Digitalization in the Financial Services Sector: A SMACIT Approach

Masterarbeit

zur Erlangung des akademischen Grades „Master of Science (M.Sc.)“ im Studiengang Wirtschaftswissenschaft der Wirtschaftswissenschaftlichen Fakultät der Leibniz Universität Hannover

vorgelegt von:

Name: Bartels Vorname: Anna-Katharina Klara

[redacted] [redacted] [redacted] [redacted]

Prüfer: Prof. Dr. Michael Breitner

Hannover, den 27. September 2018

1 Contents

List of Figures I
List of Tables II
List of Abbreviations IV
1 Introduction 1
2 Fundamentals 2
2.1 Social Media 2
2.2 Mobile Applications 4
2.3 Analytics 5
2.4 Cloud Technologies 7
2.5 Internet of Things 10
3 Research Method 13
3.1 Paper Collection for Literature Review 13
3.2 Directed Content Analysis Approach 17
4 Social Media 18
4.1 Research Framework 18
4.2 Current State of Knowledge and Discussion 20
4.2.1 Design and Features 21
4.2.1.1 Users and Society 21
4.2.1.2 Platforms and intermediaries 21
4.2.1.3 Firms and industries 22
4.2.2 Strategy and Tactics 22
4.2.2.1 Users and Society 22
4.2.2.2 Platforms and Intermediaries 23
4.2.2.3 Firms and Industries 24
4.2.3 Management and Organization 25
4.2.3.1 Users and Society 25
4.2.3.2 Platforms and Intermediaries 25
4.2.3.3 Firms and Industries 26
4.2.4 Measurement and Value 27
4.2.4.1 Users and Society 27
4.2.4.2 Platforms and Intermediaries 28
4.2.4.3 Firms and Industries 28
4.3 Discussion and Avenues for Advanced Research 29
5 Mobile Applications 31

5.1 Adapted Research Framework 31
5.2 Current State of Knowledge and Research Trends 33
5.2.1 Design and Features 34
5.2.1.1 Users and Society 34
5.2.1.2 Platforms, Provider and Developers 35
5.2.1.3 Firms and Industries 37
5.2.2 Strategy, tactics and Management 38
5.2.2.1 Users and Society 38
5.2.2.2 Platforms, Providers and Developers 39
5.2.2.3 Firms and Industries 41
5.2.3 Measurement and Value 42
5.2.3.1 Users and Society 42
5.2.3.2 Platforms, Providers and Developers 43
5.2.3.3 Firms and Industries 44
5.3 Discussion and Avenues for Advanced Research 44
6 Analytics 46
6.1 Adapted Research Framework 46
6.2 Current State of Knowledge and Research Trends 48
6.2.1 Design and Features 49
6.2.1.1 Users and society 50
6.2.1.2 Analysts and Data-Scientists 50
6.2.1.3 Firms and industries 51
6.2.2 Strategy, Tactics and Management 51
6.2.2.1 Users and society 51
6.2.2.2 Analysts and Data-Scientists 53
6.2.2.3 Firms and industries 54
6.2.3 Measurement and Value 56
6.2.3.1 Users and society 56
6.2.3.2 Analysts and Data-Scientists 57
6.2.3.3 Firms and industries 57
6.3 Discussion and Avenues for Advanced Research 59
7 Cloud Technologies 61
7.1 Adapted Research Framework 61
7.2 Current State of Knowledge and Research Trends 63
7.2.1 Design and Features 64
7.2.1.1 Users and Society 64

7.2.1.2 Providers and developers....65
7.2.1.3 Firms and Industries....66
7.2.2 Strategy, Tactics and Management....67
7.2.2.1 Users and Society....67
7.2.2.2 Providers and developers....68
7.2.2.3 Firms and Industries....70
7.2.3 Measurement and Value....72
7.2.3.1 Users and Society....72
7.2.3.2 Providers and developers....72
7.2.3.3 Firms and Industries....73
7.3 Discussion and Avenues for Advanced Research....73
8 Internet of Things....76
8.1 Adapted Research Framework....76
8.2 Current State of Knowledge and Discussion....78
8.2.1 Design and Features....78
8.2.1.1 Consumers and Society....79
8.2.1.2 Providers, platforms and developers....80
8.2.1.3 Firms and Industries....82
8.2.2 Strategy, Tactics and Management....82
8.2.2.1 Consumers and Society....82
8.2.2.2 Providers, platforms and developers....83
8.2.2.3 Firms and Industries....84
8.2.3 Measurement and Value....86
8.2.3.1 Consumers and Society....86
8.2.3.2 Providers, platforms and developers....88
8.2.3.3 Firms and Industries....89
8.3 Discussion and Avenues for Advanced Research....91
9 Current state and potential implementation of SMACIT Technologies....93
9.1 Social Media....93
9.1.1 Usage in the financial services sector....93
9.1.2 Potential Implementation....94
9.2 Mobile Applications....97
9.2.1 Usage in the financial services sector....97
9.2.2 Potential Implementation....98
9.3 Analytics....100
9.3.1 Usage in the Financial Services Sector....100

9.3.2 Potential Implementation 100
9.4 Cloud 102
9.4.1 Usage in the Financial Services Sector 102
9.4.2 Potential Implementation 103
9.5 Internet of Things 104
9.5.1 Usage in the Financial Services Sector 104
9.5.2 Potential Implementation 104
10 Conclusion and Limitations 106
References IV

1 Introduction

As Cerny (1994, p. 330) stated almost 25 years ago, the development of new communication and information technology (IT) is probably the most important development in the financial sector, since there are no physical goods to transform or sell. The sector in essence only concerns itself with the flow of information

One game changing opportunity today, are new digital technologies, provided that companies are able to transform successfully. SMACIT technologies are an area of new digital technologies, which can be combined with existing competencies of a company. This combination of technologies facilitates the possibility to offer new, compelling value propositions (Ross, et al., 2016a, p. 1).

SMACIT technologies can be distinguished from other technologies by their accessibility, they are, as well as their application, readily available in the marketplace. Thus, the application is easy to replicate and does not offer a sustained competitive advantage (Carr, 2003, p. 6; Piccoli & Ives, 2005, p. 766). In order to gain a sustained competitive advantage, it is necessary to construct applications of these technologies which are difficult or impossible to replicate (Mata, et al., 1995, p. 488).

One example for a digital customer engagement strategy in the financial services sector (FSS) is provided by the USAA[1], who redesigned their company to help their members navigate important “life events“, by constructing a seamless, multichannel experience for their members (Beath, et al., 2016, p. 3; Mocker, et al., 2015, p. 140). This leads to a new focus in product development, which is driven by perceived gaps in their ability to service customer life events (Ross, et al., 2016a, p. 6).

While companies like USAA integrate the new digital technologies today, back in 2012 they were even as a transforming company, like many others, not aware of the new emerging digital technologies. They figured that they had to go through a large transformation again in order to stay competitive. However, these companies still had an advantage compared to non-transforming companies. Through their successful internal transformations, they had already provided a stable operating platform upon which digital services could be built (Ross, et al., 2016b, p. 9).

Even today, these technologies still have a lot of unused potential. Thus, further analysis of the application of these technologies, as well as investigation of the present research is necessary. In order to investigate this topic, three research questions (RQ) are addressed in this thesis:

RQ 1: What are the thematic areas and level of analysis of scientific knowledge on SMACIT Technologies?

[1] The United Services Automobile Association (USAA) is a financial services group.

RQ 2: How can it be purposefully advanced?

RQ 3: How can these technologies be further adopted in the financial sector?

To answer these questions this paper draws on the established research framework of Aral et al. (2013, p. 4ff), in order to analyse each of the SMACIT Technologies. Through usage of the framework, it is possible to organize and categorize the findings. Further it will serve to investigate areas where further research is needed. The used research framework was proposed by Aral et al. (2013, p. 4ff) to help guide research into social media and business transformation across disciplines. The framework distinguishes four broad thematic areas of research (*activities*) across three distinct but overlapping units of analysis (*levels of analysis*). *Activities* are categorized into the four areas *design and features*, *strategy and tactics*, *management and organization*, and *measurement and value*. The *level of analysis* has the three perspectives, *consumer and society*, *platforms and intermediaries*, and *firms and industries*. In order to achieve the research objective scholarly papers concerning SMACIT technologies will be reviewed in consideration of the related research framework.

This paper is structured as follows: First, the fundamentals and key technological concepts underlying each SMACIT technology will be introduced. Subsequently, the process of collecting and analyzing the data is described. Afterwards, the general framework is introduced. The framework will then be adapted to the different SMACIT technologies if necessary, the adaptions and respective research questions will be presented. Accordingly, each technology will be investigated and the respective findings are presented. Further it will be discussed where research is necessary. Subsequently, the current state of implementation of SMACIT technologies in the FSS will be compared and the potential implementations of SMACIT technologies will be discussed. Finally, an overall conclusion of the respective findings is drawn. Further several limitations are described.

2 Fundamentals

SMACIT technologies present great opportunities for established companies to offer new, compelling value propositions, especially by combining their existing competencies with new digital capabilities.

Anxious to seize the moment, companies are reevaluating existing strategies and practices. Transforming companies tend to separate these new technologies into two types of digital strategies: customer engagement and digitized solutions. Customer Engagement transforms a company's go to the market approach. Therefore, its focus is on creating loyalty and trust or even passion, by providing innovative, superior, personalized, and increasingly integrated customer experiences while digitized solutions can be used to transform a company's business model. They further add value to the sold products by offering ongoing value-added service. Accordingly, the technologies reformulate what the company is selling (Ross, et al., 2016a, p. 5). These technologies and their key technological features are reviewed in this section.

2.1 Social Media

Social Media (SoMe) can be defined as "a group of internet-based applications that build on the ideological and technological foundations of modern web technologies (i.e. Web 2.0), and that allow the creation and exchange of user generated content" (Kaplan & Haenlein, 2010, p.

10 Conclusion and Limitations

As already mentioned in the first part, the most important development in the FSS is still the development of new communication and information technology. This can be achieved through the usage of SMACIT technologies. Companies that would like to adopt these technologies must be able to transform and integrate the solutions in digital strategies. This paper analyzed these technologies with an established framework, through which it is possible to organize and categorize the findings. Further investigated areas where further research is needed and examines potential applications in the FSS.

All of the proposed research questions were answered in this thesis. The first research question concerning the thematic areas and levels of analysis of scientific knowledge on SMACIT Technologies, was answered through the adaption and execution of the proposed research framework of Aral et al (2013, p. 4ff). Each SMACIT technology was reviewed and classified through an extensive literature review for all thematic areas (as seen in sections 4.2, 5.2, 6.2, 7.2 and 8.2). Furthermore, the predominant and the neglected fields of these technologies were identified in, in order to build a basis for advancing academic literature purposely (as seen in sections 4.3, 5.3, 6.3, 7.3 and 8.3). This study provides research questions which may guide further research on these technologies. The last research question was answered in section 9. There the adoption of all SMACIT technologies was reviewed and further potential areas of implementation in the Financial Services Sector were presented.

Conceptually, this study contributes to SMACIT research by providing a prospective research framework that was adapted, if necessary, from the prominent guiding agenda by Aral et al (2013, p. 4ff). Even beyond the research questions defined for each SMACIT technology, the conceptual framework can be used to map focal user *activities* and *level of analysis* in order to find open areas for research in the future or systematically create new research questions.

This paper was structured as follows: First, the fundamentals and key technological concepts underlying each SMACIT technology were introduced. Subsequently, the process of collecting and analyzing the data was described. Afterwards, the general research framework was introduced. The framework was then adapted to the different SMACIT technologies if necessary. Further, the adaptions and respective research questions were presented. Accordingly, each technology was investigated and the respective findings were presented. Further, it was discussed where further research is necessary. Subsequently, the current state of implementation of SMACIT technologies in the FSS was compared and the potential implementations of SMACIT technologies were discussed.

The contributions of the study need to be considered in the light of its limitations. Due to the emergent nature of the presented technologies, the reviewed literature was partly not published in high ranking journals with prolonged review cycles, but rather in conference proceedings. Furthermore, the selection criteria were adjusted during the research which leads to varying findings concerning the different technologies, for example papers concerning the application of Apps in the health sector were not included but may have led to further potential for research in that area. However, papers of this area of research were included in the section concerning *IoT* technologies. Furthermore, only articles written after 2013 were reviewed for the sections of *Apps, Analytics, Cloud*, and the *IoT*, which makes it difficult to draw an overall conclusion concerning further research potential. These selection criteria were introduced to due to the vast evolving nature and application areas of these technologies. Moreover, the

literature research was limited to a number of five databases, this may have led to the exclusion of some relevant papers in non-researched databases. Another limitation is that only articles written in English or German were reviewed.

Overall, this thesis aimed to give an initial roadmap to foster more journeys into the exciting terrain of SMACIT technologies.