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Dissertation

Structural Changes in Online Retailing and the Marketing Mix

An Analysis Considering
Multichannel Online Retailing and
Voice Dialog Interfaces

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The online retail environment is expanding, enhancing the possibilities for customers to shop online. On the one hand, a proliferation of online channels establishes a multichannel online retailing landscape, which offers customers more alternatives in terms of where to shop online. On the other hand, a change in the user interaction mode of existing customer touchpoints, from graphics to voice, creates new voice dialog interfaces, which enhance the way with regard to how customers can shop online. In this context, this publication-based dissertation aims to generate theoretical and practical contributions on these two most recent developments in online retailing, i.e., multichannel online retailing and voice dialog interfaces, to improve marketing mix decision-making.



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An Analysis Considering Multichannel Online Retailing and Voice Dialog Interfaces

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List of abbreviations

AIC	Akaike Information Criterion
B2B	Business-to-Business
B2C	Business-to-Consumer
B2G	Business-to-Government
C2B	Consumer-to-Business
C2G	Consumer-to-Government
C2C	Consumer-to-Consumer
cf.	compare (Latin: conferatur)
e.g.	for example (Latin: exempli gratia)
ed.	edition
Eds.	Editors
EM	E-marketplace
et al.	et alii
FMCG	Fast-Moving Consumer Goods
G2B	Government-to-Business
G2C	Government-to-Consumer
G2G	Government-to-Government
GE	General Electric
GHX	Global Healthcare Exchange
GUI	Graphical User Interface
HCI	human-computer interaction
i.e.	that is (Latin: id est)
Inc.	Incorporated
M	mean
n.d.	no date
No.	Number
OS	Online Shop
p.	page
Pct	percentage
PILT	product, information, logistics, transaction

pp.	pages
SD	Standard Deviation
SE	Standard Error
UK	United Kingdom
U.S.	United States
USA	United States of America
VHB	Verband der Hochschullehrer für Betriebswirtschaftslehre [<i>German Academic Association for Business Research</i>]
Vol.	Volume
VUI	Voice User Interface

1. Introduction

From department stores, supermarkets and discounters to franchises, retailing has consistently undergone significant structural changes (McArthur, Weaven, & Dant, 2016). This dynamic nature has persisted over the past two decades. The advance of the Internet – and consequently the rise of e-commerce – significantly changed the retail industry once more, by changing the way customers search for information and buy products. Today, retail e-commerce sales account for approximately 14% of total retail sales, and this share is predicted to further increase to 20% until 2022 (eMarketer, 2019).

Manufacturers¹ leveraged the rise of e-commerce to increasingly vertically integrate their supply chains, i.e., eliminating retailers and wholesalers and selling directly to customers (McArthur et al., 2016). In addition to generating cost efficiencies, this enables them to fully plan, implement and control their marketing instruments to offer a consistent brand experience to customers (Zentes, Morschett, & Schramm-Klein, 2017). Nowadays, however, the online retail landscape itself is changing significantly so that manufacturers are confronted with novel and highly relevant marketing instruments that further increase the complexity of designing the marketing mix.

On the one hand, a proliferation of online channels² leads from a singular to a multichannel online environment that enhances the opportunities for customers in terms of where to shop online (Wagner, 2015). Long perceived as a singular channel, the online retail environment has expanded. In particular, business-to-consumer (B2C) e-marketplaces³, such as Amazon Marketplace and eBay, have developed into an important distribution channel within online retailing. In 2018, these platforms accounted for approximately 40% of total retail e-commerce sales globally, and this share is predicted to further increase significantly in the coming years (iBe, 2019). Due to this proliferation of online channels, multichannel online retailing has become a crucial strategy for companies (Wagner, 2015).

¹ Manufacturers are also considered to be brand owners.

² Online channels are defined as digital retail formats that offer customers the opportunity to buy products online.

³ B2C e-marketplaces are defined as two-sided platforms that match customers and sellers whereas the ownership and control of goods is left to sellers (Hagiu, 2007).

On the other hand, a change in the user interaction mode of existing customer touchpoints⁴ – from graphics to voice – creates new voice dialog interfaces⁵ that enhance the opportunities for customers in terms of how to shop online (Gollnhofer & Schüller, 2018). Today, a diverse range of customer touchpoints exists. These touchpoints have long been merely graphical user interfaces (GUIs), but with the integration of Siri into the iPhone 4S in 2011, a new type of voice user interface has been brought into the mainstream: voice dialog interfaces. These interfaces have rapidly grown in popularity, especially since the launch of the first smart speaker device⁶, Amazon Echo, in 2015. For 2019, it has been estimated that approximately 115 million households globally have access to a smart speaker, and this figure does not include other types of devices with voice dialog interfaces such as smartphones and tablets (Strategy Analytics, 2019). According to a U.S. survey (Voicebot, 2019), currently, only 15% of customers have made a purchase through smart speakers, while 28% have used one to search for product information. Active smart speaker users, however, expect that their spending via smart speakers will grow sixfold in three years to 18% of their total expenditure (Capgemini, 2018).

Due to these structural changes in online retailing, manufacturers have to generate a clear understanding of the challenges and opportunities of multichannel online retailing and voice dialog interfaces to be able to design an efficient and effective marketing mix (see Figure 1).

⁴ Customer touchpoints are defined as Internet-enabled devices that customers can use to interact with and buy products through online channels.

⁵ Voice dialog interfaces are systems that allow users to interact through spoken natural language. In contrast to traditional voice user interfaces, these interfaces incorporate all of the following technologies: (1) voice input, (2) natural language understanding, (3) voice output, (4) intelligent interpretation and (5) agency (Budi & Laubheimer, 2018).

⁶ Smart Speakers are wireless devices with an integrated voice dialog interface that interact with users through spoken natural language and can provide information, perform tasks and offer services based on voice commands.

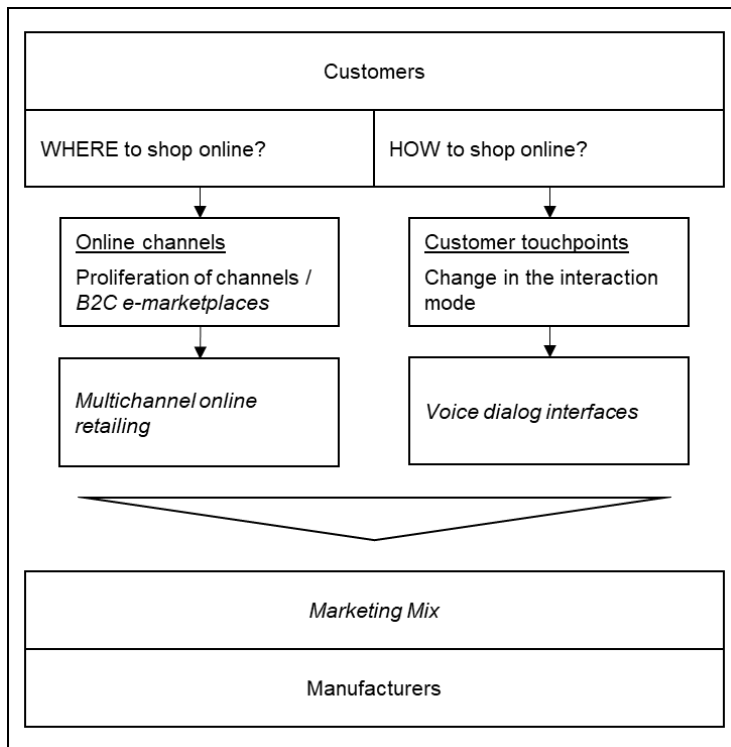


Figure 1: Structural changes in online retailing and the marketing mix
Source: Own illustration.

1.1 Research objectives

This publication-based dissertation is organized as follows (see Figure 2). After the introduction to the topic above, this chapter outlines the research objectives and summarizes each of the three papers, including the status of the publications. The following chapters present the three research papers. In general, these contribute to two overarching research fields, multichannel online retailing and voice dialog interfaces, but are all independent of each other; thus, they are ordered chronologically. The dissertation closes with a summary of the main contributions, limitations and directions for future research.

The marketing management process contains the six following tasks: (1) situation analysis, (2) definition of the marketing goals, (3) goal-oriented definition of the marketing strategy, (4) strategy-based definition of the marketing instruments, (5) design of the marketing organization and (6) marketing controlling (Meffert, Burmann, Kirchgeorg, & Eisenbeiß, 2019). The key element of the strategy-based definition of the marketing instruments, the fourth task of the marketing management process, is

the design of the marketing mix, i.e., the combination and coordination of the different marketing instruments. The most commonly known marketing mix paradigm is the Four P model, which McCarthy (1960) introduced as a marketing decision-making framework. It outlines four main marketing instrument areas: product, price, place and promotion. The model itself is straightforward and rather simplistic but the application in practice is complex as functional, chronological and hierarchical dependencies need to be considered to make reasonable decisions for each of the marketing instruments and to develop an efficient and effective marketing mix (Meffert et al., 2019). Moreover, manufacturers are constantly faced with new challenges and opportunities in the marketing mix decision-making process due to ongoing structural changes in retailing. In this context, the general objective of this dissertation is to provide theoretical and practical insights on the most recent developments in online retailing, i.e., multichannel online retailing and voice dialog interfaces, to enhance marketing mix decision-making. The following paragraphs outline the research objectives for each of the papers in more detail.

In the Four P model, place refers to all decisions and actions that deal with the distribution of products and services from manufacturers to consumers. In this context, the distribution channel structure needs to be systematically planned, coordinated, implemented and controlled based on previously defined distribution strategies and goals (Meffert et al., 2019). For this, one of the basic decisions is related to the vertical structure, i.e., whether to sell directly or indirectly to customers (Stern & El-Ansary, 1992). In direct distribution channels, manufacturers manage and control all marketing functions themselves. In contrast, in indirect distribution channels, manufacturers rely on legally and economically independent intermediaries that fulfill most or even all marketing functions. Considering B2C e-marketplaces, this vertical structuring does not seem to apply well because these two-sided platforms are intermediaries in the distribution channel but manufacturers need to perform most marketing functions themselves, e.g., pricing, shipping and customer service. Therefore, a profound understanding of this distribution channel is vital, especially in multichannel environments, to be able to make reasonable decisions with regard to the distribution channel structure. There is, however, still a lack of B2C e-marketplace understanding and knowledge as existing research has primarily focused on business-to-business

(B2B) e-marketplaces (e.g., Kaplan & Sawhney, 2000; Mohavedi, Lavassani, & Kumar, 2012) and studies that address B2C e-marketplaces have mainly examined consumer behavior or sales strategies (e.g., Hong & Cho, 2011; Pereira, Duarte, Meira, & Góes, 2009). Paper A aims to fill this gap and thereby improve decision-making in regard to the distribution channel structure by investigating the following research question:

- How can e-marketplaces be generally described and classified?
- What is the role of B2C e-marketplaces in the distribution channel?

In the Four P model, price includes all agreements about the price of the products and services including any discounts, shipping and payment terms as well as price enforcement. Based on pricing goals and exogenous and indigenous determinants for pricing decisions, general pricing strategies need to be defined (Meffert et al., 2019). In multichannel management, price differentiation, specifically the question of charging the same or different prices for the same product across channels, has been identified as a key issue (Neslin & Shankar, 2009). In general, this pricing strategy does not seem to be a reasonable approach in online retailing as transaction costs for customers with regard to search and information costs are reduced, which leads to a significantly increased price transparency for customers (Bakos, 1997). Several conceptual and empirical publications have analyzed the occurrence, extent, opportunities and risks of price differentiation between the online and offline channels (e.g., Wolk & Ebling, 2010; Zhang et al., 2010). However, the author is not aware of any study that deals with price differentiation in multichannel online retailing so there appears to be a gap in knowledge for reasonable pricing decisions within the online channel. Therefore, Paper B aims to fill this gap by addressing the following research questions:

- Do manufacturers engage in channel-based price differentiation within the online channel, i.e., is price differentiation a viable strategy in multichannel online retailing?
- Which factors influence the occurrence and direction of channel-based price differentiation within the online channel?

In parallel to the development of multichannel online retailing, customers also change the way how they shop online as they increasingly use voice dialog interfaces to buy

products and to search for product information. As of today, manufacturers cannot fully leverage this customer touchpoint to sell directly to customers because Amazon and Google do not allow the sales of physical goods through Alexa Skills and Actions on Google (Amazon, n.d.; Google, n.d.). However, as many customers leverage this touchpoint to search for product information, managers and marketers should already use voice dialog interfaces as a communication channel. In the Four P model, promotion refers to the systematic planning, design, coordination and monitoring of all communication measures with regard to the relevant target groups. In the different stages of the communication process, two of the key decisions to make are (1) which communication channels or instruments are used and (2) how the communication message is designed (Meffert et al., 2019). As the popularity of voice dialog interfaces has rapidly grown, these interfaces should be leveraged as communication channels and voice needs to be considered by manufacturers when designing communication messages. However, spoken natural language is highly complex, and various research fields, e.g., human-computer interaction, linguistics and cognitive psychology, address aspects of voice dialog interfaces, which leads to fragmentation in the existing literature (Clark et al., 2019; Landay, Oliver, & Song, 2019). In the case of marketing research, there is an overall gap in knowledge (Jones, 2018). Paper C aims to fill this gap by analyzing the current practices of fast-moving consumer goods (FMCG) brands. The following research questions are investigated to provide insights for better decision-making concerning marketing communications:

- Do FMCG brands use voice dialog interfaces as a communication channel, i.e., do they own and control the voice experience of their brands today?
- How can the quality of existing communication messages of FMCG brands through voice dialog interfaces be assessed and how can it potentially be improved?

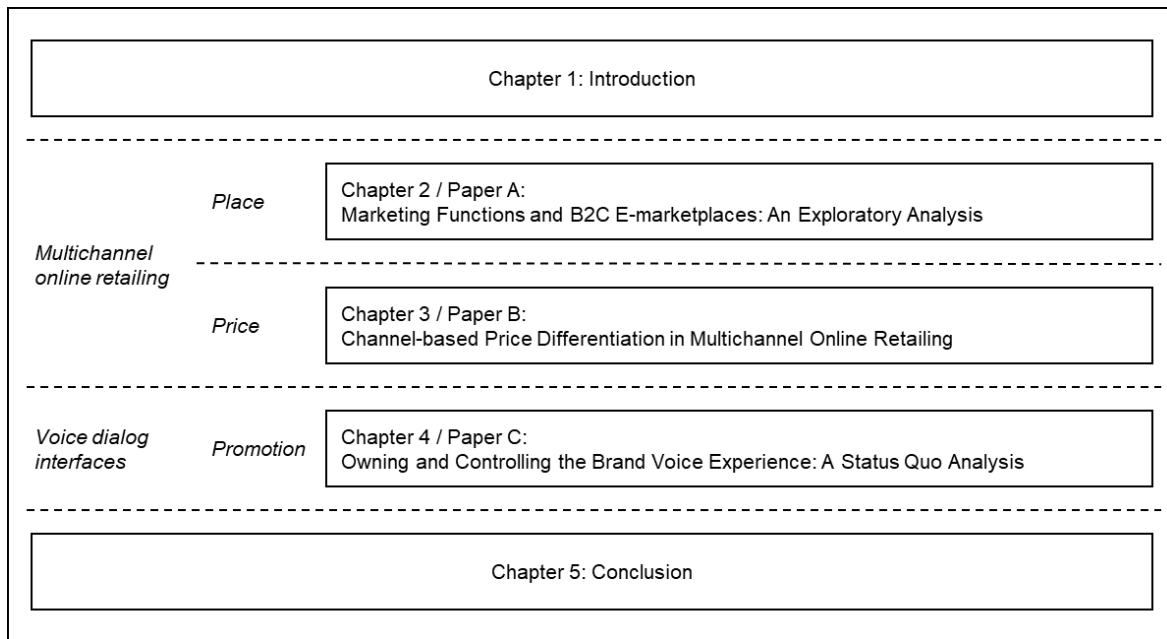


Figure 2: Structure of dissertation

Source: Own illustration.

1.2 Summary of research papers

As mentioned above, the overall research objective of this dissertation is to contribute to improved marketing mix decision-making with regard to place, price and promotion⁷ by conceptually as well as empirically investigating the research fields multichannel online retailing and voice dialog interfaces (see Figure 3).

Paper A, *Marketing Functions and B2C E-marketplaces: An Exploratory Analysis*, focuses on enhancing the understanding and knowledge of B2C e-marketplaces to provide a foundation for better decision-making in terms of the distribution channel structure. First, a general e-marketplace classification scheme which aims to answer the basic market questions of what, how and for whom is derived from extant concepts. Second, the study builds on nine selected contributions to the marketing functions theory to develop a novel analytical tool for channel research, the PILT framework. This framework is then used to analyze the role of B2C e-marketplaces in the distribution channel. Furthermore, to derive practical insights, a case study that

⁷ Product (or program), as the fourth marketing mix element, refers to all decisions that deal with the design of the offered products and services. This element, however, is not considered in this dissertation.

analyzes and compares the B2C e-marketplaces of Amazon and Walmart, two of the world's largest retailers (Debter, 2019), is presented.

Paper B, *Channel-based Price Differentiation in Multichannel Online Retailing*, focuses on pricing strategies, specifically price differentiation, and examines the occurrence and extent of channel-based price differentiation in multichannel online retailing. In addition, the paper explores factors that influence a company's decision to engage in online channel-based price differentiation. First, a conceptual model based on economic theory is developed to derive hypotheses about market, seller⁸ and product characteristics that influence this decision. Second, an empirical study investigates actual seller behavior to explore the occurrence and extent of channel-based price differentiation and its influencing factors. The study considers two online channels, seller-operated online shops and Amazon Marketplace, as a proxy for B2C e-marketplaces, and the collected data sample consists of 960 products across various categories that are sold directly to customers through both channels by 48 sellers.

Paper C, *Owning and Controlling the Brand Voice Experience: A Status Quo Analysis*, investigates the current practices of FMCG brands in regard to voice dialog interfaces and provides theoretical and practical insights into this communication channel and corresponding communication message design. First, it is analyzed whether the nine top global FMCG brands offer specific brand voice experiences in terms of own voice apps such as Alexa Skills. Second, existing Alexa Skills offered by FMCG brands are assessed to explore the current customer experience and potential areas of improvement. For this, based on extant human-computer interaction, linguistics, cognitive psychology and marketing research, a voice design guidelines framework for brands with corresponding assessment criteria is developed.

⁸ Sellers are manufacturers or retailers.

<i>Multichannel online retailing</i>	<i>Place</i>	<p>Paper A: Marketing Functions and B2C E-marketplaces: An Exploratory Analysis</p> <p><u>Rigor:</u> Based on marketing functions theory, a framework for channel research is developed to analyze B2C e-marketplaces.</p> <p><u>Relevance:</u> B2C e-marketplaces have rapidly developed and grown over the past years but there is a lack of general understanding and knowledge about their role in the distribution channel.</p>
	<i>Price</i>	<p>Paper B: Channel-based Price Differentiation in Multichannel Online Retailing</p> <p><u>Rigor:</u> Based on a collected data sample of 960 products, the occurrence and extent of channel-based price differentiation in multichannel online retailing are investigated.</p> <p><u>Relevance:</u> Pricing respectively price differentiation is one of the key issues in multichannel management but there is a gap in research on price differentiation in multichannel online retailing.</p>
<i>Voice dialog interfaces</i>	<i>Promotion</i>	<p>Paper C: Owning and Controlling the Brand Voice Experience: A Status Quo Analysis</p> <p><u>Rigor:</u> Based on existing multidisciplinary research, a design guideline framework for brands is developed to assess the current practices of FMCG brands.</p> <p><u>Relevance:</u> Manufacturers need to own and control the voice experience of their brands as spoken natural language will become a dominant customer touchpoint quickly but there is a general knowledge gap in marketing research.</p>

Figure 3: Rigor and relevance of papers

Source: Own illustration.

1.3 Publication status and author contribution

All three papers are the author's independent research without any collaboration and contribution from other researchers.

Paper A has been reviewed and published by the Journal of Marketing Channels (currently no VHB rating).

Paper B has been rejected by two journals after the peer review, i.e., this paper has not been published.

Paper C has been submitted to and is currently under review at the Journal of Strategic Marketing (VHB: "C").

Table 1 provides an overview of the contributions and the current publication status (October 7, 2010) for each paper.

	Paper A:	Paper B:	Paper C:
	Marketing Functions and B2C E-marketplaces: An Exploratory Analysis	Channel-based Price Differentiation in Multichannel Online Retailing	Owning and Controlling the Brand Voice Experience: A Status Quo Analysis
Joint work with	-	-	-
Contribution	Author's independent research	Author's independent research	Author's independent research
Publication status	10/2020: Reviewed and published by <i>Journal of Marketing Channels</i> (currently no VHB rating), DOI: 10.1080/1046669X.2020.1828687	not published	05/2020: Submitted to and under review at <i>Journal of Strategic Marketing</i> (VHB: "C")

Table 1: Summary of contributions, publications and co-authors of papers

2. Paper A: Marketing Functions and B2C E-marketplaces: An Exploratory Analysis

This paper has been reviewed and published by the *Journal of Marketing Channels* (<https://www.tandfonline.com/doi/full/10.1080/1046669X.2020.1828687>).

Abstract: Business-to-consumer e-marketplaces are an important and fast-growing distribution channel. Nevertheless, there is a lack of literature that attempts to describe and classify business-to-consumer e-marketplaces and to analyze their role in the distribution channel. This paper seeks to address this deficiency and to add clarity to our understanding of these two-sided platforms. A new innovative marketing functions concept is developed: the PILT framework. It consists of four main functions, product, information, logistics and transaction, and ten subfunctions. Applying this framework reveals that business-to-consumer e-marketplaces are infomediaries, completely fulfilling only information functions. All other functions must be managed by the sellers themselves or outsourced to other intermediaries such as logistics companies or banks. A case study of Amazon and Walmart Marketplace is presented to further illustrate the PILT framework. It reveals that Amazon Marketplace fulfills more marketing functions than Walmart Marketplace, which may be an important success factor for B2C e-marketplaces.

Keywords: business-to-consumer e-marketplaces, functional analysis, Germany, infomediaries, marketing functions framework, online intermediaries

2.1 Introduction

E-commerce has experienced rapid development and growth over the past decade, and there is no indication that this trend will end soon. eMarketer (2015) predicts that global retail e-commerce sales will more than double to \$3.578 trillion by 2019. Business-to-consumer (B2C) e-marketplaces such as Amazon Marketplace, eBay, Rakuten and AliExpress represent an important sales channel within e-commerce. There are no sales or market share data available to delineate the size and continuously growing importance of this channel in detail. However, a recent study estimated that B2C e-marketplaces in the United States generated more than \$100 billion sales in 2015 (Internetretailer.com, 2016), which corresponds to nearly one-third of all U.S. e-commerce retail sales. Moreover, Amazon reported that its third-party sellers sold more than a billion units worldwide in 2013 (Amazon, 2014), and this number doubled in 2014, which represents 40 percent of the total units sold on Amazon (Amazon, 2015).⁹ These two data examples indicate the importance and rapidly growing business of B2C e-marketplaces. It also emphasizes the need to better understand this channel.

E-marketplaces, which are also referred to as electronic marketplaces or online marketplaces, are two-sided platforms that match customers and sellers whereas the ownership and control of goods is left to sellers (Hagiu, 2007). These marketplaces are online intermediaries, or cybermediaries (a term that was introduced by Sarkar, Butler and Steinfield (1995)), in the marketing channel.¹⁰

The previous research has primarily focused on general cybermediary topics (e.g., Anderson & Anderson, 2002; Barnes & Hinton, 2007; Sarkar, Butler, & Steinfield, 1995), i.e., not e-marketplaces specifically, or business-to-business (B2B) e-marketplaces (e.g., Dai & Kauffman, 2002; Kaplan & Sawhney, 2000; Mohavedi et al., 2012). Studies that address B2C e-marketplaces have mainly examined consumer behavior (e.g., Doong, Wang, & Shih, 2008; Hong & Cho, 2011), sales strategies (e.g.,

⁹ Unfortunately, Amazon has not published any comparable data for 2015.

¹⁰ Online intermediaries or cybermediaries can be defined as business organizations that occupy “an intermediary position in a supply chain between a buyer and a seller, and whose business is based on the use of Internet-based information and communication technologies” (Barnes & Hinton, 2007, p. 64).

Hagiu, 2007; Pereira et al., 2009) or specific cases such as Amazon Marketplace channel conflicts (Ryan, Sun, & Zhao, 2012).

Thus, the purpose of this paper is to add clarity to our understanding of B2C e-marketplaces by describing and classifying them and analyzing their role in the distribution channel.

Rosenbloom (2013) recommends the functional model as a starting point for channel research. Tamilya, Senecal and Corriveau (2002) already applied functional analysis to analyze online intermediaries in general and examined “how such cybermediaries differ in the way they carry out the marketing functions or flows relative to conventional channel participants” (p. 27). Therefore, the concept of marketing functions will be used to analyze the role of B2C e-marketplaces.

The research is organized as follows. First, the history and characteristics of marketing functions are outlined. Next, the new marketing functions concept, the PILT framework, is developed based on comparing and categorizing existing contributions with functional analysis. Afterwards, an e-marketplace classification scheme is introduced to differentiate the various types of e-marketplaces and to specify the retail format B2C e-marketplaces. The PILT framework is then applied to B2C e-marketplaces to analyze their role in the distribution channel. Next, a case study of Amazon and Walmart Marketplace is presented to analyze and compare these two B2C e-marketplaces using the developed framework. The paper closes by discussing its contributions to the literature and providing insights for practice.

2.2 Marketing functions

The economy of the nineteenth and early twentieth century was a seller’s market in which demand often exceeded supply. Thus, business thinking mainly focused on production rather than addressing the challenges of marketing (e.g., Beckman, Davidson, & Talarzyk, 1973; Keith, 1960). Shaw (1912) described a change in economic conditions and outlined the need for scientific analysis of market distribution:

“While we are but upon the threshold of the possibilities of efficiency in production, the progress thus far made has outstripped the existing system of distribution. If our

producing possibilities are to be fully utilized, the problems of distribution must be solved. A market must be found for the goods potentially made available.” (p. 705).

In this context, Shaw emphasized the growing importance of middlemen or intermediaries between producers and consumers as markets widened and introduced the functions of the middleman, which is the cornerstone of the functional analysis, to analyze the corresponding challenges for producers. This concept became one of the core contributions to the marketing discipline.

Weld (1917) built on Shaw’s work and defined the functions as marketing functions because they were not solely performed by middlemen. “This seemingly minor refinement introduced by Weld actually represented a profound shift in marketing thought” (Rosenbloom, 2013, p. 192) as it stated that the functions can be performed by any organization in the market (producers, intermediaries or consumers).

The initial concepts that were introduced by Shaw (1912) and Weld (1917) have been followed by many functional classification schemes from various authors, often varying in the criteria, the focus and consequently the number of marketing functions, ranging from just one to more than hundred different functions.

2.2.1 Characteristics of marketing functions

Marketing functions can be defined as “the various types of job tasks which channel members undertake” (Mallen, 1973, p. 19) to move goods from production to consumption. To analyze the functional activity of channel members, Converse, Huegy and Mitchell (1965) emphasized the need to think of functions in a multidimensional way and identified four different aspects: (a) functions are performed or not, (b) functions are performed much or little (performance extent), (c) functions are performed with different degrees of quality (performance quality) and (d) functions are performed to the extent and quality desired (performance certainty).

This multidimensional concept “adds an even sharper analytical aspect to functions” (Converse et al., 1965, p. 141). Moreover, three main characteristics of marketing functions must be considered when analyzing functional activity: (a) consistency, (b) divisibility and (c) substitutability.

Consistency means that the activities (functions) are inherent in the marketing process, must be performed and therefore cannot be eliminated (Stigler, 1951). New technologies can facilitate transactions between producers and consumers in a fascinating way; however, “what should be remembered when the dust settles from all of the spectacular new technologies and methods is that they are essentially a means of performing basic marketing functions” (Rosenbloom, 2013, p. 194). Today, consumers can buy a new watch with a click on their smartphones, laptops or desktop computers, a phone call or a visit to a brick-and-mortar store, i.e., marketing functions can be performed in different ways, but in the end each activity must be fulfilled to move goods from producers to consumers.

Divisibility illustrates that functions can be divided and shared with other entities to enhance functional performance (Converse et al., 1965). Frazier (1999) shows that especially manufacturers often miss this opportunity as “saving costs by off-loading as many functions as possible to downstream channel members is the key imperative” (p. 235). Shop-in-shops, i.e., spaces within a retail store that are dedicated to specific brands and mostly operated by the respective manufacturers, are an example of sharing marketing functions between retailers and producers.

Substitutability delineates that marketing functions are dynamic. If an entity is able to provide an activity more efficiently, i.e., reducing the total costs of a channel system, it will substitute the current functional act (Bucklin, 1966). Disintermediation, i.e., eliminating retailers and wholesalers in the distribution channel and selling directly to consumers, is an example of the substitutability of marketing functions. For example, Amazon used Internet resources to build a convenient, electronic platform to facilitate the purchase of books and thus substituted well-established retailers such as Barnes and Noble.

2.2.2 The framework of marketing functions

Different concepts in the extant literature must be examined, grouped and categorized to develop a new marketing functions framework. The framework is based on nine selected contributions to the concept of functional analysis (Buddeberg, 1959;

Cherington, 1920; Converse, 1926; McGarry, 1950; Oberparleiter, 1930; Seyffert, 1972; Shaw, 1912; Sundhoff, 1965; Weld, 1917).¹¹

2.2.2.1 Product functions

Moving goods from producers to consumers is the ultimate goal of marketing functions. All of the above-mentioned functional schemes address the product differences of production and consumption and the adjustments that are required to meet the needs of consumers. The authors partly focus on different aspects and use various terms; however, two key functions can be summarized: assembling and standardizing and grading.¹²

As “the units of economical production and of convenient consumption seldom are the same” (Cherington, 1920, p. 58), the assembling function is needed to break up large production quantities into smaller consumption units. In this context, some of the authors also refer to the quantity function (Buddeberg, 1959; Oberparleiter, 1930; Seyffert, 1972; Sundhoff, 1965).

Converse (1926) defines standardizing as the “drawing up of rules as to quality, size, etc., while grading refers to the actual work of sorting in accordance with these rules” (p. 380). Oberparleiter (1930), Seyffert (1972) and Sundhoff (1965) call it the quality function, adjusting the product quality between production and consumption.¹³

¹¹ The Anglo-Saxon and German contributions to the functional approach have developed in the same direction, although there seems to have been no contact between the researchers of the different countries (Leitherer, 1961). In contrast to the Anglo-Saxon researchers that focused their functional approaches on marketing (marketing functions), German researchers developed functional schemes that related to retailing (retail functions).

¹² Converse (1926) does not list assembling as a separate function and argues that it is a part of the buying function, which “involves the determination by the buyer of his needs, the finding of sources of supply, the negotiation of contracts, and the transfer of title” (p. 379). These tasks underscore the informational character of the buying function (cf. section “The Information Function”) and do not relate to the main task of the assembling function; that is, adjusting quantity differences between production and consumption. Therefore, assembling is a separate function in the framework.

¹³ McGarry (1950) takes a broader perspective and lists the merchandising function including all of the product adjustments that are needed to meet the needs of consumers.

Moreover, Buddeberg (1959) and Sundhoff (1965) list the finishing function, referring to the manipulation and maintenance of products.¹⁴ This function complements the above-mentioned two key functions and will also be included in the framework.

Assembling, standardizing and grading as well as finishing are all product-related functions, and therefore these three functions are summarized as product functions.

2.2.2.2 Information functions

The early contributions to the functional approach in particular list selling or sales as a marketing function (Cherington, 1920; Converse, 1926; Shaw, 1912; Weld, 1917). However, the authors always refer to demand creation, and Shaw (1912) even adds to the selling function in parentheses “communication of ideas about the goods” (p. 731). Thus, the selling as well as the buying functions are rather information functions, which is supported by Bucklin (1966) who states that “the basic work of buying and selling consists of preparing, sending and receiving messages” (p. 12). This function of the search, organization and distribution of information about markets (e.g., customer needs, demands and trends) to producers and about goods to consumers can also be applied to the later concepts that list the contractual function (McGarry, 1950), the information and contact function (Buddeberg, 1959) and the market development function (Seyffert, 1972; Sundhoff, 1965).¹⁵

Propaganda or promotion, i.e., all activities of channel members to influence others either to buy from them or to sell to them, is listed directly (McGarry, 1950; Oberparleiter, 1930) or as part of another function, i.e., the market development function (Seyffert, 1972; Sundhoff, 1965), in all later concepts. This informational function is vital to create demand and will also be part of the framework.

Thus, information is the second main function of the framework that consists of the two subfunctions search, organization and distribution as well as promotion.

¹⁴ According to Sundhoff (1965), manipulation refers to the preparation of products, e.g., the roasting of raw coffee or the installation of technical goods, but it also accrues from other marketing functions, e.g., preservation from storage. Maintenance refers to spare parts storage and repair services.

¹⁵ The consulting function that is listed by Buddeberg (1959) and Seyffert (1972) and the pricing function that is listed by McGarry (1950) and Seyffert (1972) are seen as part of the search, organization and distribution function and will therefore not be included as separate functions in the framework.

2.2.2.3 Logistics functions

Physical distribution must be part of the marketing functions in the framework, as this task is required to finally move goods to consumers. All authors mention transportation / transporting, physical distribution or space bridging as one of the functions in their concepts.

Additionally, storage, i.e., holding stocks of goods, is essential to bridge the time between production and consumption. The storage function is listed by almost all authors as a separate function, and it is also included in the framework.¹⁶

These two identified functions, physical distribution and storage, are summarized in the framework as logistics functions.

2.2.2.4 Transaction functions

In addition to the logistics functions, Converse (1926) notes that there is also “little difference of opinion” (p. 379) throughout the various marketing functions schemes that concern the financing function, i.e., granting credits to channel members, and the risk assumption function, i.e., sharing the risk of loss, damage or value deterioration. The later concepts of Oberparleiter (1930) and Seyffert (1972) also refer to the credit function whereas none of the selected schemes after Converse (1926) list functions that are related to risk-bearing or risk assumption. Nevertheless, in addition to financing, risk assumption is also part of the marketing functions framework as risks in the distribution channel cannot be completely eliminated and therefore must be borne by channel members.

McGarry (1950) and Sundhoff (1965) also add the termination and transaction function to their lists, which focus on the processing of transactions. This function is also included in the framework as it is an important activity not only to facilitate transactions but also to realize them.

Together with financing and risk assumption, processing comprises the transaction functions.¹⁷

¹⁶ McGarry (1950) and Shaw (1912) list transporting the goods with respect to the physical distribution function but are the only ones that do not mention storage as a separate marketing function.

¹⁷ Buddeberg (1959) is the only author that does not list any transaction functions.

2.2.2.5 The PILT framework

Based on nine existing marketing function schemes, four main functions, product, information, logistics and transaction, and their corresponding ten subfunctions have been derived (see Appendix I for a summary of grouping and categorizing the existing concepts).¹⁸

The product functions address product-related quantity and quality differences that occur between production and consumption. The two key product functions, which are assembling and standardizing and grading, are complemented by the finishing function, which refers to the manipulation and maintenance of products.

The information functions handle the information flow between producers and consumers (search, organization and distribution). Producers need to receive information about markets such as customer needs or trends, and consumers need to be informed about available products. Moreover, the information functions aim to create demand (promotion).

The logistics functions address physical distribution to finally move products to consumers and storage to bridge the time between the production and consumption of products.

The transaction functions facilitate the granting of credit (financing), sharing the risk of loss, damage or value deterioration (risk assumption) and realizing transactions (processing) between channel members.

All of these functions, which are summarized in the PILT framework (see Figure 4), must be fulfilled by channel members to move goods from production to consumption.

¹⁸ As mentioned, many functional classification schemes have been developed over time. Generally, the contributions differ in some aspects, but the central idea is mostly similar. Thus, additional schemes, as well as later ones, could be added that also fit into the developed framework (e.g., Assael, 1998; Kotler, 1980; Meffert, Burmann, & Kirchgeorg, 2015; Rosenbloom, 1978; Stern & El-Ansary, 1992; Zentes et al., 2011).

Main functions	Subfunctions		
Product	Assembling	Standardizing and grading	Finishing
Information	Search, organization and distribution	Promotion	
Logistics	Physical distribution	Storage	
Transaction	Financing	Risk assumption	Processing

Figure 4: The PILT framework of marketing functions

Source: Own illustration.

2.3 B2C e-marketplaces

Today, there is a vast landscape of different e-marketplace formats. To categorize the various e-marketplace types and to further specify the retail format B2C e-marketplaces, a general e-marketplace classification scheme is derived from the extant concepts (e.g., Chelariu & Sangtani, 2009; Kaplan & Sawhney, 2000; Mohavedi et al., 2012; Premkumar, 2003). The identified criteria aim to answer the basic market questions of what, how and for whom (Samuelson & Nordhaus, 2010). Thus, six main dimensions are determined to classify e-marketplaces to address the “need for a multi-dimensional classification model” (Mohavedi et al., 2012, p. 18): (a) industry focus, (b) ownership, (c) orientation, (d) pricing mechanism, (e) participants and (f) access (see Figure 5).

E-marketplaces can be classified according to their industry focus. Vertical e-marketplaces address just one specific industry whereas horizontal e-marketplaces bring together sellers and buyers from various different industries (Chelariu & Sangtani, 2009). Airbnb is an example of a vertical e-marketplace as it only focuses on lodging. One of the most famous horizontal e-marketplaces is Amazon Marketplace, which offers products across many different categories such as toys, apparel, furniture, books, or groceries.

Another dimension for differentiating e-marketplaces is the ownership perspective. Platforms can be owned and operated by a group of buyers or sellers or by a neutral third party (Chelariu & Sangtani, 2009).

From a stakeholder perspective, e-marketplaces can also be classified based on marketplace orientation, which includes marketplaces that are buyer-oriented, seller-oriented or neutral (Mohavedi et al., 2012). Buyer-oriented e-marketplaces such as Global Healthcare Exchange¹⁹ aim to aggregate demand. Such platforms “generally have several objectives, that is to drive procurement costs down for the participating buyers, to allow buyers to ‘aggregate their expenditure’, to reduce administration costs, to increase visibility and to facilitate global sourcing” (Grieger, 2003, p. 287). In contrast, the focus of seller-oriented e-marketplaces is to aggregate supply. The key objective of these platforms is “to provide multiple sellers a forum to present their catalogues and conduct in trade with as many buyers as possible” (Grieger, 2003, p. 287).

Neutral platforms are usually operated by third parties that act as unbiased intermediaries. They are equally attractive to buyers and sellers and aggregate fragmented supply and demand. Mohavedi et al. (2012) identify the correlation but also the dissimilarities of the dimensions of marketplace ownership and orientation. The Amazon Marketplace serves as an example for them as a seller-owned but still neutral e-marketplace.

Additionally, e-marketplaces can be distinguished according to the pricing mechanism, i.e., fixed pricing or variable pricing, that is employed (Mohavedi et al., 2012). In e-marketplaces with a fixed pricing mechanism, the prices of products and services are pre-set. eBay is a well-known example of an e-marketplace with a variable pricing model as the initial business model was solely focused on auctions, which are the most commonly used form of variable pricing mechanism. As the company later introduced the fixed price feature “Buy It Now,” today sellers can also offer products with fixed prices, i.e., eBay now provides both pricing mechanisms.

¹⁹ Global Healthcare Exchange (GHX) is a healthcare trading exchange that was founded by five global medical product manufacturers (Johnson & Johnson, GE Healthcare, Baxter International Inc., Abbott Laboratories and Medtronic, Inc.) in 2000.

Furthermore, businesses, customers and governments can be differentiated as the types of participants that are involved in e-marketplace transactions. This leads to nine possible e-marketplace types (B2B, B2C, B2G, C2B, C2G, C2C, G2B, G2C and G2G) based on this dimension (Coppel, 2000).

E-marketplaces can also be classified based on access to the platform. Open e-marketplaces can be joined by any seller or buyer without any restrictions. However, closed e-marketplaces limit access for participants and require membership (Kollmann, 2001). Alibaba.com, which is one of the leading platforms for global B2B trade with millions of sellers and buyers, is an example of an open e-marketplace. Walmart Marketplace is considered to be a closed e-marketplace as sellers must be invited or submit a request to sell on the platform.

This research mainly focuses on neutral, fixed-price and open B2C e-marketplace types whereas industry focus and ownership are not further specified.

	Dimensions	Types		
WHAT?	Industry focus	Vertical	Horizontal	
HOW?	Ownership	Buyer	Seller	Third party
	Orientation	Buyer-oriented	Seller-oriented	Neutral
	Pricing mechanism	Fixed	Variable	
FOR WHOM?	Participants	Business	Customer	Government
	Access	Open	Closed	

Figure 5: Classification of e-marketplaces
 Source: Own illustration.

2.3.1 The PILT framework and B2C e-marketplaces

In the following section, the developed PILT framework will be used to classify and analyze B2C e-marketplaces.

2.3.1.1 Product functions

B2C e-marketplaces, as two-sided platforms, leave ownership and control over sales to consumers entirely to the sellers, i.e., sellers must manage listing, pricing, distribution and customer service (Hagiu, 2007). Sellers are therefore also responsible for any decisions and activities that concern the assembling function, adjusting the inequalities of production and consumption quantities.

Such platforms aggregate different product offerings, which can be seen as being part of the standardizing and grading function; however, as these platforms do not handle any sorting decisions, the quality function is also the responsibility of the sellers. Additionally, e-marketplaces do not offer any finishing or product-related services such as manipulation and maintenance.

Therefore, it can be concluded that B2C e-marketplaces do not fulfill any of the product functions. Sellers are responsible for and control all of these functions. They can either fulfill the product functions themselves or outsource them to other intermediaries.

2.3.1.2 Information functions

The Internet as a distribution channel has certain unique characteristics. Two of its fundamental characteristics are: (a) storing massive amounts of information inexpensively and (b) offering powerful and inexpensive instruments for searching, organizing and disseminating information (Peterson, Balasubramanian, & Bronnenberg, 1997).

Sellers and consumers can make use of these characteristics when they interact with B2C e-marketplaces. Sellers can receive sales, conversion and traffic data in real-time. Consumers can browse millions of product offerings including product feature descriptions and customer reviews. Thus, B2C e-marketplaces fulfill the information functions of search, organization and distribution.

B2C e-marketplaces also offer different means by which to promote product offerings on their websites (e.g., banner ads, deals) and thereby drive demand. Thus, all information functions are clearly fulfilled by B2C e-marketplaces.

2.3.1.3 Logistics functions

B2C e-marketplaces have the ability to serve as a logistics medium for digital products (e.g., music, movies and software). However, for physical products this is not the case. Sellers must fulfill the physical distribution and storage function themselves or use third-party logistics providers such as UPS, FedEx or DHL. Therefore, the logistics functions are not provided by B2C e-marketplaces.

2.3.1.4 Transaction functions

The analysis of B2C e-marketplace transaction functions are based on the concept of marketing flows, which “indicate the direction and ease of movement of specific activities between intermediaries within a given distribution channel” (Tamilia, Senecal, & Corriveau, 2002, p. 34). Vaile, Grether and Cox (1952) defined the following eight flows: physical possession, payment, ordering, ownership, negotiation, financing, promotion and risking.

Ownership cannot be separated from risk as loss, damage and value deterioration will only affect the owner of the goods. Moreover, ownership, i.e., the transfer of titles, is also directly linked to the financing function. As mentioned above, Hagiu (2007) states that B2C e-marketplaces (two-sided platforms) do not take physical possession and ownership of goods but “simply determine buyer and seller affiliation with a common marketplace” (p. 115-116). Thus, it must be concluded that B2C e-marketplaces do not fulfill the financing and risk assumption functions in a distribution channel system.

However, B2C e-marketplaces do participate in promotion, negotiation, ordering and payment flows between sellers and buyers. Therefore, the platforms take over the transaction processing function.

2.3.1.5 Summary

The analysis reveals that B2C e-marketplaces fulfill three out of the ten marketing functions of the PILT framework (see Figure 6). They take over one of the transaction

functions and the two information functions, i.e., these platforms can be defined as infomediaries²⁰.

The other seven marketing functions must be managed by e-marketplace sellers themselves or be outsourced to other intermediaries such as logistics companies and banks.

Main functions	Subfunctions		
Product	Assembling	Standardizing and grading	Finishing
Information	Search, organization and distribution	Promotion	
Logistics	Physical distribution	Storage	
Transaction	Financing	Risk assumption	Processing

Figure 6: The marketing functions of B2C e-marketplaces

Source: Own illustration.

2.3.2 Case study

In this section of the paper, the developed PILT framework will be used to analyze and compare the B2C e-marketplaces of Amazon and Walmart, which are two of the world's largest retailers.

2.3.2.1 Amazon

In 1995, Amazon launched as an online retailer to sell books, and four years later, in 1999, it opened its customer base to third-party sellers for the first time, introducing Amazon Auctions and zShops. The initiative was mainly driven by the success of eBay's business model and eventually failed as Amazons' customers refrained from

²⁰ Infomediaries, a term introduced by Hagel and Rayport (1997), are online intermediaries with business models that are based on the power of information.

exploring the auction mechanism and the various online stores of different sellers (zShops).

In 2000, the company launched Amazon Marketplace, a “platform for third-party sellers (‘Sellers’) and buyers (‘Buyers’) to negotiate and complete transactions” (Amazon, n.d.). The platform is based on the concept of a side-by-side placement of Amazon and third-party seller fixed-price offers for a specific product, i.e., the product detail page. Transactions occur directly between sellers and buyers, and sellers are responsible for product listings, shipping orders and customer service. Today, Amazon Marketplace is one of the largest B2C e-marketplaces with eleven country-specific marketplaces around the world.²¹

2.3.2.2 Walmart

Walmart opened its first store in 1962 and operates more than 11,000 stores in 28 countries today. In 2000, Walmart started its e-commerce operations and launched Walmart.com.²² Nine years later, in 2009, the company launched Walmart Marketplace and opened the website to selected third-party sellers (Walmart, 2009). The platform was developed slowly; however, it has expanded quickly over recent years, still keeping the invitation-only approach for sellers. Walmart Marketplace uses the same listing concept as Amazon Marketplace, i.e., the item page of a specific product shows all competing offers, from Walmart and third-party sellers, to the customer.

Walmart Marketplace hosts more than one thousand sellers that offer more than 10 million products (Digital Commerce 360, 2016b). By contrast, more than 2 million sellers offer more than 365 million products on Amazon Marketplace (Digital Commerce 360, 2016a). Walmart and Amazon do not disclose the sales of their third-party businesses. However, a recent study estimated that third-party sellers on Amazon.com generated \$63 billion sales in 2016, which is nearly four times those of Walmart.com with \$16.6 billion (eMarketer, 2017).²³

²¹ Amazon currently operates three e-marketplaces in North America (United States, Canada and Mexico), five in Europe (United Kingdom, Germany, France, Italy and Spain) and three in Asia (India, China and Japan).

²² Walmart currently operates e-commerce websites in 11 countries (Argentina, Brazil, Canada, Central America, Chile, China, Japan, Mexico, Puerto Rico, United Kingdom and United States).

²³ There are some differences between Walmart and Amazon Marketplace that need to be considered when comparing these numbers. Walmart is a closed e-marketplace, i.e., sellers are invited or need to

2.3.2.3 Product functions

Amazon and Walmart Marketplace do not assume ownership of the goods that are listed and sold by third-party sellers. The ownership and control is entirely left to the sellers, and therefore the platforms do not fulfill any assembling function.

Amazon's Participation Agreement states that sellers can "list any item on the Site unless it is a prohibited item" (Amazon, n.d.). Similarly, Walmart mentions that sellers "can sell just about anything on our site. However, we require all Sellers to follow the law and our policies, ..." (Walmart, n.d.). Both e-marketplaces only aggregate product offerings and do not take over the standardizing and grading function.

Moreover, the finishing function is also left to sellers as there are no product-related services such as manipulation or repair services offered by Amazon or Walmart Marketplace.

Thus, the product functions are fully owned and controlled by sellers, which is typical for B2C e-marketplaces as is shown in the section above.

2.3.2.4 Information functions

Customers can browse through millions of products on Amazon and Walmart Marketplace, research product features, read customer reviews and receive product-related recommendations, e.g., the display of products that have been frequently bought together by other customers.

For Amazon Marketplace, third-party sellers use the web interface Seller Central to manage their accounts, i.e., manage inventories and orders and update and extend product listings. Amazon also distributes a range of business reports for sellers including various operating figures such as traffic, conversions and buy box percentages²⁴. Walmart Marketplace sellers manage their listings, inventories and

apply, whereas Amazon is an open e-marketplace that can be joined by sellers without any restrictions. Moreover, Walmart Marketplace is currently only available on Walmart.com with limited delivery options to addresses outside of the United States, while Amazon hosts eleven e-marketplaces around the world. Therefore, sales numbers of third-party sellers on Walmart.com and Amazon.com are compared, which does not reflect the international third-party business of Amazon Marketplace.

²⁴ Customers start the purchasing process by adding goods to their shopping basket by clicking the buy box on a product detail page.

orders through a web interface that is called the Seller Center. This tool also provides sellers with a number of business reports for various metrics.

Sellers can participate in promotional activities on the Amazon website. Lightning Deals or Deals of the Day are time-bound offers that are featured on the Amazon Deals page, which is one of the most visited Amazon pages. Moreover, the advertising service Sponsored Products²⁵ provides third-party sellers with the opportunity to promote their products in the search results of customers. Walmart Marketplace also enables third-party sellers to engage in promotional activities such as clearance or reduced-price offers. Similar to Amazon's advertising service, Walmart offers a Sponsored Products model that enables sellers to feature products below the search results of customers.

In summary, Amazon and Walmart Marketplace completely fulfill the information functions of search, organization and distribution and promotion.

2.3.2.5 Logistics functions

In the early years of Amazon Marketplace, third-party sellers were required to manage the storage and physical distribution of the goods themselves. In 2006, Amazon launched the service Fulfillment by Amazon, which allows sellers to use Amazon's own order fulfillment. Sellers send products to Amazon's fulfillment centers, and Amazon takes care of the storing, picking, packing and shipping of goods. The Fulfillment by Amazon launch integrated the storage function; however, third-party logistics providers have usually still delivered shipments to customers. However, Amazon is currently in the process of developing its own delivery service, Amazon Logistics (Bensinger, 2016), thereby also fulfilling the physical distribution function.

Walmart Marketplace sellers must manage logistics themselves. They are responsible for managing orders including handling, shipping, customer service and returns, i.e., the logistics functions are left to sellers.

²⁵ Sellers can assign keywords to the products that they want to advertise and enter a cost-per-click bid. The products will then be displayed in the search results if customers search for one of the keywords. If a customer clicks on the ad and is directed to the advertised product listing, the seller will pay for this feature.

In contrast to Walmart, Amazon Marketplace has fulfilled the logistics functions since launching the services Fulfillment by Amazon and Amazon Logistics.

2.3.2.6 Transaction functions

The financing function is directly linked to ownership or the transfer of goods. Amazon and Walmart Marketplace do not take physical possession and ownership of goods from third-party sellers. However, Amazon offers a service to its sellers that still fulfills the financing function. In 2012, Amazon started to offer loans to selected third-party sellers. The service called Amazon Lending provides sellers with capital to purchase inventory, addressing the financing challenge of online sellers (Needleman & Bensinger, 2012).

Both e-marketplaces do not fulfill the risk assumption function, as sellers must address the loss, damage and value deterioration of their goods themselves. They only assume risk from buyers to manage and control the customer experience on the platforms. The A-to-z Guarantee Program²⁶ is an example of a means by which to protect customers from the misbehavior or fraudulent activities of Amazon sellers. Walmart Marketplace also sets high standards for customer service and interferes if sellers fail to resolve customer issues.

For Amazon Marketplace, Amazon Payments acts as an agent for third-party sellers to process payments, refunds and adjustments. The service, which is required for all sellers on the platform, is called Transaction Processing Service, and the name already indicates that Amazon Marketplace fulfills the transaction processing function. Walmart also collects all of the proceeds from transactions between buyers and third-party sellers and remits the amount that was collected to sellers after given payment cycles. Both B2C e-marketplaces fulfill the processing function. Additionally, Amazon Marketplace has offered financing to its third-party sellers since launching Amazon Lending; i.e., in contrast to Walmart, Amazon fulfills two of the three transaction functions.

²⁶ If Amazon customers have a problem with a transaction, and third-party sellers do not respond or do not resolve the issue, customers can file an A-to-z Guarantee claim and request a reimbursement through Amazon. The program is generally meant to enhance trust and confidence in Amazon Marketplace third-party sellers.

2.3.2.7 Summary

The case study of Amazon and Walmart Marketplace showed similarities as well as differences between the two B2C e-marketplaces. In line with typical B2C e-marketplaces, Walmart Marketplace is mainly an infomediary, completely fulfilling the information functions and one of the three transaction functions. In contrast, Amazon Marketplace fulfills three more marketing functions than Walmart Marketplace and other typical B2C e-marketplaces. In addition to the information functions and transaction processing, Amazon Marketplace also completely provides the logistics functions and financing, which is one of the transaction functions (see Figure 7).

Notably, these additional three functions were not part of the initial Amazon Marketplace product. In recent years, the launches of the services Amazon Logistics, Fulfillment by Amazon and Amazon Lending closed the functional gap of typical B2C e-marketplaces.

Considering the success of Amazon Marketplace, offering additional marketing functions to sellers might be an important success factor for B2C e-marketplaces.

Main functions	Subfunctions		
Product	Assembling	Standardizing and grading	Finishing
Information	Search, organization and distribution	Promotion	
Logistics	Physical distribution (Amazon Logistics)	Storage (Fulfillment by Amazon)	
Transaction	Financing (Amazon Lending)	Risk assumption	Processing

Figure 7: The marketing functions of Amazon Marketplace

Source: Own illustration.

2.4 Conclusion

First, functional analysis is still relevant today. As is shown in this paper, the concept can be used to classify and analyze modern, technology-based distribution systems such as B2C e-marketplaces. Therefore, the finding of Rosenbloom (2013) that the concept of marketing functions “is as relevant now, and for the future, as it ever was” (p. 202) can be supported.

The paper also contributes to the literature in two ways. First, the innovative marketing functions concept that is presented, i.e., the PILT framework, provides a new tool of analysis for channel research. Second, the developed framework helps to classify B2C e-marketplaces and analyze their role in the distribution channel. It reveals that such platforms are infomediaries that completely take over only the information functions. Hagel and Rayport (1997) argued that such online intermediaries will be important and successful. Considering the importance and growth of B2C e-marketplaces as is outlined in the introduction of the paper, this statement can be supported.

The finding that B2C e-marketplaces are infomediaries also contributes to the early discussions of whether electronic markets lead to disintermediation, “an elimination of one or more organizations from the distribution channel” (Gallaugher, 2002, p. 90), or hypermediation, i.e., a rise in the number of intermediaries, in the distribution channel. The product, logistics and the majority of transaction functions must be fulfilled by the sellers themselves or outsourced to other intermediaries such as logistics companies or banks. Therefore, B2C e-marketplaces can either lead to disintermediation, if sellers internalize functions, or hypermediation, if sellers purchase functions from different intermediaries. Thus, both phenomena tend to exist in this distribution channel depending on the strategy of the e-marketplace sellers.

This also reveals an important insight for practitioners, especially managers of organizations that plan to sell on B2C e-marketplaces. It is important for them to understand that such platforms are not one-stop shops but rather they increase complexity on the sellers’ side as sellers must manage the majority of the marketing functions. Therefore, a clear strategy for the distribution channel design, which also considers the specifics of each B2C e-marketplace, is inevitable.

Moreover, the case study shows that Amazon Marketplace closed the functional gap of typical B2C e-marketplaces by launching new services for sellers over time. Today,

the company offers more marketing functions to sellers than comparable e-marketplaces such as Walmart Marketplace. Considering the success of Amazon Marketplace, this strategy may be an important success factor for e-marketplaces, i.e., providing more marketing functions to sellers could be an interesting approach for e-marketplace operators to become more successful. Interestingly, Walmart has already considered “offering a fulfillment service to sellers similar to Fulfillment by Amazon” (Digital Commerce 360, 2016b).

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3. Paper B: Channel-based Price Differentiation in Multichannel Online Retailing

Abstract: The online channel has long been recognized as a singular channel and studies related to differential prices across channels have focused on price differentiation between the offline and online channels. However, the online landscape has broadened and multichannel online retailing has become an important strategy. To address this gap, an empirical study is conducted to analyze to what extent companies engage in online channel-based price differentiation and which factors influence its occurrence and direction. Two online channels are considered, seller operated online shops and Amazon Marketplace, as a proxy for Business-to-Consumer e-marketplaces. Additional market, seller and product characteristics were collected to analyze their impact on the occurrence and direction of channel-based price differentiation. The results show (1) that all observed sellers engage in price differentiation, and online shop prices are, on average, lower than e-marketplace prices and (2) that some factors have a significant influence on its occurrence and direction.

Keywords: B2C e-marketplaces, Channel-based price differentiation, Multichannel online retailing

3.1 Introduction

The rise of the online channel has turned multichannel retailing, i.e., operating multiple distribution channels for selling similar products (Zentes et al., 2017), into a crucial strategy for companies. There is no indication that the rapid growth of the online channel will end soon. In 2017, global retail e-commerce sales accounted for 10.2% of total retail sales, and the share is predicted to surpass 17% by 2021 (eMarketer, 2018; Statista, n.d.a).

In addition to operating their own online shops, sellers increasingly sell their products through Business-to-Consumer (B2C) e-marketplaces, such as Amazon Marketplace and eBay (Zhang et al., 2010). E-marketplaces, or online marketplaces, are two-sided platforms that match customers and sellers, whereas the ownership and control of goods are left to sellers (Hagiu, 2007). With over \$1 trillion in global retail sales and a 44% share of total e-commerce sales, these platforms represent a major online distribution channel (Ali, 2017). The abovementioned figures suggest that the online retailing landscape has broadened and that a perspective shift from the singular online channel to multichannel online retailing is required (Wagner, 2015). Issues related to the multichannel strategy in the online and offline contexts have received attention from researchers. One of the key issues has been pricing and the question of whether to charge the same prices in each channel or to set different prices for the same product across channels (Neslin & Shankar, 2009). Various studies have theoretically and empirically analyzed the occurrence, extent, opportunities and risks of price differentiation between online and offline channels (Kauffman, Lee, Lee, & Yoo, 2009; Neslin et al., 2006; Wolk & Ebling, 2010; Yan, 2008; Zettelmeyer, 2000; Zhang et al., 2010; Zhang, 2009). However, the author is not aware of any empirical study that analyzes channel-based price differentiation in multichannel online retailing. This paper aims to fill this gap in the multichannel price differentiation literature by considering a multichannel environment that consists of two online channels: seller²⁷ operated online shops and B2C e-marketplaces.

²⁷ In this paper, sellers can be retailers or manufacturers that sell directly to customers.

The remainder of this paper is organized as follows. First, the existing literature on price differentiation and multichannel pricing is reviewed. Second, a conceptual model based on economic theory is presented to derive hypotheses about market, seller and product characteristics that influence a company's decision to engage in online channel-based price differentiation. Next, the data and factor operationalization are described. Afterward, the results of the empirical study are presented and discussed. The paper closes with the key findings, limitations and directions for future research.

3.2 Literature review

Early research expected that the online channel would lead to one market-driven price for each product, as the reduction of buyer search costs increases competition among sellers and forces them to continually reduce prices (Bakos, 1997).

Nevertheless, several studies find high levels of price differences within the online channel (Ancarani & Shankar, 2004; Brynjolfsson & Smith, 2000; Lindsey-Mullikin & Grewal, 2006; Pan, Ratchford, & Shankar, 2004; Zhuang, Popkowski Leszczyc, & Lin, 2018). These studies show that price dispersion, i.e., the distribution of prices for the same product across sellers (Pan et al, 2004), still occurs online.

Multichannel price differentiation, i.e., a given seller charges different prices for the same product across different distribution channels (Wolk & Ebling, 2010), has also been the subject of various studies. According to Fassnacht and Unterhuber (2015), the extant channel-based price differentiation literature can be divided into three different research perspectives: theoretical studies concerning optimal retailer behavior, empirical studies dealing with the impact of channel-based price differentiation on customer behavior and observational studies analyzing actual retailer behavior.

From a theoretical perspective, some researchers emphasize the opportunities associated with channel-based price differentiation, such as increasing profits (Kauffman et al., 2009; Khan & Jain, 2005; Yan, 2008; Zettelmeyer, 2000; Zhang et al., 2010). Others rather assume risks related to customer behavior, such as customer confusion or customer perceptions of price unfairness (Neslin et al., 2006; Zhang, 2009).

In this context, Vogel and Paul (2015) analyze the impact of channel-based price differentiation on customer retention. They find positive effects (perception of value, relationship quality and repurchase intention) and negative effects (unfairness and lack of self-determination) but predict a net positive effect on customer retention. Fassnacht and Unterhuber (2016) indicate that customers accept lower online prices and that “the size of the price difference tolerated seems to depend on product category” (p. 146).

Studies concerning actual retailer behavior show conflicting results. Wolk and Ebling (2010) find that up to 60% of multichannel retailers across different product categories in Germany engage in channel-based price differentiation and that these retailers charge, on average, higher prices offline than online. Flores and Sun (2014) analyze three office supply retailers that operate offline and online channels in the USA and report no significant overall differences between online and in-store prices. All these studies with the different research perspectives mentioned deal with price differentiation between a singular online and the offline channel. However, existing literature does not consider any channel-based price differentiation in multichannel online retailing. Thus, this paper wants to close this research gap by answering the following questions: (1) to what extent do sellers engage in online channel-based price differentiation and (2) which factors influence the occurrence and direction of channel-based price differentiation within the online channel.

3.3 Theory

Wolk and Ebling (2010) introduced a conceptual model based on economic theory to derive expectations about the impact of market, seller²⁸ and product characteristics on the occurrence of channel-based price differentiation. This theoretical framework is adapted and enhanced to analyze the factors that influence a company’s decision to engage in online channel-based price differentiation and to derive corresponding hypotheses.

²⁸ In contrast to Wolk and Ebling (2010), this paper considers manufacturers and retailers, and therefore, it is referred to seller rather than retailer characteristics.

3.3.1 Competition

Under perfect competition, price differentiation is not a viable pricing strategy because increasing the price will lead to the loss of all sales to competitors. In contrast, price differentiation “arises naturally in the theory of monopoly and oligopoly” (Varian, 1989, p. 599). Therefore, economic theory argues that companies need to have some market power to conduct price differentiation (Telser, 1965). Therefore, the following is expected:

H₁: Sellers that experience higher levels of competition are less likely to engage in channel-based price differentiation.

3.3.2 Seller type

Distribution channels can be broadly divided into direct channels, in which manufacturers vertically integrate and sell directly to customers, and indirect channels, in which manufacturers sell products to independent intermediaries, e.g., retailers that resell the products to customers (Stern & El-Ansary, 1992). In indirect channels, manufacturers share residual profits with retailers, whereas they claim all residual profits in direct channels (John & Weitz, 1998). As a result, vertically integrated manufacturers should retain higher profits that yield more pricing opportunities. Thus, the following is proposed:

H₂: Manufacturers are more likely to engage in channel-based price differentiation.

3.3.3 Seller size

Larger companies with superior technology, more efficient organization or cheaper purchases enjoy economies of scale and can benefit from lower average costs (Mansfield, 1986). This lower cost structure gives companies more room for pricing decisions, and therefore, the following is expected:

H₃: Large companies are more likely to engage in channel-based price differentiation.

3.3.4 Product type

For a successful price differentiation, a company must be able to prevent customers who purchase at a lower price from reselling to other customers that face a higher

price (Phlips, 1983). Otherwise, the profits resulting from a price differentiation strategy would be eliminated. In general, goods can be classified into durables and nondurables. The probability that nondurables are resold is lower because their lifespan is shorter. Therefore, the following is proposed:

H₄: Price differentiation is more likely for nondurables than for durables.

3.3.5 Brand power

On the one hand, more credible brands lower customers' price sensitivity (Erdem, Swait, & Louviere, 2002) and enable companies to engage in price differentiation. On the other hand, researchers argue that brand equity management requires consistency in the marketing mix, i.e., prices need to be aligned across channels to maintain brand power (Erdem & Swait, 1998). Customers "may find a multiprice strategy policy confusing and unfair" (Neslin et al. 2006), and brand power may be harmed.

For manufacturers, it is therefore difficult to derive an expectation of the impact of brand power on the likelihood of engaging in channel-based price differentiation. Following the argumentation of Wolk and Ebling (2010), the same holds true for retailers, as manufacturers with strong brands are more likely to be able to influence the pricing strategies of retailers. Thus, the influence of brand power on channel-based price differentiation cannot be easily predicted and a viable hypothesis cannot be derived (*H₅*).

3.3.6 Product sales

With increases in output, i.e., higher product sales and decreased average costs (Mansfield 1986), manufacturers will have more opportunities regarding pricing decisions for products that generate higher sales. Retailers with higher sales are likely to have stronger negotiating power in the manufacturer-retailer relationship and, therefore, enjoy cheaper purchases for products that lead to more room for pricing decisions, as well. Thus, the following is proposed:

H₆: Price differentiation is more likely for products that generate higher sales.

The hypotheses concerning the impact of market, seller and product characteristics on the occurrence of channel-based price differentiation are summarized in the research model (see Figure 8). To test these hypotheses, an empirical study was conducted and is described in the following section.

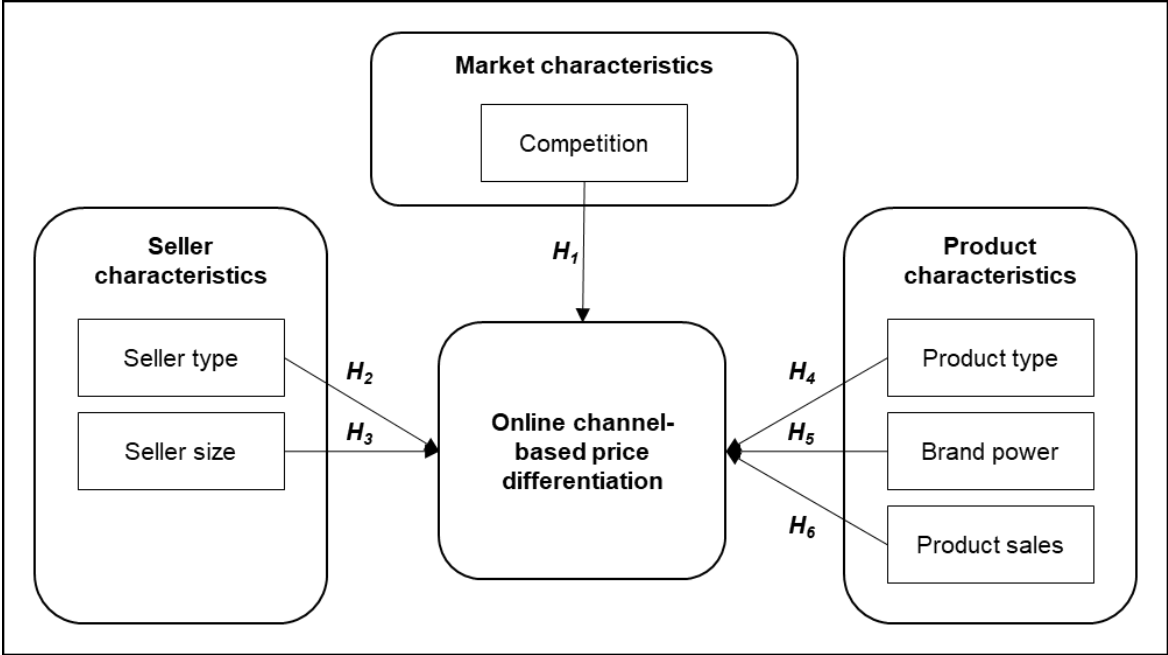


Figure 8: Research model
Source: Own illustration.

3.4 Data

Amazon Marketplace, the largest e-marketplace in Germany with more than 17 million monthly unique visitors (Alexa, 2018), was selected as a proxy for the e-marketplace channel. The data were collected between January and March 2018 and contain price observations for 960 products sold by 48 sellers.

The initial sample consisted of the top 500 Amazon.de marketplace sellers (Sellerratings, 2018a).²⁹ A total of 260 sellers were removed because they did not operate an online shop. Using systematic sampling, the final sample was further reduced to 48 sellers. Out of the products that these sellers sold through both channels, the product samples were then gathered as randomly as possible using

²⁹ The ranking is based on the number of positive reviews gathered in the last 30 days, as Amazon does not publish any sales figures for sellers (Sellerratings, 2018b).

haphazard sampling. The prices and shipping costs of the selected identical products were collected successively from the online shop and e-marketplace channel with the same laptop, i.e., the same Internet Protocol (IP), and the same browser to avoid any influence of dynamic pricing or price discrimination. The products needed to be in-stock and buyable through both channels. It has been assumed that the buyer is a non-Prime customer, i.e., for Fulfillment by Amazon offers, shipping costs have been considered for item prices below €29 (€3 or €3.99, depending on the product category), to reflect the majority of Amazon customers.³⁰ If a seller had more than one active Amazon listing on an observed product, e.g., a Fulfillment by Amazon and a Merchant Fulfilled offer, the price and shipping costs of the offer that has won the buy box was selected.

The sample includes manufacturers and retailers and covers different product categories, such as Health & Personal Care, Apparel and Electronics. The total prices range from 3.89 EUR to 1,259.90 EUR for the online shop channel and 1.26 EUR to 1,299.00 EUR for the e-marketplace channel.

3.5 Factor operationalization

Additional data has been collected about market, seller and product characteristics to analyze factors that influence the occurrence and direction of channel-based price differentiation. Many different concepts can possibly be used to test the proposed factors, and various approaches have been used and discussed in the literature. Considering these discussions and the availability of data, the factor operationalization of this paper is introduced in the following paragraphs (see Table 2 for a summary of the factor operationalization).

3.5.1 Market characteristics

The competition intensity of both the online shop and e-marketplace channels is considered, and H_1 is tested for each factor. For the online shop channel, the level of competition is measured by the number of websites that are similar to the given seller website. The data were collected from Alexa, a website that provides global web

³⁰ According to the last reported numbers, Amazon had 310 million active customers (Statista, n.d.b) and around 100 million Prime users (Amazon, 2018).

traffic analytics, using the so-called Audience Overlap Tool. The e-marketplace channel competition intensity is measured by the number of product listings in the respective category on Amazon.de. Sellics, a software platform for Amazon sellers and vendors, was used to gather this information (Sellics, 2017).

3.5.2 Seller characteristics

To analyze how the seller type influences the decision to engage in channel-based price differentiation, the sellers are categorized as manufacturers and retailers. Information from the German Patent and Trade Mark Office (DPMA) is used to check if the brand was registered by the given seller. If so, sellers are categorized as manufacturers for this brand.

There are no data available on company-specific measures, such as revenues, sales volumes or number of employees, for the observed sellers. Therefore, two different proxies for seller size, online shop and e-marketplace seller size, are considered and tested (H₃). For online shop seller size, the Alexa global rank of the given online shop website is used. The global rank measures the popularity of websites based on daily visitors and page views over the past three months (Alexa, 2018). Because Amazon sales data at the seller level is not publicly available, the number of customer reviews the given seller received on Amazon.de over the past 12 months is used as a proxy for the e-marketplace seller size.

3.5.3 Product characteristics

As mentioned above, goods can be classified into durables and nondurables. Durables are expected to have an average lifespan of more than three years (Bureau of Economic Analysis, n.d.). Accordingly, the observed products have been categorized by the author into these two types of goods. Nondurables include dietary supplements, shoes and pet food. Durables include toys, household appliances and lamps.

For the operationalization of brand power, this paper follows the approach by Wolk and Ebling (2010) and adopts the concept of brand visibility as a fundamental condition for brand power. Thus, the number of Google search results for a given brand name is used as a proxy for brand power.

Amazon sales at the product level are not publicly available. However, Amazon attributes so-called Best Sellers Ranks to all products, which reflect the recent and historical sales of items sold on Amazon (Amazon, n.d.). As this measure is category-specific, i.e., products with top Amazon Best Sellers Ranks in a large category are likely to generate more sales than those in a small category, the rank is divided by the number of product listings in the respective category on Amazon.de to account for these differences. Hence, the weighted Amazon Best Sellers Rank is used as a proxy for e-marketplace product sales.

Factor	Operationalization	Source
Market characteristics		
OS competition	Number of websites that are similar to the given seller website	Alexa
EM competition	Number of product listings in the respective category on Amazon	Sellics
Seller characteristics		
Seller Type	1 = Retailer; 0 = Manufacturer	DPMA
OS seller size	Alexa global rank of the given seller website	Alexa
EM seller size	Number of Amazon customer reviews over the past 12 months	Amazon.de
Product characteristics		
Product Type	1 = Nondurable; 0 = Durable	Categorization by author
Brand power	Number of Google search results for a given brand name	Google.de
EM product sales	Weighted Amazon Best Sellers Rank of the product	Amazon.de

Table 2: Summary of factor operationalization

Table 3 reports the mean, standard deviation and correlation coefficients between the previously derived factors and the relative price difference that is defined as (online shop price – e-marketplace price)/online shop price.

	M	SD	1	2	3	4	5	6	7
1. OS competition	62.833	43.747	1						
2. EM competition (million)	11.540	16.765	0.04	1					
3. OS seller size (million)	2.332	2.670	-0.64**	0.07**	1				
4. EM seller size (thousand)	5.301	4.387	0.07**	0.11**	-0.05	1			
5. Brand power (million)	1.269	7.711	0.05	-0.05	-0.03	-0.03	1		
6. EM product sales (weighted)	0.034	0.063	-0.10**	-0.18**	0.01	-0.02	-0.03	1	
7. Relative price difference	-0.051	0.225	0.01	-0.07**	-0.01	-0.01	0.02	0.05	1

*p<0.10, **p<0.05

Table 3: Descriptive statistics and correlation matrix

3.6 Results and discussion

3.6.1 Descriptive results

The study shows that multichannel online sellers engage in channel-based price differentiation. Price differences between the two channels are observed for 91.88% of the 960 products analyzed.³¹ In 60.45% of the cases with price differentiation, the price of the seller operated online shop was lower than the seller's e-marketplace price. The mean of the relative extent of the price difference ((price online shop–price e-marketplace)/price online shop) equals -5.10%, i.e., online shop prices are, on average, lower than e-marketplace prices (see Figure 9 for a histogram of relative price differences). This average relative price difference is significantly different from 0 (p<0.001).

³¹ Studies that analyze channel-based price differentiation in the offline and online channels ignore the costs related to obtaining the product, i.e., transportation and shipping costs, and only consider prices because results show that these transaction costs do not drive price gaps or price differentiation (Brynjolfsson & Smith, 2000; Wolk & Ebling, 2010). The data presented here does not support this approach to an analysis of channel-based price differentiation in multichannel online retailing. Only considering prices, not shipping costs, would reduce the products with differential prices to 82.08% of the observed selection, i.e., sellers seem to differentiate prices in the online channel through shipping costs, as well.

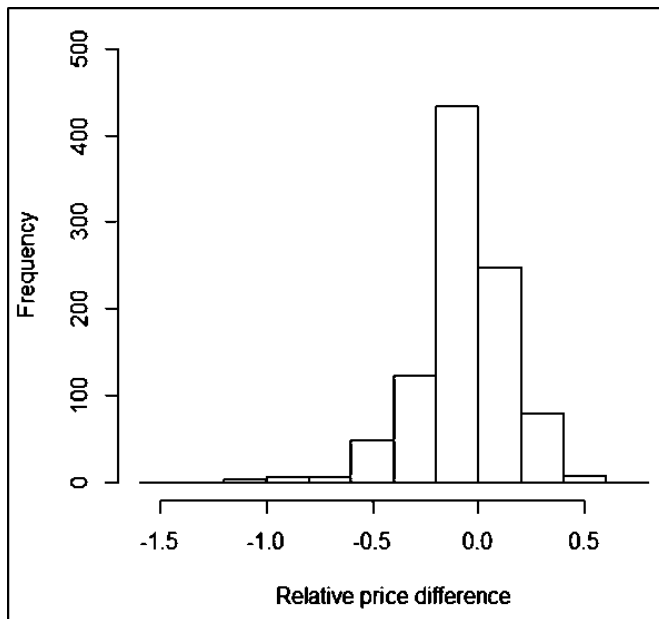


Figure 9: Histogram of relative price differences

Source: Extracted from R.

If prices are different, the mean of the relative extent of price differentiation is -5.55% ($p < 0.001$). The highest negative relative price difference observed is -150.38% (€19.95 in the online shop channel versus €49.95 in the e-marketplace channel) and the highest positive relative price difference observed is 71.03% (€1.26 in the e-marketplace channel versus €4.35 in the online shop channel).

The mean of the absolute relative price gap ($|(price\ online\ shop - price\ e-marketplace) / price\ online\ shop|$) equals 15.59% and is significantly different from 0 ($p < 0.001$). If prices are different, the mean absolute relative extent of the price differentiation was 16.97% ($p < 0.001$). The analysis at the seller level shows that all of the observed sellers engage in online channel-based price differentiation. 58.33% of sellers charge different prices across channels for their whole selection, the remaining 41.67% of sellers do not fully engage in channel-based price differentiation, i.e., they also charge the same prices across channels for some products. Two of the observed sellers (4.17%) always charge higher prices through the e-marketplace channel and two of the observed sellers (4.17%) always charge higher prices through the online shop channel. The remaining 91.67% of sellers follow a mixed strategy, i.e., these sellers either charge higher prices in both the e-marketplace and the online shop channel or do not engage in channel-based price

differentiation for some products. For those sellers that also charge the same price in both channels, price differences are still observed on average for 80.50% of the analyzed selection.

To summarize, all of the observed sellers engage in online channel-based price differentiation. Compared to the results by Wolk and Ebling (2010) for price differentiation between the offline and online channels, more sellers engage in online price differentiation, and the price gap of 16.97% for products with price differences between the online channels is rather consistent. The minority of sellers (8.34%) follow a consistent price differentiation strategy. 91.66% of observed sellers pursue a mixed price differentiation strategy, implying that sellers seem to make the price differentiation decision on a product level. Table 4 summarizes the descriptive results.

	M	Pct
Price differences		
Relative extent of price difference (%)	-5.10	
Relative extent of price difference given price differentiation (%)	-5.55	
Absolute, relative extent of price difference (%)	15.59	
Absolute, relative extent of price difference given price differentiation (%)	16.97	
Product level		
Products with price differences		91.88
Products with price differences not considering shipping costs		82.08
Products with lower online shop prices given price differences		60.45
Seller level		
Sellers engaging in price differentiation		100
Sellers charging different prices for their whole selection		58.33
Sellers always charging higher online shop prices		4.17
Sellers always charging higher e-marketplace prices		4.17
Selection with price differences of sellers also charging the same prices for some products		80.50

Table 4: Summary of descriptive results

3.6.2 Factors impacting the occurrence of online channel-based price differentiation

The first regression model aims to analyze factors that influence the occurrence of channel-based price differentiation in multichannel online retailing. To test the corresponding hypotheses that have been derived previously, the following logit model³² with two log-transformed independent variables is used:

$$\text{occpricediff} = \beta_0 + \beta_1 \text{oscomp} + \beta_2 \text{emcomp} + \beta_3 \text{sellertype} + \beta_4 \text{ossellersize} + \beta_5 \log(\text{emsellersize}) + \beta_6 \text{prodtype} + \beta_7 \log(\text{brandpow}) + \beta_8 \text{emprodsales} + \beta_9 \text{osprice} + \beta_{10} \text{osshipping} + u$$

occpricediff is the binary dependent variable that takes the value 0 if no price difference is observed and the value 1 if a price difference is observed. In addition to the eight independent variables given by the factor operationalization, the two control variables, online shop price (osprice) and online shop shipping costs (osshipping), are introduced. u is the error term. Seller type (sellertype), coded as 0 for manufacturers and 1 for retailers, and product type (prodtype), coded as 0 for durables and 1 for nondurables, are dummy variables.

The results show that online shop competition (oscomp) has a significant positive influence on the occurrence of online channel-based price differentiation (0.010, $p < 0.05$). This implies that higher levels of online shop competition increase the probability that a multichannel online seller engages in price differentiation, which does not support H_1 . This effect may be driven by the fact that sellers with high online shop competition either reduce online shop prices to compete more aggressively or charge higher online shop prices to focus more strongly on the e-marketplace channel. For e-marketplace competition (emcomp), a significant effect on the occurrence of channel-based price differentiation could not be found, i.e., neither of the competition factors that have been considered support H_1 .

Seller type (sellertype) has a significant positive influence on the occurrence of channel-based price differentiation (0.658, $p < 0.05$). As retailers have been coded as 1, this implies that the probability of price differentiation is higher for retailers than

³² Compared to the probit model, the logit model has a better fit with a slightly lower AIC (490.03 vs. 490.29) and slightly higher McFadden Pseudo- R^2 (0.1350 vs. 0.1345). Therefore, the logit model was chosen for this analysis.

manufacturers, which does not support H₂. This may be driven by the fact that manufacturers, as brand owners, prefer to focus on price consistency across channels to maintain brand power and to avoid any customer confusion or perceptions of unfairness. Online shop seller size (*ossellersize*), measured by the Alexa global rank of the online shop, has a significantly positive influence on the occurrence of price differentiation (0.231, $p < 0.01$), i.e., the probability of channel-based price differentiation increases with higher ranks of respectively smaller sellers. This result does not support H₃. Sellers operating large online shops have a higher customer awareness and visibility. Thus, engaging in online channel-based price differentiation yields a higher risk of customer confusion or customer perceptions of price unfairness about these sellers and, therefore, they may rather refrain from this pricing strategy. A significant effect of the e-marketplace seller size (*emsellersize*) on the occurrence of online channel-based price differentiation could not be found, i.e., neither of the factors that have been considered for seller size support H₃. For product type (*prodtype*), a significant impact on the occurrence of channel-based price differentiation could also not be found. Hence, H₄ cannot be supported. However, brand power (*brandpow*) has a significant negative impact on the occurrence of channel-based price differentiation (-0.227, $p < 0.05$). This implies that high levels of brand power decrease the probability that a multichannel online seller engages in price differentiation. The result is particularly interesting because the expected impact of brand power based on economic theory could not be easily predicted (H₅). This result supports the view of Erdem and Swait (1998), who argue that strong brands need consistency in the marketing mix to maintain brand power. E-marketplace product sales (*emprodsales*), measured by a weighted Amazon Best Sellers Rank, have a significantly negative influence on the occurrence of price differentiation (-3.443, $p < 0.05$), i.e., the probability of channel-based price differentiation increases with lower ranks and more product sales. Thus, H₆ is supported. Lower costs for manufacturers and the stronger negotiation power of retailers are probably the drivers of this effect. Table 5 presents the results of the logit model and Table 6 summarizes the results of the hypotheses testing.

Variable	Factor	Estimate	SE	z Value	Pr (> z)
oscomp	OS competition	0.010	0.004	2.282	0.022*
emcomp	EM competition	-0.005	0.008	-0.607	0.544
sellertype	Seller Type	0.658	0.315	2.085	0.037*
ossellersize	OS seller size	0.231	0.087	2.646	0.008**
log(emsellersize)	EM seller size	0.186	0.216	0.862	0.389
prodtype	Product type	-0.244	0.280	-0.872	0.383
log(brandpow)	Brand power	-0.227	0.091	-2.500	0.012*
emprodsales	EM product sales	-3.443	1.577	-2.184	0.029*
McFadden Pseudo-R ²			0.1350		

Coefficients for intercept and control variables omitted.

*p<0.05, **p<0.01, ***p<0.001

Table 5: Results of logit model

Hypothesis	Factor	Supported?
Market characteristics		
<i>H₁</i> Sellers that experience higher levels of competition are less likely to engage in channel-based price differentiation.	OS competition	No*
	EM competition	No
Seller characteristics		
<i>H₂</i> Manufacturers are more likely to engage in channel-based price differentiation.	Seller Type	No*
<i>H₃</i> Large companies are more likely to engage in channel-based price differentiation.	OS seller size	No*
	EM seller size	No
Product characteristics		
<i>H₄</i> Price differentiation is more likely for nondurables than for durables.	Product Type	No
<i>H₅</i> A reliable hypothesis for the influence of brand power on channel-based price differentiation could not be derived.	Brand power	-
<i>H₆</i> Price differentiation is more likely for products that generate higher sales.	EM product sales	Yes

*The effect was statistically significant (H1 at p<0.05, H2 at p<0.05 and H3 at p<0.01) but opposite to the hypothesized direction.

Table 6: Summary of hypotheses testing

3.6.3 Factors impacting the direction of online channel-based price differentiation

Next, the factors that influence the direction of online channel-based price differentiation, i.e., the sellers' decision to charge higher online shop prices or higher e-marketplace prices, are analyzed. To estimate the influence on the relative price difference, the following linear-log OLS regression model is used:

$$\text{relpricediff} = \beta_0 + \beta_1 \log(\text{oscomp}+1) + \beta_2 \log(\text{emcomp}) + \beta_3 \text{sellertype} + \beta_4 \log(\text{ossellersize}) + \beta_5 \log(\text{emsellersize}) + \beta_6 \text{prodtype} + \beta_7 \log(\text{brandpow}) + \beta_8 \log(\text{emprodsales}) + \beta_9 \log(\text{osprice}) + \beta_{10} \log(\text{osshipping}+1) + u$$

The dependent variable, *relpricediff*, is defined as (online shop price – e-marketplace price)/online shop price. Seller type (*sellertype*), coded as 0 for manufacturers and 1 for retailers, and product type (*prodtype*), coded as 0 for durables and 1 for nondurables, are dummy variables again. In addition to the eight independent variables, the two control variables, online shop price (*osprice*) and online shop shipping costs (*osshipping*), are introduced once more. *u* is the error term. As the two variables, online shop competition (*oscomp*) and online shop shipping costs (*osshipping*), contain zero values, the value of 1 needed to be added to all observations for the log-transformation.

Table 7 presents the results of the linear-log OLS regression model. The results show that higher online shop competition (*oscomp*) significantly increases the size of the relative price difference (0.027, $p < 0.001$), i.e., higher online shop competition increases the online shop price relative to the e-marketplace price. This implies that sellers that face high online shop competition prefer to avoid this competition and instead focus more on the e-marketplace channel. For e-marketplace competition (*emcomp*), a significant effect on the direction of online channel-based price differentiation could not be found.

A significant effect of the seller type (*sellertype*) on the direction of online channel-based price differentiation could not be found. Online shop seller size (*ossellersize*), measured by the Alexa global rank of the online shop, significantly increases the relative price difference (0.026, $p < 0.001$), i.e., sellers with smaller online shops increase online shop prices relative to e-marketplace prices. This may be because

these sellers primarily focus their efforts on the e-marketplace channel with its larger customer potential. Therefore, they reduce e-marketplace prices relative to online shop prices to attract additional e-marketplace customers. E-marketplace seller size (emsellersize) does not yield any significant effect on the sellers' decision to charge higher online shop prices or higher e-marketplace prices.

The same holds true for product type (prodtype), as no significant influence on the direction of channel-based price differentiation could be found. Higher brand power (brandpow) has a significant positive influence on the relative price difference (0.010, $p < 0.05$) and, therefore, increases online shop prices relative to e-marketplace prices. Because of their sales potential, strong brands are likely to have more seller offers on e-marketplaces. This leads to higher direct competition among sellers and results in lower e-marketplace prices relative to online shop prices. Additionally, sellers may have an incentive to charge lower e-marketplace prices because the prices of strong brands may serve as a visible signal of the seller's overall pricing strategy. E-marketplace product sales (emprodsales), measured by a weighted Amazon Best Sellers Rank, increase the size of the relative price difference (0.007, $p < 0.05$), i.e., products with a higher sales rank and lower generated sales increase online shop prices relative to e-marketplace prices. This may be because sellers offering products with lower e-marketplace sales probably tend to reduce e-marketplace prices to attract more customers and generate more sales.

Variable	Factor	Estimate	SE	t Value	Pr (> t)
log(oscomp+1)	OS competition	0.027	0.006	4.190	0.000***
log(emcomp)	EM competition	-0.003	0.005	-0.617	0.538
sellertype	Seller Type	-0.007	0.015	-0.457	0.648
log(ossellersize)	OS seller size	0.026	0.006	4.174	0.000***
log(emsellersize)	EM seller size	-0.006	0.012	-0.510	0.610
prodtype	Product type	0.018	0.014	1.222	0.222
log(brandpow)	Brand power	0.010	0.005	1.963	0.050*
log(emprodsales)	EM product sales	0.007	0.003	2.374	0.018*
Adjusted R ²			0.1708		
F(p)			20.76(0.000***)		

Coefficients for intercept and control variables omitted.

*p<0.05, **p<0.01, ***p<0.001

Table 7: Results of linear-log OLS regression model

3.7 Conclusion

3.7.1 Key findings

This paper analyzes the occurrence and extent of channel-based price differentiation in multichannel online retailing. The results show that differential prices across online channels have an important practical relevance, as all of the observed sellers engage in online price differentiation. The majority of sellers apply a mixed pricing strategy, implying that pricing decisions are mainly made at the product level. For products with price differences, the online price gap of 16.97% is comparable to the findings by Wolk and Ebling (2010), who analyzed channel-based price differentiation between the offline and online channels.

The results also show that online shop prices are, on average, lower than e-marketplace prices. This practice is presumably driven by the fact that sellers experience higher direct costs, such as account and referral fees, when selling through e-marketplace channels. Therefore, they may charge higher e-marketplace prices to offset lower e-marketplace margins, or to migrate customers to their online shops that are less costly. Furthermore, sellers may also pursue different strategies for the online shop and e-marketplace channels that lead to different price levels between the two online channels.

The empirical results regarding the occurrence of online channel-based price differentiation show that multichannel online sellers mostly do not act in accordance with economic theory. Higher levels of online shop competition increase the probability of price differentiation, and sellers with smaller online shops have a higher incentive to charge different prices across online channels. Additionally, retailers are more likely to engage in online channel-based price differentiation than manufacturers. In contrast, higher product sales increase the probability of differentiated prices across channels, which is in line with economic theory. Concerning brand power, the results support the view that strong brands need to be consistent in the marketing mix. The analysis regarding the direction of online channel-based price differentiation shows that higher levels of online shop competition, sellers with smaller online shops, products with stronger brand power and products with lower sales increase the size of the relative price difference, i.e., online shop prices increase relative to e-marketplace prices.

3.7.2 Implications

As online shop and e-marketplace websites are just a click away from each other and buyer search costs are therefore reduced, one may expect that charging differentiated prices across channels is not a viable strategy for multichannel online sellers. However, this research shows that not only price dispersion but also multichannel price differentiation occurs online, i.e., sellers are still able to successfully engage in online channel-based price differentiation. This implies that customers have different channel valuations and price sensitivities for the online channels.

On the one hand, financial- and privacy-related issues are perceived as two major risks by online customers and influence the customers' willingness to pay, i.e., customers have a lower price sensitivity when the perceived risks are reduced (Dai, Forsythe, & Kwon, 2014). As trust mitigates risk in the online environment (Mou, Shin, & Cohen, 2017), higher levels of trust provide an opportunity for sellers to increase prices. B2C e-marketplaces transfer customer trust to their community of sellers (Hong & Cho, 2011) and reduce the perceived risks of customers. Therefore, e-marketplace sellers are able to charge higher e-marketplace prices and engage in

online channel-based price differentiation. On the other hand, one of the main reasons that customers buy online is convenience (Chiang & Dholakia, 2003). If customers purchase at various different online shops, they need to register an account for every online shop. In contrast, e-marketplaces enable customers to buy from a large range of different sellers while using just a single customer account. This implies that B2C e-marketplaces provide more convenience to customers, thereby reducing the customers' price sensitivity and offering sellers the opportunity to engage in price differentiation.

3.7.3 Limitations

The nonstatistical sampling method for the observed products does not allow the findings to be fully generalized. It also needs to be considered that this research has been conducted in Germany and that Amazon Marketplace has been used as a proxy for the e-marketplace channel, i.e., the findings may not apply to other countries or other B2C e-marketplaces, such as eBay. The Amazon Marketplace prices have been pulled for non-Prime users, so the outcomes may also not be applicable to Prime users.

Furthermore, the lack of statistically significant results in both models for e-marketplace competition, e-marketplace seller size and product type may be because the factor operationalization does not capture all relevant aspects of these factors. Finally, the profitability of online channel-based price differentiation has not been considered, and thus, a recommendation concerning an optimal pricing strategy for sellers cannot be derived.

3.7.4 Future research

The abovementioned limitations of this research offer opportunities for future research, e.g., by conducting similar research in other countries or by using other B2C e-marketplaces as a proxy for the e-marketplace channel. Considering the three research perspectives that Fassnacht and Unterhuber (2015) identified for price differentiation between the online and offline channel, this paper analyzes the actual seller behavior regarding online channel-based price differentiation. Therefore, first investigations dealing with the other two fields, optimal seller behavior and the impact

on customer behavior, may yield valuable insights for multichannel online retailing. For example, a worthwhile research approach in the field of customer behavior could be an empirical study on channel valuations and price sensitivities of customers within the online channel, which have been discussed conceptually in this paper.

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4. Paper C: Owning and Controlling the Brand Voice Experience: A Status Quo Analysis

This paper has been submitted to and is currently under review at the *Journal of Strategic Marketing*.

Abstract: Devices with an integrated voice dialog interface, such as Amazon Alexa, are rapidly growing in popularity and creating new customer touchpoints. Brands need to leverage these touchpoints, i.e., they need to own and control their voice experience. This study analyzes the current practices of top global fast-moving consumer goods brands in Germany and develops a voice design guidelines framework for brands to assess the quality of existing voice apps. The results indicate that, today, only a minority of these brands offer voice apps and, if they do, they deliver a poor customer experience, mostly in terms of simplicity, variation, personalization, context and branding.

Keywords: brand voice experience, business-to-consumer brands, conversational voice apps, smart speakers, voice dialog interfaces

4.1 Introduction

Spoken language or ordinary conversation is the “familiar predominant kind of talk in which two or more participants freely alternate in speaking, which generally occurs outside specific institutional settings” (Levinson, 1983, p. 284). It is the type of language almost all people produce naturally (Chafe & Tannen, 1987), and it is intuitive and time-efficient, reducing friction and allowing people to multitask and speak freely (Google, n.d.a). Schafer (1995) summarizes voice as being the most natural, widely used and efficient communication mode for humans.

Voice user interfaces (VUIs) have long been established, e.g., telephone-based or interactive voice response interfaces (Clark et al., 2019a). However, with the integration of Siri into the iPhone 4S in 2011, Apple made voice dialog interfaces, i.e., a new type of VUI that uses spoken natural language as an input as well as an output, available to the general public. With the recent advance of smart speakers, such as Amazon Echo and Google Home, these interfaces have rapidly grown in popularity and are becoming dominant touchpoints for customers to interact on the internet.

In 2018, 86.2 million smart speakers were sold worldwide, 2.5 times more than in 2017, and in Q4, more units were shipped than in all of 2017 (Strategy Analytics, 2019a). For 2019, more than 130 million of these devices, a growth of more than 50%, were expected to be sold, with the result that approximately 115 million households globally would have access to a smart speaker (Strategy Analytics, 2019b). It needs to be emphasized that these numbers do not include other types of voice dialog interface devices such as smartphones and tablets.

As a new customer touchpoint, these interfaces have a significant impact on marketing because they change how brands and consumers connect and interact (Dawar & Bendle, 2018; Gollnhofer & Schüller, 2018; Grewal, Roggeveen, & Nordfält, 2017). Marketing stimuli are no longer sent by technology and received by consumers in a unidirectional way; bidirectional, real-time interaction takes place in which both parties have the capacity to affect and to be affected (Hoffman & Novak, 2017).

According to a U.S. survey by Voicebot (2019), consumers mainly use smart speakers for listening to music (69.9% monthly active users), asking questions (66.0% monthly active users) and checking the weather forecast (61.4% monthly active users). While only 15.0% of the consumers surveyed use their smart speakers to make a purchases,

27.8% search for product information via smart speakers on a monthly basis (Voicebot, 2019). Active smart speaker users expect that their spending via smart speakers will increase six-fold in three years to 18.0% of their total expenditure (Capgemini, 2018). These numbers outline how voice dialog interfaces have already changed and will continue to change “consumer behavior, the path to purchase, and the way consumers interact with brands” (Huisman & Huisman, 2018, p. 39). Therefore, it is critical to actively manage this new customer touchpoint, i.e., to own and control the voice experience for their brands.

Due to the newness of this technology, few studies concerning voice dialog interfaces and marketing have been published, which creates “a gap in knowledge” (Jones, 2018, p. 240). This paper aims to fill this gap by analyzing the current practices of top fast-moving consumer goods (FMCG) brands and by developing a voice design guidelines framework for brands.

The remainder of this paper is organized as follows. First, voice dialog interfaces and relevant corresponding terms are defined and smart speakers, as one of the key device types of voice dialog interfaces, and their general architecture are outlined. Second, the existing marketing literature on voice dialog interfaces is reviewed. Next, research on the existence of branded conversational voice apps is conducted by examining the top global FMCG brands. Afterward, the voice design guidelines framework for brands with respective assessment criteria is developed and then applied to four conversational voice apps. The paper closes with key findings, implications, limitations and directions for future research.

4.2 Voice dialog interfaces

In contrast to traditional VUIs that only use voice either as an input or an output, voice dialog interfaces incorporate all of the five following fundamental technologies: (1) voice input, (2) natural language understanding, (3) voice output, (4) intelligent interpretation and (5) agency (Budiu & Laubheimer, 2018).

In the extant literature, there is often a lack of clear differentiation between the hardware of the device, e.g., Amazon Echo or Google Home, and the underlying software, e.g., Amazon Alexa or Google Assistant. The software, i.e., the voice dialog interface, which is also referred to as virtual assistant in the extant literature, can be

integrated into other products such as smartphones or tablets, and thus, there are different device types that are dialog-enabled today.

As outlined in the introduction, smart speakers have brought voice dialog interfaces into the mainstream, and therefore, this paper will focus on this device type. Among researchers, there is no common name for this product category, and consequently, there is no unanimous definition. In the existing literature, this product category is, for example, referred to as AI-enabled voice assistants (Gollnhofer & Schüller, 2018), conversational agents (Luger & Sellen, 2016), intelligent personal assistants (Cowan et al., 2017), AI assistants (Dawar & Bendle, 2018), voice-controlled virtual assistants (Jones, 2018) and smart speakers (Huisman & Huisman, 2018; Shankar, 2018). To clearly differentiate between the hardware and the software, the term smart speakers will be used for this product category. Smart speakers are defined as wireless devices with an integrated voice dialog interface that interact with users through spoken natural language and can provide information, perform tasks and offer services based on voice commands.

There are also higher-priced multimodal smart speakers, such as the Amazon Echo Show and Echo Spot, that have a screen as an additional graphical user interface (GUI), but due to a low market share, e.g., approximately 6.5% in the US (Voicebot, 2019), this research focuses on headless or voice-only smart speakers.

The basic architecture of smart speakers consists of two main channels that provide content: (1) voice platforms and (2) voice apps (Hörner, 2019). The voice platform provides functionalities and applications that are developed, managed and controlled by the smart speaker operators themselves, e.g., Amazon and Google. On the other hand, voice apps, which are comparable to smartphone apps, are developed, managed and controlled by third-party providers, i.e., voice app developers.

There are two types of voice apps: conversational types and transactional types (Hörner, 2019). Conversational voice apps are focused on dialogs with customers, i.e., they typically use voice to reply to customer requests, whereas transactional voice apps are mainly designed to activate and control other devices, such as smart home devices, e.g., to turn on the lights. These apps usually do not provide any voice replies, i.e., they only process voice input, and they merely execute the desired customer action. In contrast to conversational voice apps, transactional voice apps are, thereby,

a direct part of the product-related customer experience. In this context, conversational research distinguishes between turns, i.e., activities that people perform through voice, and actions that are performed by other activities such as physical activities (Schegloff, 2007).

To summarize, this paper focuses on conversational voice apps for headless smart speakers (see Figure 10).

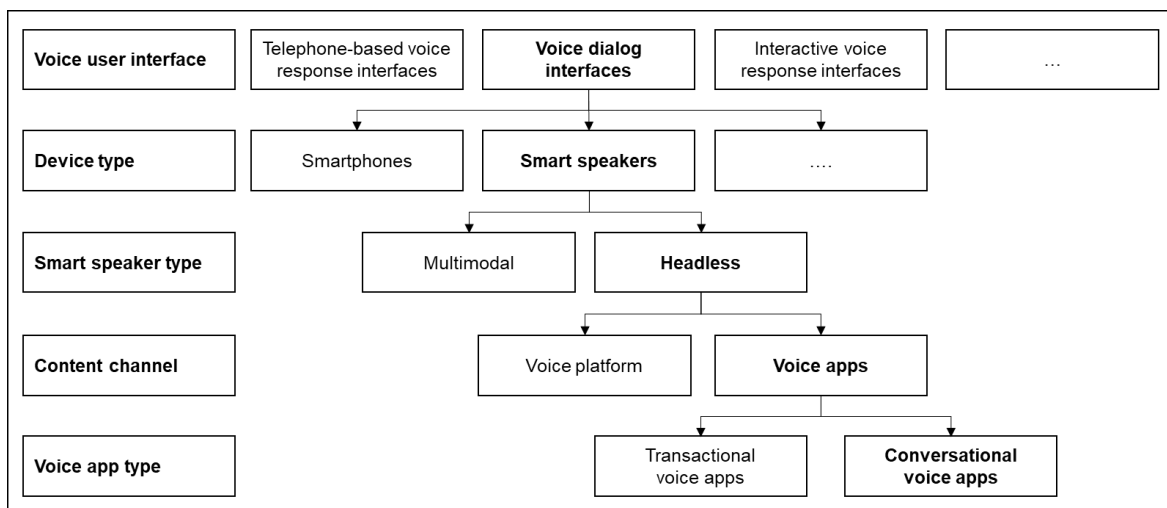


Figure 10: Overview of the focus of this paper
Source: Own illustration.

4.3 Literature review

Extant marketing literature has mainly focused on general challenges, user behavior and user experience of voice dialog interfaces. Some researchers have also developed generic recommendations for creating, designing and managing brand content for voice dialog interfaces. The next paragraphs summarize the main results of the existing literature.

Concerning challenges, researchers outline the implications of this new customer touchpoint for the interaction between brands and customers. As today's most popular voice dialog interfaces are operated by Amazon and Google, they expect that brands may find themselves in a weaker position because the operators control the access to their customers (Dawar & Bendle, 2018; Grewal et al., 2017; Huisman & Huisman, 2018; Jones, 2018). Jones (2018) also presents a case study to examine applications and opportunities for voice dialog interfaces in marketing and advertising and

concludes that successful conversations need to be relevant and tailored to the individual customer.

Bentley et al. (2018) study the long-term usage of Google Home users in the US and observe differences over time and depending on time of day. They also identify four distinct user groups: “one heavy group, the ‘super users’, two medium-use groups that differed in the number of commands per session, and one lighter group. The super users and those who explored more domains were similar in that they used on average over 40 subdomains. The lightest users and those who used shorter commands were similar in that they used less than 30 subdomains but listened to proportionally more music” (p.16).

In terms of general user experience, several researchers find that user experience with voice dialog interfaces leaves significant room for improvement because technology is, at present, still limited in terms of being able to simulate human conversation (Clark et al., 2019a; Ram et al., 2018). Based on 14 semistructured interviews with regular smart speaker users in the UK, Luger and Sellen (2016) find that user expectations are misaligned with smart speaker intelligence and capabilities so that people adapt their language, e.g., dropping words, removing complex words or speaking more clearly and slowly, during interactions. Thus, users state that one must learn to use smart speakers. Budiu and Laubheimer (2018) conducted usability testing and interviews with 17 frequent users in the US, finding that an unpleasant user experience is defined as the delivered usability being worse than the promised usability. Cowan et al. (2017) analyze the experience of 20 infrequent users who are native or near-native in English by a two-stage method: (1) an online questionnaire and tasks with Siri and (2) semistructured focus groups. They find that users see limits to the voice dialog interfaces’ humanness, a lack of customization and integration for the apps and services they frequently use, and concerns related to data privacy. Lovato and Piper (2015) study children’s use of voice dialog interfaces by conducting an online survey with parents and analyzing the content of YouTube videos in which children interact with voice dialog interfaces. They find that Siri has challenges with recognizing children’s speech, so children try to speak louder and slower to solve such issues.

In regard to generic recommendations for brands, Gollnhofer and Schüller (2018) outline the sensorial differences between voice and other customer touchpoints and

offer managers and marketers three generic recommendations for creating, designing and managing customer experience on voice dialog interfaces: (1) use sense mapping to create a strong voice touchpoints, (2) design own, specific voices to differentiate brands and (3) think in voice content to deal with the complexity of voice. Smith (2018) also analyzes what types of marketing messages customers find acceptable on smart speakers and concludes that a cognitive message strategy is effective. As potential executional frameworks, she refers to authoritative (using expert or research data), testimonial (using average people) and slice-of-life (using real life examples) messaging to endorse products. Similarly, Hörner (2019) recommends a content marketing strategy for smart speakers to drive customer retention and customer satisfaction and presents seven quality criteria for voice apps to provide brand content for these devices: offer customer value, first things first, conversation instead of just question-and-answer, avoid dialog dead ends, concentrate on one point, short and concise sentences and both factually and emotionally.

In summary, existing research on voice dialog interfaces emphasizes the relevance and challenges, provides general insights on user behavior and user experience and outlines some overall and generic recommendations for managers and marketers concerning the creation, design and management of strong brand voice content. However, there is still a lack of marketing knowledge on current brand practices, actual customer experience with brand voice content and specific guidelines for brands on how to create, design and manage high-quality content for voice dialog interfaces. This paper aims to enhance marketing knowledge in this field by analyzing current practices of FMCG brands and developing a general voice design guidelines framework for brands.

4.4 Conversational voice apps and FMCG brands

The following section will analyze whether FMCG brands already provide their own specific conversational voice apps to leverage this new customer touchpoint.

The nine top global FMCG brands in terms of brand value have been examined (Statista, 2019). The FMCG industry has been selected because this industry has traditionally been very successful in creating continuous growth through strong brands but faces several serious challenges today due to shifts in consumer behavior and

changes in the channel landscape. The top global FMCG brands seem to be an interesting and reasonable starting point for research because the FMCG industry is under great pressure to leverage new technology-driven trends, such as voice dialog interfaces, to refuel success and growth (McKinsey, 2018).

Amazon is the global market leader for smart speakers (Canalys, 2019), and Alexa Skills serve as a proxy for voice apps, and the US, UK and Germany are considered the leading countries in smart speaker usage (eMarketer, 2019). Two approaches have been used to identify whether brands offer their own Alexa Skills. First, the respective Amazon websites were searched (“[brand name] Alexa Skill”), and second, a Google search using local Google websites (“[brand name] Alexa Skill”) was conducted to discover any potentially deprecated or planned Alexa Skills. The data were collected in August 2019.

The results of this research show that only 33% of these brands offer an Alexa Skill in the US (Colgate, Lego and Johnson & Johnson). Additionally, L’Oréal has acted as a sponsor for the beauty voice app “My Beauty Chat”, which was developed by the Hearst Corporation (WARC, 2018). However, this Alexa Skill is no longer active. In the UK, 22% of the leading FMCG brands offer an Alexa Skill (Kellogg’s and Lego), whereas in Germany, just one brand (11%) provides an Alexa Skill (Nestlé). Table 8 summarizes these results.

Brand	US	UK	Germany
Gillette	-	-	-
Pampers	-	-	-
Kellogg's	-	Every Day Nutrition (by Special K)	-
L'Oréal	<i>My Beauty Chat*</i>	-	-
Danone	-	-	-
Nestlé	-	-	Babyservice
Colgate	Save Water By Colgate	-	-
Lego	LEGO Duplo Stories	LEGO Duplo Stories	-
Johnson & Johnson	Zyrtec – Your Daily AllergyCast	-	-

*Sponsor and deprecated

Table 8: Overview of Alexa Skills of the leading global FMCG brands (August 2019)

Additionally, a German Amazon Echo Dot (third generation) was asked about all nine brands (“Alexa, what is [brand name]”) to examine which information is provided to customers via the voice platform. For all these brands, Alexa provides generic information from Wikipedia about the manufacturer (see Appendix II for details).

This research shows that today, the majority of the top global FMCG brands do not own and control the brand voice experience in Germany because they neither offer voice apps nor provide their own brand-relevant content to the voice platform of smart speakers.

4.5 Voice design guidelines framework for brands

Researchers have developed various VUI design guidelines (e.g., Murad, Munteanu, Clark, & Cowan, 2018; Suhm, 2003; Wei & Landay, 2018) but, though natural and spoken language processing technology has improved significantly, there is a lack of general VUI design guidelines, and the existing guidelines are outdated (Clark et al., 2019a; Landay, Oliver, & Song, 2019). Han and Yeh (2019) argue that, on the one hand, general VUI and voice app design for voice dialog interfaces share certain aspects, but on the other hand, voice apps still have particular characteristics, such as a strong interaction focus. Therefore, they emphasize the need to develop specific design guidelines for conversational voice apps.

From a practical perspective, Amazon (Amazon, n.d.a) and Google (Google, n.d.b) provide a set of design guidelines to their voice app developers. Amazon's principles consist of four main design patterns and more than thirty guidelines. Google provides conversation design principles for Actions on Google developers, which consist of four high-level and twelve more specific concepts. The cornerstone of Google's principles and one of the high-level concepts is the cooperative principle, which was introduced by Grice (1989). The principle consists of four categories for an efficient conversation: quality, quantity, relation and manner. In addition, there is no observable research or empirical foundation behind Amazon's and Google's guidelines.

There are various different fields, e.g., marketing, human-computer interaction (HCI), linguistics and cognitive psychology, that deal with aspects of voice dialog interfaces, which leads to the fragmented structure of the corresponding research (Clark et al., 2019a). Landay et al. (2019) assert that "natural human conversation is highly complex" and call for multidisciplinary research in this field (p. 8). Therefore, contributions from different research disciplines need to be taken into account to develop a generally applicable voice design guidelines framework for brands.

For this, a two-stage approach has been used. First, existing VUI design guidelines from HCI research (Murad et al., 2018; Suhm, 2003; Wei & Landay, 2018), Amazon's Alexa design guide (Amazon, n.d.a) and Google's conversation design principles (Google, n.d.b) have been grouped and categorized. Second, linguistics, cognitive psychology, HCI and marketing research have been reviewed to verify the identified categories based on scientific theory (see Appendix III for details). This approach has led to a framework of seven voice design guidelines for brands: basic functionality, error handling, simplicity, variation, personalization, context and branding.

To be able to apply this framework, assessment criteria for each of the design guidelines have also been derived to test and evaluate the compliance of branded conversational voice apps. These criteria are rather basic in order to account for the current technological limits in regard to being able to truly simulate human conversation (Clark et al., 2019a; Ram et al., 2018).

According to Clark (1996), conversations can be divided into three sections: (1) entry into the conversation, (2) body of the conversation and (3) exit from the conversation. Conversational voice apps, therefore, need to be able to process basic commands that

support these sections in order to enable the emergence of conversations with customers in the first place. Thus, **basic functionality** is the foundation for all other design guidelines. “Activate” and “open” commands enable the entry section of conversations. The “repeat” command, i.e., fully repeating an utterance provided by the voice app, is an important basic functionality for the body of conversations, as utterances of voice dialog interfaces are only momentarily available (Moore, 2018). For the exit section, voice apps need to support “stop” commands.

Conversational research uses the term “repair” to refer to any effort in dealing with speaking, hearing or understanding issues to get interactions back on track (Schegloff, Jefferson, & Sacks, 1977). As errors are symptomatic of conversations (Keysar, Barr, & Horton, 1998), voice apps need to be able to repair interactions as soon as problems are detected; therefore, **error handling** is another design guideline. For conversational voice apps, the Amazon (Amazon, n.d.a) and Google (Google, n.d.b) design guides outline three situations in which they need to handle errors. First, if they do not understand a customer utterance, they should acknowledge this and ask for the information again. Second, if customers request unsupported functionalities, voice apps should inform customers accordingly. Third, in cases in which customers do not respond, voice apps should prompt them again with a variation of the original prompt. The quick, short and sequential nature of conversations increases the customer’s cognitive workload (Parush, 2005; Shneiderman, 2000) and “if either the task or the length of the system’s utterances exceeds people’s routine processing abilities, users may find themselves mentally overloaded” (Le Bigot, Rouet, & Jamet, 2007, p. 1052). Thus, **simplicity** in terms of short and brief utterances and limited choices for customers is important to enable customers to easily follow the interaction. Voice apps need to be designed in the way people speak and not in the way people write. Research has shown that spoken sentences are, on average, significantly shorter than written sentences. For English, Chafe and Danielewicz (1987) compared a written and spoken language corpus. They found that the written corpus contained, on average, 24 words per sentence, with a normal distribution around the mean, whereas the spoken corpus only contained, on average, 18 words per sentence, with a high variation in sentence length from one or two words up to more than 100 words per sentence. For German, the research of Weijenberg (1980) even showed a shorter

sentence length of, on average, 11 words per sentence for spoken language. These numbers can be used as a benchmark for the average number of words per sentence. Moreover, the average number of sentences per turn needs to be considered to calculate the brevity criterion, which is the average number of words per turn. Additionally, if voice apps offer multiple options or present a list of items in an utterance, this set of choices should be limited in order to reduce the cognitive load of customers. Le Bigot, Caroux, Ros, Lacroix and Botherel (2013) found that the recall of content words for three options was 70%, whereas it dropped to 50% for five options; thus, they recommend offering no more than three or four options.

Variation or heterogeneity is a general language characteristic because language offers multiple ways, e.g., different choices of words or syntax, to express the same meaning (Schiffrin, 1994). Therefore, voice apps need to be able to process and offer variation, i.e., to understand varying commands with the same intent (input) but also offer variation in its own utterances (output). Input variation can be assessed by reviewing the voice app responses of varying commands with the same intent. Reviewing the welcome and goodbye messages of voice apps multiple times is a good but rather basic means for assessing output variation.

In communication theory, common ground or mutual understanding is essential for good conversations (Clark, 1996). The respective grounding process is a collaborative action between the interlocutors, which creates problems in human-computer interaction (Brennan, 1998). Clark et al. (2019b) found that voice dialog interface users conceptualize common ground as personalization, i.e., the interfaces need to lead the grounding process by remembering information about the user and customizing the user experience accordingly. Therefore, **personalization** is another design guideline. Voice apps need to be able to personalize the customer experience, and basic functionalities should include (1) adjusting welcome messages for new and returning customers and (2) offering to pick up aborted conversations again rather than just directly starting over again as soon as the customer returns.

In natural conversations, people expect that all prior utterances, both their own and those of others, are memorized and leveraged throughout the whole interaction, as current utterances may refer to previous utterances (Luger & Sellen, 2016; Schegloff, 1988, 1992). Thus, voice apps need to be able to keep track of **context**, i.e., any

information that customers (input) and the voice apps themselves (output) have previously provided during the interaction. This can be assessed either by initially giving additional information that is relevant for the ongoing conversation or by checking how voice apps react to customers that consecutively repeat the same command. Ideally, voice apps refer to the fact that this information has just been provided and offer to repeat it instead of repeatedly providing the same response.

Finally, yet importantly, **branding** is another design guideline that starts with creating an effective voice app name. In general, Hörner (2019) and Smith (2018) recommend a content marketing strategy for voice apps to indirectly influence future purchase decisions at an early stage of the customer journey rather than trying to directly push sales. Following this strategy, Pulizzi (2012) emphasizes that the brand name should be entirely removed from the content in order to build trust and credibility. Thus, the brand name should not appear in the voice app name, which is the first assessment criterion for branding. In this context, the brand name should only be used wisely during interactions with customers, if at all. The average number of times the brand name is mentioned per turn can be used to assess this. Moreover, the voice app theme and provided content need to relate to the brand's area of life, which results in the third branding assessment criterion (Pulizzi, 2012).

For almost three decades, hearing, as one of the five basic senses, has been part of marketing and consumer research (e.g., Bruner, 1990; Scott, 1990). It is emphasized that "unconscious triggers, like those appealing to the basic senses, may be a more efficient way to appeal to consumers" (Krishna, 2012, p. 334). North, Mackenzie, Law and Hargreaves (2004) showed that music and voice that correspond well with their respective brands may have a positive impact on recall and affective responses. Therefore, companies should craft congruent and well-designed audio brands, including acoustic brand elements such as a voice, song, jingle, sound logo or sound icon, to enhance the customer experience and engagement (Jackson, 2003; Springer, 2008; Steiner, 2018). Westermann (2010) states that sound branding will be a key future challenge for successfully designing brand personalities. Concerning brand voice, at present, Amazon does not offer the possibility to use one's own voices for Alexa Skills. Nevertheless, brands can still leverage a variety of different male and female voices that Amazon offers to optimize the fit between voice and brand.

Concerning other audio brand elements, it is possible to integrate other audio types into Alexa Skills so that brands can leverage, e.g., songs or jingles, to create a brand-specific acoustic experience. By reviewing the usage of (1) voices other than the typical Alexa voice and (2) other audio types, voice apps can be assessed in terms of acoustic brand elements.

Figure 11 summarizes the developed framework and the corresponding assessment criteria.

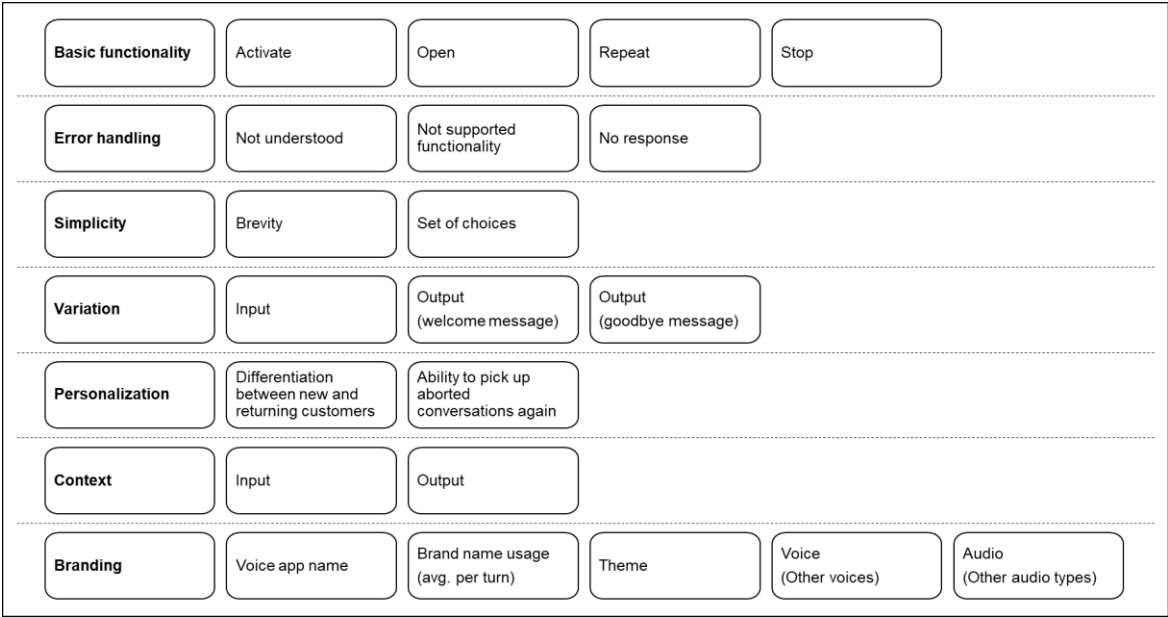


Figure 11: Voice design guidelines framework for brands and assessment criteria
Source: Own illustration.

4.6 Voice design guidelines compliance of FMCG brands

The prior research has shown that there seems to be a general lack of available conversational voice apps by the top global FMCG brands in Germany. Further research on the German Amazon website revealed that the two most popular laundry detergent brands, Persil, by Henkel (Amazon, n.d.c), and Ariel, by Procter & Gamble (Amazon, n.d.d), offer Alexa Skills. These two brands account for 51.3% of the German laundry detergent market (Statista, 2018).

Both of these conversational voice apps, called Persil Fleckenhilfe and Ariel, focus on stain removal. There is also another Alexa Skill in this category, called Fleckentferner (Amazon, n.d.e), which is offered by a third party, non-brand-related developer. This

non-branded voice app is also considered to compare its voice design guidelines compliance to the branded voice apps. To further broaden the scope of the analysis, the Nestlé Alexa Skill (cf. section 4), called Babyservice (Amazon, n.d.f), will also be included. Thus, the developed framework will be applied to four conversational voice apps to assess their compliance with the identified design guidelines.

The research was manually conducted with a German Amazon Echo Dot (third generation). The same commands were given to all Alexa Skills, with a slight need for adaptation for the Babyservice Alexa Skill due to the different theme of this voice app. The Alexa responses were extracted from the Alexa App. The data were collected in August 2019. An online text analysis tool called Wortliga was used to analyze the sentence and turn lengths.

All four Alexa Skills enabled customers to activate, open and stop the voice app. However, Babyservice and Persil Fleckenhilfe did not support the repeat functionality. When Babyservice was asked to repeat a command, it replied with “I’m afraid I didn’t understand that. Say the time of day. For example, noon” several times. In the same context, Persil Fleckenhilfe replied with “you have no notifications” repeatedly.

None of the voice apps were able to handle all three error scenarios that were assessed. Ariel and Persil Fleckenhilfe properly responded to two scenarios. When faced with indistinct commands, both Alexa Skills acknowledged that they did not understand these commands and asked for the information again. Ariel and Persil Fleckenhilfe also provided a variation of the original prompt when there was no response given, e.g., Persil Fleckenhilfe first asked “what kind of stain are we talking about” and asked “what kind of stain do you want to remove” when there was no response given after the first question. However, both voice apps were not able to inform about unsupported functionality. Amazon does not allow physical products to be sold through Alexa Skills today (Amazon, n.d.b) and commands and questions around “I would like to buy” or “where can I buy” were handled with “which stain do you need help removing” or “what kind of stain are we talking about”. Fleckentferner only dealt well with no responses and, in such cases, provided a variation of the original prompt, e.g., “how can I help you” was rephrased to “if you’re not sure, say help me”. When prompted with indistinct commands and questions around purchasing products, this Alexa Skill always replied with “I’m sorry, I don’t currently have a removal tip for X.

Maybe ask me for some general tips. What other stains can I help you with” in which “X” was just a random word or a random series of letters. Babyservice did not support any error handling and mostly just repeated prior utterances over and over again in each of the three scenarios.

Concerning brevity, the first assessment criterion for simplicity, Babyservice, Ariel and Persil Fleckenhilfe used, on average, ten words per sentence, whereas Fleckentferner only used, on average, eight words per sentence. Considering the abovementioned benchmark of approximately 11 words per sentence for spoken German language (Weijenberg, 1980), all voice apps used a reasonable sentence length. However, also using the average number of sentences per turn to calculate the average number of words per turn, the Alexa Skills revealed different levels of complexity. In using Ariel, with an average of 47 words per turn, and Persil Fleckenhilfe, with an average of 33 words per turn, customers faced a higher cognitive load compared to using Fleckentferner (an average of 25 words per turn) and Babyservice (an average of 23 words per turn). Thus, it can be concluded that Ariel and Persil Fleckenhilfe did not fulfill the brevity criterion.

Concerning the other simplicity criterion, set of choices, Ariel partly listed up to six steps that needed to be followed, e.g., for avoiding damages to favorite clothes, which does not align with the recommendation to limit choices or lists to three or four items. Babyservice, however, fulfilled this criterion by consistently limiting the list of choices to three. Persil Fleckenhilfe and Fleckentferner did not offer any choices or lists during the interactions; therefore, this criterion could not be assessed for these two voice apps.

None of the four Alexa Skills were able to handle input variation. Ariel, Persil Fleckenhilfe and Fleckenentferner were tasked with “you can help me remove a wine stain today”, “a wine stain” and “wine stain”. All three voice apps replied differently to each of these commands and only occasionally offered the requested recommendations for wine stain removal. Babyservice was tasked with “I would very much like to hear today's suggestions for my baby”, “I like to hear today's suggestions” and “today's suggestions” but always replied with “would you like to hear the nutrition plan for today, tomorrow or for example Sunday”. When considering output variation, Ariel was the only Alexa Skill that provided variation in the welcome and the goodbye

messages. In the welcome messages, Ariel offered help to remove varying stain types and changed the end of the messages, e.g., from "... happy to help. Which stain do you have to remove" to "... stains are annoying, but Ariel's taking care of it. What kind of stain do you want to remove". In the goodbye messages, Ariel also offered output variation, e.g., "okay, if you need more stains removed, just ask Ariel" and "remember, to remove a tough stain, just ask Ariel". Babyservice provided only changing goodbye messages, e.g., "see you soon", "bye" and "take care", whereas Persil Fleckenhilfe and Fleckentferner did not offer any variation at all.

Concerning personalization, Babyservice was the only voice app that partly met this criterion by differentiating the welcome message between new and returning customers. When activated for the first time, the Alexa Skill started with "welcome to Babyservice...", provided some general information on the voice app's offering and asked for the baby's birth date. When returning to Babyservice, the Alexa Skill started with "welcome back to Babyservice. Would you like to hear today's suggestions for your baby". Babyservice was, however, not able to pick up any aborted conversation again. The three other voice apps did not fulfill any of the personalization criteria.

When faced with the utterance "I had a glass of wine and poured it over my cotton pants", only Ariel was able to leverage all the given input to directly provide a reasonable response. In contrast, the other voice apps either asked for previously given information again, e.g., Persil Fleckenhilfe replied with "what material is it", or did not understand the utterance at all, e.g., Fleckenentferner replied with "I'm sorry, I don't currently have a tip on how to remove X" in which "X" were random words again. For Babyservice, the utterance "my child likes fish. I'd like a recipe for that" was used and the voice app asked "would you like a recipe for lunch, afternoon or evening". When answering "for lunch", Babyservice replied with "how do you feel about lamb, chard and mashed potatoes" which showed that the Alexa Skill was not able to leverage context from previous utterances. Considering the output context, none of the voice apps were able to memorize information they have already given to customers before, i.e., when consecutively repeating the same command, the voice apps provided exactly the same response over and over again. This part could not be assessed for Persil Fleckenhilfe, as this voice app closed the interaction autonomously after

providing the information, which, in general, does not seem to be a pleasant customer experience.

Two out of the three analyzed brand voice apps (Ariel and Persil Fleckenhilfe) used their brand name in the Alexa Skill name, which is not recommended, according to content marketing strategy. These two voice apps also used their brand name extensively throughout the interactions. The brand names were mentioned, on average, at least once per turn (Ariel: on average 1.4 times per turn; Persil or Sil, Henkel's stain remover brand: 1.1 times per turn). Thus, Ariel and Persil Fleckenhilfe do not fulfill the first two branding criteria. Nestlé, however, did not use the brand name in the Alexa Skill name and also only cautiously used the brand name during conversations (on average 0.2 times per turn).

The theme of all brand voice apps related to the brands' area of life. Ariel and Persil focused on stain removal, and Nestlé dealt with baby nutrition.

Concerning acoustic brand elements, all Alexa Skills used the same generic Alexa voice and did not include any other audio types, i.e., none of the voice apps used the current available options to establish a brand-specific acoustic experience.

To summarize the assessment and quantify the results, a compliance rate for each Alexa Skill, based on the above outlined findings, was calculated (see Table 9). According to this, Babyservice and Ariel had the highest compliance rate (48%), followed by Fleckentferner (35%) and Persil Fleckenhilfe (32%). These rates, however, show a general lack of compliance for all overserved Alexa Skills and indicate a poor customer experience for the branded and non-branded voice apps.

Excluding Fleckentferner as the only non-branded voice app, the overall compliance rate for the brands Ariel, Persil and Nestlé is 43%. For these three voice apps, the compliance rates for the seven design guidelines are: 83% for basic functionality, 44% for error handling, 40% for simplicity, 33% for variation, 33% for branding, 20% for context and 17% for personalization. Based on these results, simplicity, variation, branding, context and personalization score below average and seem to drive the poor customer experience for the branded voice apps.

On the Amazon website, customers have rated these Alexa Skills differently. They have given five stars to Persil Fleckenhilfe, 3.7 stars to Fleckentferner, 3.4 stars to Babyservice and one star to Ariel. However, considering the number of customer

ratings, Fleckentferner provides the only reliable measure, with 338 customer ratings, which also indicates a significantly higher customer adoption (Babyservice: nine customer ratings, Persil Fleckenhilfe: five customer ratings, Ariel: one customer rating). Due to the limited number of ratings for three of the four Alexa Skills, the Amazon star ratings do not provide valuable data for comparing the customer ratings with the findings of this research.

	Ariel	Persil Fleckenhilfe	Fleck- entferner	Baby- service
Basic functionality				
Activate	yes	yes	yes	yes
Open	yes	yes	yes	yes
Repeat	yes	no	yes	no
Stop	yes	yes	yes	yes
Error handling				
Not understood	yes	yes	no	no
Not supported functionality	no	no	no	no
No response	yes	yes	yes	no
Simplicity				
Brevity	no	no	yes	yes
Avg. number of words per turn	47	33	25	23
Standard deviation	63.63	47.59	16.82	29.20
Avg. number of sentences per turn	5	3	3	2
Standard deviation	4.53	2.84	1.71	2.04
Avg. number of words per sentence	10	10	8	10
Standard deviation	7.25	9.85	3.26	5.77
Set of choices	6	-	-	3
Variation				
Input	no	no	no	no
Output (welcome message)	yes	no	no	no
Output (goodbye message)	yes	no	no	yes
Personalization				
Differentiation between new and returning customers	no	no	no	yes
Ability to pick up aborted conversations again	no	no	no	no
Context				
Input	yes	no	no	no
Output	no	-	no	no
Branding				
Voice app name	no	no	-	yes
Brand name usage (avg. per turn)	1.4	1.1	-	0.2
Theme	yes	yes	-	yes
Voice (other voices)	no	no	no	no
Audio (other audio types)	no	no	no	no
Assessed criteria	21	19	17	21
Compliant criteria	10	6	6	10
Compliance rate	48%	32%	35%	48%
Amazon customer assessment				
Star rating (max. 5)	1	5	3.7	3.4
Number of customer ratings	1	5	338	9

Table 9: Overview of the Alexa Skills voice design guidelines compliance

4.7 Key findings and implications

The analysis of the current practices of top FMCG brands provides three key findings. First, only the minority of these brands offer own Alexa Skills, which indicates that this industry seems to lag behind the development of voice dialog interfaces. Considering the significant relevance of voice dialog interfaces for brands, as outlined by several researchers (Dawar & Bendle, 2018; Grewal et al., 2017; Huisman & Huisman, 2018), managers and marketers need to leverage this customer touchpoint now in order to avoid being left behind by technological development. Due to the current lack of brand voice content provided, there still seems to be the possibility of constituting a competitive advantage in this field.

Second, the results of the voice design guidelines assessment for Alexa Skills indicate a poor quality of existing FMCG conversational brand voice apps and thus a poor customer experience. This finding supports similar results in regard to general user experience with voice dialog interfaces (e.g., Budiu & Laubheimer, 2018; Cowan et al., 2017; Lovato & Piper, 2015; Luger & Sellen, 2016). The still limited technology in the area of social conversation and free-form conversations with smart speakers (Clark et al., 2019a; Ram et al., 2018) is one reason for the poor customer experience but this research shows that the existing FMCG conversational brand voice apps do not even leverage today's smart speaker capabilities sufficiently. Wei and Landay (2018) support this finding and outline that "even accounting for current technical limitations, especially for natural language understanding, we believe that system designers could deliver a better user experience" (p. 93).

Third, this research found that the considered Alexa Skills mostly did not comply with the developed voice design guidelines framework in terms of simplicity, variation, personalization, context and branding. Therefore, the findings also provide specific insights on how to improve the customer experience.

To summarize, managers and marketers need to understand the importance of this new customer touchpoint and start owning and controlling the voice experience for their brands. For that purpose, the developed voice design guidelines offer a valuable framework for brands to develop own conversational voice apps with an improved customer experience.

4.8 Limitations and future research

This research has been focused on voice-only smart speakers and branded conversational voice apps; therefore, the results cannot be generalized for (1) all smart speakers and voice dialog interfaces or (2) all functionalities and voice apps. The voice app compliance assessment was also conducted with a German Amazon Echo Dot. Thus, the results may not apply to other markets and languages. The research has also been focused on FMCG brands so that the findings cannot be generally transferred to other industries and business-to-consumer brands.

The voice design guidelines of the framework and most of the assessment criteria are language agnostic. For simplicity respectively brevity, however, the results of Chafe and Danielewicz (1987) and Weijenberg (1980) show that there are differences in terms of the average number of words per sentence for spoken language in English and German. Thus, the benchmark used for this assessment criterion needs to be adapted according to the language of the research.

These limitations leave room for valuable future research on marketing and voice dialog interfaces. As a next step, due to the lack of available data from customers (cf. the limited amount of customer ratings on the Amazon website), the developed framework could be used to conduct similar research with customers and let them evaluate existing branded conversational voice apps.

Furthermore, as existing literature on natural human conversation is fragmented across various research fields, the author encourages multidisciplinary research to leverage the specific expertise from each discipline and to jointly enhance research on voice dialog interfaces.

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5. Conclusion

Nowadays, the online retail landscape is expanding in terms of where and how customers can shop online. Therefore, manufacturers are confronted with novel marketing instruments that create additional challenges and opportunities. In this context, this dissertation generates valuable research findings and practical implications in the fields of multichannel online retailing and voice dialog interfaces with regard to improved marketing mix decision-making. This chapter presents these contributions and outlines limitations as well as directions for future research.

5.1 Contribution to research and practice

Existing marketing research on recent structural changes in online retailing, specifically multichannel online retailing and voice dialog interfaces, is generally limited, which hinders thorough and reasonable marketing mix decision-making. To enhance better marketing mix decisions in terms of place, price and promotion, this dissertation, therefore, focuses on contributing research findings that can be further built upon.

The limited marketing literature on multichannel online retailing seems to be driven by a general lack of perspective shift from the singular online channel to multichannel online retailing. For voice dialog interfaces, the scarce amount of marketing research seems to be due to the newness of the technology so that significantly more contributions are expected over time. This dissertation, therefore, leverages generic marketing concepts, multichannel research in the offline and online context and literature from other research fields to provide answers to the initially outlined research questions.

First, in terms of place, on the one hand, a general e-marketplace classification scheme with six dimensions is presented. On the other hand, the most popular B2C e-marketplace type, i.e., neutral, fixed-price and open B2C e-marketplaces, such as Amazon Marketplace and eBay, is further analyzed. For this purpose, a novel and generic analytical tool for channel research (the PILT framework) is developed, based on marketing functions theory, which shows that the role of this online channel is only centered on information functions. This implies that B2C e-marketplaces are a hybrid between a direct and an indirect channel. They act as legally and economically

independent intermediaries between manufacturers and customers but manufacturers still need to fulfill the majority of marketing functions themselves.

For business practice, this novel structure creates increased complexity as well as certain risks because the B2C e-marketplace operators control the access to customers. Therefore, clear strategies in terms of who manages which marketing function across online channels and how to mitigate the dependency on the B2C e-marketplace operators are crucial for success.

Second, with regard to price, it is shown that channel-based price differentiation exists in multichannel online retailing. The observed price gaps are similar to the price gaps between the offline and online channels that researchers reported previously. The existence of online price differentiation implies that manufacturers are still able to charge different prices for the same product, which indicates that customers have different channel valuations and price sensitivities for the online channels. At the end of the 1990s, researchers expected one market-driven price for each product in online retailing due to the reduction in buyer search costs but the findings of this dissertation do not support this theory. In general, price differentiation seems to be a viable pricing strategy, which should be considered in multichannel online retailing. In terms of influencing factors for online channel-based price differentiation, one of the main findings is that stronger brands seem to be less likely to charge differential prices. Thus, the theory that brands need to provide consistency across distribution channels to maintain brand power is supported.

Third, in terms of promotion, it is shown that the majority of the top global FMCG brands do not use voice dialog interfaces as a communication channel today. Considering the quality of the existing communication messages, a voice design guidelines framework for brands is developed, which presents that the currently delivered customer experience is poor, especially with regard to simplicity, variation, personalization, context and branding. Business practice can leverage the developed voice design guidelines for brands as a hands-on tool to design high quality voice apps and to identify design-specific areas to improve the customer experience of existing voice apps.

Figure 12 summarizes the main contributions of each of the three papers with regard to marketing mix decision-making.

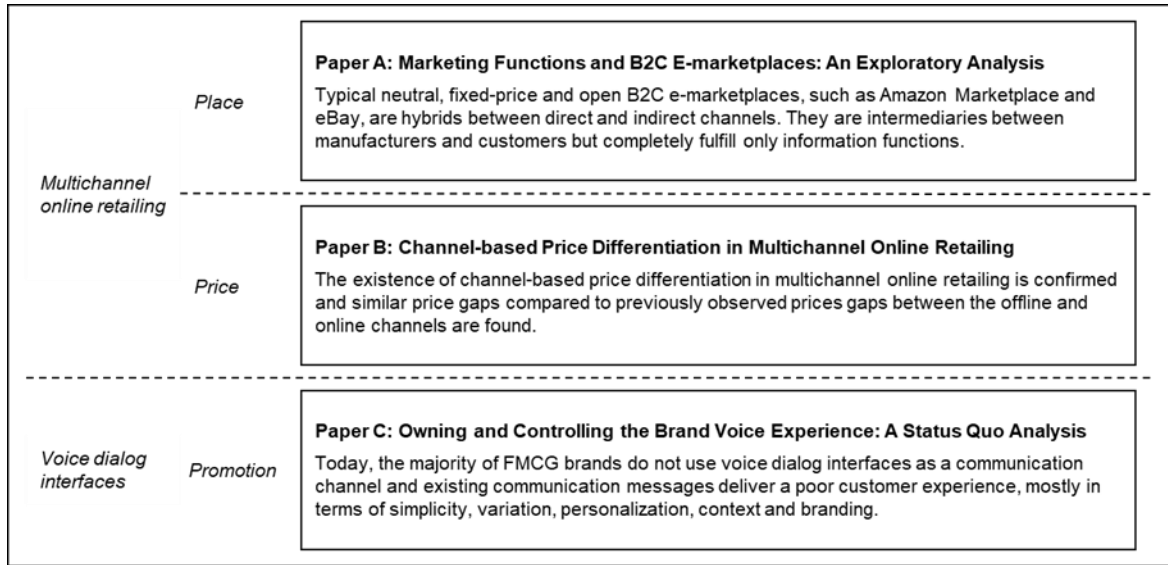


Figure 12: Main results of papers

Source: Own illustration.

5.2 Limitations and future research

In addition to the contributions, there are certain limitations of this dissertation, which provide opportunities and directions for future research.

Considering the Four P model, this dissertation focuses on place, price and promotion but product, the fourth marketing instrument area, is not examined specifically. As the fundamental and core offering of companies, it, nevertheless, provides relevant areas for research with regard to multichannel online retailing and voice dialog interfaces. Future studies could analyze which challenges and opportunities the proliferation of online channels and the change in the user interaction mode yield in terms of product innovation, variation and differentiation for tangible as well as intangible goods. For example, it could be valuable to investigate how voice dialog interfaces can create additional customer value around existing product offerings or how this customer touchpoint can be leveraged for product innovation.

In terms of place, price and promotion, there are also some limitations. The marketing mix is only indirectly addressed in the three research papers and each paper focuses on just a single marketing instrument area. However, as mentioned in the introduction, there are functional, chronological and hierarchical dependencies between the four

marketing mix elements so that future research could examine a more holistic marketing mix approach to consider these interdependencies.

Furthermore, there are also certain limitations based on the design of the investigations. The research has mostly been focused on Germany, and proxies have been used for the B2C e-marketplace channel (Amazon Marketplace) and voice dialog interfaces (Amazon Echo Dot); thus, the results cannot be generalized because they may not apply to other countries, other B2C e-marketplaces or other voice dialog interfaces. Therefore, similar studies in other countries or with other proxies for the e-marketplace channel and voice dialog interface are suggested to validate and potentially generalize the observed results.

While this dissertation provides relevant findings in terms of the existence and extent of channel-based price differentiation in multichannel online retailing, the analysis of the influencing factors on the occurrence and direction only generates limited contributions due to the lack of statistically significant results for three factors in both models. In this context, future studies could address this by investigating different approaches with regard to the factor operationalization. Moreover, this investigation only considered actual seller behavior, i.e., it does not provide any insights into profitability, and consequently, any recommendation on the optimal pricing strategy, which could also be a relevant area for future research. Research on optimal seller behavior and its impact on customer behavior may also generate valuable additional insights for multichannel online retailing. An interesting starting point in the field of customer behavior could be an empirical study on channel valuations and price sensitivities of customers within the online channel.

The developed design guideline framework for brands and most of the assessment criteria are language agnostic. However, language differences affect the brevity assessment criterion, which needs to be considered when using the framework for non-German research. Additionally, the lack of available data from customers leaves room for further validation of the assessment criteria of the developed framework. Therefore, further empirical research could evaluate customers' attitudes toward the quality of existing branded conversational voice apps. Lastly, natural human conversation is very complex, and many different fields conduct relevant research, which leads to fragmentation in the existing literature. Thus, the author encourages

multidisciplinary research to bring together specific expertise from each discipline and thereby holistically drive understanding and knowledge in terms of voice dialog interfaces.

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Appendix

Appendix I: Summary of the PILT Framework

PILT Framework	Shaw (1912)	Weld (1917)	Cherington (1920)	Converse (1926)	Oberparleiter (1930)	McGarry (1950)	Buddeberg (1959)	Sundhoff (1965)	Seyffert (1972)
Product <ul style="list-style-type: none"> ▪ Assembling ▪ Standardizing and grading ▪ Finishing 	<ul style="list-style-type: none"> ▪ Assembling, assorting and re-shipping 	<ul style="list-style-type: none"> ▪ Assembling ▪ Rearrangement 	<ul style="list-style-type: none"> ▪ Assembling ▪ Grading 	<ul style="list-style-type: none"> ▪ Packing ▪ Dividing ▪ Standardizing and grading 	<ul style="list-style-type: none"> ▪ Quantity ▪ Quality 	<ul style="list-style-type: none"> ▪ Merchandising 	<ul style="list-style-type: none"> ▪ Quantity rearrangement ▪ Product rearrangement ▪ Finishing 	<ul style="list-style-type: none"> ▪ Quantity ▪ Assortment ▪ Quality ▪ Finishing 	<ul style="list-style-type: none"> ▪ Quantity ▪ Quality ▪ Assortment
Information <ul style="list-style-type: none"> ▪ Search, organization and distribution ▪ Promotion 	<ul style="list-style-type: none"> ▪ Selling (communication of ideas about the goods) 	<ul style="list-style-type: none"> ▪ Selling 	<ul style="list-style-type: none"> ▪ Sales functions (equipment, personnel, relations to the public) 	<ul style="list-style-type: none"> ▪ Selling ▪ Buying (including assembling) 	<ul style="list-style-type: none"> ▪ Promotion 	<ul style="list-style-type: none"> ▪ Contractual ▪ Propaganda ▪ Pricing 	<ul style="list-style-type: none"> ▪ Information ▪ Consulting ▪ Contact 	<ul style="list-style-type: none"> ▪ Market development 	<ul style="list-style-type: none"> ▪ Market development ▪ Interests protection and consulting ▪ Pricing
Logistics <ul style="list-style-type: none"> ▪ Physical distribution ▪ Storage 	<ul style="list-style-type: none"> ▪ Transporting the goods ▪ Storage 	<ul style="list-style-type: none"> ▪ Transporting ▪ Storing 	<ul style="list-style-type: none"> ▪ Transporting ▪ Storing 	<ul style="list-style-type: none"> ▪ Transporting ▪ Storing 	<ul style="list-style-type: none"> ▪ Space ▪ Time 	<ul style="list-style-type: none"> ▪ Physical distribution 	<ul style="list-style-type: none"> ▪ Space balancing ▪ Time balancing 	<ul style="list-style-type: none"> ▪ Bridging 	<ul style="list-style-type: none"> ▪ Space ▪ Time
Transaction <ul style="list-style-type: none"> ▪ Financing ▪ Risk assumption ▪ Processing 	<ul style="list-style-type: none"> ▪ Financing the operations ▪ Sharing the risk 	<ul style="list-style-type: none"> ▪ Financing ▪ Assumption of risk 	<ul style="list-style-type: none"> ▪ Financing ▪ Assumption of risk 	<ul style="list-style-type: none"> ▪ Financing ▪ Risk-bearing 	<ul style="list-style-type: none"> ▪ Credit 	<ul style="list-style-type: none"> ▪ Termination 		<ul style="list-style-type: none"> ▪ Transaction ▪ Assurance 	<ul style="list-style-type: none"> ▪ Credit

Appendix II: Overview of the Alexa voice platform responses for the leading global FMCG brands (Alexa, was ist [Markenname] [Alexa, what is [brand name]])

Brands	Alexa response	Wikipedia link
Gillette	The Gillette Company war ein multinationales Unternehmen mit Sitz in Boston im US-Bundesstaat Massachusetts. Die Gesellschaft produzierte Rasierapparate, elektrische Geräte, Zahnpflegeprodukte und Batterien. [The Gillette Company was a multinational company based in Boston, Massachusetts. The company produced shavers, electrical appliances, dental care products and batteries.]	https://de.wikipedia.org/wiki/The_Gillette_Company
Pampers	The Procter & Gamble Company ist ein US-amerikanischer, in 70 Ländern vertretener Konsumgüterkonzern mit Hauptsitz in Cincinnati im US-Bundesstaat Ohio. [The Procter & Gamble Company is a U.S. consumer goods group with headquarters in Cincinnati, Ohio, USA, and operations in 70 countries.]	https://de.wikipedia.org/wiki/Procter_%26_Gamble
Kellogg's	Die Kellogg Company ist eines der weltweit größten Unternehmen für Getreideprodukte, speziell Frühstücksflocken, mit Produktionsstätten in zwanzig Ländern. [The Kellogg Company is one of the world's largest companies for cereal products, especially breakfast cereals, with production facilities in twenty countries.]	https://de.wikipedia.org/wiki/Kellogg_Company
L'Oréal	Die L'Oréal S.A. ist ein französischer Konsumgüterkonzern mit Hauptsitz in Paris und derzeit der größte Kosmetikerhersteller der Welt. [L'Oréal S.A. is a French consumer goods group headquartered in Paris and currently the largest cosmetics manufacturer in the world.]	https://de.wikipedia.org/wiki/L%2E280%99Or%C3%A9al
Danone	Danone ist ein multinationaler Getränke- und Lebensmittelkonzern mit Hauptsitz in Paris. [Danone is a multinational beverage and food company headquartered in Paris.]	https://de.wikipedia.org/wiki/Danone
Nestlé	Nestlé S.A. ist der weltgrößte Nahrungsmittelkonzern und das größte Industrieunternehmen der Schweiz. Die Hauptverwaltung befindet sich in Vevey, Schweiz. [Nestlé S.A. is the world's largest food company and the largest industrial enterprise in Switzerland. The head office is located in Vevey, Switzerland.]	https://de.wikipedia.org/wiki/Nestl%C3%A9
Colgate	Colgate-Palmolive ist ein multinationaler Konzern mit Stammsitz in New York, NY. Während in Deutschland die eingedeutschte Aussprache des Unternehmensnamens üblich ist, verwendet man in Österreich und der Schweiz die US-amerikanische. [Colgate-Palmolive is a multinational corporation headquartered in New York, NY. While in Germany the German pronunciation of the company name is common, in Austria and Switzerland the American pronunciation is used.]	https://de.wikipedia.org/wiki/Colgate-Palmolive
Legó	Die Legó A/S ist ein dänisches Unternehmen und größter Spielzeughersteller der Welt, das durch die mittlerweile als Spielzeugklassiker geltenden Legosteine bekannt wurde. Das Wort Legó leitet sich von dänisch „leg godt“ , auf deutsch „spiel gut“ , ab. [Legó A/S is a Danish company and the largest toy manufacturer in the world, known for its Legó bricks, which are now regarded as classic toys. The word Legó is derived from the Danish "leg godt", in German "spiel gut".]	https://de.wikipedia.org/wiki/Lego
Johnson & Johnson	Johnson & Johnson ist ein weltweit tätiger amerikanischer Pharmazie- und Konsumgüterhersteller mit Hauptsitz in New Brunswick im US-Bundesstaat New Jersey. Das Unternehmen ist im Dow Jones Industrial Average gelistet. [Johnson & Johnson is a global pharmaceutical and consumer goods company headquartered in New Brunswick, New Jersey, USA. The company is listed in the Dow Jones Industrial Average.]	https://de.wikipedia.org/wiki/Johnson_%26_Johnson

Appendix III: Developing the design guidelines framework (two-stage approach)

Design guidelines	Suhm (2003)	Murad et al. (2018)*	Wei and Landay (2018)**	Alexa design guide (Amazon, n.d.a)	Conversation design principles (Google, n.d.b)	Scientific theory
Basic functionality	<ul style="list-style-type: none"> Control and Freedom 	<ul style="list-style-type: none"> Allow users to exit from errors or a mistaken conversation 	<ul style="list-style-type: none"> Support the "Repeat" command 	<ul style="list-style-type: none"> Clark, 1996; Moore, 2018 		
Error handling	<ul style="list-style-type: none"> Control and Freedom Visibility/Feedback Preventing Errors Recovering from Errors 	<ul style="list-style-type: none"> Make the system status clear Start and stop conversations Make conversation a back-and-forth exchange Guide users through a conversation so they are not easily lost Use responses to help users discover what is possible Use speech-recognition system confidence to drive feedback style Avoid cascading correction errors Use normal language in communicating errors 	<ul style="list-style-type: none"> Ask for more information Accept corrections Handle errors gracefully Design for when Alexa doesn't understand Design for when Alexa understands but can't help yet Re-prompt when the customer does not respond Design for response time limits 	<ul style="list-style-type: none"> Get the dialog back on track Move the conversation forward 	<ul style="list-style-type: none"> Keysar et al., 1998; Schegloff et al., 1977 	
Simplicity	<ul style="list-style-type: none"> Recognition over Recall Minimalism Help and Documentation 	<ul style="list-style-type: none"> Speak the user's language Use spoken language characteristics Keep feedback and prompts short Confirm input intelligently 	<ul style="list-style-type: none"> Avoid data entry Create a simple set of options Create well defined, concrete tasks Avoid ambiguous and complex tasks Provide definitive choices Find the top three best matches to the input Write it the way you say it Use parallel language Be brief Apply the one-breath test 	<ul style="list-style-type: none"> Speak clearly, in plain English Ask questions Do not monopolize Optimize for relevance 	<ul style="list-style-type: none"> Chafe and Danielewicz, 1987; Le Bigot et al., 2007; Le Bigot et al., 2013; Parush, 2005; Shneiderman, 2000; Weijnenberg, 1980 	

Appendix III: Developing the design guidelines framework (two-stage approach) [continued]

Design guidelines	Suhm (2003)	Murad et al. (2018)*	Wei and Landay (2018)**	Alexa design guide (Amazon, n.d.a)	Conversation design principles (Google, n.d.b)	Scientific theory
Variation		<ul style="list-style-type: none"> Flexibility and Efficiency 		<ul style="list-style-type: none"> Match a variety of utterances to your intents Add variety Vary Alexa's responses in repetitive tasks 	<ul style="list-style-type: none"> Variation 	Schiffrin, 1994
Personalization			<ul style="list-style-type: none"> Adapt agent style to who users are, how they speak, and how they are feeling 	<ul style="list-style-type: none"> Recognize new and returning customers Capture information through skill use Use adaptive prompts Access a customer's location Resume a skill session after exit 		Brennan, 1998; Clark, 1996; Clark et al., 2019b
Context			<ul style="list-style-type: none"> Pay attention to what the user said and respect the user's context 	<ul style="list-style-type: none"> Handle over-answering Provide contextual help Be contextually relevant 	<ul style="list-style-type: none"> Expect users to be informative Listen between the lines Pronouns or generic references Follow-up intents 	Luger and Sellen, 2016; Schegloff, 1988; Schegloff, 1992
Branding	<ul style="list-style-type: none"> Carefully select the appropriate persona 	<ul style="list-style-type: none"> Mapping Consistency 	<ul style="list-style-type: none"> Give the agent a persona through language, sounds, and other styles 	<ul style="list-style-type: none"> Create an effective invocation name Use other voices Add other types of audio to your skill 		Bruner, 1990; Jackson, 2003; Krishna, 2012; North et al., 2004; Pulizzi, 2012; Scott, 1990; Steiner, 2018; Westermann,

* The two guidelines "Transparency/Privacy" and "Context" are not applicable to this framework as it is focused on smart speakers, which are mainly used in private (at home) and not in public.

** The guideline "Use multimodal feedback when available" is not applicable to this framework as it is only focused on voice-only (not multimodal) devices.



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