



Institut für Wirtschaftsinformatik  
Prof. Dr. rer. nat. Michael H. Breitner

# Use Cases for the Integration of Digital Speech Assistants in Insurance Business Models

Masterarbeit

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

vorgelegt von

Name: Zeytünlü



Vorname: Cansu



Prüfer: Prof. Dr. Michael H. Breitner

Hannover, 04. Oktober 2018\*

\*(Datum der Beendigung der Arbeit)

# Table of Contents

List of Figures .....	IV
List of Tables .....	V
List of Abbreviations .....	VI
Abstract .....	
.....	
.....	VII
<b>1 Introduction .....</b>	<b>1</b>
1.1 Motivation and Relevance .....	1
1.2 Research Questions and Objectives .....	1
1.3 Framework of the Thesis .....	2
<b>2 Theoretical Foundations .....</b>	<b>4</b>
2.1 Literature Review .....	5
2.1.1 Systematic Literature Review Methodology .....	5
2.1.2 Evaluation of the Review Results .....	7
2.2 Transformation of the Insurance Industry .....	12
2.2.1 Overview: Current Challenges and Transformation Drivers .....	12
2.2.2 Analysis of Customer Expectations and Customer Experiences .....	18
2.2.3 Insurance Business Model and Value Chain .....	21
2.3 Digital Speech Assistants .....	23
2.3.1 Artificial Intelligence enables Human-Machine Communication .....	23
2.3.2 State of the Art .....	26
2.3.3 Application: Conversational Commerce .....	31
<b>3 Research Design .....</b>	<b>33</b>
3.1 Design Science Research Approach .....	34
3.2 Requirements Elicitation .....	36
3.3 Qualitative and Quantitative Methods .....	39
3.3.1 Fundamentals .....	39
3.3.2 Expert Interview: Framework and Implementation Design .....	40

---

3.3.3 Survey: Framework .....	42
3.4 Writing Use Cases .....	44
<b>4 Derivation of a Requirement Profile .....</b>	<b>46</b>
4.1 Expert Interview Evaluation .....	46
4.2 Setting up a Requirement Profile.....	54
<b>5 Use Cases: Digital Speech Assistants in the Insurance Industry .....</b>	<b>59</b>
5.1 Use Cases .....	60
5.1.1 Use Case 1: Deutsche Familienversicherung Advises its Customers Digitaly .....	60
5.1.2 Use Case 2: Customer Communication in Natural Language is Digitized.....	64
5.1.3 Use Case 3: Interactive Voice Response helps to solve Technical Problems of Employees .....	71
5.1.4 Use Case 4: Effective Workplace Organization by Proactive and Reactive Assistance Functions in Natural Language .....	74
5.2 Assessment of the Use Cases .....	78
5.2.1 Empirical Analysis of the Survey Results .....	78
5.3 Results.....	82
<b>6 Impact and Recommendations .....</b>	<b>84</b>
<b>7 Limitations .....</b>	<b>85</b>
<b>8 Conclusion and Outlook.....</b>	<b>86</b>
<b>Attachment.....</b>	<b>88</b>
Literature used .....	89
Interview-Guide (German).....	89
Interview-Guide (English).....	91
Transcription Interviews (A-F).....	92
Survey .....	126
Survey Evaluation .....	129

---

<b>References .....</b>	<b>135</b>
<b>Ehrenwörtliche Erklärung.....</b>	<b>142</b>

# 1 Introduction

## 1.1 Motivation and Relevance

We live in an exciting time in which more than 4.5 billion people are connected to each other via social networks. Today not only people communicate via the Internet, but also machines and products and even human-machine communication is possible. Data flows in ever-increasing quantities between participants, regardless of whether they are humans or machines.<sup>1</sup> So far, the human-machine communication has been carried out via the familiar input devices such as keyboard, mouse, touchpad or other input devices. The actions with the input devices lead to an interaction with the user. Digital Speech Assistants offer the possibility of a voice-activated user interface. Using an artificial personality, Digital Speech Assistants can mimic human communication by communicating interactively and emotionally with the user. It can respond to user questions, submit suggestions, keep track of the user's calendar, perform control functions on smart home devices, play desired music, or perform remote control functions. The emerging technology offers various application options; in a more advanced concept, digital assistants also function as driver assistants, for example.<sup>2</sup> The objective of Digital Speech Assistants is primarily to increase the productivity of the user.<sup>3</sup>

Digitalization and technologies are rapidly changing the financial sector. Innovative applications of digital technologies such as Digital Speech Assistants for financial services are used, for example, to improve and intensify the interface between customers and financial service providers.<sup>4</sup> The term digital transformation describes a change that is triggered by digitalization. The term encompasses continuous changes in business models, business processes and customer interaction due to new information and communication technologies to improve competitiveness.<sup>5</sup> Tischhauser et al. defines digitization with a focus on business consequences in the insurance sector as the use of new technologies to industrialize and automate processes, to change communication

## 1.2 Research Questions and Objectives

The overarching goal of this thesis is to analyze and formulate use cases for the integration of Digital Speech Assistants in the business models of insurance companies. In advance, requirements for Digital Speech Assistants are to be defined, which are to

---

<sup>1</sup> Cf. Streibich, K.-H. (2015), p. 15.

<sup>2</sup> Cf. ITWissen.info (Editor) (2018) and Floyd, B./ Schuster H. (2017).

<sup>3</sup> Cf. Sarikaya, R. (2017), p. 68.

<sup>4</sup> Cf. OECD (Editor) (2018), p. 3.

<sup>5</sup> Cf. KPMG (Editor) (2014), p. 16.

be taken into account in the development of the use cases. These successive goals that build on one another are to be achieved by answering the following research questions in the context of this thesis:

- A. *What requirements do Digital Speech Assistants need in order to be integrated into sustainable business models of insurance companies?*
- B. *How can Digital Speech Assistants be integrated into insurance business models?*

When answering the second research question, it should be taken into account at which point in the insurance value chain the use of Digital Speech Assistants makes sense, and which benefits arise for both insurance companies and customers. The concluding assessment of the implementation potential of use cases can be seen as an objective with reference to both research questions. The transformation of the insurance industry plays a central role in the approach of using Digital Speech Assistants in the Insurance Industry.

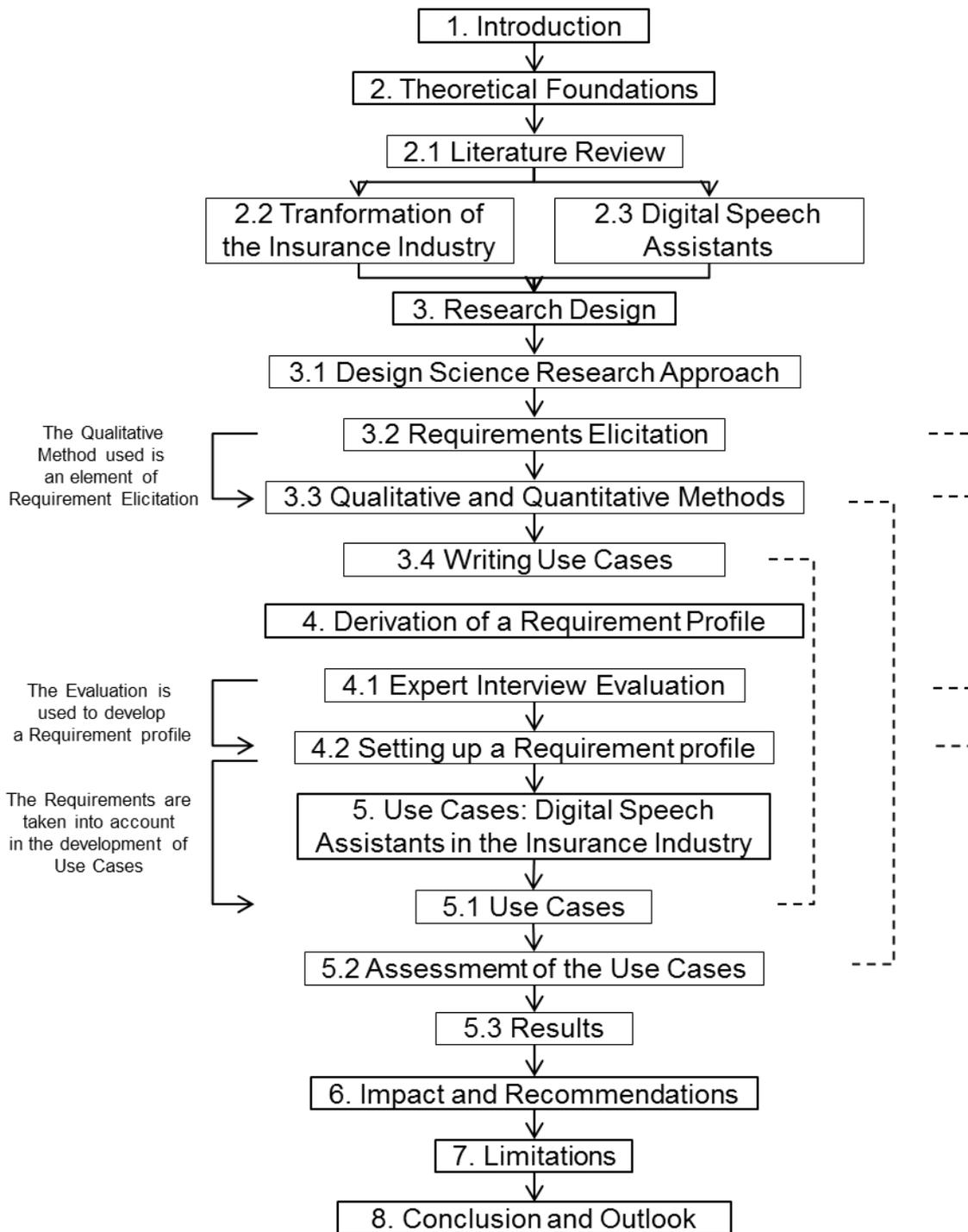
### **1.3 Framework of the Thesis**

In order to achieve a comprehensive study of the above-mentioned research questions the study will comprise seven consecutive chapters following this introduction. Figure 1 shows the structure of this work graphically. Chapter 2 sets out the theoretical foundations providing a guideline for the topics covered in each chapter. In this context, first a structured and systematic literature review according to Webster and Watson<sup>6</sup> is carried out in chapter 2.1. Based on the literature review, the transformation of the insurance industry will be examined in advance (chapter 2.2) and then the state of the art of Digital Speech Assistants will be presented (chapter 2.3). Chapter 3 lays the foundations for research design and methodology. Subsequently, the interviews and the survey are evaluated on this basis in the following chapter. The interviews serve to set requirements for Digital Speech Assistants and the applied survey serves to explore the potential of the different uses of speech assistants in a representative sample. The dashed lines in Figure 1 show the connections between the research methods used and the main part of this work.

---

<sup>6</sup> Cf. Webster, J./ Watson, R. T. (2002).

Figure 1: Thesis Framework

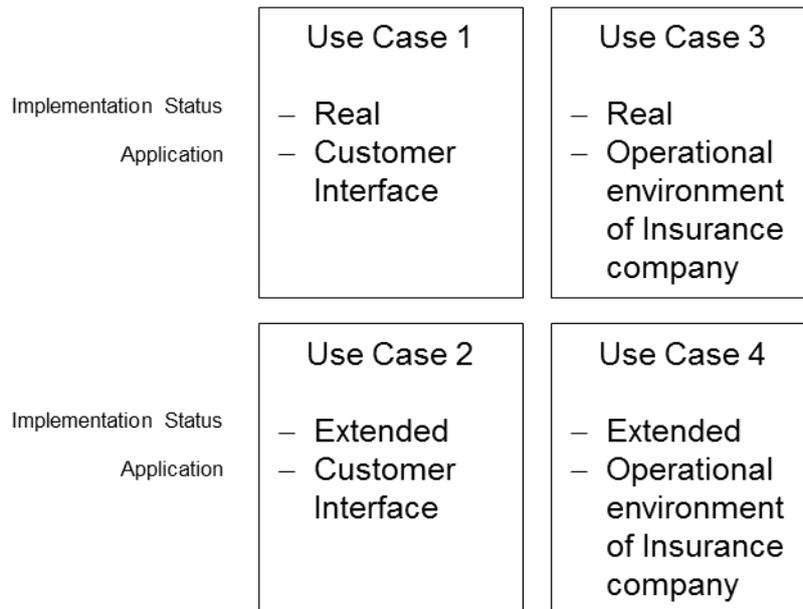


Source: own representation.

In Chapter 5, four use cases are presented. Two of these use cases are based on real applications of speech assistants, the other two cases are extended versions. One of the two real cases describes the use of speech assistants at the customer interface of insurance companies, the second case represents an application of voice assistants

in the company's internal use. Accordingly, one of the extended use cases represents the use at the customer interface, the other extended case refers to the use in the operational environment of insurance companies. Figure 2 shows an overview of the use cases with the according implementation status and the area of application.

*Figure 2: Use Cases Overview*



*Source: own representation.*

## 2 Theoretical Foundations

Chapter two sets out important principles on the insurance market and Digital Speech Assistants to provide a basic, thematic understanding of the analysis of the following chapters. For this purpose, a literature analysis on the respective topic areas is carried out. First, the method of structured and systematic literature review will be described. Subsequently, the literature results of the analysis will provide an overview of the challenges and transformation drivers in the insurance industry and focus on customer needs and customer expectations. This sets the starting point for the use of new innovation technologies within the insurance industry. It follows a description of the impact of the digital transformation on the insurance business models and on the value chain of insurance companies. The results of the literature review also serve as a basis to describe the state of the art of Digital Speech Assistants and their application in conversational commerce as well as the possibilities and drivers of speech assistants. The aim of this chapter is to illustrate the links between the current situation of the insurance market and the development and application of Digital Speech Assistants in this industry.

of success. Another topic that has not been examined is the technical implementation of use cases.

## 8 Conclusion and Outlook

This chapter concludes the thesis with a summary and an outlook for possible further research areas. Within this framework, the research questions from chapter 1.2. will first be taken up and answered.

As described in Chapter 1.1, the use of Digital Speech Assistants is increasingly contributing to changes in communication within the insurance industry. This results in new challenges and fields of action. Within the context of this study, possible applications in the form of use cases for the integration of Digital Speech Assistants into the business models of insurance companies were examined. In connection with this, requirements for Digital Speech Assistants in the context of the insurance industry were first determined by means of expert interviews, which were taken into account when creating the use cases.

The first two objectives of this work (reference to figure/table) were used to answer the following research question:

- A. What requirements do Digital Speech Assistants need in order to be integrated into sustainable business models of insurance companies?

Sustainable business models of insurance companies have to be able to adapt due to the advancing developments in the insurance ecosystem. With regard to this, the integration of Digital Speech Assistants into Insurance Business Models requires that they contribute to the restructuring of the insurance value chain by enhancing the efficiency of primary and secondary activities without involving human agents.

With regard to the performance and capabilities of the Digital Speech Assistants, the primary requirement is that mature Artificial Intelligence enables Natural Language Processing at a high level. The requirement characteristics identified by the expert interviews also include transparency in connection with data security and data protection. Furthermore, the requirement is made that Digital Speech Assistants can establish human contact if desired.

Targets three and four were developed to answer the second research question:

- B. How can Digital Speech Assistants be integrated into business models?

In the context of this research question, four use cases were developed. Two already implemented use cases of Digital Speech Assistants in insurance companies serve as

the basis for this. These two real use cases were each extended by fictitious use cases. It can be concluded that the implementation of Digital Speech Assistants can contribute to added value both at the customer interface and in the operational environment of insurance companies.

The overarching 5th objective serves to evaluate the implementation potential of the developed use cases. A survey was carried out within the scope of this thesis. Of the given possible areas of application (in everyday life, at the customer interface of service companies and at the workplace), the survey indicates that the majority of the representative sample has so far used or would use the Digital Speech Assistants for support in everyday life. The use of Digital Speech Assistants has so far achieved little acceptance at the customer interface of service companies.

This work took up the task and developed on the basis of four use cases possible integrations of Digital Speech Assistants at the customer interface as well as in the operational environment of insurance companies. With regard to further research possibilities, this area offers the opportunity to analyze and develop further approaches for the use of Digital Speech Assistants in the insurance industry. The problem-oriented approach presented in this thesis for the creation of use cases, which mainly contain the functional requirements for Digital Speech Assistants, can be extended by the solution-oriented approach. For this purpose, future research topics may deal with the development and implementation of use cases.

Furthermore, the application of Digital Speech Assistants in this context refers to the implementation in the business models of insurance companies. For further research the use of Digital Speech Assistants in other industries could be investigated, e.g. in the industrial sector for the process of communication between suppliers and manufacturers.