</td>
<td>• Technology works as an enabler for bond-creation with a brand</td>
<td>• Danger of lagging behind consumer’s changing tastes by putting feelings and expectations center stage</td>
<td>• Utilization will be limited because successful bonding via crowdsourcing will require highly agile and skilled organization to not lose control over changing crowd perceptions and technical requirements</td>
</tr>
<tr>
<td>Form of Crowdsourcing</td>
<td>Description</td>
<td>Peculiarities</td>
<td>Limitations</td>
<td>Future Potential</td>
</tr>
<tr>
<td>-----------------------</td>
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</tr>
</tbody>
</table>
| Crowdauditing         | • Letting the crowd perform data analysis  
                       • Finding opportunities and problems in data | • „Investigative“ instinct mobilizes the crowd to participate  
                       • Especially useful for public organizations | • Some companies have no interest in getting audited  
                       • Companies do mostly not want to publish data about them | • Development seems to stagnate  
                       • Less and less data sets get published for audit  
                       • Private firm crowdauditing appears to have failed |
| Crowdcontrol          | • Using the crowd to provide public security—e.g., police information, etc. | • Builds on civic-mindedness, curiosity and even, to some extent, voyeurism  
                       • Normally, small rewards are used | • Leaving such tasks to private individual might meet resistance  
                       • Partially unclear legal situation  
                       • Danger of harmful effects due to people becoming vigilantes | • Bright future for assisting public order  
                       • Suitable for utilization in communities |
| Crowdcuration         | • Classification of data, information and knowledge  
                       • Example: Buzzfeed categories | • Endlessly growing amounts of data require crowd capabilities  
                       • Psychological phenomenon of people liking to arrange things | • Crowdcuration requires a lot of users to arrange data, since not everyone actually „curates“  
                       • Wanting specific data to be arranged will be a hard task  
                       • Data has to be interesting to the crowd | • Will likely grow and be of interest to various types of companies |
| Crowdcare             | • Using the crowd to assist in health care and protection of individuals | • Based on the need to care for others, empathy and compassion for others | • Health care requires skilled persons  
                       • Unskilled persons might cause harm by „helping“ | • Can be used to enhance any social aid activity |

### 4.2.3. Overview of Results

In this part of the thesis, the found influences and logically made assumptions about influences of the four digitization trends on future business models are summarized in the proposed structure of chapter 4.2.1. For a better understanding, the trends have been divided into specific aspects of the trends.

<table>
<thead>
<tr>
<th>Digitization Trend</th>
<th>Type of Effect</th>
<th>Customer Identification</th>
<th>Customer Engagement</th>
<th>Value Chain Linkages</th>
<th>Monetization</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distributed Ledger</strong>&lt;br&gt; Making transaction intermediaries obsolete</td>
<td>Imposing Constraints</td>
<td>Blockchains will decrease the number of people who will pay for transaction intermediary services as well as tax and financial audit services</td>
<td>Transaction intermediary services might become an obsolete value proposition. Tax and financial audit services might become obsolete as well</td>
<td>-</td>
<td>Non-applicants will face cost disadvantages</td>
</tr>
<tr>
<td><strong>Distributed Ledger</strong>&lt;br&gt; Improving supply chain transparency and accountability</td>
<td>Creating Opportunities</td>
<td>Customers of intermediaries will turn to blockchain solutions and become customers of related service firms</td>
<td>New value propositions will be offering infrastructure as well as access and support for utilizing blockchain technology</td>
<td>Value chains will be simpler because intermediaries are excluded</td>
<td>Diminishing transaction costs will increase overall profitability</td>
</tr>
<tr>
<td><strong>Distributed Ledger</strong>&lt;br&gt; Improving supply chain transparency and accountability</td>
<td>Imposing Constraints</td>
<td>Non-application might dissatisfy sustainability-focused customers</td>
<td>Non-application might weaken value propositions of suppliers in supplier networks</td>
<td>Blockchain solutions will add complexity to value chains</td>
<td>Higher supply chain risks lead to higher risk of critical errors and respective costs</td>
</tr>
<tr>
<td><strong>Distributed Ledger</strong>&lt;br&gt; Improving supply chain transparency and accountability</td>
<td>Creating Opportunities</td>
<td>Application can expand customer base with sustainability-focused customers</td>
<td>Applicants might enhance their value propositions in supplier networks</td>
<td>Supply chain risks can get reduced drastically</td>
<td>Reduced risks leads to more reliable financial performance</td>
</tr>
<tr>
<td>Digitization Trend</td>
<td>Type of Effect</td>
<td>Customer Identification</td>
<td>Customer Engagement</td>
<td>Value Chain Linkages</td>
<td>Monetization</td>
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<td>--------------</td>
</tr>
<tr>
<td>Distributed Ledger</td>
<td>Imposing Constraints</td>
<td>Lack of valid ownership or authenticity of high-value goods keeps customers away</td>
<td>Offering a high-value product alone might not be sufficient anymore without credible blockchain validation of authenticity and ownership</td>
<td>Legally non-compliant suppliers (blood diamonds, stolen art, …) might endanger value chains</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Creating Opportunities</td>
<td>New customers through trusted ownership status and authenticity</td>
<td>Validation of authenticity and ownership of high-value goods might become a necessary part of their value proposition</td>
<td>Legal risks in supply chain can be virtually eliminated</td>
<td>-</td>
</tr>
<tr>
<td>Distributed Ledger</td>
<td>Imposing Constraints</td>
<td>-</td>
<td>Global currency transaction services might become obsolete</td>
<td>-</td>
<td>High transaction costs and long delays in payments</td>
</tr>
<tr>
<td>Cryptocurrencies and improved efficiency of cross-border currency transactions</td>
<td>Creating Opportunities</td>
<td>Potential to increase global customer base through improved payment conditions</td>
<td>New value propositions revolving around digital currency will evolve</td>
<td>Simplified payment relations within a value chain on a global scale</td>
<td>Lower transaction costs, faster payment</td>
</tr>
<tr>
<td>Distributed Ledger</td>
<td>Imposing Constraints</td>
<td>-</td>
<td>Existing uncertainty when agreeing on contracts about future settlement weakens value propositions</td>
<td>Complexity through manual contract settlement and possible disputes</td>
<td>Delayed payments and potential of disputes over payments and dispositions</td>
</tr>
<tr>
<td>Possibility of automated settlement of contracts („smart contracts“)</td>
<td>Creating Opportunities</td>
<td>-</td>
<td>Automated contracts eliminate uncertainty</td>
<td>Simplified real-time automated settlement</td>
<td>Quicker payments and less friction in disputes</td>
</tr>
<tr>
<td>Digitization Trend</td>
<td>Type of Effect</td>
<td>Customer Identification</td>
<td>Customer Engagement</td>
<td>Value Chain Linkages</td>
<td>Monetization</td>
</tr>
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</tr>
<tr>
<td><strong>Multisided Platforms</strong>&lt;br&gt;Using a platform as sales intermediary</td>
<td>Imposing Constraints</td>
<td>Choosing a classical target customer group will not be an appropriate choice anymore</td>
<td>-</td>
<td>The sales force of a firm will face diminishing importance</td>
<td>Cost of sales disadvantages</td>
</tr>
<tr>
<td></td>
<td>Creating Opportunities</td>
<td>Choosing a suitable platform automatically provides access to many customers</td>
<td>-</td>
<td>Integrating a platform as an effective and automated sales tool</td>
<td>Strong revenue potential on large platforms</td>
</tr>
<tr>
<td><strong>Multisided Platforms</strong>&lt;br&gt;Operating a multisided platform</td>
<td>Imposing Constraints</td>
<td>Critical necessary numbers of users for a platform are hard to attain and keep</td>
<td>The value of a sales intermediary service or advertisement scales with the size of the user base</td>
<td>Reliance on users</td>
<td>Revenue depends on user base</td>
</tr>
<tr>
<td></td>
<td>Creating Opportunities</td>
<td>An existing large database is hard to imitate</td>
<td>Strong user bases lead to strong value propositions</td>
<td>Users contribute offers, etc. themselves</td>
<td>Strong revenue potential through scalability</td>
</tr>
<tr>
<td><strong>Big Data</strong>&lt;br&gt;Customer insights and individualized offers to customers</td>
<td>Imposing Constraints</td>
<td>Ex ante choosing a target customer group based on management decisions or market research might be inaccurate</td>
<td>Traditional individualizing efforts are blunt and shallow and offer no additional value</td>
<td>Value chain guided by internal data only</td>
<td>Missing insights about financial performance</td>
</tr>
<tr>
<td></td>
<td>Creating Opportunities</td>
<td>Big data analysis can give a clear picture about potentially most accurate customer groups for specific products or services</td>
<td>Big data respects situational context when making individual offers and creates additional value through better customer relationships</td>
<td>Value chain guided by additional external data</td>
<td>Additional insights about financial performance allow financial optimization on a new level</td>
</tr>
<tr>
<td>Digitization Trend</td>
<td>Type of Effect</td>
<td>Customer Identification</td>
<td>Customer Engagement</td>
<td>Value Chain Linkages</td>
<td>Monetization</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-------------------------------------</td>
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<td>-----------------------------------</td>
</tr>
<tr>
<td><strong>Big Data</strong></td>
<td>Imposing Constraints</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>New big-data-based business models</td>
<td>Creating Opportunities</td>
<td>New services lead to new customers (individuals and firms)</td>
<td>Value propositions are: aggregation, analytics and generation of data</td>
<td>Integration of big data firms into the value chain of other firms</td>
<td>Mostly subscription- and usage fees</td>
</tr>
<tr>
<td><strong>Crowdsourcing</strong></td>
<td>Imposing Constraints</td>
<td>Assuming customer preferences is inaccurate</td>
<td>Potentially weaker value propositions without utilizing the crowd</td>
<td>Crowd inclusion might be complex</td>
<td>Traditional firms will likely face a tighter cost structure than crowdsourcing firms</td>
</tr>
<tr>
<td>Utilizing the crowd for traditionally organization-internal tasks</td>
<td>Creating Opportunities</td>
<td>Validation of assumed customer preferences by customers themselves</td>
<td>Enhanced value propositions due to increasing authenticity and out-of-the-box innovations</td>
<td>Inclusion of the crowd into the firm’s value chain using numerous options such as crowdjobbing, crowd wisdom and others</td>
<td>The crowd is cheaper than experts Increasing revenues through larger and more loyal customer base</td>
</tr>
<tr>
<td><strong>Crowdsourcing</strong></td>
<td>Imposing Constraints</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>New crowdsourcing-based business models</td>
<td>Creating Opportunities</td>
<td>New services lead to new customers</td>
<td>The crowd creates value propositions for itself</td>
<td>The crowd performs essential tasks of the firm and is therefore included in the value chain</td>
<td>High revenue potential</td>
</tr>
</tbody>
</table>

Table 12: Summary of the Influence of Digitization Trends Based on the Elaborated Framework - created by the author
4.2.4. Limitations of the Results

This chapter should discuss the viability of this thesis´ results by objectively assessing the limitations of the methodology they have been developed with.

Since the results are based on a sophisticated estimation of the future based on currently available indicators, it appears logical that time will prove some of the made predictions wrong. Nonetheless, this is a limitation which lies in the nature of forward-looking statements and which cannot be improved as of now.

During the answering of this thesis´ main research question it became apparent that it is relatively hard to make accurate statements about a business model´s element´s appropriateness or inappropriateness in regard to the peculiarities of specific digitization trends on a generalized level without considering an individual case. Still, this is the main focus of this thesis. Therefore, the results represent general tendencies about the design of future business models.

Apparently, as only a small portion of publications about the four chosen digitization trends has an explicit business model context, the author needed to draw numerous conclusions himself to create a link with the concept of the business model. Although every assumption was made logically on the basis of existing scientific literature, they include the inherent uncertainty of assumptions.

Moreover, it remains noteworthy that an additional source of inaccuracy of the results lies in the high complexity of the chosen digitization trends. Within the trends there are numerous use cases and aspects which were impossible to be fully recognized in the scope of this paper. Therefore, it should be explicitly stated that the trends are not discussed exhaustively in this paper.

Concluding this chapter, the developed results face several limitations, especially regarding their completeness and accuracy. Nonetheless, in the author´s opinion they provide a useful overall big picture of the main business model dynamics resulting from the chosen digitization trends.
4.3. Summary

This chapter contains the link between digitization and the business model, which ultimately provides the basis for answering this thesis’ main research question. It discussed a best practice and a bad practice example of digitization’s utilization in real-world business models. Furthermore, the four chosen digitization trends have been explained in further detail and were analyzed in regard to their influence on future business models.

To answer the remaining research questions of this thesis, they should be answered briefly at this point.

- **Practical Input: How did recent digital innovations impact firms’ business models? Which adaptations were successful and which were not?**

The best practice and bad practice example have shown that business models were influenced crucially by digital innovation in the recent past. Valve Corp. and their business model based around the Steam online sales platform reached profitability ratios which outperformed even firms such as Google.³⁸² To the contrary, Blockbuster Inc. was completely driven out of the market because their formerly superior business model became inefficient due to digital technology turning their key assets into obsolete cost factors.³⁸³

The increasing distribution of broadband access allowed Valve to make their online sales platform a unique competitive advantage. It allowed the video game developing firm to include the distribution of their product into their own value chain. As the platform found more and more users they identified the potential of utilizing the platform by selling other developer’s games and collecting commissions. The business model evolution of the firm impressively shows how understanding and utilizing technological advancements can lead to new levels of growth and profitability. The firm increased its customer base with developers and any individual who has access to the internet. Their value proposition got enhanced by offering online sales intermediary services and access to a growing customer base. The value chain got rid of physical boxing of games and included online distribution. In terms of monetization the firm added sales commission as a main revenue driver.³⁸⁴

The adaption of new technology in the case of Blockbuster Inc. faced a different fate. The business model of the firm was heavily reliant on optimizing internal efficiency in their numerous brick-and-mortar stores and underestimated the potential of online streaming of movies.³⁸⁵ By the time competitors achieved superior results with mostly online streaming solutions, the company also implemented one.³⁸⁶ Nonetheless, the key assets of Blockbuster’s business model, the physical stores, became obsolete and weighted as cost factors on the firm. The firm’s business model, although trying to adapt to online streaming, failed due to the undertow of its old business model’s remains. The value chain included

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³⁸² Cf. Chiang, 2011
³⁸³ Cf. Downes & Nunes, pp. 2ff.
³⁸⁴ Cf. blogphilofilms, 2013
³⁸⁵ Cf. Satell, 2014
³⁸⁶ Cf. Blockbuster Inc., 2011
hard-to-divest and expensive assets which led to uncompetitive prices and eventual bankruptcy. Arguably, the switch from the stores came too late.

- **How might future developments of digitization shape future business models?**

As already explained in chapter 2.3, digitization should be represented by four chosen current and probable future digitization trends. The general influences of those trends on business models were analyzed in this chapter representing the answer to the main research question of this thesis. The respective results are summarized in Table 12. It can be said that digitization has a considerable impact on new possibilities for viable business model designs and limits the viability of other business model setups.

The distributed ledger technology, also called the blockchain technology, is a relatively young phenomenon with revolutionary potential for business. For example, it might be able to make transaction intermediary value propositions completely obsolete since it found a technological solution to be sure about a transaction status without the necessity to check it. Furthermore, the technology has the potential to increase transparency and accountability in complex supply chains to reduce supply chain risks. For high-value goods the technology can eliminate uncertainty about the ownership status and authenticity of, for example, diamonds or art. As a part of cryptocurrencies, the blockchain technology can simplify the process of transaction and reduce the costs of transactions. Additionally, the technology can be used to automatically settle contracts and distribute respective rights, obligations and payments. Generally, it seems that business models can profit from the technology by simplifying processes and eliminating complexity and costs which result from the traditional need of validating the status things such as transactions, legal compliance, compliance with supply chain guidelines among many others.

Multisided platforms are currently already successful in use and create value by connecting groups of buyers and sellers. Therefore, as buyer or seller, the identification of customers will require the choice of the right platform or several platforms. Operating a platform provides the value propositions of sales intermediary services and offering advertisement space. Moreover, the multisided platform has the potential to substitute the sales force of a firm in a value chain. Platform operators mostly receive sales commissions or advertisement fees while platform sellers have an increased revenue potential.

Big data can enhance existing business models and create business models which are mainly based on the technology. Existing business can target customers more accurately, identify potentials to strengthen their value proposition and optimize financial performance by identifying insights in their business and their customers’ behavior which were

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387 Cf. Downes & Nunes, pp. 2ff.
388 Cf. Tapscott & Tapscott, 2016b, pp. 2ff.
389 Cf. Casey, Michael, J. & Wong, 2017; Pilkington, 2016, p. 244
390 Cf. Casey, Michael, J. & Wong, 2017; Pilkington, 2016, p. 244
391 Cf. Volpicelli, 2016; Evans-Greenwood et al., 2016, p. 39
393 Cf. Evans-Greenwood et al., 2016, pp. 20ff.
397 Cf. Evans, 2003, p. 193
undetectable using traditional data manipulation.\textsuperscript{396} New business models are evolving which specialize on value propositions including aggregating, analyzing as well as tracking and generating data using their IT capabilities. They mostly charge subscription- and usage fees.\textsuperscript{397}

Crowdsourcing represents an interesting design option for future business models. The crowd offers sheer endless capabilities, creativity and expert knowledge. Crowdsourcing projects provide the possibility to include the crowd in formerly internal activities of organizations.\textsuperscript{398} There are numerous kinds of crowdsourcing practices such as crowdjobbing, crowdwisdom, utilization of the crowd for innovation or others which offer diverse use cases in a firm’s value chain. Assumptions about customers can be validated by consulting those customers themselves. Value propositions can be tailored more towards the crowd’s perceptions and the crowd can be utilized as a creative engine providing innovations with extraordinary degrees of novelty and customer benefit.\textsuperscript{399} The financial impact of crowdsourcing utilization lies in its relatively low costs and the important aspect of compensating the crowd in a fair way for its contributions.\textsuperscript{400}

\textsuperscript{396} Cf. Djemaiel et al., 2014, p. 1; Chen et al., 2016, pp. 5096ff.
\textsuperscript{397} Cf. Hartmann et al., 2016, pp. 1394ff.
\textsuperscript{398} Cf. Lebraty & Lobre-Lebraty, 2013, p. 17
\textsuperscript{400} Cf. Kohler & Nickel, 2017, pp. 29ff.
5. Conclusion & Reflection

In this concluding chapter, the author discusses noticeable peculiarities and insights which were encountered during the creation of this thesis. The diverse trends of digitization, their highly complex respective contents as well as their linking to specific business model elements led to numerous topics to further line out.

When questioning the distinct meaning of digitization and digitalization, it became apparent that this was a useful question to ask since the understanding of the terms seems to have entered a stage in which many scholars and also the public self-evidently assume that the term’s content is clear for everyone without the need for explicitly stating it. Although, the usage of the terms suggests that there is a mainly agreed-on definitional basis, still, an amount of divergence remains. Especially, in the light of the existential importance of digitization for today’s human coexistence, the author expected perfectly agreed-on definition of the terms. This situation was further the reason why this paper includes the elaboration of the definition for further progression in chapter 2.1.3.

Furthermore, when exploring the world of digitization, it became clear that digitization has no coherent tendency of influence on future business models as a collective term containing many different technological trends. Therefore, the phenomenon of digitization had to be separated into dividable sub-trends (see chapter 2.3) to be able to make an appropriate and accurate statement about effects on future business models.

Current digitization trends appear to be even more manifold and complex than initially expected. Due to the comprehensive literature environment, every single one of the four chosen digitization trends has the potential to be discussed in a whole master’s thesis in regard to its relation with future business models. For example, the relatively young uprising of the distributed ledger technology already resulted in publications of many possible use cases with expert-contributions to details such as the legal framework issues in capital market utilization. Since this thesis has covered four digitization trends, the author concentrated on those main aspects of the trends which promise the most influence future business models in his opinion.

The concept of the business model faces a similar if not worse situation than digitization in regard to its the definitional unclarity. Numerous authors published numerous articles with mostly divergent understandings and usages of the term. Beyond the definitions, many different business model structures with respective elements and their interrelation were created. Interestingly, in the authors opinion, although it is often claimed by scholars that definitions are diverse, they mostly share content-wise commonalities while using different wordings. The author got a similar impression when reviewing literature about business model structures and their elements. Although there are several different business model structures as outlined in chapter 3.3, they appear to mostly agree on basic elements from a content point-of-view.
As this paper’s main research question was addressed, it quickly became apparent that it was necessary to simplify the approach of finding influence factors on business models since one could make virtually endless assumptions about which individual businesses would make use of trends in a different way. Therefore, eventualities were mostly ignored when answering the main research question.

The distributed ledger technology was found to be in a highly interesting state. Beyond the stated potential of the blockchain as it is outlined in chapter 4.2.2.1, it faced increasing attention as one of the current use cases, the Bitcoin, climbed in value dramatically from about 250 USD to about 4500 USD in only five years. Apparently, blockchain is receiving increasing attention while, as it was also noticeable when reviewing relevant literature, functioning use-cases are scarce. Andreas Antonopoulos, a leading distributed ledger expert, comments this situation as follows:

“This technology was approximately where the Internet was in 1992, but the hype around blockchain is exactly where the hype around the internet was in 1998. You know what comes next. There will be a shakeout.”

It will be interesting to see how the current hype about the technology can be confirmed in the future. Arguably, it is likely that history might repeat itself regarding premature praises of a newly made innovations. In the context of the future business model influence, this means that blockchain business models and their constraints on other business models might be farther from realization than anticipated by many.

Contrary to the blockchain, the other chosen trends, multisided platforms, big data and crowdsourcing have already proven to be able to be a viable basis respectively a viable part of a business model. Beyond the detailed influences described in Table 12, one trend appears to be observable on a general level. All of those digitization trends, including blockchain, require opening up the organizational boundaries to external influences and interaction. The blockchain should make ledger entries perfectly trustable and more transparent based on a decentralized, therefore open, collective of network participants. The multisided platform, an “external party” to buyers and sellers, can be integrated into the value chain of an organization as an automated sales tool. Big data’s additional value comes from integrating external and formerly unused unstructured data in the logic of the firm. Furthermore, integrating the crowd into organizational processes directly by using crowdsourcing practices is more evidence that business models evolve more towards openness to their external environment.

As a closing remark, in the opinion of the author, analyzing current digitization trends from a business model point-of-view included the necessity to think about all business-relevant aspects of those trends. Some scholars argue that the business model concept has little to no value to bring to business research or practice. The author argues against such statements. In the course of this thesis, and comparable similar research and practical tasks, a business model structure ensures that all aspects of business are respected when dealing with organizational issues, enabling individuals to gain higher-quality insights and make higher-quality decisions.

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401 Bitcoin Events, 2017
402 Cf. Porter, 2001, p. 73
Reference List


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