Artificial Intelligence:
The cutting-edge technology that revolutionizes
the digital marketing

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ABSTRACT

The marketing landscape has tremendously changed over the past several years. Digital touchpoints just keep multiplying, giving customer endless options for buying products and services, everywhere and every time. Notwithstanding, the increasing demand for incredible customer experience across all digital touchpoints. Customers want one-to-one personalization. The solution to both improving the digital experience and producing more personalized content is Artificial Intelligence (AI). With the use of AI, businesses get deeper real-time insights into what customers want and based on these insights, businesses can create a unique experience for each individual customer. Nevertheless, commercial adoption of AI-based applications by businesses is still limited due to lacking knowledge about the technology. The current research is developed to fill this gap. This paper advances the theoretical understanding of various AI-based marketing applications that can improve the online customer experience (OCE) across the customer decision journey. Specifically, this research has examined how Programmatic Advertising, Personalized Search Optimization, Product Recommendations, and Chatbots affect a set of five antecedent factors of OCE. These include usability, interactivity, enjoyment, customization and perceived benefits. Thereby, an extensive literature review and an expert interview have informed this study. The literature review shows that (1) all proposed applications affect the OCE antecedent factors customization and usability, (2) Product Recommendations and Chatbots also influence the factors perceived benefits and interactivity and (3) only little support is found about the impact of Chatbots on the factor enjoyment. These findings are to a great extent validated by the empirical results of the interview. No empirical results are available to support the findings of Personalized Search Optimization. Key managerial implications for businesses are provided by highlighting the importance of incorporating AI into marketing practices to create a unique experience for customers along their journey to purchase.

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1. INTRODUCTION

The marketing landscape has been rapidly changing over the past several years due to digitalization. Digital touchpoints just keep multiplying, giving customers endless options for researching and buying new products and services, every time and everywhere (van Bommel, Edelman, & Ungerman, 2014). Besides, customers demand a consistent and personalized experience across all digital touchpoints. They want one-to-one personalization in the form of individual incentives, product recommendation, and messaging. Hence, understanding the needs and demands of each individual customer is becoming increasingly important and it has become critical for businesses to respond to market dynamics accurately and quickly (Olmez, 2018b).

Artificial intelligence is at the forefront of this change. Automation and personalization are now key elements to engaging and communicating with consumers. AI digital marketing efforts rely in some part on the ability to personalize the customer decision journey and create incredible and memorable experiences across physical and digital channels that keep customers coming back again and again. With the use of AI and machine learning, businesses get deeper real-time insights into what customers want and based on these insights, businesses can create unique ads and personalized messages for each individual customer in real-time. Customers will feel more special and welcome which in turn drive higher conversions (247.ai, 2018).

Research has found that almost 74 percent of online customers are frustrated by unnecessary content they are exposed to on websites. Notwithstanding, about 40 percent of these customers will go so far as to leave the digital platform and 61 percent of them stopped doing business with the company because of poor customer experience. Nowadays, personalized customer experiences are becoming the norm. By personalizing the digital experience, up to 65 percent of the customers will be inclined to make a purchase (Olmez, 2018a). Therefore, it is crucial for companies to know how they can engage with customers in these digital touchpoints as the purchase decision highly depends on the quality of their experiences all along their journey.

Most of today's AI investments can be credited to tech giants and digital native companies such as Apple, Google, and Amazon. They are investing billions of dollars in the development of various AI applications to create more targeted, tailored experiences for consumers. Nevertheless, commercial adoption of AI-based applications is still limited to sectors that are already strong digital adopters. Businesses experience difficulties with the integration of AI applications in the context of understanding the impact and assessing the ROI. Consequently, they still stick to traditional marketing technologies which are less effective than AI. Thus, in order to remain competitive, businesses need to incorporating AI into marketing practices to provide an intelligent, convenient and informed customer experience along the customer journey (Bughin et al., 2017).

Most recently, technological breakthroughs facilitate a change: AI is finally delivering real-life business benefits. Developments in the field of cloud computing and open source will make AI applications available to the masses (Panetta, 2019). Next, computing power is growing, algorithms become more advanced and big data is being generated massively (Bughin et al., 2017). Now it's up to the weak AI adopters to embrace this technology and unleash its potential to improve and revolutionize businesses.

1.1 Research Question

Although AI is already well developed and harnessed by companies from other industry sectors, technology gains little attention in the marketing landscape. Various scientific paper about AI applications is available. Nevertheless, most of them are published within the computer science field and emphasize the technical capabilities and limitations. A theoretical understanding of AI marketing solutions that can improve the online customer experience is missing. The current research is developed to fill this gap. Thereby, various AI-based digital marketing applications will be the focal point of this research paper and the conducted research will be centered around the following research question:

How can businesses successfully leverage AI in digital marketing to create an improved online customer experience across the customer decision journey?

As different concepts in the field of marketing and computer science form an integral part of this study, the research question has been divided into various sub-questions discussing all concepts in particular to provide an overall answer to the general question. The following sub-questions are formulated:

(1) What are the different stages of the customer decision journey, and what consumer activities are undertaken at each stage?

The concept of 'customer decision journey' in the context of marketing will be used in this research as the consumer is expected to go through different stages to make a final purchase. E-commerce marketers need to understand what the stages are that the consumer is going through and what activities the consumer undertakes at each stage in order to reach and engage with the consumer and provide excellent customer experience.

(2) What are the dimensions of the online customer experience and what antecedent factors influence the online customer experience?

The 'online customer experience' is the dependent variable in this research. It plays a crucial part in this research, as the purchase decision of a consumer is influenced by it. Nowadays, consumers demand excellent experiences along their journey to purchase. Therefore, various factors that influence the online customer experience will be extensively explored and explained in this study. These factors are used to examine in how far AI applications improve the experience by looking at the impact of them on the factors.

(3) What Artificial Intelligence applications can be used at what stage of the consumer decision journey and what are their effects on the OCE antecedent factors?

In this research, 'AI applications' is the independent variable. It will be investigated what effect the AI application has on the selected OCE antecedent factors. Therefore, a general understanding of AI applications needs to be provided. The most promising applications in the digital marketing landscape will be explored and what their main functions are. Based on this, it can be defined at what stage the application can be used.

1.2 Methodology

This study considers two research approaches. The first approach entails an extensive literature review about customer decision journey, online customer experience, and Artificial Intelligence applications. Different concepts of the customer decision journey have been explored to identify the different stages of the journey and related customer activities at each stage. Furthermore, studies about online customer experience will be reviewed, and various antecedent factors that influence the online customer experience will be examined. Both literature reviews were conducted by categorically inspecting and evaluating literature

from scholarly articles, journals, and conference papers. For the literature search a set of keywords have been used and are presented below in **Table 1**:

Table 1: List of keywords for literature search

Research topics		
Online customer experience (OCE)	**Customer decision journey**	**Artificial Intelligence (AI) in marketing**
"Online customer experience"	"Customer decision journey"	"AI"
"Online experience"	"Online customer journey"	"AI marketing"
"Shopping experience"	"Customer journey"	"AI digital marketing"
"Web experience"	"Path to purchase"	"AI applications"
"Online shopping experience"	"Purchase journey"	"Programmatic advertising"
"Dimensions of online customer experience"	"Digital touchpoints"	"Intelligent bots"
"Antecedent factors of online customer experience"	"Stages of purchase"	"Conversational bots"
"Determinants of online customer experience"		"Chatbots"
		"Product recommendations"
		"Recommendation engines"
		"Personalized search optimization"
		"Web search optimization"
Search operators AND/OR were also used		

Thereby, literature databases such as Google Scholar, Web of Science, Scopus, and Science Direct were used for searching related articles. The articles used for this research were selected based on their relevance (similar research topics). Furthermore, various AI applications in the online marketing and advertising domain will be investigated. Considering the limited number of scientific articles about AI in this domain additional information is retrieved from business reports, websites and other businesses publications. Overall, a final set of at least 25 relevant articles is targeted for the literature research.

The second research approach entails an empirical study. One expert interview is conducted together with a fellow student. The interviewee is Chief Technology Officer at SAP for Middle & Eastern Europe and a renowned international keynote speaker. He shares his insights into topics related to new technologies, developing customer experience and digital transformation. This data collection method is used to provide additional insights from a practitioner's perspective and to validate the findings from the literature reviews and/or to complement them. The interview will be an informal and conversational interview instead of a structured interview with pre-determined questions. The questions will be centered around the findings from the literature review and probing questions will be asked to build upon these. Lastly, short real-life use cases of SAP customers will be provided to support the results of the interview.

2. LITERATURE REVIEW
This chapter reviews different studies related to customer decision journey, online customer experience, and Artificial

Intelligence application. **Figure 1** illustrates the model adopted as a comprehensive conceptual framework in this study.

2.1 Customer Decision Journey
What are the different stages of the customer decision journey, and what consumer activities are undertaken at each stage?

In the vast majority of reviewed papers, the customer journey perspective has been closely linked to the notion of customer experience and often has been presented as a means to understand the customer experience. Lemon & Verhoef (2016) conceptualized the customer experience as a "customer's journey with a firm over time during the purchase cycle across multiple touchpoints" (p. 74). Wolny & Charoensuksai (2014) define the customer journey as "description of customer experience where different touch points characterize customers' interaction with a brand, product or service of interest" (p. 319). The customer journey is typically described as a process spanning a number of steps, stages, touch points, or activities (Følstad & Kvale, 2018). One of the most-cited and widely known models to describe the journey is the five-stage consumer decision-making process of Kotler & Keller (2015). The consumer is expected to go through the stages of need recognition, information search, alternative evaluation, purchase and post-purchase (Constantinides, 2004; Kietzmann, Paschen, & Treen, 2018; Wolny & Charoensuksai, 2014). In the model proposed by McKinsey (Court, Elzinga, Mulder, & Vetvik, 2009), the decision-making process is mapped as a circular journey entailing four phases: initial consideration, active evaluation, purchase and post-purchase. When moving through the customer journey to purchase, consumers use and are exposed to multiple touch points that each have direct and more indirect effects on purchase and other consumer behaviors. Hence, it is of great importance that marketers understand the journey that consumers undertake when they make purchasing decisions as there will be "a much greater chance of reaching consumers in the right place at the right time with the right message" (Court, Elzinga, Mulder, & Vetvik, 2009, p.2).

In this research, the following, widely agreed, purchase stages have been adopted: *awareness, active evaluation, purchase and post-purchase*. Thereby, online consumer activities at each stage of the journey have been extensively examined. In the *awareness* stage, the consumer already has triggered a need and begins to deliberate possible offerings to satisfy its need. Here, the task of the marketer is to increase the brand's visibility in order to be inserted into the consumers' consideration set. This could be accomplished by targeting and reaching the consumers, through display ads or viral videos (Galante, Moret, & Said, 2013; Kietzmann et al., 2018). In the a*ctive evaluation* stage, the consumer is refining its brand choices by evaluating different brand options based upon product attributes, price, availability and purchase channels. The consumer reviews and compares the products before choosing the product that will satisfy the need in the best possible manner. Information is mostly gathered from search engines, websites and comparison sites (Wolny & Charoensuksai, 2014). The marketer's job is to facilitate information access and to persuade the consumer of being the best choice. One tactic is to optimize the search engine to present results that will meet the information needs of the consumer (Kietzmann et al., 2018). In the *purchase* stage, the consumer already has evaluated the different brand options of its consideration set and also may have formed an intention to buy for a preferred brand. Here, the marketer should convert the consumer to a customer by ensuring that the online store is working well, offering special promotions and providing credible and personalized content on the (Kietzmann et al., 2018). In the *post-purchase* stage, consumers use the product and evaluate their purchase. The main objective of marketers is to facilitate
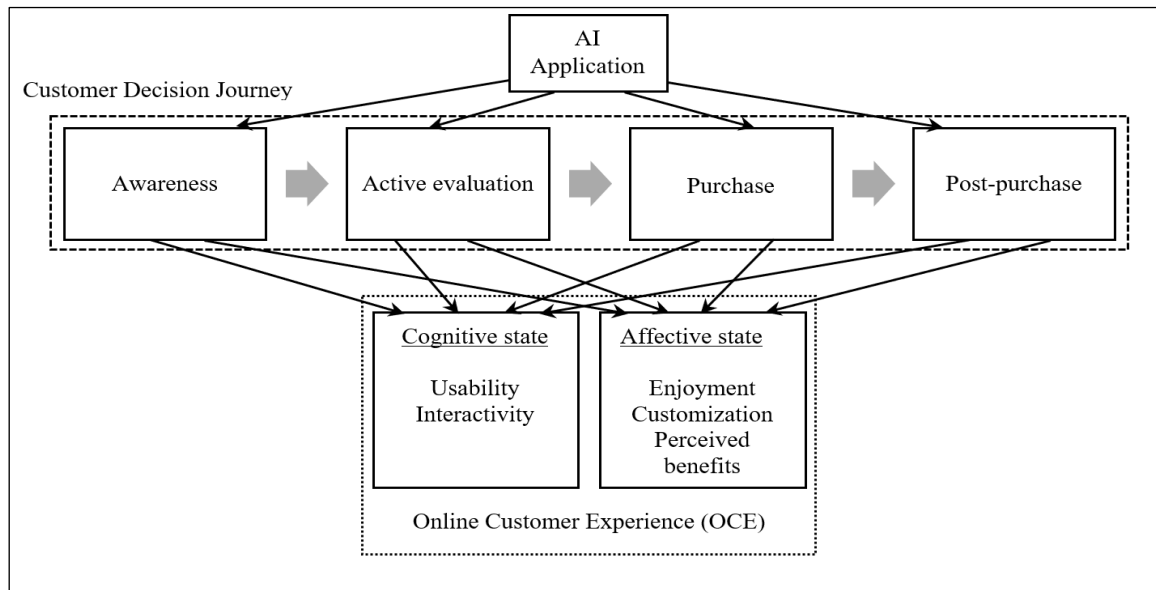
Figure 1: Conceptual framework created by Estelle Schipmann

brand engagement and loyalty. This can be done by providing good customer service by giving assistance to customers on how to best use the product and help with any issues (Wolny & Charoensuksai, 2014).

2.2 Online Customer Experience (OCE)

What are the dimensions of the online customer experience and what antecedent factors influence the online customer experience?

Extant literature has pointed out that online customer experience (OCE) becomes an important concept for digital commerce, given the increasing performance in online sales. According to Lemon & Verhoef (2016):

> The customer experience is viewed as one of the most important research challenges, because of the increasing number and complexity of customer touch points and the belief that creating strong, positive experiences within the customer journey will result in improvements to the bottom line by improving performance in the customer journey at multiple touch points and through improved customer loyalty and word of mouth. (p.10).

A variety of close but slightly different expressions of OCE exist in the literature, including 'web experience' (Constantinides, 2004), 'online experience' (Novak, Hoffman, & Yung, 2003) and 'online shopping experience' (Izogo & Jayawardhena, 2018). The difference in such concepts is predominantly in relation to the nature of the experience is explained. For example, Bleier, Harmeling, & Palmatier (2019), define OCE as of being comprised of customer's subjective, multidimensional psychological response to a product's presentation online. Rose et al. (2012) define OCE as "a psychological state manifested as a subjective response to the e-retailer's website" (p.309). Constantinides (2004) similarly explains web experience in terms of web sites functionality, psychological and content elements. Regardless of conceptualizations, the various publications all argue that the online customer experience is a psychological response to the e-commerce environment (Martin, Mortimer, & Andrews, 2015).

Although the importance of this topic has been acknowledged to a wide range, research about it is still limited to the domain of customer experience in the face-to-face context. As highlighted by Rose et al. (2011), "little attention has been paid to exploring

the concept in the online context" (p. 24). A distinction between customer experience in the online and offline context has to be made due to varying characteristics. First, personal interaction ranges from intensive in the offline context to almost non-existing in the online environment. Next, information provision is rather intensive in the online context and quite limited offline. Yet another difference is the time period. Whereas customers can purchase online anytime, anywhere, it's restricted to the opening hours in the offline context (Rose, Hair, & Clark, 2011). These characteristics direct different customer experiences and hence need to be understood.

Recent methodological work on the development of models around OCE informs this study. The review of the literature highlights a significant number of antecedent factors that appear to have both a direct and indirect effect upon OCE. Those include ease of use, information processing, enjoyment, perceived usefulness, etc. (Izogo & Jayawardhena, 2018; Rose, Clark, Samouel, & Hair, 2012; Rose, Hair, & Clark, 2011). Moreover, the study of Roy, Balaji, Sadeque, Nguyen, & Melewar (2017) investigated the concept of customer experience in the smart retailing context and defined smart customer experience " as a component of smart retailing which focuses specifically on the technology-mediated retailing experiences" (p. 260).

The study identified five factors which constitute customer experience with smart retail technologies. These factors are a relative advantage, perceived control, perceived interactivity, perceived enjoyment, and personalization (Roy et al., 2017). The literature also provides a theoretical foundation for understanding the dimensions of OCE, namely cognitive, and affective aspects of the customer. The cognitive state of OCE is specified as being "connected with thinking or conscious mental processes" and the affective state "involves one's affective system through the generation of moods, feelings, and emotions" (Rose et al., 2012, p.312).

Five antecedent variables are proposed that independently influence the two OCE dimensions supported by the literature (**Table 2**). In the model proposed by Izogo & Jayawardhena (2018) and Roy et al., (2017), usability and perceived interactivity were all significant antecedents to the cognitive state of OCE. The following definitions are used in this study: *usability* is considered to be the customers' experience of fast information browsing, easy to use, clear organization, accuracy and relevance of information, and functionality (Rose et al.,

2011), and *interactivity* relates to the consumers subjective and overall assessment of the interaction with online vendors. Online customer service (online help-desks for technical assistance or support) is an important component of interactivity between customer and online vendor (Constantinides, 2004). Izogo & Jayawardhena (2018); Martin et al. (2015); Rose et al. (2012) and Roy et al. (2017) proposed three antecedents for the affective state of OCE, enjoyment, customization, and perceived benefits. For the purpose of this study, *customization* is defined as a customers' experience of personal tailoring of appearance and customized services; *enjoyment* relates to the extent to which pleasure or playfulness is perceived by the consumer, and *perceived benefits* reflect advantages associated with the online customer experience, including convenience, enhanced customer-retailer relationship, ease of shopping (Martin et al., 2015).

Table 2: Summary of OCE antecedent factors

Studies	Antecedent factors				
	Usability	Interactivity	Enjoyment	Customization	Perceived benefits
Martin, Mortimer, & Andrews (2015)	✓	✓	✗	✓	✓
Roy, Balaji, Sadeque, Nguyen, & Melewar (2017)	✗	✓	✓	✓	✓
Liu, Pu, Guan, & Yang (2016)	✓	✗	✗	✗	✗
Constantinides (2004)	✓	✓	✗	✓	✗
Rose, Hair, & Clark (2011)	✓	✗	✓	✗	✓
Rose, Clark, Samouel, & Hair (2012)	✓	✓	✗	✓	✓
Izogo & Jayawardhena (2018)	✓	✓	✓	✗	✗
Bilgihan, Kandampully, & Zhang (2016)	✓	✓	✓	✓	✓

2.3 Artificial Intelligence

The original idea of computer-based Artificial Intelligence first appeared in the publication of Alan Turing about a so-called Turing test in 1950. Later, Princeton students have built the first neural network. The term 'Artificial Intelligence' was coined in 1955, but the technology has become popular today thanks to advances in fields such as deep learning, underpinned by increased data volumes, advanced algorithms, and improvements in computing power and storage (Bughin et al., 2017).

2.4 AI Applications

What Artificial Intelligence applications can be used at what stage of the consumer decision journey and what are their effects on the OCE antecedent factors?

2.4.1 Programmatic Advertising

In the *awareness* stage of the consumer decision journey, the consumer begins to deliberate possible offerings to satisfy his/her need. In order to be inserted into the consumers' consideration set marketers need to increase the brand's visibility (Galante et al., 2013). This can be achieved by using, for example, programmatic ads to target and reach the consumer. According to White & Samuel (2019), programmatic advertising is defined as "a data-driven system that facilitates the real-time bidding for advertising space to deliver personalized marketing materials to potential customers" (p.159). Programmatic advertising has radically altered the way conventional online advertising is undertaken. Compared to traditional media buying techniques, programmatic advertising powered by AI technologies has many advantages. In his study about artificial intelligence, Cannella (2018) identified several of these. For example, traditional techniques followed "a labor-intensive process involving coordination of pricing, placement, and many other details in advertising agreements" (p.35), leading to inefficient marketing practices and high costs. With the development of AI programmatic advertising, these processes are fully automated facilitating techniques like real-time, automated ad buys and automated personalization of ad content. Nowadays, almost half of all digital adverts were traded programmatically and a rise of over 80% is expected in the near future (White & Samuel, 2019). This substantial growth provides evidence that programmatic advertising may have a positive effect on the consumer decision-making process. Additionally, previous research also indicates that targeted advertisements, sub-part of programmatic advertising, enhance click-through rates by as much as 670% relative to traditional online ads (Watts, 2016).

With programmatic advertisement, companies can take advantage of placing the right advertisement in the right place at the exact moment at which consumers are most likely to click on an ad. Contrasted with traditional segment-based buying where advertisers are limited to serving one generic ad to a large segment of consumers, "programmatic buying executes campaigns with fine-grained control on a true one-to-one marketing scale" (Watts, 2016, p.7). A key attribute of programmatic advertising is the ability to match adverts with potential consumers that are viewing a webpage or social media sites. Programmatic advertisements are more accurately than conventional online ads as more and complete real-time data can be processed by the algorithm. The term 'complete data' infer data correctness, timeliness and relevance (White & Samuel, 2019). The AI enabled application allows the exact audience for each advert to be precisely defined according to search history, previous website navigation or most visited pages. This information helps to target and personalize the advertisements that are shown to consumers (Palos-Sanchez, Saura, & Martin-Velicia, 2019). Literature also acknowledges that consumers consider the perceived usefulness of programmatic advertising as positive, as long as it is personally related to them (Palos-Sanchez et al., 2019; Watts, 2016). Research of Watts (2016) shows that consumers carry more positive attitudes toward a brand and exhibit greater online purchase intention when delivered a programmatically served advertisement. Greater personal relevance and greater reflection of the consumers' online behavior are reported. Further, the research highlighted the fact that programmatic advertisements intrigue consumers more to click on the ad (Watts, 2016).

2.4.2 Personalized Search Optimization

In the virtual environment of e-commerce, companies can offer a wider range of products and services to the customer compared to traditional brick and mortar stores, resulting in information overload (Knotzer, 2018). If the consumer is evaluating different brand options in the *active evaluation* stage of the consumer decision journey, he or she usually uses a search engine to browse information before choosing the product that best satisfies the need. However, it is a cumbersome task to retrieve relevant

information related to the topic (Remesh Babu & Samuel, 2015). In fact, decision making in the face of a large number of choices has become challenging, especially when customers have diverse tastes or criteria. There still exists a problem of getting search results based on user importance to save time and complexity while searching. Various queries made to a search engine are short and not properly specified. The search engine usually provides search results without considering user context or interest. Thus, a different user with different intentions for the same query will get results related to all possible meanings of the query. Hence, the user has to provide a detailed description while making a query each time. Consequently, the searching time and accuracy of results are both affected. This could lead to the continuous loss of consumers and hinder the development of e-commerce. Therefore, personalized search optimization is a solution to all these problems (Yoon, 2016).

According to the existing work on personalized search (Remesh Babu & Samuel, 2015; Wang, Shao, Zhou, Wan, & Bouguettaya, 2016; Yoganarasimhan, 2015; Yoon, 2016), the application is defined as a method of providing information to the user on the basis of user's interest. User profiling is a fundamental component of this application. All data collected about the user is retained in the user profile and frequently updated Thereby, the AI-powered application learns from user data in real-time and produces more context-aware results and recommendations based on user location, device, search history (links browsed or click history), user's social networking activities and the behavior of users' similar to them (Ramesh & Andrews, 2015; Sharma, Mahajan, & Rana, 2018; Yoon, 2016). The majority number of studies have discovered a positive connection amongst search quality and personalized search optimization (Remesh Babu & Samuel, 2015; Shtykh & Jin, 2015; Wang et al., 2016; Yoganarasimhan, 2015; Yoon, 2016). Here, the term 'search quality' refers to the accuracy and relevance of search results. Furthermore, Yoganarasimhn (2015) indicated that personalized search optimization would lead to a substantial increase in click-through-rates at the top positions, which is a leading measure of user satisfaction. Lastly, a significant body of work on personalized search optimization also highlighted the positive effect of personalization on search time. Personalized search allows fast information browsing as users do not need to browse various search result pages to find the relevant information and they do not need to specify their query to get optimal search results (Remesh Babu & Samuel, 2015; Yoganarasimhan, 2015; Yoon, 2016).

As a result, including personalized search into SEO strategy provides ranked lists of results that are accurate and relevant based on content, engaging based on past user engagement, timely and personally of interest to the user.

2.4.3 Product Recommendations

Once the consumer is in the *purchase* stage of the consumer decision journey the consumer often must search and browse on the website to find the right product or service. Usually, a website contains rich information spread across many links and to find particular information customers need to explore the links by opening them one-by-one. This is inefficient, less interactive and time wasting. Therefore, in this stage consumers are in urgent need of a purchasing assistant that recommend a subset of the product and service mix to reduce information overload (Knotzer, 2018).

Product recommendation systems can help e-commerce websites to provide personalized decision support and information service for customers. It frequently interacts with the customer and analyzes customer feedback to update the recommendation results to best match the customer interest with higher accuracy.

The system is a business intelligence platform based on massive data mining that automatically completes the process of personalized selection, and recommends personalized products to meet customer demand (Guo, Wang, & Li, 2017). It uses customer history record and also analyzes current behavior data of the customer to give real-time feedback. Information about the customer's current browsing/search products, click, evaluation, conversion path and so on is used as a basis for calculating personalized recommendations (Guo et al., 2017). Based on the collected data, the system tries to predict what items in the product catalog best match the customer preferences, and finally presents the customer those items that have the highest predicted value. Thus, the more accurate the predictions, the more accurately the system can predict the best recommendations for the customer (Knijnenburg, Willemsen, Gantner, Soncu, & Newell, 2012).

Product recommendations powered with AI engine lead to perceivably better recommendations, which in turn lead to better online customer experience in terms of product choice satisfaction and perceived system effectiveness. The system is easy to use and provides accurate and relevant information about recommended products (Guo et al., 2017). Furthermore, it facilitates personalization of product offers for all users and supports interaction between customer through visualization techniques (human-recommender interaction). Pleasant interactions of co-creation activities provide additional personalized service and make the use of the system more enjoyable. Another factor that influences the online customer experience (customers' subjective evaluation of their interaction with the recommendation system) is efficiency. Product recommendation systems help customers to make faster purchase decisions and enhance ease of shopping (Ricci, Rokach, Shapira, & Kantor, 2015).

2.4.4 Chatbots

Customer service in the *post-purchase* stage plays an important role to increase customer satisfaction and maintain customer relationship. In case of complaints, technical assistance or other customer service inquiries, chatbots are a helpful and efficient solution for customers (Zumstein & Hundertmark, 2017). They are built to have tailored customer care conversations, serve personalized information and recommendations (Van den Broeck, Zarouali, & Poels, 2019). Generally, chatbots are defined as composing of computer programs that are written to enable and promote a conversation with the customer by means of auditory or textual inputs. Further, Chatbots are identified as a sub-category of intelligent virtual assistants (IVA's). However, both technologies should not be confounded. Chatbots are mainly used as information acquisition interface for e.g. retrieving product details. IVA's, on the other side, are much more sophisticated and assist companies in conducting business such as scheduling meetings and taking down notes (Joshi, 2018).

All information regarding the company and of the website is stored in chatbot's knowledge base (Pradana, Goh, & Kumar, 2018). According to Van den Broeck, Zarouali, & Poels (2019), 25% of customer interactions will be managed without a human through chatbots by 2020.

Extant literature punctuated the ease of use, speed, and convenience of using Chatbots (Brandtzaeg & Folstad, 2017; Van den Broeck et al., 2019; Zumstein & Hundertmark, 2017). Chatbots help saving time and make it easier and faster for consumers to obtain help or information, such as by providing efficient assistance in a customer support situation or by point to an easy-to-use manual or FAQ. Furthermore, availability is also reported as being the main motivation for using Chatbots. Chatbots provide 24/7 customer services and support,

independent of working or opening hours (Brandtzaeg & Folstad, 2017). Moreover, through the pre-programmed chat dialogue structures, companies can communicate to the consumer in a highly personalized and interactive, yet automated way (Van den Broeck et al., 2019). Chatbots can collect necessary personal customer and usage data during the dialog with the customer and store individual customer preferences based on the customers' request, purchase history, and other activities. Based on the data, companies can address their customers in a relevant manner and target users directly and personally with customized offers (Zumstein & Hundertmark, 2017). Lastly, research also noted that consumers perceive chatbots as 'fun' and 'entertaining' (Brandtzaeg & Folstad, 2017)

A short summary entailing critical findings of the literature review regarding the impact of AI applications on OCE antecedent factors is illustrated below in **Table 3**:

Table 3: Summary of critical findings of the literature review

Application	Studies	Usability	Interactivity	Enjoyment	Customization	Perceived Benefits
Programmatic Advertising	Palos-Sanchez et al. (2019)	✓	✗	✗	✓	✗
	Watts (2016)	✓	✗	✗	✓	✗
	White & Samuel (2019)	✓	✗	✗	✓	✗
	Benzoni & Clignet (2017)	✗	✗	✗	✓	✗
Personalized Search Optimization	Ramesh & Andrews (2015)	✗	✗	✗	✓	✗
	Remesh Babu & Samuel (2015)	✓	✗	✗	✓	✗
	Sharma et al. (2018)	✗	✗	✗	✓	✗
	Shtykh & Jin (2015)	✓	✗	✗	✓	✗
	Wang et al. (2016)	✓	✗	✗	✓	✗
	Yoganarasimhan (2015)	✓	✗	✗	✓	✗
	Yoon (2016)	✓	✗	✗	✓	✗
Product Recommendations	Guo et al. (2017)	✓	✓	✗	✓	✗
	Knijnenburg et al. (2012)	✓	✗	✗	✓	✗
	Knotzer (2018)	✓	✗	✗	✓	✓
	Ricci et al. (2015)	✓	✓	✓	✓	✓
Chatbots	Brandtzaeg & Folstad (2017)	✓	✓	✓	✓	✓
	Pradana et al. (2018)	✓	✗	✗	✓	✓
	Van den Broeck et al. (2019)	✗	✓	✗	✓	✗
	Zumstein & Hundertmark (2017)	✓	✗	✗	✓	✓

3. EMPIRICAL STUDY (EXPERT INTERVIEW)

This chapter discusses the main findings of the expert interview. Various questions regarding the selected AI applications and their effect on OCE antecedent factors were asked to the interviewee based on the summary of critical findings (Table 3) of the literature review. The selected OCE antecedent factors were explained to the interviewee beforehand. This ensures that the interviewee can better relate his knowledge about AI to these specific factors. However, the interviewee is not familiar with SEO and personalized search and therefore was not able to give answers to questions related to this topic. In the following sections, the results for each AI application is presented and supported by some SAP customer cases.

3.1 The importance of customer experience and its relation with AI

Can you explain the importance of customer experience and its relationship with AI?

The interviewee highlighted the importance of online customer experience by referring to research conducted by Forrester Consulting on behalf of SAP. A total of 333 global decision makers that are engaged with AI technologies (e.g. machine learning) were asked what the driven demand is for predictive analytics and machine learning technology and solutions. Almost 60 percent of the respondents answered that these technologies are essential to improve customer experience. The interviewee added that creating an incredible customer experience is crucial for businesses to succeed. Basically, it is about being different than competitors and delivering extra value to the customers in addition to the products or services offered. Furthermore, the interviewee explained that AI technologies have two important functions within businesses. Firstly, to make front-end business processes more efficient and secondly, to differentiate back-end processes. Thereby, the interviewee emphasized that improving the last one leads to enhanced customer experience. Additionally, it has been mentioned that when businesses consider making investments in AI technologies in both front-end and back-end processes that the processes should be connected. Accordingly, the interviewee provided an example of chatbots. If businesses connect the chatbot application with other internal business operation systems, such as CRM or ERP then it will provide exclusive customer experience.

3.2 Effect of Programmatic Advertising on OCE

What is the effect of programmatic ads on the proposed OCE factors?

The interviewee argued that the following antecedent factors of OCE are affected by the application: *customization* and *usability* (e.g. accuracy and relevance of information, and easy to use). The interviewee explained that with machine learning algorithms businesses are able to process more and complete real-time customer data (e.g. social networking activities, browsing history, etc.). Based on the data richer customer profiles can be build that enable more accurate customer segmentation and targeting. Moreover, using machine learning algorithms allows for better customer tracking (device, location and time). Hence, advertisements can be placed in the right place at the exact moment of time. It has also been stated that advertising campaigns do not need to be build up by marketers anymore. AI-driven content management can perform this task more efficiently. Furthermore, the interviewee underlined that programmatic advertising offers accurate, relevant and personalized content to the customers. Thereby, he used an example of a customer placing shoes of a certain brand on his wish list on an e-commerce website. Based on the data highly personalized ads will be placed on the currently visited site referring to this wish list. Finally, the interviewee confirmed that the other antecedent factors *interactivity*, *enjoyment*, and *perceived benefits* will not be affected by the application. He explained that customers might find programmatic ads annoying as they pop up whenever they browse online.

3.2.1 Case: SPAR Switzerland
SPAR Switzerland uses AI-driven customer data of their Facebook audience to produce personalized campaigns. The campaign successfully increased the member base of the loyalty program and more personalized customer experience is provided.

3.2.2 Case: SEA Group
SEA Group uses AI-driven customer data to produce real-time and highly personalized marketing campaigns for a specific customer segment. The campaign resulted in better customer engagement and facilitates customer loyalty.

3.3 Effect of Product Recommendations on OCE

What is the effect of product recommendations on the proposed OCE factors?

First, the interviewee stated that the application is part of AI-enabled content management. Additional applications of content management include website search engine, shopping cart or wish list. Further, the interviewee argued that the following antecedent factors of OCE are affected by the application: *Customization*, *usability* (e.g. easy to use, accuracy and relevance of information, faster information browsing) and *perceived benefits* (e.g. ease of shopping). It has been explained that AI-powered recommendations use customer history record and analyzes current behavior data of the customer to give real-time feedback. The application presents customer tailored product offers. Besides, the interviewee punctuated that recommendation systems provide specified product descriptions and display only top sellers or niche products to the customer. Moreover, the interviewee agreed that the application enhances the ease of shopping as the customer does not need to go through the complete product catalog to find the product that fulfills the need. A set of products that best match the customer preference were recommended beforehand. Further, the interviewee added to this that recommendation systems help customers to make faster purchase decisions. Nevertheless, he is of the opinion that customers do not perceive product recommendation systems as fun or enjoyable. Lastly, the factor interactivity did also find support from the interviewee. The application interacts with the customer by indirectly saying "Special recommendation!" or "This might be interesting for you!". Although no conversation takes place between the customer and the application, it indirectly reacts to the customer and helps to make a purchase decision.

3.3.1 Case: Office Depot
Office Depot uses AI-driven customer data to build rich customer profiles (e.g. 360-degree view of their customers) and based on the data provides a personalized customer journey. As a result, the company could offer relevant and personalized product recommendations based on customer preferences.

3.4 Effect of Chatbots on OCE

What is the effect of chatbots on the proposed OCE factors?

With the advancements in Natural Language Processing and machine learning algorithms, chatbots have become smarter. Accordingly, chatbots are one of the most widely used application in e-commerce to facilitate customer service in the purchase and post-purchase stage. The interviewee highlighted that the factors *usability*, *interactivity*, *customization,* and *perceived benefits* are affected by the application. The AI-enabled application enables tailored customer care conversations and provides personalized information and recommendations. Besides, chatbots help saving time and make it easier and faster for consumers to obtain help such as by providing assistance in a customer support situation. The interviewee confirmed that chatbots are highly interactive as they have real-time conversations with the customer (e.g. asking and answering questions). Lastly, the interviewee stated that there could be some customers who perceive chatbots as entertaining. For example, they are asking some funny questions to see what the system responses. However, he is not very sure whether Chatbots really have an impact on enjoyment.

3.4.1 Case: Groupe Mutuel
Groupe Mutuel uses AI-enabled chatbots for customer service. The application provides 24/7 customer support to more than 1.2 million health plan members. Almost 75 percent of customer inquiries have been correctly answered. Besides, the application immediately responded to product-related questions outside of office hours. Lastly, communication between the customer and the company become easier and conveniently. This all has led to an overall superior and personalized experience.

A short summary entailing critical findings of the expert interview regarding the impact of AI applications on OCE antecedent factors is illustrated below in **Table 4**:

Table 4: Summary of critical findings of expert interview

Application	Antecedent factors				
	Usability	Interactivity	Enjoyment	Customization	Perceived Benefits
Programmatic Advertising	✓	✗	✗	✓	✗
Personalized Search optimization	No Results				

Product Recommendations	✓	✓	✗	✓	✓
Chatbots	✓	✓	✗	✓	✓

4. CONCLUSION AND DISCUSSION

The aim of this study was to investigate what AI applications can be utilized by marketers to improve the online customer experience across the customer decision journey. Currently, customer experience is a highly discussed topic in the marketing domain as customers demand more excellent and personalized experiences along their journey to purchase. Hence, understanding the needs and demands of each individual customer has become critical for businesses. By incorporating AI into marketing practices, businesses can get deeper real-time insights into what customers want and based on these insights, businesses can create personalized and memorable experiences across the journey. Although some tech giants are investing in various AI applications, many other companies struggle to keep up due to lacking knowledge about AI technologies. Consequently, they still stick to traditional marketing practice which is less effective.

Due to the exploratory nature of the research question, this study considered two research approaches. The first approach entailed an extensive literature review about the customer decision journey, online customer experience, and Artificial Intelligence application. Thereby, various scientific papers and business reports have been reviewed and compared. Different concepts of the customer decision journey have been explored to identify the different stages of the journey and related customer activities at each stage. In this research, the following purchase stages have been adopted: *awareness*, *active evaluation*, *purchase* and *post-purchase*. The concept of the customer decision journey is used to relate the different AI applications to the stages. Furthermore, various antecedent factors of online customer experience have been examined. A final set of five antecedent factors were selected in this research. These include *usability*, *interactivity*, *enjoyment*, *customization* and *perceived benefits*. Based on the two preexisting theories a comprehensive conceptual framework is developed which informs this study. Lastly, the literature about different AI applications has been reviewed. Thereby, the effects of the different applications on the selected OCE antecedent factors have been investigated. The review has revealed the following findings:

(1) According to recent literature about Programmatic Advertising, the application can be best used in the *awareness* stage. Further, all related studies have found a positive impact of Programmatic Advertising on *usability* and *customization*.

(2) According to recent literature about Personalized Search Optimization, the application can be best used in the *active evaluation* stage. Besides, some studies have found a positive impact of Personalized Search Optimization on *usability*, and all studies found an impact on *customization*.

(3) According to recent literature about Product recommendations, the application can be best used in the *purchase* stage. Additionally, all studies have found a positive impact of Product Recommendations on *usability*, and *customization*, some studies have found a positive impact on *interactivity* and *perceived benefits*.

(4) According to recent literature about Chatbots, the application can be best used in the *post-purchase* stage. Moreover, all studies found an impact of Chatbots on

customization, and some studies found an impact on *usability*, *interactivity* and *perceived benefits*. Only one research has found a relationship between Chatbots and *enjoyment*.

The second approach entailed an empirical study in the form of an expert interview. The interview has been conducted together with a fellow student. Questions regarding the impact of the different AI applications on the OCE antecedent factors have been asked to the interviewee. The interview has revealed the following results:

(1) The interviewee mentioned that Programmatic Advertising has an impact on *usability* and *customization*.

(2) The interviewee stated that Product Recommendations influence the factors *usability*, *customization*, and *perceived benefits*.

(3) The interviewee argued that Chatbots have an impact on *usability*, *interactivity*, *customization* and *perceived benefits*.

(4) No results could be found regarding Personalized Search Optimization.

Both research approaches have provided solid results to answer the research question. In general, the research confirms that AI improves the online customer experience to some extent. Firstly, supporting literature has been found regarding the impact of each AI applications on *customization* and *usability*. These findings are also validated by the expert. With the use of AI, marketers can get deeper insights into their customer preferences in real-time. Thereby, the machine learning algorithm allows for processing more and complete real-time data. It uses customer history record and also analyzes current behavior data of the customer. All data is then retained in so-called 'user profiles' and frequently updated. Each of the proposed AI application uses the data to provide personalized, relevant and accurate content (i.e. ads, search results, recommendations or messages). Next, a positive impact on the factors *perceived benefits* and *interactivity* has been found in the literature about Product Recommendations and Chatbots, which is also justified by the expert. Both applications enhance the ease of shopping for the customer. Moreover, the applications are perceived as highly interactive as they, directly and indirectly, communicate with the customer and provide customer support. However, no supporting literature has been found for the other AI applications nor did the expert confirm that the other applications have an impact on the aforementioned factors. The last OCE antecedent factor studied in this research is *enjoyment*. The factor grants support from only one study about Chatbots. No other literature is found that validates the impact of the selected AI applications on enjoyment. The expert also did not find any relationship between the factor and AI applications. Finally, the results of the literature research about Personalized Search Optimization and OCE antecedent factors did not find approval from the expert due to lacking knowledge about this application.

Based on the result, it can be stated that by incorporating the four proposed AI application into marketing practices would provide an intelligent, frictionless, convenient and informed customer experience along the customer journey.

4.1 Managerial implications

According to research from Gartner, by 2020, 30 percent of digital commerce revenue growth will be attributable to AI technologies and 60 percent of organizations will use AI for digital commerce (Criteo, 2017). The overarching managerial implication from this study is the need for businesses to incorporate AI in their digital marketing practices to improve the

online customer experience and thus to stay competitive. Although some tech giants are investing in various AI applications, many other companies struggle to keep up due to lacking knowledge about AI technologies. Consequently, they still stick to traditional marketing practices which are less effective. This research informs businesses about several promising AI technologies that can be used to improve the online customer experience, and thus fill the knowledge gap. Additional insights are provided about the utilization of the selected AI technologies at an explicit stage of the customer decision journey. This ensures that businesses can deliver a frictionless customer experience along the journey.

4.2 Theoretical implications

The present study contributes to the existing literature in three important ways. Firstly, the conceptual model extends the notion of OCE by including four stages of the customer decision journey. Secondly, the model identifies the customer decision journey to be an important mediator variable that explains the relationship between AI applications and OCE. One specific AI-based marketing application can be used at a specific stage of the customer decision journey to improve the online customer experience at that stage. Finally, the model combines insights from marketing and computer science literature. Due to the explorative nature of this research, further research can be conducted about testing the strength of the relationship between the different variables (i.e. AI applications and OCE antecedent factors) by using real-life customer data.

5. LIMITATIONS AND FURTHER RESEARCH

Firstly, only a limited number of scientific papers about AI applications in the context of marketing are available. Most scientific papers about AI are published in the field of computer science. Hence, some information used in this study is retrieved from business publications. Consequently, the academic relevance of this information can be questioned. Secondly, this research studies only a few AI technologies and describes their applicability explicitly for one specific stage of the customer decision journey. This is due to time restrictions and the limited scope of research. However, some of the applications can be utilized at several stages. For example, Chatbots can be used along the journey to improve customer experience. Hence, further research is needed to complete this study by exploring more AI technologies and examining their applicability at all stages of the journey. Moreover, the findings of the literature review about Personalized Search Optimization did not find support from the expert interview due to missing knowledge about this topic. Accordingly, further research about this need to be conducted to validate the results. Lastly, the reliability of the interview results is also questionable due to the small sample size. Only a few businesses and/or marketing professionals have knowledge about AI and customer experience which makes it more difficult to get multiple insights. Some experts are hard to access due to distance and time limitations. Consequently, a critical evaluation of different expert findings is missing in this research.

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