

Artificial Intelligence: The next disrupting technology of Online Marketing

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ABSTRACT

Lately, notable changes are occurring in the field of online marketing: customers demand ever greater customer experiences when passing through the purchasing journey. Concepts such as hyper-personalization, speed, and convenience are gaining enormous attention. With traditional online marketing techniques, businesses are lacking capabilities to tackle these emerging challenges. Most recently, businesses start realizing the possibilities of Artificial Intelligence to solve this problem. Advancements in AI marketing applications are now paving the way for businesses to deliver an immersive experience to their customers. Although most business executives acknowledge these developments, a deeper understanding of how exactly AI can facilitate this process is lacking. This knowledge gap is underlined by the identified research gap: there is barely any scientific literature that gives a comprehensive overview of how various AI marketing applications can be used to improve the online customer experience across the entire consumer journey. The objective of this research is to provide such a complete overview. To do so, a literature review is conducted to determine relevant factors of the customer experience and to explore the different stages of the online consumer journey. A set of five customer experience factors is identified including ease-of-use, usefulness, customization, enjoyment and risk. Next, research papers studying the effects of selected AI marketing applications on the identified factors were reviewed. Lastly, an expert interview was conducted, which provided additional practical insights. This research paper has been finalized with relevant theoretical and managerial implications. The findings from the literature research and expert interview highlight that (1) AI marketing applications enhance the 'ease-of-use, customization and risk' factors; (2) effects on the 'usefulness' are present but should be interpreted with great care and (3) no solid argumentation is found that validates improvements of the 'enjoyment' factor.

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Keywords

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1. INTRODUCTION

Artificial Intelligence is representing the next revolutionary development which is transforming various industries ranging from the high tech to the health care sector. The importance is demonstrated by a rapidly growing increase in the volume of AI activities. As highlighted by Shoham, Perrault, Brynjolfsson, Clark, & LeGassick (2017), the number of published, AI-related papers has increased by more than 9 times from 1996 to 2017. Next, the number of active US startups developing AI systems has increased by 14 times since 2000 (Shoham et al., 2017). These are only some amazing facts highlighting the increased attention for Artificial Intelligence.

One of the most promising developments of AI takes place in the field of Martech and advertising. Research conducted by Forbes (Columbus, 2018) emphasizes that 84% of marketing organizations are implementing or expanding AI and machine learning in 2018. Within the field of marketing, digital commerce is evolving faster than ever. The internet has become a crucial marketplace for various transactions which is demonstrated by rapidly growing demand rates of between 25% and 50% for goods and services (Leefflang, Verhoef, Dahlström, & Freundt, 2014). According to Gartner (2017), the impact of AI on marketing practices is expected to be dominant in digital commerce. By 2020, 60% of businesses will use AI for digital commerce and 30% of its revenue growth will be imputable to AI technologies.

Sekar & Geetha (2013) identified the top three B2C online marketing challenges to be (i) increasing awareness/ traffic; (ii) social media and (iii) customer targeting. Those challenges are complemented by changes in the behavior of online customers. They have become more demanding and mercurial. Next, “the upsurge of online review websites, social networks, and mobile web access have enabled customers to know more than sellers about products, services, competitors and pricing” (Stein & Ramaseshan, 2016, p.8). Due to the increase in online information availability, customers have become more powerful than ever before (Rose, Hair, & Clark, 2011).

These developments direct the most notable change in the online environment: customers ask for ever greater online customer experience. As highlighted by OpenText (2016), “delivering an exceptional continuous customer experience is mission-critical in a digital world” (p.7). In addition, 57% of business executives expect that using AI to improve customer experience will display exceptional growth. However, only 47% of business executives understand how AI will improve customer experience (PwC, 2018). Clearly, there is a knowledge gap in this relationship. Another problem is that many CIO’s give preference to adopting AI for further automation of production processes rather than for their online marketing activities. Hence, they will miss out on great opportunities to deliver an immersive experience to their customers (Panetta, 2019).

Stein & Ramaseshan (2016) argue that the ‘customer experience trend’ is driven by customers desiring “more than just the production, delivery and consumption of products and services; instead, they seek unique and memorable experiences that accompany the delivery of products and services” (p.8). 73% of all people perceive customer experience to be one of the most important decision factors in their purchasing process. And even 35% of all customers say they would stop interacting with the favored brand after just one bad experience (PwC, 2018). To deliver a positive experience, businesses need to remove “the friction from the purchasing process” (OpenText, 2016, p.8). This means, systems and processes are needed to help customers

arriving at purchase decisions faster and more easily (OpenText, 2016). However, only 49% of US consumers think that businesses are successful in delivering such a positive experience (PwC, 2018).

- Hyper-personalization is one of the most prevalent challenges in the concept of customer experience. People want to use their time most effectively. Online customers will no longer accept irrelevant information. Instead, they are looking for personal, tailored experiences such as custom ads and product offerings (Erragcha & Romdhane, 2014)
- Yet another major challenge that relates to the online customer experience is speed and convenience. Customers are demanding faster and more effective service provision and interaction more than ever before. They will no longer accept long customer service waiting times and incompetent chat support (Morgan, 2017a)

These examples give a clear demonstration of how customer behavior is changing in the field of online experience. Companies need to understand and anticipate these changes to stay competitive and relevant to customers. Artificial Intelligence is one important technology facilitating this process. In general, this requires “data and the underlying capabilities for analyzing data” (Leefflang et al., 2014, p.10). Traditional marketing techniques will not be effective anymore due to a lack of these capabilities. AI will be faster and far more effective in capturing, processing and inferring this data.

Although the importance of this topic is widely accepted, related research is still limited. Most papers focus on the technical implications and limitations of AI technologies. These papers are published within the computer science field. To a great extent, they study the technological advancements of machine learning and deep learning (Shoham et al., 2017). Scientific papers about AI in marketing and digital commerce are available too, but they are rather focused. Mostly, focus is given to one specific AI application and its impact on digital marketing or the online customer experience. In this context, personalization is getting a lot of attention. However, studies that give a comprehensive overview of how various AI marketing applications impact the OCE across the consumer journey are lacking. Hence, the combination of different insights will be of particular interest. This research is developed to fill the identified knowledge and research gap.

1.1 Research Question

This leads to the following research question: **How is Artificial Intelligence (AI) transforming the customer experience across various stages of the digital customer journey?** To give a complete answer to the overall research question, several sub-questions need to be answered first. These are:

(i) *What are common determinants of the online customer experience?*

The online customer experience will form an important part of this research. Essentially, customer experience will be one of the variables being tested in this study (dependent variable). It will be studied how it will be changed/improved by various AI applications. The term ‘customer experience’ however, is rather an umbrella term covering different elements and definitions (Morgan, 2017b). Therefore, it’s important to explain the online customer experience in the context of its relevance for this research. To do so, various determinants of the OCE which are

most likely to be affected by AI applications will be selected and explained.

(ii) *What are the different stages and touchpoints of the online consumer journey?*

As mentioned earlier, 73% of all people perceive customer experience to be one of the most important decision factors in their purchasing process (PwC, 2018). This indicates that AI-driven improvements of the customer experience are likely to be relevant at different stages of the customer journey (dependent variable). Hence, it will be included in this research. However, numerous definitions and explanations of different purchasing processes exist, both for the online and offline environment. In this paper, attention will be given to the first one. Therefore, clarification is needed about the different stages and touchpoints that shape the online purchasing process, further referred to as online consumer journey.

(iii) *What are promising AI marketing applications in digital commerce, at what stage of the consumer journey are they relevant and what is their effect on OCE factors at this specific stage?*

In this research, AI marketing applications will be the independent variable. It will be studied how it affects the OCE across the consumer journey. Therefore, an explanation of some of its applications relevant to digital commerce is needed. This will provide a deeper understanding of the impact of AI which is needed to answer the overall research question.

(iv) *How do business practitioners expect AI to change online marketing practices and the OCE?*

This sub-question will be answered by conducting one expert interview with a business practitioner who has an exceptional knowledge about this research topic. This will be useful to find validating or new insights which can complement the findings of the literature review.

1.2 Methodology

To answer the research question, two research approaches will be used.

(i) First, an extensive literature review of the published information about this research topic will be conducted. This will be used to answer sub-questions one to three. The literature will give insights on the most important digital touchpoints that shape the digital customer journey. Next, information about factors influencing the online customer experience will be reviewed. The information is needed to select OCE factors that are likely to be affected by AI and hence, will be included in this research. Lastly, a literature review will be used to get information about the current, most promising AI applications in the field of Digital Commerce. It will be demonstrated how AI is going to re-shape traditional marketing techniques. This will provide a deeper understanding of this topic. This, in turn, is needed to properly evaluate at what stage of the consumer journey AI applications are relevant and what their effect on OCE factors is.

To do so, keywords related to the 3 key concepts will be defined (digital customer journey; online customer experience; artificial intelligence in digital marketing). An overview of search queries used in this paper is presented in appendix A. The databases ‘Web of Science’ and ‘Google Scholar’ will be used to search for relevant literature. Due to rapid developments in the field of AI applications, literature about this concept will only be selected if published from 2010 onwards. Exceptions will be made only if the insights of a specific research still are relevant and useful today, even if published before 2010. A final set of at least n= 20 relevant articles is targeted.

(ii) The second approach will be conducting an expert interview. This data collection method is preferred due to the complexity of this research topic. Other data collection methods such as consumer surveys will not be useful for this research, because most consumers are not yet familiar with AI technologies sufficiently. It’s expected that only experts in the field of AI can deliver in-depth knowledge. The interview partner will be Mark Raben, international speaker and employee of SAP. In his current role as CTO (Chief Technology Officer) of SAP Middle & Eastern Europe, he is one of the leaders in the field of IT innovations. He has a lot of insights into topics related to new technologies, customer experience and digital transformation (“Mark Raben,” n.d.). It’s expected that he can provide a lot of useful, real-life insights about this research topic. The information collected will be used to validate the findings from the literature research and/or to add new ones. Next, it will give insights needed to answer sub-question four. The interview will be an informal and conversational interview instead of a structured interview with pre-determined questions. They will be centered around the findings from the literature research. Probing questions will be asked to build upon these.

2. LITERATURE REVIEW

2.1 Online Customer Experience (OCE)

What are common determinants of the online customer experience?

2.1.1 General Definition

The online customer experience can be described as “the internal and subjective response that customers have to any direct or indirect contact with a company.” (Rose, Clark, Samouel & Hair, 2012, p.309). With the internet becoming a crucial marketplace for various transactions, and developments in new distribution and communication channels, “the opportunity for a range of online organization-customer interactions” (Rose, Hair, & Clark, 2011, p.24) has increased over the last years. To sustain a competitive advantage, e-marketeers need to deliver unique and memorable customer experiences at all these interaction touchpoints (Stein & Ramaseshan, 2016).

2.1.2 Online Customer Experience

The OCE model proposed by Rose et al. (2011) allows for a complete understanding of the determinants of the online customer experience. Moreover, Liu et al. (2016), Martin et al. (2015) and Roy et al. (2017) identified factors that impact the OCE, complementing the findings from Rose et al. In general, OCE determinants are subdivided into two categories: rational, cognitive processing and emotional, affective processing. First one refers to customers reviewing incoming information rather goal-directed involving rational processing. Affective processing identifies the emotional response of a customer as exposed to the online shopping experience (Rose et al., 2011).

To identify and select OCE determinants relevant for this research, findings from previously mentioned papers have been studied. Only factors that are assumed to be affected by AI applications were selected.

Table 1: Overview Determinants OCE

OCE Determinant	(Rose et al., 2011)	(Liu, Pu, Guan, & Yang, 2016)	(Martin, Mortimer, & Andrews (2015)	Roy et al., 2017
Ease of Use	✓	✓	✓	✗

<i>Perceived Usefulness</i>	✓	✓	✓	✗
<i>Risk</i>	✓	✗	✗	✗
<i>Customization</i>	✓	✗	✓	✓
<i>Enjoyment</i>	✓	✓	✗	✓

Five factors will be studied in this paper that independently influence the online customer experience. These are:

(i) *Ease of Use*: This factor describes the perceived ease of use, or convenience, of using a website. Common aspects of this factor include a clear organization, logical flow, easy navigation and fast information browsing. Next, the relevance of the information that is delivered to the customer is identified as an additional determinant (Rose et al., 2011). (ii) *Perceived Usefulness*: This “is the idea that the website will fit with and support the customer’s daily life” (Rose et al., 2011, p. 29) e.g. when shopping online. According to Liu et al. (2016), this factor is the belief that using the website will be helpful. Next, a websites’ functionality determines the perceived usefulness and is, in turn, significantly correlated to a customer’s purchase intention (Liu et al., 2016). (iii) *Customization*: This factor defines the customer experience when exposed to personal tailoring and customized services (Roy et al., 2017). (iv) *Enjoyment*: This factor is closely related to the construct of ‘playfulness’ and ‘fun’. Enjoyment refers to how customers experience e.g. the interactions with and quality of a website and the availability of Q&A opportunities. Rose et al. (2011) argue that enjoyment can be a strong determinant of the likelihood of customer’s returning to a website. (v) *Risk*: The concept of perceived risk performs an important role in the online context. Due to the de-personalization and low personal contact of web shops, customers feel vulnerable towards the integrity and honesty of the retailer. Moreover, risk in an online context is “associated with both the decision regarding the goods or services being purchased or used and the exchange process itself (i.e. use of the website)” (Rose et al., 2011, p.31). Common risk factors are economic-, personal- and time-loss -related in nature. To produce exceptional online customer experience, e-marketers need to remove and/or reduce customers’ concerns about risk.

2.2 Customer Journey

What are the different stages and touchpoints of the online consumer journey?

2.2.1 General Definition

The customer journey is “...a description of customer experience where different touchpoints characterize customers’ interaction with a brand, product, or service of interest.” (Wolny & Charoensuksai, 2014, p.319). This concept is closely related to the decision-making model. According to Wolny & Charoensuksai (2014), some aspects differ though. The decision-making model identifies several hierarchical stages that customers will follow to make a purchase decision. This process is characterized by a linear structure and reflects only cognitive drivers. The customer journey model, however, emphasizes a non-linear structure. According to this model, customers use various channels and touchpoints prior to making a purchase decision. Instead of reflecting only cognitive drivers, emotional and behavioral ones will be included as well.

This argumentation is proven well-founded if compared to the traditional consumer decision journey. Take, for example, the traditional Elmo Lewis’ purchase funnel model which illustrates the decision journey in several, linear stages (Vázquez et al.,

2014, p.70). Across these stages, consumers will “systematically narrow the initial consideration set as they weigh options, make decisions, and buy products” (“The consumer decision journey | McKinsey,” n.d., paragraph 7). However, this model has evolved during the last years by which means differences between the customer journey model and decision-making model are reduced. Modern versions recognize that customers do not follow the linear funnel structure. Instead, they are following a purchasing loop. Besides, the number of brands taken into consideration are likely to increase rather than hierarchically narrow due to the information overload of the internet (“The consumer decision journey | McKinsey,” n.d.). It can be stated that the basic framework and stages are the same in almost all models imposing difficulties in selecting the appropriate one for this research. Therefore, the model emphasizing online purchase stages will be applied.

2.2.2 Customer Journey Model by Wolny & Charoensuksai (2014)

Scientific papers about customer journey models that exclusively identify digital touchpoints are lacking. For this reason, the customer journey model proposed by Wolny & Charoensuksai (2014) will be used in this paper. This model maps customer journeys in a multichannel decision-making process. Hence, both offline and online touchpoints are explained. This research will be centered around the online touchpoints. As mentioned before, similarities exist between modern consumer decision models and this customer journey model. Therefore, information about the various stages as introduced by other papers will be used to complement the Wolny & Charoensuksai model.

The first stage is ‘orientation, inspiration, horizon scanning’. At this stage, consumers are not explicitly shopping but they are consciously or unconsciously scanning the marketplace. Digital touchpoints in this stage are product reviews, social networks, online ads and product display (website). In turn, marketers can use the customer information published at these touchpoints (e.g. social media account, review site) to build rich consumer profiles. This will improve the STP (segmentation, targeting, processing) process and the customization of advertisements. The second stage is ‘information search’. At this stage, consumers have a purchase intention. Blogs, review sites, display ads and search engines are used to find relevant information about the product/service. The task of the marketer is to increase the brand’s visibility at all these touchpoints. The third stage is ‘evaluation’. At this stage, consumers already know the product, respectively the brand as they limit the number of purchase choices they have (Vázquez et al., 2014). More information about the price, physical attributes and availability will be collected. Common touchpoints are the online store (website), mobile channel and social media (Wolny & Charoensuksai, 2014). The marketer is responsible for facilitating customers access to relevant and useful information (“The consumer decision journey | McKinsey,” n.d.). At the fourth stage ‘purchase’, consumers make the final purchase decision. Products are being browsed in the online store, mobile channels and on social media. Interaction with the company in the form of online chats can accompany the purchase process. The last stage is ‘post-purchase’. At this stage, consumers share their shopping experience on review sites and social media platforms (Wolny & Charoensuksai, 2014). To support brand loyalty and engagement, marketers can use marketing processes such as re-targeting (“The consumer decision journey | McKinsey,” n.d.).

The literature findings of section 2.1 and 2.2 are summarized in figure 1. This framework will be used as a theoretical foundation for the next part of this research paper.

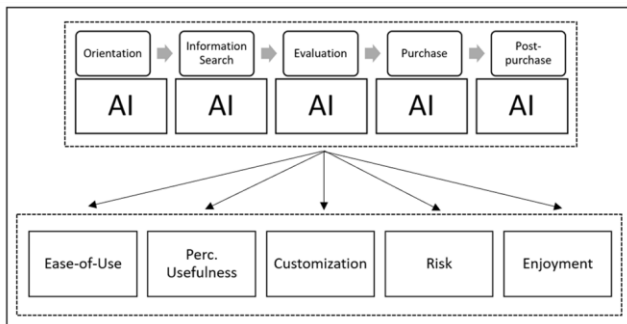


Figure 1 Framework OCE factors & Consumer Journey

2.3 Artificial Intelligence

Min (2010) defines AI as “the use of computers for reasoning, recognizing patterns, learning or understanding certain behaviors from experience, acquiring and retaining knowledge, and developing various forms of inference to solve problems in decision-making situations where optimal or exact solutions are either too expensive or difficult to produce” (p. 13-14). McKinsey & Company (2019) defines AI as “the ability of a machine to perform the cognitive functions that we associate with human minds, such as perceiving, reasoning, learning, interacting with the environment, problem-solving, and even exercising creativity” (p.7). In general, we can say that artificial intelligence is an umbrella term covering systems that try to mimic human intelligence to make computer operations smarter and more efficient (Cannella, 2018). Common examples of such systems are machine learning, deep learning, and nature-language processing.

In the field of AI, ‘machine learning’ is one of the most promising systems. This technology is the basis for many of the AI applications most relevant to today’s marketers. Machine learning algorithms allow systems to learn and improve upon themselves by processing large amounts of data. Traditionally, analyzing this data has been a complex process involving rule-based programming performed by humans. Machine learning is able to do so without being explicitly coded. Yet another promising sub-field of AI is ‘deep learning’. This technology facilitates unsupervised learning from and analyzing of big data in a non-linear way using neural networks. Nature-language processing is another example of the AI system. It’s focused on understanding the complexities of the human language. Combined with machine learning algorithms, NLP allows programs to interpret human voice into data. This process has been a complex problem in the field of computer science (Cannella, 2018). These three examples are only a few out of many promising sub-fields of artificial intelligence.

2.4 AI in Digital Commerce

What are promising AI marketing applications in digital commerce, at what stage of the consumer journey are they relevant & what is their effect on OCE factors at this specific stage?

The application of AI-based systems in digital commerce is likely to vastly alter common marketing practices. Utilizing AI to improve marketing tactics will help companies to create novel ways to add value to their customers and their brand (Cannella, 2018). In the following, various AI marketing applications will be explained that businesses can utilize to improve the customer experience alongside the consumer journey.

2.4.1 AI Programmatic Advertising – Stage 1&2

Programmatic advertising can be defined “as automated digital media buying using machines” (Cannella, 2018, p.35). In recent years, it has received increasing attention from both businesses and researchers. Studies such as those by Kietzmann, Paschen, & Treen (2018), Yang, Yang, Jansen, & Lalmas (2017) and Charski (2016) have highlighted the importance of programmatic advertising as a new marketing technique applied to the internet. Besides, more and more businesses use programmatic advertising to increase the efficiency of their marketing activities (McKinsey & Company, 2019). As already as in 2016, Charski (2016) estimated “programmatic will make up 67% of total digital display ad spending, or \$21.55 billion” (p.18) compared to 59% of spending in 2015. By 2022, this number will even increase to approximately 71% (McKinsey & Company, 2019).

The biggest advantage of programmatic advertising is its ability to analyze the huge amount of customer data in real time. This data is available through the customers’ social and web interactions. As highlighted by Charski (2016), data is crucial for programmatic advertising, it fuels the machine. It is “so integral to programmatic that not having a solid chunk of it can be an impediment” (p.21). Powered by artificial intelligence algorithms, this customer data is now being analyzed faster and more efficient than done by traditional web analytics and data mining methods. It allows programmatic advertising systems to build ever richer consumer profiles (Kietzmann et al., 2018).

This AI enabled application is especially used at the first and second stage of the consumer journey model. As mentioned earlier, consumers are not explicitly shopping but they are consciously or unconsciously scanning the marketplace at the first stage. Marketers need to understand their customer demands and get their attention with the use of the right message, often in the form of online ads. This is quite similar to the second stage, at which customers search for relevant information about a product or brand. Again, marketers need to engage the customers by displaying ads which will increase the brand’s visibility (Wolny & Charoensuksai, 2014). Hence, advertising plays an essential role in both stages. Today, customers become increasingly impatient as they are confronted with information overload, which in turn decreases their attention span (McKinsey & Company, 2019). With traditional advertising techniques, getting the attention of those customers became more difficult. For example, online ads were often not of high relevance for the customer or not of interest at that precise moment of time. Facilitating AI algorithms, programmatic advertising is now helping marketers to reach their target audience with online ads that “accurately reflect the precise interests of a user at the exact moment at which they are most likely to make a purchase or click on an ad” (Palos-Sanchez et al., 2019, p. 61). Next, online ads are displayed in the right environment. It reaches the right customer whether he/she is scanning through social networks, news platforms, websites or review sites (Palos-Sanchez et al., 2019). Hence, customers will be engaged with more personalized ads, helping them to get better product ideas when scanning the online marketplace. In the end, customers will arrive at their purchase decision faster and more simply.

Impact on OCE: Programmatic Advertising is showing great potentials to deliver an immersive experience to customers. Highlighted by McKinsey & Company (2019), Palos-Sanchez et al. (2019), Cannella (2018) and Benzoni & Clignet (2017), programmatic advertising will have a large, positive impact on the ‘customization/ personalization’ factor of the OCE. This is emphasized by the fact that programmatic advertising allows for extreme personalization by offering customer-tailored messages (ads) that are delivered at the right time and right device based on the user’s preferences (McKinsey & Company, 2019). ‘Perceived usefulness’ is yet another OCE factor positively

affected. Palos-Sanchez et al. (2019) mentioned that “users consider the perceived usefulness of PA as positive, as long as the PA is personally related to them and offers them better savings, products and Internet services” (p.62). Lastly, ‘perceived risk’ will be influenced as well, however both positively and negatively. Because programmatic advertising allows customers to get product ideas faster and at the right time, they are likely to show fewer concerns with respect to time-loss risks. On the other hand, the customer’s concerns about privacy issues are rising. This concern originated from the large amounts of customer data collected to optimize the programmatic advertising system. To do so, companies need access to the users browsing behavior, as well as information from e.g. their social media channels. The number of customers disagreeing with being tracked is increasing (Palos-Sanchez et al., 2019). Since customer data is essential for many AI algorithms, privacy issues are likely to be relevant for most of the AI marketing applications discussed in this paper. As this research will be mainly focused on how AI is going to improve the customer experience, privacy issues will not be discussed in detail. However, it’s important that companies considering AI for their digital commerce are aware of their customer's privacy concerns. Informing customers about how their data is collected and how it will be used will be crucial to gain the customer's trust and improve the overall customer experience. It can be concluded that OCE factors most likely being affected by AI programmatic advertising are customization/personalization, usefulness and risk.

2.4.2 AI Recommendation Systems – Stage 3

In the last few years, recommendation systems were adopted by companies to a wide range. A well-known example is the book recommender system which is used by Amazon on their own e-commerce website. In general, these systems can be defined as software tools that “generate recommendations using various types of knowledge and data about users, the available items, and previous transactions stored in customized databases” (Ricci, Lior, Bracha, & Editors, 2015, p.2). The need for recommendation systems developed across the years as the number and variety of products and services available online increased significantly. This information overload led customers to experience even more problems to arrive at the most satisfying purchase decision. With the help of recommendation systems, customers are now offered personalized subsets of items supporting them in making better choices when shopping online.

To do so, data about user preferences of each customer is needed. This data is collected in two ways. First, the clicking and purchasing behavior of customers can be analyzed, known as implicit feedback. Secondly, explicit feedback is available when customers rate items, review items or indicate their specific needs online. The recommendation system is then, in turn, analyzing the preference data. It calculates personalized recommendations for each customer by predicting “how much the user would appreciate each of the available items in the catalog” (Knijnenburg, Willemsen, Gantner, Soncu, & Newell, 2012, p. 442). For this process, algorithms are needed. In their study, Knijnenburg et al. (2012) mentioned that the more sophisticated the algorithm is, the more accurate the personalized predictions will be leading to better customer experiences. However, software engineers are increasingly facing problems developing such complex algorithms. This is due to the fact that transactions in the digital marketplace have increased tremendously during the last years leading to customer data available more than ever before (Leefflang et al., 2014). With the development of AI-based algorithms such as machine learning, recommendation systems are now able to provide users with better and more accurate product recommendations and predictions. As already as in 2003, Vozalis & Margaritis stated

that machine learning methods in recommendation systems will probably outperform conventional approaches.

AI Recommendation Systems will be of particular interest in the ‘evaluation’ stage of the consumer journey model. Remember that at this stage, the customer is limiting the number of purchase choices he/she has. For example, imagine a customer who is willing to buy new shoes online. Hence, the customer is browsing the e.g. online store of Amazon.com to collect additional information about the prices, attributes, and availability of different shoes (Wolny & Charoensuksai, 2014). To make an appropriate purchase decision at this stage, the information provided to this customer must be relevant and useful (“The consumer decision journey | McKinsey,” n.d.). With the help of AI-driven recommendations, the customer will get highly personalized product recommendations about shoes he/she is most likely to buy. Instead of browsing through the whole product catalog, the customer can now easily evaluate the proposed recommendations (Ricci et al., 2015).

Impact on OCE: Recommendation systems allow businesses to provide tailored product recommendations to their customers. Using ever more sophisticated AI algorithms, predictions about the user’s preferences will be more accurate as the system is learning from new customers insights. Hence, the ‘customization/personalization’ factor will be improved constantly. This is highlighted by various studies such as by Knijnenburg et al. (2012), Adolphs & Winkelmann (2008) and Ricci et al. (2015). Moreover, Knijnenburg et al. (2012) demonstrated that, due to recommendations getting more personalized, customers perceive its information as having a higher quality. This study also investigated that personalized product recommendations will lead to higher system effectiveness, which in turn leads to reduced browsing activity indicating faster information browsing. This relationship has been studied by Ricci et al. (2015) as well. They found that, due to a lack of personal experience, customers have difficulties to “evaluate the potentially overwhelming number of alternative items that a website, for example, may offer” (p.1). Supported by recommendations systems, customers are now capable of browsing the available information faster. Hence, the risk of losing time when browsing online is reduced. Besides, Ricci et al. (2015) explained that those systems are easy to navigate. All these indicate improvements in the perceived ‘ease of use’ and ‘risk’ factor. Next, recommendation systems help customers to make better purchase decisions when using a website. Hence, the ‘usefulness’ of websites is improved (Knijnenburg et al., 2012). In combination with a properly designed human-computer interaction, customers will also ‘enjoy’ recommendation systems (Ricci et al., 2015). It can be concluded that OCE factors most likely being affected by AI recommendation systems are usefulness, ease of use, enjoyment, time-loss risk and customization/personalization.

2.4.3 AI Chatbots – Stage 4

The increasing importance of utilizing AI enabled chatbots as new information and communication channel has been acknowledged by a variety of companies and scientists. As already as in 2017, the number of chatbots available in the Facebook messenger exceeded 100,000 (Zumstein & Hundertmark, 2017). Even more impressive are the estimations presented by Zumstein & Hundertmark (2017): “the potential global annual revenue generated by chatbot transactions is estimated up to 32 billion US Dollars” (p.97).

In general, AI chatbots can be defined as robots who” field inquiries from customers (from online or in the call center)” and that “can automatically respond to customer inquiries...or intelligently route inquiries to human agents” (Gartner, 2017, p.

12). The development of chatbots, as we know them today, has been powered by technological breakthroughs in the field of artificial intelligence and natural language processing. These technologies enable chatbots to analyze customer requests faster and more accurate than before. For example, AI techniques such as machine learning and deep learning help chatbots to recognize and combine patterns in the customer request and to match them with backend databases. Information retrieved from databases such as customer relationship management systems (CRM) or enterprise resource planning systems (ERP) is then used to provide the chatbot, and ultimately the customer, with smart, AI-driven customer insight (Zumstein & Hundertmark, 2017). Next, with developments in the natural language processing capabilities, chatbots are now capable of communicating with customers through natural, open-ended questions (McKinsey & Company, 2019).

In the purchase stage of the customer journey, chatbots can be facilitated in two ways. First, as ‘customer service chatbots’. This type of chatbot is mainly used to handle frequently handled customer service inquiries. Traditionally, these repetitive questions were answered by humans. Now, customers can get these answers on their convenience, 24/7. Even if they are shopping at night, questions related to e.g. delivery charges will be answered in real-time. Waiting to reach the human customer service during its opening hours is no longer needed. Hence, it can simplify and accelerate the customer’s purchase decision (Cannella, 2018). Secondly, chatbots can serve as ‘e-commerce assistants’. These chatbots are “designed to make placing orders easier for customers, guiding them through their shopping by offering smart product recommendations and answering questions they may have” (Cannella, 2018, p.64-65). To do so, data from backend databases such as the customer’s purchase history, sentiment and much more is used. In combination with new customer data, it’s used to train the chatbot. This will allow chatbots to answer customer questions and guide them through the purchase process in a meaningful, personalized way (McKinsey & Company, 2019). Next, in cases where human assistance is needed, the chatbots can “intelligently route inquiries to human agent” (Gartner, 2017, p. 12). The human agent, in turn, can assist the customer with the help of AI-driven customer insights generated by the chatbot. Similar to ‘customer service chatbots’, ‘e-commerce chatbots’ are available 24/7 as well.

Impact on OCE: AI chatbots are showing great potential to improve the customer experience. A variety of studies such as by McKinsey & Company (2019), Cannella (2018) and Cui et al. (2017) emphasized customer time savings gained through chatbots. Customers are no longer dependent on the opening hours of the customer service. With the help of ever advanced AI chatbots, they can interact with a brand at any time, at their convenience (Cui et al., 2017). This is strongly related to the ‘risk’ factor of the OCE which explains e.g. personal- and time loss risks as a consequence of the de-personalization and low personal contact of web shops (Rose et al., 2011). Hence, due to 24/7 availability, chatbots are likely to improve both personal- and time loss risks. Further, Cui et al. (2017) mentioned that chatbots will improve the ‘perceived usefulness’ factor of the OCE. This is in line with research conducted by Duijst (2017) who concluded that “most users found chatbots useful” (p.12). Next, chatbots will constantly improve as they learn from new customer insights. Besides, developments in NLP algorithms will allow chatbots to respond in a human-like manner more sophisticated than before. In combination, this will most probably enhance the interactions with and quality of a website and its Q&A opportunities. (Cannella, 2018). This is strongly related to the ‘enjoyment’ factor of the OCE (Rose et al., 2011).

The fact that NLP algorithms will get more sophisticated will improve the ‘ease of use’ of chatbots as well. Traditionally, customers needed to ask questions in a pre-defined way, without any typos, so that chatbots could understand the request. Now, chatbots can process complex requests, even if they include a lot of typing errors (Zumstein & Hundertmark, 2017). Hence, customers perceive more convenience when communicating with a chatbot (ease of use). The last customer experience factor affected by chatbots is ‘customization/personalization’. Both, Cannella (2018) and Duijst (2017) highlighted the importance of chatbots for personalization. Cannella (2018) argues that chatbots will improve the personalization of the customer experience. This because chatbots customize the interactions with customers using deep AI-driven user insights. It can be concluded that OCE factors most likely being affected by AI chatbots are risk, ease of use, usefulness, enjoyment and customization / personalization.

2.4.4 AI E-mail Marketing – Stage 5

Traditional email marketing has been an integral part of businesses already for a while. It is used to directly approach customers with the objective of promoting products and services in the post-purchase stage. A common approach is to send emails offering current promotions and discounts with the purpose of re-targeting existing customers (“Care - AI Across the Funnel - Episerver,” n.d.).

As customers are increasingly demanding evermore personalized interactions, it became clear that traditional email marketing is increasingly ineffective to engage the customer. Many companies are still struggling to do so. They still use segments for their email marketing campaigns, whereas today’s customers ask for individual customer-company interactions. This is highlighted by numbers presented by Solis (2017): 91% of consumers unsubscribe from emails and 44% of direct emails are never opened (Solis, 2017).

With the advancements of AI technologies, many new ways to personalize after-sales processes are available to businesses. Powered by AI and machine learning algorithms, companies are now capable of collecting and analyzing customer data from different sources. All in real time. AI will automatically turn this data into rich customer profiles which help marketers to gain a deeper understanding of who their customers are, what their preferences are and how they will respond to specific promotions and discounts. The system will continuously learn from new data and adjust the individual consumer profiles accordingly. Hence, companies will have access to valuable, up-to-date customer insights non-stop. These insights provide the basis for many of the AI marketing applications explained in this paper. In the context of e-mail marketing, they are used to enable businesses to deliver extreme personalized promotion and re-targeting emails to each individual customer.

Impact on OCE: As highlighted by Cannella (2018), Solis (2017) and “Care - AI Across the Funnel - Episerver,” (n.d.), AI email marketing will have a large, positive impact on the ‘customization/ personalization’ factor of the OCE. This is emphasized by the fact that it allows for extreme personalization by offering tailored promotional and re-targeting emails. The content of the emails can be specified for different objectives. For example, if the company is aiming to deepen the relationship with its customers, it can send transactions emails (e.g. confirmation email) with highly personalized content. If the objective is to re-target the customer, the email content will be personalized according to the individuals’ preferences towards discounts. For example, “Would this individual be likely to open an email with a 20 percent discount in the subject line, or would free shipping suffice?” (“Care - AI Across the Funnel -

Episerver,” n.d., p.2). Further, it’s expected that the ‘perceived usefulness’ will be positively affected. The basic idea of perceived usefulness is that something (e.g. the website) supports the customers when e.g. shopping online (Rose et al., 2011). Imagine that a customer has a purchase intention for a new jacket. Most likely, this will be recognized by the AI email system of company X, which in turn sends a personalized discount for

jackets to this specific customer. Indeed, this will support the customer, hence improving the perceived usefulness.

A summary of the main findings is to be found in table 2 (✓ indicates improvements, X indicates no relationship found).

Table 2: Summary findings literature review

Application	Studies	OCE factors				
		Ease-of-Use	Customization	Risk	Enjoyment	Perc. Usefulness
Stage 1 & 2 AI Programmatic Advertising	McKinsey & Company (2019)	X	✓	✓	X	X
	Palos-Sanchez et al. (2019)	X	✓	✓	X	✓
	Cannella (2018)	X	✓	X	X	X
	Benzoni & Clignet (2017)	X	✓	X	X	X
Stage 3 AI Product Recommendations	Knijnenburg et al. (2012)	✓	✓	✓	X	✓
	Adolphs & Winkelmann (2008)	X	✓	X	X	X
	Ricci et al. (2015)	✓	✓	✓	✓	X
Stage 4 AI Chatbots	McKinsey & Company (2019)	✓	X	✓	X	X
	Cannella (2018)	X	✓	✓	✓	X
	Cui et al. (2017)	X	X	✓	X	✓
	Duijst (2017)	X	✓	X	X	✓
	Zumstein & Hundertmark, 2017	✓	X	X	X	X
Stage 5 AI E-mail Marketing	“Care - AI Across the Funnel - Episerver,” (n.d.)	X	✓	X	X	✓
	Solis (2017)	X	✓	X	X	X
	Cannella (2018)	X	✓	X	X	X

Key Findings:

- Notable improvements are found for all selected OCE factors, except ‘enjoyment’
- Improvements in the ‘customization’ and ‘risk’ factor are validated by most papers
- Changes in the ‘risk factor’ are mainly driven by a reduction of time-loss risks
- Changes in the ‘ease-of-use’ factor result from more relevant information provided by recommendations and chatbots

3. EMPIRICAL STUDY (EXPERT INTERVIEW)

How do business practitioners expect AI to change online marketing practices and the OCE?

This chapter discusses the main findings of the expert interview. Various questions regarding the selected AI applications and their effect on the OCE were asked to the interviewee based on findings from the literature review. The selected OCE factors were proposed and explained to the interview partner in advance. In this way, the interviewee was able to relate his AI knowledge to these specific factors. Relevant findings from the expert interview are presented.

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

First, the interviewee underlined the importance by referring to research which is conducted by Forrester Consulting on behalf of SAP, asking 333 global decision makers involved with machine learning. The interview partner pointed out that when asked

“What is driven demand for predictive analytics and machine learning technology and solutions?”, almost 60% of the respondents answered: The need to improve customer experiences. Further, he explained that delivering an immersive customer experience is crucial for businesses to differentiate themselves from competitors and stay relevant for the future. Basically, it’s about delivering extra value to the customers, beyond that of just using the product/service. The interviewee explained that businesses need to facilitate different AI applications across the whole customer journey to have the greatest impact. It’s important that these applications are considered as one, interconnected system that exchanges new customer data in real-time and is connected with back-end databases. This to ensure a seamless customer experience across the entire customer journey. In addition, the interview partner emphasized the role of AI in the field of customer experience. He explained that AI fulfills two general roles for businesses: making front-end business processes more efficient and make back-end processes different (e.g. faster time-to-insights; broader use of customer data such as creating extremely accurate

customers segments). The interviewee argued that the last one will ultimately lead to better customer experiences. Hence, businesses need to recognize that AI investments in both, front-end and back-end processes, need to be balanced.

What is the effect of AI Programmatic Ads on the proposed OCE factors?

The interviewee argued that the following factors are most likely being affected: Customization / Personalization; Time-loss risk & Ease-of-Use (relevance of the ads). He stated that supported by AI-driven customer insights, businesses can now offer individualized, customized ads to their customers. At the right time and right device. Further, the interview partner argues that the customer profiles are used to deliver advertisement campaigns with the right content, meaning that the displayed information of the ads will be more relevant to the customers. For illustration, the interviewee explained that if a customer is saving a wish list on an e-commerce website, this data is used to send highly personalized, relevant ads to this specific customer. If the customer placed shoes from a certain brand in his/her wish list, only campaigns related to these will be sent. Next, the interview partner argued that the time-loss risk will be positively affected. This because AI driven ads can be adjusted to the customer data in real-time, delivering individualized ads to customers faster than ever before. Lastly, the interviewee disagreed with the findings of AI Programmatic Ads having a positive effect on the 'usefulness/ helpfulness' factor. He brought forward the argument that businesses use ads/campaigns to get the attention of potential customers. However, most customers do not perceive ads as really useful when shopping online. Instead, customers might perceive ads as disturbing when browsing online. Anyhow, he thinks that if ads get more relevant and personalized over time, this relationship might change. The interviewee gave two customer cases by way of illustration of this application:

Office Depot: Using AI-driven customer insights to achieve a 360-degree view of their customers and offer a personalized customer journey. Results: Marketing campaigns that reach the right audience at the right time; they can be scheduled down the minute and can be easily adapted (to personal user content).

SEA Group: Using AI-driven customer insights to run relevant real-time marketing campaigns that focus on specific customer segments. Results: Stronger customer loyalty, better customer engagement as a result of more personalized, relevant and real-time marketing campaigns.

What is the effect of AI Recommendation Systems on the proposed OCE factors?

The interview partner explained that AI recommendation systems can be seen as one specific application of AI-driven content management. Related applications are e.g. a website's search facility, shopping cart or wish list. The interviewee argued that the following factors are most likely being affected: Customization / Personalization; Usefulness; Ease-of-Use (relevance of the recommendations & easy navigation); and time-loss risk. First, the interview partner explained that AI-driven recommendations can interact with customers in real-time. It delivers tailored content using e.g. a customer's shopping history and behavior. The interviewee illustrated that recommendations can then be enriched with personal customer data to specify for example product descriptions or to display only top sellers or only niche products. Further, he argued that these characteristics do not only influence the personalization factor, but also the ease-of-use. This due to the fact that recommendations become more relevant to the customer and allow for easier navigation across the website's content. Next, the interviewee stated his position on the other OCE factors. He agreed that the usefulness of a website probably will improve

because relevant recommendations can help customers to reach a purchase decision more easily, perhaps also faster. This, in turn, is related to the time-loss risk. However, he didn't think that customers will experience more fun/ enjoyment when being faced with AI product recommendations.

What is the effect of AI Chatbots on the proposed OCE factors?

The interviewee explained that chatbots are just starting to deliver positive customer experience outcomes. This due to advancements in NLP and machine learning algorithms leading to chatbots getting smarter. Before, chatbots were characterized as quite 'dumb' robots who e.g. provided customers with the same wrong answer one after another. Now, businesses are realizing a change and start implementing chatbots in their business processes, often as customer service agents in the purchase and post-purchase stage of the customer journey. Here, the interview partner emphasized the importance of integrating chatbot applications with back-end databases such as CRM, finance, ERP etcetera. He stated that only in this case, chatbots realize their true potential with respect to improving the customer experience. The interviewee explained that the following factors are most likely being affected: Risk (time-loss and personal contact); Customization/ Personalization; Ease-of-Use; Usefulness (helpfulness). He argued that supported by AI-driven consumer profiles and information from back-end systems, chatbots are now capable of providing the customer with tailored, relevant messages and answers. In addition, they can customize the whole shopping experience by serving as a personal shopping assistant. In this case, chatbots engage the customer with relevant questions or product ideas, helping him/her to reach the intended purchase more easily and faster. Chatbots can also provide information about product prices or delivery policies to the customers, hence helping them when shopping online. Lastly, the interview partner argued that current AI Chatbots will probably not improve the enjoyment factor of the customer experience. This due to lacking capabilities in NLP algorithms. Developments are needed that allow chatbots to recognize the customer as a social being that has emotions and certain characteristics. Only then chatbots will be capable to adjust its questions and answers accordingly and have a fun conversation with the customer. The interviewee gave a customer case by way of illustration of this application:

Groupe Mutuel: Using conversational AI services (Chatbots) to provide an intelligent 24*7 communication channel to >1,2 million health plan members. Result: 75% of customer questions can be answered right away; immediate responses to product-related questions outside of office hours (anytime, anywhere); superior, personal experience with a chatbot; easier and more convenient communication between customers and the business.

What is the effect of AI E-mail marketing on the proposed OCE factors?

The interview partner argued that AI-enabled technologies such as machine learning and NLP can enrich E-mail services in many ways. One way is to use e-mails as marketing tools. For example, promotional e-mails can be sent to existing customers to push forward a new sale. With AI-driven customer insights, these promotions can be highly personalized towards the customer's preferences. Most likely, the information from promotions will also be more relevant to the customers, which is related to the 'ease-of-use' factor of the customer experience. By way of illustration, the interviewee explained that many businesses use these AI-driven insights for a detailed segmentation of their customer base, which in turn is used to send intelligent, contextualized e-mail promotions. In the 'Aerospace and Defense' industry, for example, these include relevant offers for

services, parts & warranties whereas in the clothing industry, relevant promotions such as discounts for the next purchase are used. All personalized to the individual customer. Further, he argued that E-mail marketing is probably improving the 'perceived usefulness'. The interviewee related this effect to improvements in the relevance and personalization of promotional e-mails. Only if this is the case, the 'perceived usefulness' will be improved too.

Additional Information: The interview partner also mentioned that customer engagement will be improved. For example, businesses can proactively offer relevant, personalized products based on consumer needs, hence engaging the customer to make a purchase. Next, he argued that businesses can encounter customer concerns (risks) related to data privacy by clearly communicating the advantages of data collection to the customer. Basically, this can be solved by smart marketing campaigns.

A summary of the main findings is to be found in table 3. Again, ✓ indicates improvements, X indicates no relationship found.

Table 3: Summary expert interview

Application	OCE factors				
	Ease-of-Use	Customization	Risk	Enjoyment	Perceived Usefulness
AI Programmatic Advertising	✓	✓	✓	X	X
AI Product Recommendations	✓	✓	✓	X	✓
AI Chatbots	✓	✓	✓	X	✓
AI E-mail Marketing	✓	✓	X	X	✓

Key Findings:

- Notable improvements are found for all selected OCE factors, except 'enjoyment'
- Improvements in perceived usefulness are most probably driven by changes in other factors (customization / ease-of-use)
- 'Customer engagement' is identified as additional factor
- Integration with back-end databases is crucial
- Businesses already using customer-centric AI experience pos. outcomes such as more personalized, relevant and real-time marketing & better customer engagement

4. CONCLUSION & DISCUSSION

The objective of this research was to study how various AI marketing applications will improve the customer experience across various stages of the digital customer journey. This topic has experienced increased attention over the last years as customer behaviors have changed. Improving the production and delivery process of products and services is no longer mission-critical for businesses. Instead, the focus has shifted to delivering an immersive customer experience. Although the importance of this topic is widely accepted by business executives, knowledge about how AI technologies can facilitate this process is lacking.

To answer the research question, two different research approaches were applied. To answer sub-questions one to three, a literature review is conducted. For sub question four, an expert interview is held. The results of the sub-questions can be summarized as follows.

To answer the first sub-question, a literature review was conducted which examines the various factors and elements that make up the online customer experience. Various scientific papers have been studied and their insights have been compared. A final set of five factors was selected that was assumed to be affected by AI applications and hence, was included in this research. These are: ease-of-use, perceived usefulness, customization, risk and enjoyment.

To answer the second sub-question, another literature review is conducted which determines the different stages that are part of the online customer journey. In this paper, the customer journey model proposed by Wolny & Charoensuksai (2014) was used. The five stages that are identified are: 1. Orientation, inspiration, Horizon scanning; 2. Information search; 3. Evaluation; 4. Purchase; 5. Post-purchase. The insights gained from the first two literature reviews formed the theoretical foundation of this research.

In the following part of this paper, research was centered around determining promising AI marketing applications and studying their effect on the selected OCE factors and relevance for the customer journey stages. To answer the third sub-question, literature was reviewed again. In this paper, attention has been given to four AI applications that are relevant in the field of digital commerce. According to the literature findings, the following customer experience factors will be improved:

- Stage 1&2 / AI Programmatic Advertising: customization, perceived usefulness and risk
- Stage 3 / AI Recommendation Systems: perceived usefulness, eas-of-use, enjoyment, risk and customization
- Stage 4 / AI chatbots: risk, ease of use, perceived usefulness, enjoyment and customization/personalization
- Stage 5 / AI E-mail Marketing: perceived usefulness, customization
- BUT: A negative relationship is identified between AI applications in general and risk. This due to privacy concerns related to the large amounts of customer data collected that is needed to optimize AI systems

To answer sub question four, an expert interview was conducted. This to get some real-life insights on this topic from a business practitioner. These insights complemented the findings from the literature review. The findings of the expert interview highlighted the following improvements of OCE factors:

- AI Programmatic Ads: customization, ease-of-use, risk
- AI Recommendation Systems: customization, usefulness, ease-of-use and risk
- AI Chatbots: risk, customization, ease-of-use and perceived usefulness
- AI E-mail Marketing: customization, ease-of-use and perceived usefulness.

In Figure 2, a Venn diagram combining the findings from the literature research and expert interview can be found.

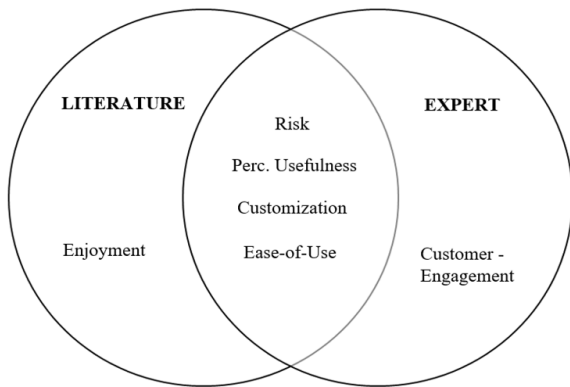


Figure 2 OCE factors pos. affected: overlap literature & expert

The findings from the literature research and expert interview answer the research question to a great extent. **Solid argumentation is found that AI will transform the customer experience by improving some of its most important factors.** The most notable effects have been found in improvements of the ‘ease-of-use, customization and risk’ factors of the customer experience, which is validated by multiple papers and the expert findings. Findings related to the ‘perceived usefulness’ should be interpreted with great care.

First, a positive effect on the ‘customization’ factor is proven well founded by both, the literature (10 out of 12 articles) and expert interview. In all cases, the AI marketing application is delivering a highly personalized experience to the customer. This can be in the form of personalized ads, product recommendations, e-mail promotions or interactions with the company. This effect is driven by the fact that AI systems use plenty of customer data to build rich customer profiles including detailed information about customer preferences.

Next, a positive effect on the ‘ease-of-use’ factor is validated by the literature research (4 out of 12 articles) and expert findings. This is attributable to AI-driven improvements in the relevance of the displayed information of ads, recommendations or e-mails. Further, AI-driven recommendations allow for easier navigation and faster information browsing. All these are identified as elements of the ease-of-use factor, highlighted by Rose et al. (2011). However, comparing the insights from the literature research to the findings from the expert interview, it’s found that some differences exist. The interview partner argued that all of the selected AI applications will enhance the ‘ease-of-use’ whereas literature only examined improvements driven by AI Recommendation Systems and AI Chatbots. The expert justified his opinion by arguing that the information of personalized ads and e-mail promotions will also be much more relevant to the customer. Although this argumentation can be considered significant, it can not be confirmed by scientific papers.

Yet another positive relationship is found between AI marketing applications and the ‘risk’ factor. Both, the literature (5 out of 12 articles) and expert findings agree that all applications, except for AI e-mail marketing, will help customers to find relevant product information faster or to arrive at an intended purchase decision faster. In addition, chatbots allow for 24/7 customer service. Customers do no longer need to wait to reach customer service, hence the risk of losing time when shopping online is reduced significantly. Further, chatbots allow customers to contact the company more easily, counteracting risk factors that result from the de-personalization of the internet.

The last two OCE factors studied in this paper are ‘perceived usefulness’ and ‘enjoyment’. Findings from the literature

research (5 out of 12 articles) and the expert interview validate that the perceived usefulness will be improved. In general, all AI marketing applications will be more helpful for the customer when e.g. searching for a new product online or shopping online. The interview partner, however, mentioned that AI Programmatic Ads will not improve this factor. He argued that most customers do not perceive ads as really useful when shopping online, they might even perceive them as disturbing when browsing online. The validity of this statement can be questioned because it was not based on scientific findings nor on findings from a customer case. Moreover, the independence of ‘perceived usefulness’ was questioned by the expert. He expected that customers will perceive AI marketing applications only as more helpful, hence useful if they are relevant and personalized. This is in line with research conducted by Palos-Sanchez et al. (2019). It cannot be guaranteed that improvements in the ‘perceived usefulness’ are only driven by improvements in the ‘ease-of-use’ and ‘customization’ factor. Hence, related findings must be used with great care.

No solid argumentation is found that validates improvements of the ‘enjoyment’ factor. Although some papers such as by Ricci et al. (2015) mentioned that AI applications such as Chatbots can be more enjoyable to use, it’s only achieved in combination with a properly designed human-computer interaction. The expert argued that this is not the case yet, as capabilities in e.g. NLP algorithms aren’t developed sufficiently. One customer experience factor that was not found in the literature research but is mentioned by the expert is ‘customer engagement’. He explained that AI-driven marketing applications will help businesses to proactively engage their customers. For example, AI-driven personalized campaigns (think of look-a-like campaigns) can be run on Facebook to engage the customer on his/her social media platform.

Lastly, this study highlighted the relevance of AI applications for the different customer journey stages. Universally it’s concluded that, supported by AI, the customer journey is simplified significantly. The customer journey time will be reduced, meaning that customers will arrive at their purchase decision much faster. More importantly, they will make better purchase decisions. However, it must be mentioned that the AI applications that were studied in this paper just form a representation of a wide range of applications available in the field of digital commerce. Moreover, as highlighted by the interview partner, AI applications should not be facilitated exclusively for one specific stage. Chatbots, for example, can be used to improve the customer experience at different digital touchpoints along the customer journey. The reason to include customer journey stages in this study is (i) its relationship with customer experience, (ii) to give the reader tangible examples of AI possibilities across the whole customer journey and (iii) to structure this research paper.

4.1 Managerial Implications

This research has both managerial and theoretical implications. First of all, the managerial implications. As mentioned earlier, most businesses acknowledge the importance of delivering an immersive customer experience. Still, business executives are not familiar with how exactly AI can facilitate this process. This paper will assist businesses in getting a deeper understanding about the possibilities of AI technologies in digital marketing practices. The findings will help businesses to realize that AI will not only improve production processes but will significantly help them to tackle major customer experience challenges such as hyper personalization, speed and convenience. This is crucial to stay relevant in the future. Further, promising examples of AI applications were explained that are relevant at different stages

of the customer journey. The findings can serve as a guideline for businesses: they illustrate how a seamless customer experience is achieved across the entire customer journey. Ultimately, business executives can use the information provided in this paper to raise interest in this topic throughout the company and to adjust online marketing strategies accordingly.

4.2 Theoretical Implications

In AI related papers known so far, focus is given to study the technological developments of AI systems. Further, investigating how AI will enhance the efficiency of production processes is of particular interest. These papers take a rather business centric view. Research papers studying the effects of AI on the customer experience are available, but they are rather focused on one particular application or are limited related to the OCE factors. This paper gives a complete and general overview of different customer experience factors. Instead of focusing on one AI technology only, several are discussed leading to a complete picture of how the customer experience is affected across the entire consumer journey. Some interesting findings are discovered in this paper which can be used for further research. First, a positive relationship is studied between AI and the customization, ease-of-use and time-loss risk factor of the OCE. It will be of particular interest to conduct further research that build upon these findings. For example, the strength of these relationships can be tested with real-life, customer data. Moreover, it is suggested that AI marketing applications will cause improvements in engaging customer more proactively. Further research can study this relationship in greater detail. Lastly, it has been found that the risk factor can have a negative impact on the customer experience. This due to privacy issues related to customer data. Studying how businesses can minimize this effect will be of particular interest.

5. LIMITATIONS

This research is conducted with great attention with respect to its statistical representation, still there are some limitations. First of all, the **number of scientific papers** relating artificial intelligence to online marketing and customer experience was limited. In the academic world, most attention is paid to the technological challenges and developments of AI systems, hence are published in the field of computer science. As a result, several of the articles which were used originated from business papers. It must be stated that these were carefully selected, analyzed and compared to other papers. Still, the academic relevance of business papers can be questioned. Secondly, **only a few AI marketing applications** were explained and related to the customer experience. This due to time restrictions and limitations set on the length of this paper. Further research will be needed that builds upon findings of this paper and that will provide an even more complete research on this topic. The next limitation is related to the **selection of online customer experience factors**. During this research, it became clear that some of the selected OCE factors probably are not independent. In most cases, effects on the 'perceived usefulness' were related to improvements of 'customization/personalization' and 'ease-of-use' (relevance of the information) factors. In further research, more attention on the selection of relevant OCE factors is needed. Lastly, limitations exist concerning the **sample size** and **objectivity** of the selected data collection method 'expert interview'. This interview was conducted with only one expert. Additional experts from the field of AI and customer experience were not accessible or not available due to other obligations within the limited time period of this research. Conducting an expert interview with multiple experts would have been the preferred option. This to increase the reliability of the findings. Having multiple experts would also have allowed for a critical evaluation

of the given answers, which was not possible in this research. Besides, attention is needed to the objectivity of the interview partner. Since he is an employee of SAP, his answers might be affected by SAP's own AI strategy, hence they can be biased. However, being an international speaker as well, the interview partner is also working closely with other companies and research universities to elaborate on AI and customer experience topics, enriching his own knowledge. The expert tried to maintain an objective vision on this topic throughout the interview. Still, the impact of SAP on the interviewee's opinions need to be recognized. Future research should conduct a more extended interview session, preferable with experts from different companies that are familiar with AI customer-centric applications.

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Appendix A – Methodology

Queries used to find relevant literature (Boolean search operators AND/OR were used to optimize search queries)

Digital Customer Journey	Online Customer Experience	Artificial Intelligence
<ul style="list-style-type: none">• "customer decision journey"• "online customer journey"• "digital customer journey"• "digital touchpoints"• "stages online purchase journey"	<ul style="list-style-type: none">• "customer experience"• "customer experience challenges"• "online customer experience"• "digital customer experience"• "web experience"• "determinants customer experience"• "factors influencing online customer experience"	<ul style="list-style-type: none">• "AI"• "AI applications"• "AI marketing"• "machine learning"• "programmatic advertising"• "programmatic media buying"• "AI conversational"• "chatbots"• "intelligent bots"• "personalized product recommendations"• "AI product recommendations"• "AI E-mail marketing"• "AI 1:1 marketing"• "customer concerns about big data"