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Literature Review on Usability and Responsiveness of Artificial Intelligence Chatbots on Online Customer Experience in E-retailing

Mohammad Masud

mohdmasud07@yahoo.co.uk

Khalid Karim

ad4739@coventry.ac.uk

Coventry University London

Abstract

The aim of this review is to understand how customer experience is enhanced with usability and responsiveness of AI based chatbots, while the objective here is to underline the research methodologies, while reflecting on the role of theory, epistemology, ontology and axiology in interpreting and shaping research. As is evidenced through the review of literature, there are ample studies that have been carried out in this domain regarding the usability and responsiveness of AI chatbots on online customer experience, several gaps have emerged during this review. One of the major gaps in this direc-tion would be chatbots falling short to meet customer expectations due to miscommunication or inabilities in understanding customer queries. Also studies conducted in the past have focused largely on technology, there is a need to investigate value-additions provided by chatbots from customers' point of view. Other gaps would refer to lack of empathy, social capabilities and also the variation across industries in terms of chatbot adoption by customers. These factors warrant further research.

Keywords: Usability, Responsiveness, Artificial Intelligence, Chatbots, Customer Experience, E-retailing

Introduction

In the present day, artificial intelligence (AI) has permeated our lives and there is hardly any scope of life that has not been impacted by AI. Conceivably, to the less initiated, it could a novel concept; however, it has already made a huge impact on our day-to-day lives. On this basis, it would not be wrong to state that as humans, we do interact with AI in some or the other manner. At the same time, AI is known to have several uses within the business domain as well. Right from traditional to modern, AI is playing a vital role in remodeling almost all business procedures across industries. With the rapid boom in AI technologies, in order to gain a competitive edge, it has become imperative for current businesses to essentially embrace AI. According to Syam and Sharma (2018), it has been suggested by experts that the future is poised to present detailed insights into the fourth industrial revolution that has been driven by information technology, digitization, AI and machine learning. This has the propensity to slowly take away the obligation of decision-making from people to machines. In addition, consequent changes within the society would have a substantial impact on sales management, research and practices, personal selling and consumer markets (Schrotenboer, 2019).

The focus of the article: In the 21st century, AI Is changing various Industries and society ; and the risks and rewards that it brings are often as exaggerated as they are uncertain. Robotics and AI have penetrated life and business, creating economic opportunities and socio-economic challenges for businesses and their stakeholders (Alt et al, 2019). As this new relatively new form of technology gains popularity in the media and art, it seems that often the term is being misused. Nowadays thanks to globalization and technological advancements the power of AI systems are being utilized in everything (Bradsheet, 2019). There are already many products that exist claming to use this AI in their systems. From Home voice Assistant operating tasks to Facial ID recognition; from Self-driving cars to identify specific gene mutations in tumors; from analyzing the trading stocks to generating our weekly shopping lists. As economists we should realize that there is no free lunch, and everything has its cost.

Review of the literature:

In international business growth, AI already has been and much more than simply playing significant role in global expansion. There is a billion and billions of dollars worldwide being invested into its development**.**

AI is also playing a very vital role particularly in functions related to marketing. It has been stated by Murgai (2018), AI based marketing would essentially refer to leveraging technology to enhance customer service. However, irrespective of the massive benefits from AI, technology does not always have positive outcomes, technology such as AI are known to have their own misconceptions and it would vary from technical flaws to ethical issues. On the basis of a research conducted by Hermann (2021), trust has been found to be a key facet of AI. Nonetheless, more than half the respondents within their research reported that they were not very open to use AI. Clearly, there is mistrust on the part of customers which emerges from a resistance to change which tends to be controversial. Given these factors and rapid proliferation of AI within all aspects of business, this particular topic on AI was chosen. The aim of this review is to understand how customer experience is enhanced with usability and responsiveness of AI based chatbots, while the objective here is to underline the research methodologies, while reflecting on the role of theory, epistemology, ontology and axiology in interpreting and shaping research.

Conceptual Model

Since there is a difference between adoption of chatbots by businesses and willingness amongst customers' to adopt, accept and use this technology, it would be imperative to get an in-depth insight into the specific reasons for adopting chatbots. This would be instrumental in the development of improved technologies within e-commerce (Chopra, 2019). To facilitate this, Chen et al., (2021), made an attempt to augment knowledge about chatbot adoption for improving customer satisfaction and experience within research on e-retail, by proposing a conceptual model, while adhering to the technology acceptance model (TAM). The conceptual model is depicted through figure 2 and it investigates the association between chatbot adoption, online customer experience and customer satisfaction while testing the moderating role played by personality.

Levels of AI

According to Joshi (2019), there are two ways to classify AI. The first is using the following four types - Reactive Machines (RM), Limited Memory (LM), Theory of Mind (TM), and Selfaware (SA). (see Figure3) The second method uses the label -Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI), and Artificial Superintelligence (ASI). He elaborates that we have achieved the RM, LM, and ANI today. The following levels are completely mimicking the human mind or even exceed it. To test the level of AI, Turing (1950) developed the methodology. The length of the test is important as well it reveals more of the flows of the machine to "pretend" acting like a human. Many companies use the ANI like Apple's Siri or Google's Alexa. They help consumers of the product to engage with technology in a different way from typing or clicking. However, they are still not intelligent enough to substitute the human mind. (Novet 2021).

According to Bajpai (2020), Amazon spent 12%($22. 62 billion) and Alphabet working for Google - 15% ($16. 62 billion) of their revenue on AI R&D. At the time, the two companies were the biggest spenders in this sector. The author will comment that there seem to be the most successful with developing and advertising it as well.

Deep learning/ Data Learning

According to the website Bigcommerce, data learning is a subset of artificial intelligence which is Data learning from big data. Machine learning technology uses data to perform actions or predict the future. The more data input, the more accurate its outputs. That's how algorithms in this area are described as being able to 'learn'. (Islam et al, 2019)There is already fictional work created by artificial intelligence, which demonstrates that human mind is not impossible replace by machines even in art and creative industry.(Michaela et al, 2021).; as in Prague Theatre was staged an AI written play on anniversary of Capek, the man who invented the word robot.

How Ai is used in eCommerce

According to a research done by McKinsley (2019) AI has the biggest potential for creating the most value in the retail sector. The least value can be created in the Pharmaceutical and medical products as well Aerospace and defense. However the author must disagree as impact is a very general term plus the impacts of a potential risk in the last two categories can certainly have a much greater effect on the world economy as demonstrated in the recent years throughout the COVID-19 pandemic where almost 3 trillion USD were estimated lost due to lack of economic growth.(Szmigiera, 2021)

Adoption of Chatbots

According to the website, investopedia.com defines a chatbot as " a computer program mimicking human conversation through voice commands or text chats''(Frankenfield, 2020) IPG Media brands' Connections Panel research, instant messaging is a top-three behavior on digital devices among consumers aged 15-49 who use the Internet regularly. (Li et al, 2021.)

E-commerce companies are increasingly turning towards chatbots or digital assistants to provide 24×7 support to their online shoppers. (Go and Sundar, 2019) by implementing AI technology, chatbots are enabling a better customer experience. This is major advantage for the companies who are depended on online service.

AI has significantly changed strategies for marketing and the behaviour of customers, this is inclusive of chatbots (Kumar et al., 2019; Davenport et al., 2020). Simply said, chatbots are computer programs that tend to impersonate human conversation while leveraging capabilities of natural language and they tend to frequently act as virtual assistants on online platforms (Fryer et al., 2019). The use of chatbots within business have been discussed through several studies (De Cicco et al., 2020; Belanche et al., 2019; Vassinen, 2018). For instance, AI within the domain of financial technology was discussed by Belanche et al. (2019), while recognizing key factors that drove adoption of chatbots amongst customers. At the same time, a social relationship viewpoint was applied by De Cicco et al. (2020), while taking young customers into consideration. They stated that such platforms for AI based conversations tend to develop advanced dialog systems that provided engaging and pragmatic interfaces for natural languages. At the time of interaction with customers, chatbots are expected to understand the request of a customer, and pose questions to clarify their request while ensuring customer engagement (Alt et al., 2019). Regardless of the massive influx of chatbots, they are frequently known to fall short of the expectations of customers. This is mainly due to the fact that they are unable to comprehend the queries raised by customers. For instance, a failure in more than 70% interactions was reported through Facebook's project M (text based virtual assistant) (Sheehan et al., 2020), warranting an intervention from a live agent to resolve customer issue. Further, using chatbots also tend to create miscommunication errors, which might negatively impact customer perceptions related to chatbots (Buhrke et al., 2021).

Online Customer Experience with Chatbots

Two key components in a chatbot would refer to responsiveness and usability. Responsiveness pertains to the readiness to assist customers by providing services that are accessible thus offering prompt convenience (Tsai et al., 2011). Considering that chatbots respond promptly, can be easily reached tends to make customers comfortable and valued while giving them satisfaction during their interaction with chatbots (Roy et al., 2018). On the other hand, usability refers to a trait that signifies the ease with which human-computer interface can be effectively utilized to realize a specific purpose. On the basis of a survey carried out by, indicated that organizations using chatbots are perceived by Chen et al. (2021) customers as being innovative instead of cheap owing to their capability to present product functionality or initiate conversations on online portals. When chatbots offer credible advice, customers are made to feel as if communication has been customized to meet their requirements, which is indicative of credibility being vital to cater to customer requirements without presenting new challenges (Prentice et al., 2019). While studies conducted in the past (Mende et al., 2019; Ciechanowski et al., 2019; Araujo, 2018), have largely investigated variety in terms of chatbots and how they impact user response, along with factors that influenced acceptance of chatbots and its adoption by users (Rese et al., 2020), nonetheless, the focus of these studies were mainly on technology. Value add-ons provided by chatbots from the perspective of customers have been overlooked.

Dimensions of Intrinsic and Extrinsic Values

Evaluating the experience of customers in terms of chatbot adoption has been carried out through an assessment of two key dimensions which includes; intrinsic values and extrinsic values. Intrinsic values in terms of customer experience within an online environment would comprise of a sense of achievement, confidence, enjoyment, independence and novelty. As per studies carried out in the past, intrinsic values are known to drive the intention of customers towards adopting technology (Mehta et al., 2019). It has also been observed that a certain level of fun was involved in interaction with chatbots. Fun is known to be vital as it augments value perceptions which drive customers to adopt digital tools (Go & Sundar, 2019). Furthermore, Chung et al. (2020a) stress that positive perceptions regarding understanding and pertinent communication can only be evoked if interactions were precise, smooth and complete. When customers were offered easy-to-read, clear and specific information, in tandem with extensive discussion, it augmented the scope

for customers to feel valued. Particularly, when there is awareness on the part of chatbots within an interaction, customers feel a personal connection with them (Roy et al., 2018).

The review of literature does indicate that intrinsic and extrinsic values for customers can be increased with the use of chatbots, wherein it has been observed that customers have a reported a positive experience during their interactions with chatbots, as compared to human agents. This can be attributed to the fact that chatbots are capable to effectively tackle simple queries in a responsive manner (Tran et al., 2021). Also, AI has the capability to outperform humans in routine and repetitive tasks. Nonetheless, it is imperative that organizations should also be aware of the possible fallouts from the use of chatbots, in terms of service quality and customer expectations (Tran et al., 2021). One fallout is the inability of chatbots to empathize with customers. Further, it has also been reported that positive customer experiences from chatbots might not be the case for all business sectors. For instance, the study conducted by Rafaeli et al. (2020), revealed that customers in retailing and fashion sector tend to have more positive experiences from chatbots. While, it might be different for other sectors. The study by Rafaeli et al. (2020), was instrumental in indicating that online chatbots are highly preferred over live human agents within the sector of fashion, as compared to telecommunication sector. This difference across industries warrants the need to conduct further studies across diverse industry sectors to study customer experience from chatbots.

Chatbots and Customer Satisfaction

Rossmann et al. (2020) state that when the expectations of customers are met during chatbot interactions, there is high probability that it would lead to customer satisfaction. This is mainly due to the capability of the chatbot to find relevant information and identify products which cater to customer needs (Sanny et al., 2020; Tzeng et al., 2021) indicated customization, recommendation accuracy, process efficiency and convenience as key traits which were positively associated with customer satisfaction. The viewpoints of customers in terms of elapsed time, has also emerged as a vital factor in customer satisfaction, given that customers expect systems to be reliable, prompt and efficient. However, it has been reported through studies conducted by (Zamora, 2017; Brandtzaeg & Følstad, 2018), that there is failure on the part of chatbots to meet the expectations of customers which negatively impacts customer satisfaction. Though there are several studies which implies that the focus of chatbot design should veer towards enhancing its

functional accuracy and performance (Jiang & Banchs, 2017; Maslowski et al., 2017), it has been consistently suggested on the basis of literature that the objectives of chatbot interaction needs to essentially include social capabilities. Social capabilities are currently absent in chatbots and chatbot interactions (Jain et al., 2018).

Personality

Human behaviours and beliefs have been elucidated within literature pertaining to information systems, by extensively utilizing personality as an explanatory tool. Personality is considered as a direct factor that drives individual behaviour which in turn, outlines interaction patterns within the environment while influencing online behaviours. While personality within internet usage is undergoing rapid evolution, it is known to critically drive customer experience (Smith, 2020). The focus here is largely on openness to experience while concentrating on extraversion, considering its pertinence to execution of chatbot technology. A study conducted by Ul Islam et al. (2017), was instrumental in proving that openness to experience and extraversion had a positive link with customer engagement. Extraversion and openness to experience thus can be said to positively associated with using novel technology and its acceptance. Studies conducted in the past have indicated that personality was a key decisive factor within social interactions, with a chatbot in this instance.

The current Challenges

Many companies have introduced AI technology to explore the road to future development. However, manual implementation of intelligence in the retail industry is not yet satisfactory. The emergence of these results says It is clear that the application of AI in the retail industry still has many bottlenecks and obstacles, and it faces significant challenges. This could explain why we do not see “just walk out” stores all around us today.

(1) Formal AI applications to catch up with the tide of AI applications, many companies have begun to use formal AI Application landings. For example, many supermarkets currently have multiple apps in the checkout process. Scan code payment or digital self-checkout display, consumers, enter membership, self-service barcode Scanning and opening the mobile to scan the QR code for price. These changes reduce consumption. The pressure on consumers to queue up has also increased the workload of shopping. Save the staffing of the supermarket may be efficient,

but whether they meet the needs of consumers is still open to question. And here is where this research comes to attempt to answer.

(2) AI application and unemployment The application of AI in the retail industry is often associated with unemployment. In the previous article, The introduction of supermarket's shelf scanning robot mentioned in Recruitment of ordering staff in stores has led to a reduction in jobs and even unemployment (of course, as After Wal-Mart guarantees that it will not affect the provision of employment). Another example is Amazon‘s "Amazon Go" related technologies is also very likely to impact sales assistant positions and the provision of cashier positions. On the other hand, it might create new positions for people to be there only to interact with the customers who need human help, while the robots are doing the laborious redundant tasks.

3) Despite the algorithm helping retail personalize recommendations. The current data learning and algorism are still challenging to make correct. According to a survey made by Bazaarvoice, barely 25% of users indicated that they had seen personalized home pages on the websites, and fewer than 20% can say these were very matched to their needs. It is hard to say whether without enough data weather consumers expectations of the providers has risen dramatically over the development of technology. However, more than 63% of people want to get these exclusive offers tailored to their preferences. If we look into its principle, How does AI fit into the e-commerce product recommendations process? The idea behind it is pretty simple. The customer can get a series of intelligent calculations and algorithms that gradually

learn based on their past behavior and predict their future preferences. By analyzing the amount of data: User search queries, viewing history, the past purchases, items placed in the shopping cart, products that have been recommended on social media, user location, and customer segments/buyer personas. Some algorithm are bale to predict whether the customer is expecting a child before in the first weeks by analyzing the change of shopping behavior.(Kashmir Hill, 2012) For AI to create personalized product recommendations, there are trillions of dependencies between users and items. (see Figure 4) There is just too much data and dependencies among them to make correct recommendations without going through complete databases. In addition, customers' tastes and preferences will naturally change over time. This would take years and years and would never keep up with the fast changes. (Borodescu, C. (2020, July 1))

Figure 5 Lots of association (Borodescu, C. (2020, July 1))

Research Gap

As is evidenced through the review of literature, there are ample studies that have been carried out in this domain regarding the usability and responsiveness of AI chatbots on online customer experience, several gaps have emerged during this review. One of the major gaps in this direction would be chatbots falling short to meet customer expectations due to miscommunication or inabilities in understanding customer queries. Also studies conducted in the past have focused largely on technology, there is a need to investigate value-additions provided by chatbots from customers' point of view. Other gaps would refer to lack of empathy, social capabilities and also the variation across industries in terms of chatbot adoption by customers. These factors warrant further research.

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