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Virtual agents and flow experience: An empirical examination of AI-powered chatbots

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ABSTRACT

The aspects that could shape customers' virtual experiences with chatbot applications are poorly understood. Therefore, this study aims to empirically examine the main factors that shape customers' virtual flow experiences with AI-powered chatbots. The conceptual model was based on flow theory and the technology interactivity model. This model was extended to include the impact of both readability and transparency. The data were collected using an online questionnaire survey posted to 500 customers of courier, package delivery, and express mail services. The statistical results largely supported the role of readability, transparency, personalisation, responsiveness, and ubiquitous connectivity in shaping the virtual flow experience with chatbots, which in turn has a significant impact on both communication quality and satisfaction. This study opens new horizons for researchers and practitioners to consider dimensions other than satisfaction and intention to use, to facilitate and accelerate the pace of success of chatbot applications. However, several areas have not been fully addressed in the current study which could be worth considering in future research, as discussed in the related subsection.

1. Introduction

Technology plays an integral part in consumers' daily life, and many shopping activities (product search, payment, actual buying, and even post-purchase services) are conducted in the digital marketing and e-commerce worlds (Kar and Kushwaha, 2021; McLean and Osei-Frimpong, 2019; Moore, 2018; Wang et al., 2021). In line with this shift in consumer behaviour, organisations seek to exploit artificial intelligence (AI) applications to enhance the quality of services provided to customers, and thus create more unique, positive, and personalised experiences (Aladwani and Dwivedi, 2018; Allal-Chérif et al., 2021; Bhawiyuga et al., 2017). By using such AI applications, marketers and AI system developers are also able to better predict customers' needs and behaviours, and help organisations in the decision-making process (Forrest and Hoanca, 2015; Tintarev et al., 2016). Chatbots have been considered among the most important and popular AI applications that serve companies' endeavours in this context (Adam et al., 2021; Kushwaha et al., 2021; Paikens et al., 2020). In this respect, 25% of customer service activities are expected to be conducted using virtual agent systems, such as chatbots (Gartner, 2016; Marketer, 2018; Moore, 2018). Chatbots have been playing an increasingly significant role in the new era of digital marketing and information systems, especially in customers' service interactions, which have been transforming from 'human-driven to technology-dominant' (Selamat and Windasari, 2021).

Conceptually, chatbots are defined as 'machine conversation system [s] [that] interact with human users via natural conversational language' (Shawar and Atwell, 2005, p. 489). The 'bot' in the term *chatbot* refers to 'robot' and reflects the fact that chatbots are a smart system that robotically connects and interacts with customers in a manner similar to human beings (Okuda and Shoda, 2018). In recent years, customer service areas have improved tremendously, especially in terms of customer contact and communication (Kushwaha and Kar, 2020; Kushwaha et al., 2021; Xu et al., 2020). Using more updated and smart interfaces (i.e. virtual agents and chatbots) allows customers to chat and interact live with their service providers, and therefore, provides faster

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and better-quality service (Mindbrowser, 2017; Xu et al., 2020). In fact, virtual agents (i.e. chatbots) have increasingly replaced the role of human agents and traditional of customer service methods (Patil et al., 2019). Chatbots have proved their capabilities in providing real value to both customers and business organisations. For example, a recent report by Statista (2021) indicated that the market value of chatbots is expected to reach 6.83 billion U.S. dollars. Further, a recent report indicated that the adoption of chatbot applications by business organisations has increased significantly, reaching 93% in the year 2020. Customers are also more interested in using chatbot applications to communicate with their service providers, with a usage rate of 24% (Drift, 2020).

In the courier services sector, the importance of chatbots is evident, as customers need smart applications that can automatically track the delivery status of their shipment (Adam et al., 2021; Selamat and Windasari, 2021). This would satisfy the customer's need for constant contact with their service providers and for up-to-date and accurate information regarding their orders and shipments (Adam et al., 2021). Furthermore, in 2020, under the influence of COVID-19 and the conditions of the lockdown, companies, especially those working in the field of logistics and supply chain services, began to seek alternative smart solutions such as chatbots to communicate with their customers and serve them without any interruption (Viola et al., 2021). This, in turn, has led to significant growth in the global chatbots market, whose value has reached USD 2.9 billion (Marketer, 2021). In addition, chatbot applications often help service organisations cut customer service expenses by 30%, as reported by Marketer (2021).

In this context, chatbots can considerably help service organisations shape their customers' experiences and retain their market share (Kushwaha et al., 2021). Thus, providing a smooth and sophisticated customer experience has been a main motivation for courier service companies to extensively adopt and rely on chatbots as a new mechanism (Androutsopoulou et al., 2019; Cui et al., 2017; Ngai et al., 2021). This could be reflected in the ability of chatbots to predict customers' attitudes and emotional and conative engagement, and consequently, their satisfaction and loyalty (Araujo, 2018; Sivaramakrishnan et al., 2008). Kunze (2016) also noted the significance of personalised features that chatbots could provide customers by tailoring information and recommendations based on their preferences. However, little attention has been paid to the implications of chatbots in this area.

The majority of chatbots studies have focused exclusively on customers' intention, adoption, and satisfaction with such systems; however, customers' virtual flow experience also calls for further analyses and examinations (Brandtzaeg and Følstad, 2017; Zarouali et al., 2018; Zumstein and Hundertmark, 2017). As a smart means of communication, chatbots' success also largely depends on their ability to enhance communication quality with the targeted customers. Therefore, it is important to consider the interactive nature of chatbots and how this can impact customers' virtual flow experience. Accordingly, this study aims to investigate how customers' flow experience with chatbots could accelerate the communication quality between customers and organisations.

The success of chatbots in creating a unique and positive customer experience depends largely on certain critical factors, such as the proposed conversation content factors (readability and transparency) or the chatbots-as-systems factors (responsiveness, personalisation, and ubiquitous connectivity). Some of these factors are related to the ability of customers to accurately read and fully understand the chatbots' text replies. In turn, to match customers' expectations, chatbots will need to fully understanding their input and enquiries and replying to them accurately (Sheehan et al., 2020). Therefore, readability is one of the main factors that can predict customers' virtual experience. Further, the perception of conversation transparency could reflect the extent to which the customer is interested in interacting with chatbots. However, aspects related to chatbots' conversation readability and transparency have not been fully addressed by previous studies in related areas. Therefore, the linguistic features of chatbots conversation and how they could shape human interaction with such applications need to be examined.

In general, the current study intends to address the following research questions:

(i) How do readability and transparency shape customers' virtual flow experience with AI-powered chatbots?
(ii) How do interactive features (i.e. responsiveness; personalisation; and ubiquitous connectivity) predict customers' virtual flow experience with AI-powered chatbots?
(iii) To what extent does customers' virtual flow experience with AI-powered chatbots contribute to communication quality and customer satisfaction?

This study will hopefully expand the current understanding of the aspects that could shape customers' virtual experiences with AI-chatbots. Further, the by concentrating on customers' virtual flow experience with chatbots, this study attempts to contribute to opening new horizons for researchers and practitioners to consider dimensions that have not been fully addressed by prior studies. Furthermore, the current study offers a set of recommendations and guidelines to improve chatbot design which, in turn, guarantees a positive and unique customer experience.

2. Literature review

In addition to the practitioners' interest in the implementation of chatbots to provide a unique and personalised customer experience, researchers have begun focusing on chatbot-related issues, especially over the last five years (Dwivedi et al., 2017; Lim et al., 2021; Selamat and Windasari, 2021; Sheehan et al., 2020; Stieglitz et al., 2022; Sung et al., 2021). A close and careful review of the chatbots literature helps identify the features and aspects that have been considered in prior studies in this area. The common themes that have been considered by extant studies of chatbots have centred on customer intention and adoption (Brachten et al., 2021; Fittkau, 2017); users' personal and profile characteristics (Jin and Youn, 2021; Mahmud et al., 2022; Van den Broeck et al., 2019); drivers of (Drift, 2018) and barriers to (Helpshift, 2018) chatbot use; chatbot features (Rese et al., 2020); online customer experience (Jiménez-Barreto et al., 2021; Kushwaha et al., 2021); and trust and perceived risk (Kushwaha et al., 2021; Rese et al., 2020).

2.1. Adoption and acceptance of chatbots

Studies that have focused on customer adoption and acceptance of chatbots (i.e. Drift, 2018; Helpshift, 2018; Kasilingam, 2020; Selamat and Windasari, 2021; Sheehan et al., 2020) have also proposed and tested different factors and features that could facilitate or hinder customers' behavioural intention and adoption of chatbots. For example, Selamat and Windasari (2021) have proposed a model based on the technology acceptance model (TAM) that integrates ease of use and perceived usefulness with anthropomorphism and entertainment. Their empirical results largely confirm that usefulness and perceived enjoyment play a role in shaping customers' intention to use chatbots, which neither anthropomorphism nor ease of use do. Further, in their exploratory study, Kar and Kushwaha (2021) have reported a number of enablers of the adoption of AI systems, such as innovation, product newness, research development, and flexibility, while failure concerns and upgrading concerns were key hindrances to AI system adoption.

Kasilingam (2020) tested both customer attitudes and intention to use AI chatbots in the Indian e-commerce market context and proposed a model based on the TAM with other factors (i.e., perceived risk, trust, price consciousness, perceived enjoyment, and innovativeness). His results largely support the mediating role of attitudes between perceived usefulness and customer intention to use AI chatbots. Similarly, Rese

et al. (2020) have adopted the uses and gratifications (U&G) theory to test customers' behavioural intention to use AI chatbots. Based on the data collected from online shoppers in Germany, they found a significant influence of both conversation authenticity and perceived enjoyment on online shoppers' intention to use chatbots. However, those online shoppers who perceive a high level of privacy concerns and see chatbots as an immature technology were less interested in using such emerging conversation systems.

2.2. Trust in chatbots

In a qualitative study, Følstad et al. (2018) tested the main features that could shape customer trust in chatbots. Their results, based on interviews with 13 customers who actually use chatbots, reported the importance of the quality of responses and interpretation in predicting customer trust in chatbots. Furthermore, the authors argued that chatbots' ability to simulate human interaction and provide a sense of self-presentation are also important for customer trust. Aspects related to perceived security and privacy were also reported by chatbot users as key drivers of their trust in such emerging systems (Følstad et al., 2018; Janssen et al., 2018). Kasilingam (2020) also supported the role of trust in predicting both attitudes and intention to use AI chatbots. More recently, Jin and Youn (2021) tested the impact of new features pertaining to chatbots (i.e. parasocial interaction and relationship type) on brand personality aspects (i.e. competence and sincerity). They proved the impact of parasocial interaction and relationship type on brand personality aspects, and thus, accelerated customer trust in online shopping websites and satisfaction.

2.3. Chatbots features

Chung et al. (2020), in their study of the online luxury brands sector, found that aspects related to AI chatbots—namely interactivity, trendiness, entertainment, customisation, and problem solving—considerably shape communication quality (accuracy and credibility) between consumers and brands. Furthermore, these aspects also significantly enhance customer satisfaction. Other aspects, such as call length and actual purchasing behaviour, were considered by Luo et al. (2019). They empirically tested and confirmed that perceived knowledge and perceived empathy in AI chatbots impact call length, which in turn predicts actual purchase behaviour. More recently, Kushwaha and Kar (2021) developed and tested the MarkBot framework, which employs an AI application to respond to a website user's browse via the product catalogue. They applied a long short-term memory recurrent neural network (LSTM) to predict user replies through chatbots. They authors noted that the proposed model could decrease the time limit that the company needs to adopt MarkBot.

2.4. Customer experience with chatbots

A few studies have attempted to examine how AI chatbots can influence online customer experience (i.e. Arya et al., 2019; Chen et al., 2021; Jiménez-Barreto et al., 2021; Kushwaha et al., 2021; Verma et al., 2021). For example, within the context of online retailing, Chen et al. (2021) empirically tested the main predictors of online customer experience based on the TAM model. Their results largely supported the crucial impact of ease of use and usefulness on customers' cognitive (i.e. extrinsic) experience, while chatbot responsiveness has a more significant impact on the affective (intrinsic) part of the customer experience. Further, they statistically proved that customers who have a positive online experience with AI applications in general are more likely to be satisfied with their company. In particular, they considered two dimensions to capture the customer's online experience with AI-chatbots: intrinsic and extrinsic. The authors also addressed the role of usability and responsiveness in shaping the customer online experience with AI-chatbots. Furthermore, Verma et al. (2021), through their systematic review, confirmed the positive role of AI-enabled chatbots in accelerating customer experience.

To predict customer experience with AI chatbots, Kushwaha et al. (2021) integrated a comprehensive model based on various theories: customer experience theory, Hoffman and Novak's model of flow in interactive computer-mediated environments (CME), customer experience theory, IS success model, commitment trust theory, and diffusion of innovation. The model was able to predict approximately 57.40% of customer experience with AI chatbots. They authors also found that service quality, brand trustworthiness, transparency, telepresence, perceived risk, challenges, and skills significantly impacted customer experience with AI chatbots. In particular, motivational customer experience was tested by Jiménez-Barreto et al. (2021) using a novel model based on self-determination and assemblage theories, and a mixed-method approach based on both quantitative and qualitative data. They empirically confirmed the impact of self-determined interaction dimensions (competence, autonomy, and relatedness) on customers' experience with AI chatbots, which was also proven to positively determine customers' attitudes toward such emerging systems. Trivedi (2019) considered IS success model factors and perceived risk to examine customer experience with AI chatbots. Their empirical results confirmed the impact of information, service, and system quality on customer experience and that perceived risk moderates the relationship between IS success factors and customer experience. Trivedi also noted another interesting relationship, between customer experience with chatbots and brand love.

2.5. Literature gap

Regardless of the value added by prior studies examining customer experience with chatbots, customers' virtual flow experience, as proposed by Koufaris (2002) and Csikszentmihalyi and LeFevre (1989), has not been fully addressed in such contexts. Furthermore, two dimensions captured in the flow experience (enjoyment and concentration/attention focus) have not been fully covered or tested by chatbot studies. This presents a significant gap which should be fully addressed to understand how customers can effectively and successfully interact with chatbots.

Testing customers' virtual flow experience with chatbots is important because it could significantly improve a chatbot system, which is highly dependent on consumer concentration/attention focus and his/her sense of enjoyment. There is also a lack of studies addressing the impact of the interactive nature of chatbots on customers' virtual flow experience. In fact, interactive features such as personalisation, responsiveness, and ubiquitous connectivity could play a crucial role in predicting aspects pertaining to customers' virtual flow experience (i.e. consumer concentration/attention and enjoyment). Therefore, these aspects are worth testing in this study. As discussed in the introduction, the success of chatbots relies on the ability of such systems to provide content and conversations that are characterised by a high degree of readability. However, the impact of readability on customers' virtual flow experience in general and with chatbots, in particular, has not received adequate attention in prior studies. This study attempts to address this gap by examining the impact of readability on customers' virtual flow experience. Furthermore, the vast majority of chatbots studies have focused on retailing (i.e. Rese et al., 2020); B2B (i.e. Kushwaha et al., 2021); airlines (i.e. Jiménez-Barreto et al., 2021); hotels (i.e. Sheehan et al., 2020); luxury brands (Chung et al., 2020); SMEs (Selamat and Windasari, 2021); banking (i.e. Trivedi, 2019); advertising (i.e. Sharma et al., 2021; De Cosmo et al., 2021); online shopping (i.e. Kasilingam, 2020); and healthcare (i.e. Abd-Alrazaq et al., 2019). Thus, despite the highly sensitive area of courier services and the major role that chatbots may play in improving the experience of communication with the consumer, no study has addressed the related issues of customer virtual flow experience with chatbots in the courier services sector. This, in turn, motivates the empirical focus of the current study in the courier, package delivery, and express mail service settings.

3. Conceptual model

To provide an accurate view of the customer experience with chatbots, the conceptual model was based on the flow theory perspective (Csikszentmihalyi and LeFevre, 1989; Csikszentmihalyi, 1988; Csikszentmihalyi, 1990; Koufaris, 2002). Based on the technology interactivity model (Lee, 2005), personalisation, ubiquitous connectivity, and responsiveness. Considering the textual nature of chatbot conversations, other factors (i.e. text language readability and transparency) are considered in the current study model (i.e. Bakar and Ameer, 2011; Clerwall, 2014; Hoozée et al., 2019; Lock and Seele, 2017; Nazari et al., 2017; Rauschnabel, 2018; Wang et al., 2018) (Fig. 1).

3.1. Flow theory

In line with the arguments of Koufaris (2002); Csikszentmihalyi and LeFevre (1989); Csikszentmihalyi (1990); Csikszentmihalyi (1988); and Csikszentmihalyi (1975), a flow experience refers to a state of complete involvement in a particular action, and is therefore considered a positive psychological state that is intrinsically stimulating, rewarding, and entertaining (Bressler and Bodzin, 2013). It is 'a psychological state in which the person feels simultaneously cognitively efficient, motivated, and happy' (Moneta and Csikszentmihalyi, 1996, p. 277). According to the flow theory perspective, customers who have a positive flow experience with an interactive digital platform (i.e. chatbots) are more likely to be cognitively and emotionally engaged with them, and thus, are more likely to effectively communicate with organisations (Csikszentmihalyi, 1997).

Flow experience has been proved effective in its applicability and predictive validity for studies in the virtual area, as reported by Cooper (2010) in his systematic review. Cooper documented that 'studies indicate a positive relationship between flow and learning in technology environments' (2010, p. 4). Hoffman and Novak (2009) and Novak et al. (2000) provided empirical evidence supporting the validity of the flow experience over the virtual area. For the purpose of the current study, two main dimensions are proposed to cover the flow of customer experience with chatbots: concentration and enjoyment, as proposed by Koufaris (2002), Choi et al. (2007), Chen et al. (2018), and Wu and Liang (2011a, b, c).

Flow theory was selected as appropriate for this study based on the practical nature of chatbots, which require customers to be fully immersed in their use of such interactive systems. This could be attributed to the fact that the expected consequences in the current study (i.e. communication quality and customer satisfaction) largely rely on the extent to which the user is absorbed intensely in the conversation, as well as finds such conversations interesting and enjoyable (i.e. Huang et al., 2014; Lin and Lu, 2011; Novak et al., 2000). Furthermore, flow theory has been proposed as a theoretical base in many studies (Bilgihan et al., 2014; Chang, 2013; Chen et al., 2018; Hradecky et al., 2022; Esteban-Millat et al., 2014; Finneran and Zhang, 2005; Huang, 2006; Jung et al., 2016; Novak et al., 2000; Pelet et al., 2017; Wu and Liang, 2011a, b, c) that have tested the positive impact of users' experiences

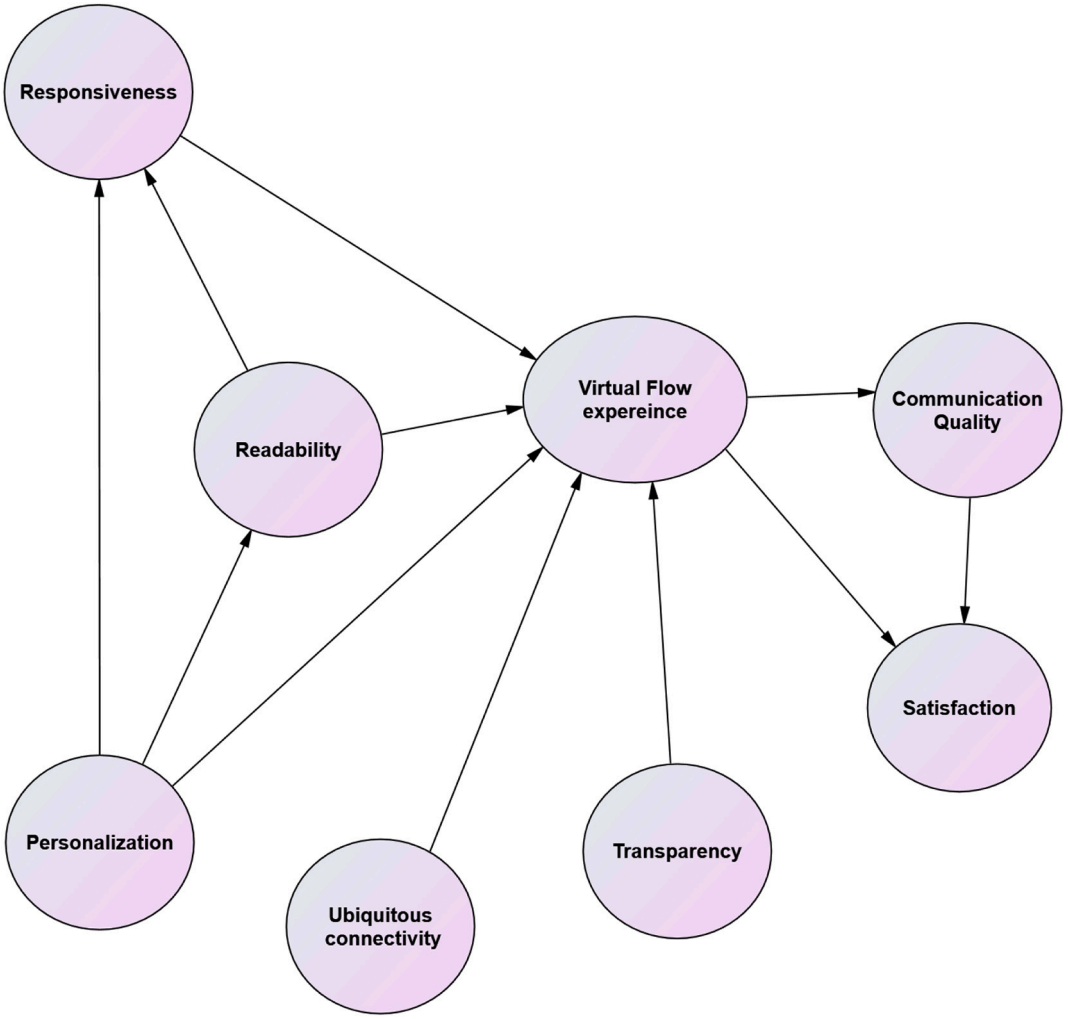

Fig. 1. Conceptual model adapted from Koufaris (2002); Csikszentmihalyi and LeFevre (1989); Nazari et al. (2017); Wang et al. (2018); and Lee (2005).

with different types of digital platforms and applications (i.e. social media; mobile TV; online shopping; digital games; online tourism; online learning) (Sharma et al., 2022)Fig. 1.

3.2. Readability

According to Hoozée et al. (2019, p. 572), text readability can be defined as the extent to which a given text can be read at the optimum speed, fully understood, and found to be interesting. This, in turn, requires such a text to be explicitly and directly expressed using a limited number of words (Hoozée et al., 2019). In other words, readable text should avoid ambiguity, bloated jargon, and complex sentence constructions (Hoozée et al., 2019; Shawar and Atwell, 2005). Therefore, if a chatbot's conversion text has a high level of readability, users are more able to fully concentrate on the given text rather than being confused by complex language. Indeed, the success of chatbots in creating a unique and positive flow experience largely depends on the ability of customers to effectively read and fully understand the chatbot's reply text (Sheehan et al., 2020). In this regard, a lack of understanding resulting from poor language use and the inability of the user to read the text effectively is one of the most important concerns that could hinder the success of chatbots, as reported recently. Thus, the following hypothesis is proposed:

H1. . Readability will be positively associated with the customer virtual flow experience with AI-based chatbots.

3.3. Transparency

Conceptually, transparency is related to customers' feelings and perceptions of honesty and openness in their interaction and communication (Jensen, 2001; Hofstede et al., 2004; Theuvsen, 2004). Hofstede also articulates 'transparency' as 'the extent to which stakeholders have a shared understanding of, and access to information that they request, without loss, noise, delay and distortion' (Hofstede, 2003, p. 18; quoted in Theuvsen, 2004: 125). Interaction with chatbots requests customers to relinquish their privacy and share their personal and sensitive information (Kushwaha et al., 2021), which could make them concerned regarding their privacy and security (Kumar and Yakhlef, 2016). In this respect, the extent of chatbots' transparency would mitigate such customers' concerns and facilitate their interaction with chatbots. According to Hofstede (2003) and Kumar and Yakhlef (2016), high transparency by the sender in the communication process ensures constructive response and interaction from the receiver. Accordingly, it could be argued that customers who perceive chatbots' conversation as transparent are more likely to fully concentrate on their interaction with chatbots and find such interaction enjoyable as well. This assumption has recently been proved within the context of B2B by Kushwaha et al. (2021), who supported the positive role of transparency in the business customer experience with chatbots. Thus, the following hypothesis is proposed:

H2. . Transparency will be positively associated with customer virtual flow experience with AI-based chatbots.

3.4. Personalization

As with other types of AI systems, chatbots have a high level of personalisation capabilities (i.e. natural language) to track customer behaviour and content, which, in turn, leads to the accurate anticipation of customers' preferences and needs (Kunze, 2016). Thus, customers are more likely to have a high level of personalised conversation when they use chatbots as a communication channel (Kunze, 2016). For example, chatbots can tailor the information and recommendations presented to customers in the conversation text (Algharabat et al., 2017; Letheren and Glavas, 2017; Simonofski et al., 2022; Zumstein and Hundertmark, 2017). Therefore, personalisation is among the most interactive features that make the customer experience with chatbots unique and attractive (Alalwan, 2018; Alalwan et al., 2020). In other words, the extent of personalisation provided by chatbots would considerably help match customers' expectations and questions, and accordingly, customers would be more fully concentrated in the chatbots' conversation and find it very interesting (Alalwan et al., 2020; Alalwan, 2018; Kim and Han, 2014; Shareef et al., 2017). In this respect, a recent study conducted by Statista (2020) plotting the opinion of customer service agents toward chatbots indicated that 64% of those agents think that chatbots will largely help them to provide their customers with a highly personalised service experience, which in turn reflects on their marketing performance and business performance in general. Kim and Han (2014) empirically confirmed the impact of personalisation on the flow experience by examining digital ads on smartphones. Thus, the following hypothesis is proposed:

H3. . Personalization will be positively associated with customer virtual flow experience with AI-based chatbots.

It is also worth arguing that personalisation improves the quality of the content provided to customers by tailoring it based on customer capabilities and language preferences (Topac, 2012). This causes customers to more effectively read and fully understand the given text in the chatbot conversation. In contrast, a high level of personalisation in chatbots' conversation text reduces the level of customer annoyance and sustains the level of readability in chatbots 'conversations (Kim and Han, 2014). Rello et al. (2013) also demonstrated that readers are better able to access and read the given text if the layout and content of such text are customised in line with the reader's preferences. Therefore, we would argue that a high level of personalisation would accelerate the level of readability in chatbots' conversations. Thus, the following hypothesis is proposed:

H4. . Personalization will be positively associated with the chatbots' conversation readability.

Careful consideration of the definition of responsiveness suggests that customers who have personalised conversations with chatbots are more likely to perceive a high level of responsiveness (Kim and Han, 2014). For example, the personalised features in chatbots would help respond to customers' questions and enquire relevantly. In turn, this enhances the level of responsiveness perceived by chatbots (Alalwan et al., 2020). In other words, as chatbots' conversation text is closely related to customers' interests and needs, customers are less likely to see such conversations as an irritation (Ducoffe, 1995; Kim and Han, 2014). Therefore, we argue that if chatbots' conversation text is perceived as customised and personalised based on customer preferences and expectations, a high level of responsiveness would be perceived by customers in such conversation text. Thus, the following hypothesis is proposed:

H5. . Personalization will be positively associated with the chatbots' responsiveness.

3.5. Responsiveness

Responsiveness is one of the most important interactive features that makes chatbots attractive from the customer's perspective. Conceptually, responsiveness refers to the ability of chatbots to receive and handle customer requests and questions in an immediate, accurate, pertinent, and interactive manner (Alalwan et al., 2020; Johnson et al., 2006; Lee, 2005; Zhao and Lu, 2012). In practice, chatbots can accompany customers across all stages of the shopping journey, starting with welcoming the consumer, presenting available options, answering queries, or providing any service requested by the consumer (Copulsky, 2019; Forrest and Hoanca, 2015; Marinchak et al., 2018; Marinchak et al., 2018; Selamat and Windasari, 2021; Sotolongo and Copulsky, 2018). Based on algorithms and intelligent systems, chatbots are able to

immediately predict which product and services customers look at and suggest the options that can fit the customers' needs (Forrest and Hoanca, 2015). Chatbots can also help customers in the actual buying stage by guiding them to the main shopping webpage or giving them a special promotion deal (Luo et al., 2019). Thus, chatbots can provide companies with more opportunities to actively engage with customers in productive relationships (Alalwan et al., 2020; Følstad et al., 2018). In other words, customers who see that chatbots are highly responsive are more likely to fully concentrate on the chatbot's conversation and find it interesting (Zhao and Lu, 2012). This assumption is in line with Yang and Lee (2017), who empirically proved the significant impact of responsiveness on the customer's sense of enjoyment in using mobile shopping.

In light of the above discussion, a high level of responsiveness perceived in using chatbots would largely help customers have a positive virtual flow experience while using such an interactive system. Thus, we propose the following hypothesis:

H6. . Responsiveness will be positively associated with customer virtual flow experience with AI-based chatbots.

3.6. Ubiquitous connectivity

Ubiquitous connectivity is another important interactive feature of chatbots that enables customers to contact the organisation 24/7 and from any place convenient for them (Lee, 2005). As long as the Internet is available, customers who use chatbots enjoy more flexibility and freedom in selecting the time and place where they feel comfortable connecting with their service providers (Alalwan et al., 2020; Gutierrez et al., 2019; Lee, 2005; Yang and Lee, 2017). Therefore, as Alalwan et al. (2020) argue, ubiquitous connectivity is more likely to cognitively and emotionally contribute to the customer experience of using chatbots. That is, chatbots enable customers to seamlessly, continuously, and synchronously keep in touch with the organisation. This, in turn, improves customers' enjoyment and increases concentration in their communicating with the organisation. Accordingly, we argue that the ubiquitous connectivity perceived in using chatbots would affect the customer virtual flow experience with chatbots. Thus, the following hypothesis is proposed:

H7. . Ubiquitous connectivity will be positively associated with the chatbots' conversation readability.

3.7. Flow experience

Due to their interactive nature, chatbots can facilitate two-way communication between customers and companies, which in turn reflects on the overall communication quality (Chung et al., 2020). Therefore, chatbots have been considered by many business organisations for targeted communication with their customers. Chatbots have tremendously improved the aspects pertaining to customer contact and communication (Kushwaha and Kar, 2020; Kushwaha et al., 2021; Paikens et al., 2020; Xu et al., 2020) and customers are able to have a live and chat and interact with their service providers, and therefore, better and faster service quality (Mindbrowser, 2017; Xu et al., 2020). Using natural language powered by AI systems makes customer–company communications smarter, as customers can obtain a wide range of information they want or have the help they need at any stage of their shopping journey (Luo et al., 2019; Marinchak et al., 2018). In other words, the new versions of chatbots can mimic real experiences in dialogue with a human being rather than the experience of talking to a machine (i.e. Murtarelli et al., 2021). The dimensions of flow experience (enjoyment and concentration) are considered as key facilitators of the customer–company communication. Therefore, customers with a positive flow experience with chatbots are more likely to perceive a high-quality communication process. This proposition was empirically supported by Chen et al. (2008), who tested the positive role of flow experience with an interactive messaging system on communication quality and effectiveness. Thus, the following hypothesis is proposed:

H8. . The virtual flow experience with chatbots will be positively associated with the communication quality.

Customer satisfaction is usually determined by the ability of customers to perceive that the targeted actions provide both intrinsic and extrinsic utilities, as expected. Therefore, customers who are able to fully concentrate on the conversation process with chatbots and who find such interactions more enjoyable are more likely to attain intrinsic and extrinsic utilities, and therefore, are more likely to be pleased with their experience with chatbots (Chen et al., 2018; Cyr and Bonanni, 2005). In other words, when engaging with chatbot conversations, customers are able to have more positive flow experiences which leads to satisfaction and positive feelings. Wu and Liang (2011a, b, c) confirmed the relationship between flow experiences and customer satisfaction. Chen et al. (2018) also argued that a flow experience could enhance a user's ability to learn and thus elicit positive emotions.

H9. . The virtual flow experience with chatbots will be positively associated with customer satisfaction.

If chatbots can enable customers to have better communication quality, customers' questions, requests, and expectations are more likely to be effectively addressed and matched. This, therefore, reflects positively on the customer's overall satisfaction with their interaction with chatbots and organisations overall (Chung et al., 2020). Better communication quality means that business organisations are better able to understand, diagnose, and satisfy customers' needs, wants, and expectations (Clokie and Fourie, 2016; Zhao and Rosson, 2009). In previous literature, it has been widely argued that customers are more likely to be satisfied as long as organizational communication channels (offline [i.e. salespersons] and online channels [i.e. chatbots]) provide credible, personalised, and in-depth information (Annie Jin, 2012; Jian et al., 2014; Setia et al., 2013; Yuan et al., 2016). Better communication quality would also positively shape customers' attitudes toward chatbots as communication channels and business organisation overall (i.e. Annie Jin, 2012; Chen and Xie, 2008; Mimoun et al., 2017; Yuan et al., 2016). The relationship between communication and customer satisfaction with chatbots has been empirically proven by Chung et al. (2020), who reported that aspects of communication quality (accuracy and credibility) largely enhance the level of customer satisfaction.

H10. . Chatbots' Communication quality will positively associate with the customer satisfaction.

4. Methodology

The empirical part of the current study was conducted over courier, package delivery, and express mail services in Saudi Arabia. The data were also collected using an online questionnaire survey which was posted to a convenience sample of 500 Saudi customers of courier, package delivery, and express mail services over the period extending from July 2021 to the end of September 2021. As the main focus on the customers' virtual flow experience with AI-powered chatbots, this study targeted those customers who have already used chatbot systems to complete the questionnaire. The total number of valid responses captured in the current study was approximately 361, with a response rate of 0.72. In line with what has been suggested by statistical scholars (i.e. Kline, 2005; Harris and Schaubroeck, 1990; Hair et al., 1995; Hair et al., 2006; Gerbing and Anderson (1993), the suitable sample size for conducting the structural equation modelling (SEM) analyses should not be less than 200 and not higher than 400. Therefore, the size of the extracted sample (361) appears to be suitable for conducting SEM analyses.

As presented in the current study's model, eight latent constructs were proposed and measured using scale items derived from prior

literature (see Appendix A). Four items were taken from Lock and Seele (2017) to measure readability. Transparency was tested using the five scale items derived from Lock and Seele (2017) and Hoozée et al. (2019). The scale proposed by Lee (2005) and later validated by Kim and Ko (2012) and Krishnaraju et al. (2016) was adopted in the current study to measure personalisation. Likewise, responsiveness was tested based on the scale items proposed and validated by Jiang et al. (2010), Johnson et al. (2006), and Lee (2005). Four scale items adapted from Lee (2005) were used in the current study to test ubiquitous connectivity. Communication quality was tested using a scale proposed by Mohr and Spekman (1994). Satisfaction was tested using scale items extracted from Anderson and Srinivasan (2003), Wang et al. (2019), and Lee and Chung (2009). Flow experience was treated in the current study as a second-order factor comprising two main dimensions: concentration (attention focus) and enjoyment which were considered first-order factors and tested based on scale items proposed by Chani et al. (1991).

These items were tested using seven-point Likert scale anchors ranging from strongly agree to strongly disagree. The questionnaire was translated into Arabic using the back-translation method suggested by Brislin (1976), as Arabic is the native language in Saudi Arabia. Then, the translated version was tested by a number of academic staff at King Abdulaziz University to assure an adequate level of validity and to avoid any problems in the translation process.

To ensure that all scale items were written and readable prior to conducting the main survey, a pilot study was conducted with a sample of 25 MBA students. The sample size (25) was defined based on the suggestions of Isaac and Michael (1995) and Hill (1998), who reported that 10–30 participants would be adequate to provide estimates for pilot studies in survey-based research. The vast majority of the pilot study participants reported that the questionnaire was understandable and consumed reasonable time to complete. Further, Cronbach's alpha (α) was tested to ensure that all scale items had an extended level of internal consistency (reliability). The lowest Cronbach's alpha (α) was about 0.81 which is higher than the acceptable level of 0.70 (Nunnally, 1978).

5. Results

5.1. Demographic characteristics

As mentioned in the Methodology section, the data were collected from a convenience sample of 500 Saudi customers of courier, package delivery, and express mail services who have already used chatbot systems. Out of the 500 targeted participants, only 361 fully completed the online questionnaire, with a response rate of 0.72. Approximately 60.1% of the participants were male, while 39.9% were female. The age group of 25–30 years makes up the largest portion of the study sample (31.6%). Table 1 also shows that the vast majority of the current study sample had a monthly income of less than $400. Regarding educational level, most of the current study sample participants were well educated, as most of them had a bachelor's degree or higher. About 40.1% of the participants in the current study had used chatbots for 2 to 3 years.

Table 1
Demographic characteristics.

Demographic profile	Number of participants (N = 361)	Percentage (%)
Gender		
Male	217	60.1
Female	144	39.9
Total	361	100
Age		
18–24	71	19.7
25–30	114	31.6
31–40	86	23.8
41–50	47	13.0
51–60	37	10.2
60+	6	1.7
Total	361	100.0
Monthly income level (JOD)		
Less than 400	78	21.6
400–600	55	15.2
601–800	52	14.4
801–1000	43	11.9
1001–1200	19	5.3
1201–1500	22	6.1
1501–2000	17	4.7
2001–2500	30	8.3
2501–3000	11	3.0
More than 3000	34	9.4
Total	361	100
Education level		
High school	14	3.9
Diploma	37	10.2
Bachelor	196	54.3
Master	79	21.9
PhD	32	8.9
Other	3	0.8
Total	361	100
Chatbots experience		
Less than one year	86	23.8
1–2 years	70	19.3
2–3 years	145	40.1
More than 3 years	60	16.6
Total	361	100

Table 2
Fit indices.

Fit indices	Cut-off point	First version of measurement model	Revised measurement model
CMIN/DF	≤3.000	3.663	2.301
GFI	≥0.90	0.871	0.922
AGFI	≥0.80	0.789	0.885
NFI	≥0.90	0.858	0.944
CFI	≥0.90	0.942	0.973
RMSEA	≤0.08	0.0521	0.045

5.2. Structural equation modelling (SEM)

The structural equation modelling (SEM) was applied in two stages to analyse the data and validate the proposed model. In the first stage, confirmatory factor analysis was conducted to inspect the model's goodness of fit, construct reliability, and validity (Byrne, 2010; Hair et al., 2010; Holmes-Smith et al., 2006). The proposed model was then tested in the second stage of a structural model (Anderson and Gerbing, 1988; Byrne, 2010; Hair et al., 2010).

5.2.1. Measurement model analyses

As seen in Table 2, some of the fit indices (i.e. CMIN/DF = 3.663; GFI = 0.871; AGFI = 0.789, NFI = 0.858) of the first version of the measurement model were not within recommended levels (Byrne, 2010; Hair et al., 1995, 2006; Holmes-Smith et al., 2006). Therefore, the measurement model was refined by eliminating the problematic items. Therefore, a number of scale items that have factor loadings of less than 0.50 (TRANS4; ENJ3; UBQS4) or a higher residual value (TRANS5) were removed. The revised version of the measurement model adequately fits the observed data, as all fit indices (i.e. CMIN/DF = 2.301, GFI = 0.922, AGFI = 0.885, NFI = 0.944, CFI = 0.973, and RMSEA = 0.045) matched recommended levels (Hair et al., 2006; Hair et al., 2010).

To attain an adequate level of construct validity and reliability, three measures [i.e. Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE)] were also tested in the current study (Fornell and Larcker, 1981; Hair et al., 2010; Anderson and Gerbing, 1988;

Nunnally, 1978). All constructs have a Cronbach's alpha (α) not less than 0.70, as suggested by Nunnally (1978). VR.FLOW had the highest Cronbach's alpha (α) (0.988), while UBQS had the lowest (α) (0.811) (see Table 3). CR values for all constructs were tested and noticed within their suggested level of not less than 0.70 (Fornell and Larcker, 1981; Hair et al., 2010). Similar to the Cronbach's alpha (α), the highest CR value (0.987) was observed for VR.FLOW, while the lowest was for UBQS (0.808) (see Table 3). The AVE values for all constructs matched their threshold levels, with values not less than 0.50. Once again, VR.FLOW showed the largest AVE (0.974), whereas RESPV had the smallest (0.579) (Hair et al., 2010) (see Table 3).

Construct validity was also tested by inspecting two common criteria: convergent and discriminant validity (Anderson and Gerbing, 1988; Hair et al., 2010). After refining the measurement model, standardized regression weight values (factor loading) of more than 0.50 were obtained for all other scale items, with a significant p value of not higher than 0.0001 (Anderson and Gerbing, 1988; Hair et al., 2010) (see Table 3). As seen in Table 4, all constructs match the discriminant validity standard, as the inter-correlation values between constructs are less than the square root of AVE captured by each construct (Kline, 2005).

5.2.2. Structural model analyses

The results of the structural model largely support the predictive validity and goodness of fit of the proposed model. For example, the yielded fit indices of the structural model were found to be within their suggested levels (i.e. CMIN/DF = 2.363, GFI = 0.921, AGFI = 0.883, NFI = 0.942, CFI = 0.969, and RMSEA = 0.048). The conceptual model was also able to predict approximately 0.60, 0.56, 0.47, and 0.41 of variance in VR.FLOW, COMQ, SATIS, and READ, respectively. All the VR.FLOW drivers were also supported and found to be significant. READ was the most significant factor predicting VR.FLOW ($\gamma = 0.355$, $p < 0.000$), followed by PRS ($\gamma = 0.228$; $p < 0.000$) and TRANS ($\gamma = 0.163$, $p < 0.000$). The UBQS significantly predicted VR.FLOW ($\gamma = 0.163$, $p < 0.004$) (Fig. 2). RSPV had the lowest but still significant impact on VR.FLOW ($\gamma = 0.147$, $p < 0.000$). As proposed, the PRS strongly predicted both READ ($\gamma = 0.599$, $p < 0.000$) and PRS ($\gamma = 0.339$, $p < 0.000$). VR.FLOW proved to have a significant impact on both COMQ ($\gamma = 0.599$, $p < 0.000$) and SATIS ($\gamma = 0.449$, $p < 0.000$) (Fig. 2). Finally, a strong and significant causal relationship was found between COMQ and SATIS scores ($\gamma = 0.454$, $p < 0.000$) (see Table 5).

Table 3
Constructs reliability and validity.

Item		Latent construct	Estimate	(α)	CR	AVE
CONRT	←	VR.FLOW	0.991	0.988	0.987	0.974
ENJ	←	VR.FLOW	0.967			
RSPV1	←	RSPV	0.788	0.836	0.833	0.579
RSPV2	←	RSPV	0.913			
RSPV3	←	RSPV	0.866			
RSPV4	←	RSPV	0.334			
READ1	←	READ	0.955	0.908	0.905	0.732
READ2	←	READ	0.991			
READ3	←	READ	0.979			
READ4	←	READ	0.276			
SATIS1	←	SATIS	0.875	0.854	0.852	0.610
SATIS2	←	SATIS	0.905			
SATIS3	←	SATIS	0.848			
SATIS4	←	SATIS	0.371			
CONRT1	←	CONRT	0.795	0.948	0.949	0.823
CONRT2	←	CONRT	0.881			
CONRT3	←	CONRT	0.954			
CONRT4	←	CONRT	0.987			
ENJ1	←	ENJ	0.788	0.912	0.913	0.779
ENJ2	←	ENJ	0.869			
ENJ3	←	ENJ	0.980			
COMQ1	←	COM	0.812	0.939	0.935	0.705
COMQ2	←	COM	0.894			
COMQ3	←	COM	0.865			
COMQ4	←	COM	0.787			
COMQ5	←	COM	0.854			
PRS1	←	PRS	0.792	0.876	0.870	0.630
PRS2	←	PRS	0.886			
PRS3	←	PRS	0.837			
PRS4	←	PRS	0.638			
TRANS1	←	TRANS	0.856	0.915	0.919	0.792
TRANS2	←	TRANS	0.913			
TRANS3	←	TRANS	0.899			
UBQS1	←	UBQS	0.814	0.811	0.808	0.585
UBQS2	←	UBQS	0.765			
UBQS3	←	UBQS	0.712			

6. Discussion

The results presented in the previous section largely support the predictive validity of the current study's model. In particular, five factors (i.e. READ, PRS, UBQS, RSPV, and TRANS) were able to predict approximately 0.60 of the variance in VR.FLOW. About 0.56 of the variance was accounted for in COMQ. Both VR.FLOW and COMQ predicted approximately 0.47 of the variance in SATIS. Further, the fit indices yielded in the structural model largely support the current study's goodness of fit to the observed data. This supports the selection of flow theory as a suitable theoretical foundation to explain customers' experiences and interactions with AI-chatbots. Despite the parsimony of the current model, all research hypotheses are strongly supported (see Table 5), which thus support the suitability of these factors within the context of AI-chatbots as well (Mahmud et al., 2022; Viola et al., 2021).

As discussed above, all antecedences of VR.FLOW were significantly confirmed according to path coefficient analyses. As shown in Table 5, readability was the strongest predictor of VR.FLOW. This means that as long as customers see Chatbot conversation text clearly written and presented in a more understandable way, they are more likely to fully concentrate on and enjoy their interaction with AI-chatbots. In other words, customers who perceive a high level of readability have a positive flow experience with chatbots. This could be reflected in the ability of chatbots to use natural language which fits the customer's native language and culture (Shawar and Atwell, 2005, p. 29). These results are similar to those reported by Hoozée et al. (2019), Gupta et al. (2021), Kar and Kushwaha (2021), and Shawar and Atwell (2005). These studies extensively argued the role of readability of the content given in shaping customer understanding, and accordingly, to the extent to which the customer would adopt and be affected by such content.

Aspects related to transparency in chatbot conversations also received considerable attention from the participants of the current study sample. In other words, customers are more likely to fully concentrate and enjoy interacting with chatbot conversations if they see a high level of transparency in such interactions. As argued in the conceptual model, customers are requested to provide more personal and sensitive information during their conversations with chatbots. Therefore, transparency is a fundamental condition that guarantees that customers will openly and freely interact with chatbots and more opportunities to have a positive flow experience (Alalwan et al., 2016; Kushwaha et al., 2021; Jensen, 2001; Hofstede et al., 2004; Selamat and Windasari, 2021; Theuvsen, 2004; Jin and Youn, 2021). These results are close to those reported by Kushwaha et al. (2021), who proved the significant impact of transparency in the business customer experience with chatbots.

In line with what has been proposed in the conceptual model, personalisation was the second-strongest factor predicting VR.FLOW. This result indicates that a high level of personalisation motivates customers to focus attention and enjoy their interaction with Chatbot conversations. As with other types of AI applications, chatbots are able to keep track of customers' activities, content, and information, which creates an opportunity to accurately predict what they need and want (Jiménez-Barreto et al., 2021; Kunze, 2016). These results are similar to those of Kim and Han (2014), who empirically validated the significant impact of personalisation on customer flow experience within the smartphone context.

Table 4
Discriminant validity.

	READ	COM	VR.FLOW	TRANS	PRS	SATIS	UBQS	RSPV
READ	0.856							
COMQ	0.598	0.840						
VR.FLOW	0.736	0.707	0.987					
TRANS	0.503	0.740	0.591	0.890				
PRS	0.422	0.518	0.556	0.501	0.794			
SATIS	0.720	0.723	0.705	0.620	0.411	0.781		
UBQS	0.352	0.470	0.497	0.491	0.541	0.368	0.765	
RSPV	0.636	0.570	0.585	0.445	0.236	0.611	0.290	0.761

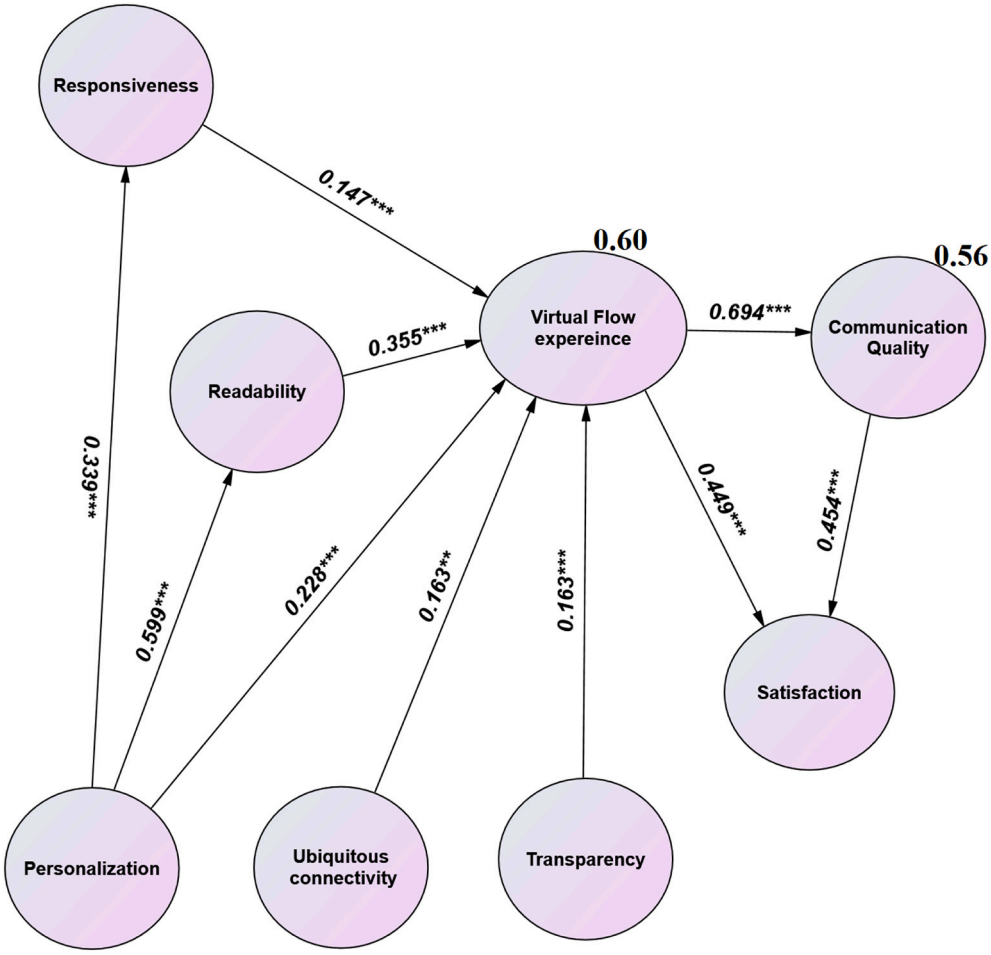

Fig. 2. Structural model results.

Table 5
Hypotheses testing.

			Estimate	S.E.	C.R.	*p*	Label
READ	←	PRS	0.599	0.075	7.961	***	par_36
RSPV	←	PRS	0.339	0.075	4.523	***	par_37
VR.FLOW	←	UBQS	0.163	0.057	2.880	0.004	par_24
VR.FLOW	←	READ	0.355	0.039	9.192	***	par_25
VR.FLOW	←	RSPV	0.147	0.038	3.861	***	par_26
VR.FLOW	←	PRS	0.228	0.048	4.772	***	par_27
VR.FLOW	←	TRANS	0.163	0.039	4.131	***	par_35
COMQ	←	VR.FLOW	0.694	0.054	12.956	***	par_30
SATIS	←	VR.FLOW	0.449	0.065	6.861	***	par_31
SATIS	←	COMQ	0.454	0.070	6.481	***	par_34

Furthermore, the high level of personalisation in the AI-chatbots also helps to customise conversation text based on the customer's skills, language, educational level, and preferences, and accordingly, contributes to the level of readability. This assumption was supported in the current study by a positive and significant relationship between personalisation and readability. These results are similar to those reported by Topac (2012), Ngai et al. (2021), Kim and Han (2014), and Rello et al. (2013), who argued that customers are better able to successfully read and fully understand the given text in the chatbots conversation if the text is tailored to the customer's language preferences and skills. Similarly, a positive and strong causal relationship was found between personalisation and responsiveness. A high level of personalisation makes chatbots more able to match customers' requirements and expectations, and accordingly, a higher responsiveness that customers could perceive in their interaction with such interactive systems (Kim and Han, 2014). For instance, customers are able to obtain more relevant answers and

information using chatbots because of the personalised features of such systems (Alalwan et al., 2020; Ducoffe, 1995; Kim and Han, 2014; Sharma et al., 2022).

Another interactive feature approved in the current study model was responsiveness, which significantly contributed to VR.FLOW. This means that those customers who perceive that chatbots can respond to their questions and enquire effectively will largely consciously concentrate on the chatbots conversation and enjoy such interactions. Responsiveness could be attributed to the interactive capabilities of AI-enabled chatbot systems that could comprehensively, accurately, and relevantly predict and address customers' questions and enquirers. These results are close to those of Alalwan et al. (2020), who proved the significant role of responsiveness in customers' cognitive and emotional engagement with mobile shopping. Other studies (i.e. Yang and Lee, 2017; Zhao and Lu, 2012) have validated role responsiveness and have reached the same conclusions as in the current study in this regard.

Path coefficient analyses supported the significant role of ubiquitous connectivity in enhancing VR.FLOW. Considerations related to time and place are among the most important determinants that may hinder or facilitate consumer interactions with service providers. In this respect, chatbots help customers freely and flexibly identify when and where they interact with the service (Alalwan et al., 2020; Lee, 2005; Yang and Lee, 2017). This, in turn, gives customers more opportunities to concentrate on and enjoy their interactions via chatbot channels.

According to the structural model results, VR.FLOW presents a significant level for both communication quality and customer satisfaction. This means that customers who were successfully able to have a positive flow experience with AI- chatbots are more likely to be pleased about their interaction with such systems and their service providers overall. The core success of the flow experience largely relies on the ability to help customers focus mentally and enjoy their interaction and communication with chatbots (Chen et al., 2018; Cyr and Bonanni, 2005). Accordingly, customers who have a positive flow experience are more likely to obtain both intrinsic and extrinsic utilities, which accelerates their satisfaction. Further, a successful flow experience with chatbots would empower customers to clearly express their needs and expectations, and thus increase the organisation's ability to understand these needs and meet them in the best way, which enhances the chances of consumer satisfaction. Various works (Chen et al., 2018; Cyr and Bonanni, 2005; Hsu et al., 2019; Wu and Liang, 2011a, b, c) have supported the relationship between flow experience and customer satisfaction.

Customer satisfaction is usually determined by the ability of customers to perceive that the targeted actions provide both intrinsic and extrinsic utilities, as expected. Therefore, customers who are able to fully concentrate on the conversation process with chatbots and find such interactions more enjoyable are more likely to attain intrinsic and extrinsic utilities, and therefore, are more pleased regarding their experience with chatbots (Chen et al., 2018; Cyr and Bonanni, 2005; Ovak et al., 2000). In other words, when engaging with chatbot conversations, customers are more able to have positive flow experiences which leads to satisfaction and positive feelings. Wu and Liang (2011a, b, c) confirmed the relationship between flow experiences and customer satisfaction. Chen et al. (2018) also argued that in mobile shopping, a flow experience could enhance a user's ability to learn and thus elicit positive emotions.

The results also indicated that customers who have a positive flow experience will likely have a positive perception of communication quality with chatbots. In fact, the vast majority of our study sample had a positive perception of the quality of communication with chatbots, as the average mean of the communication quality scale items was about 5.86. Such results could be attributed to the interactive nature of chatbots, which allows customers to have more responsive and synchronous communication with their service providers (Chung et al., 2020; Kushwaha and Kar, 2020; Kushwaha et al., 2021; Paikens et al., 2020; Xu et al., 2020). A high level of communication quality means that customers' enquiries and questions are better received and understood and, accordingly, better satisfied by service providers. As argued in the conceptual model section, AI-chatbots largely use natural language that makes company–customer communicate smarter. Furthermore, AI-chatbots can help customers over all stages of their shopping journey and provide suitable assistance and support whenever needed (Luo et al., 2019; Marinchak et al., 2018).

6.1. Theoretical implications

In line with the discussion in Sections 1 and 2, this study identified a lack of understanding regarding the aspects that could shape customers' virtual experience with AI-chatbots. This could be attributed to the fact that the majority of prior chatbots studies have fully focused on the customers' intention, adoption, and satisfaction toward such systems, while customers' virtual flow experience has not been well covered in the relevant area of chatbots (Brandtzaeg and Følstad, 2017; Adam et al., 2021; Zarouali et al., 2018; Zumstein and Hundertmark, 2017). Therefore, this study makes a considerable contribution by focusing more on the customers' virtual flow experience with chatbots, which opens new horizons for researchers and practitioners to consider dimensions other than satisfaction and intention to use to facilitate and accelerate the pace of success of Chabot applications. In fact, the selection of the customer's virtual flow experience as a core construct in the current study's model was not random but rather based on the fact that the success of the chatbot system relies heavily on consumer concentration/attention focus and his or her sense of enjoyment while interacting with such a system.

It is also important to note that aspects related to conversation language and readability have not been fully covered by prior studies on chatbots, which thus require further analyses. Accordingly, an important contribution of the current study is that it sheds light on the role of readability as a key driver of customers' virtual experience with chatbots. Due to the particular nature of customer chatbot interactions which largely take place through conversation texts, issues related to conversation language and readability are crucial in shaping the customer's virtual flow experience with chatbots. The relationship between transparency and customers' flow experience has not received adequate interest in the prior literature on chatbots. Thus, this study adds value by identifying on the significant role of transparency in shaping a unique consumer experience with chatbots.

Another contribution of the current study is related to the role of the interactive features of chatbots (i.e. personalisation, responsiveness, and ubiquitous connectivity). These features have rarely been covered in the related studies on chatbots. There is also a lack of understanding of the impact of these features on the customer virtual flow experience. Therefore, by considering these three interactive features (i.e. personalisation, responsiveness, and ubiquitous connectivity), the current study provides a clear vision of the most important factors that should be considered in shaping a unique consumer experience with chatbots. Furthermore, this study contributes by validating the impact of personalisation on readability. Such a relationship between personalisation and readability has not been empirically validated in the literature on information systems in general and chatbots in particular.

As discussed in Section 2.5, the majority of chatbots studies were conducted over different sectors (i.e. retail, hotels, luxury brands, SMEs, banking, advertising, online shopping, and healthcare) (Chung et al., 2020; Jiménez-Barreto et al., 2021; Hoffman and Nadelson, 2010; Kasilingam, 2020; Kushwaha et al., 2021; Rese et al., 2020; Selamat and Windasari, 2021; Sheehan et al., 2020; Trivedi, 2019). However, no study has addressed the related issues of customer virtual flow experience with chatbots in the courier services sector. This is despite the importance of considering the implications and contributions of chatbots in the courier, package delivery, and express mail service setting. In this context, the overall success of the service delivery process depends on the quality and efficiency of the communication process between the

consumer and providers of such services. Therefore, this study has gone beyond just examining the customer flow experience with chatbots to test the level of communication quality between customers and service providers using chatbot channels. In turn, the current study expands the implications of the use of chatbots in a new setting (courier, package delivery, and express mail service) and theoretically by validating the role of new aspects (customers' virtual flow experience and communication quality).

We also make a methodological contribution by conducting the empirical portion of the study in both a new setting (courier, package delivery, and express mail service) and a new country (Saudi Arabia). In detail, this study was able to develop a date instrument according to well-established scale measurements from previous studies, and then the derived measurement items were adapted to the Chatbot context and translated using the back-translation method suggested by (Brislin, 1976) to be suitable for the Saudi customer setting. Furthermore, the statistical results of the measurement model largely supported the validity and reliability of the current study's data instrument, which makes it effective and accurate for use by Saudi or Arab researchers, especially given the scarcity of research in the field of AI and chatbots worldwide.

6.2. Practical implications

The empirical results of the current study have yielded various implications that could help marketers, system developers, and practitioners improve chatbot design to guarantee a positive customer flow experience. For example, the significant impact of readability gives clues about paying more attention to aspects related to the quality of the language used in chatbots conversation text. Thus, all responses and information posted by chatbots should be easy to read and friendly. In this respect, it is necessary to use linguists to check the quality and ease of the language used, and to avoid spelling or grammatical errors. The language used in chatbot conversations should also consider individual differences in reading and comprehension skills. Using natural language in the chatbots conversation text could also give a sense of human interaction and, accordingly, reflect the level of readability (Bargas-Avila and Brühlmann, 2016). It is also highly recommended to consider customers' language preferences by presenting the chatbots' conversation text in multiple languages (Baabdullah et al., 2019; Liu, 2003).

According to the current study's results, the ability of chatbots to create a positive flow experience pertains to the level of transparency perceived in the chatbot conversation. Various aspects should be considered in this regard, such as chatbots' ability to always provide accurate and correct responses to customers' enquiries and questions. Companies should also promote virtual channels such as chatbots to consumers as a more convenient interact method; therefore, companies should clearly express their genuine intentions from using such channels to help customers. The customer also has a comprehensive understanding of the mechanism by which the chatbot works, which enhances the extent of his confidence and, thus, the extent of the perceived transparency in this regard. Therefore, the organisation should be open to all the details related to the use of chatbots and how to collect customer information and how to use it in a way that makes the customer feel more comfortable and reassured (Kumar and Yakhlef, 2016).

More attention should also be paid to the interactive features of chatbots, especially those related to personalisation and responsiveness. In this respect, customers who actively use chatbots should be motivated to disclose their personal data and preferences, which will be used later to tailor solutions for customers' problems and answers to their queries based on their preferences and personal profiles. In this respect, system developers and marketers' efforts should stress the level of privacy and security in maintaining and processing such information to allow customers to feel safer and more comfortable in disclosing such information. Further, by using the personalised capabilities embedded in AI applications in general and chatbots in particular (i.e. pre-programmed chat, cookies, natural language), service providers can tailor their conversations and interactions with their targeted customers (Kunze, 2016; Zarouali et al., 2018; Zumstein and Hundertmark, 2017).

Enhancing the level of responsiveness would considerably help form a positive flow experience with chatbots. Therefore, more effort should be made to improve the mechanism by which chatbots receive and address customers' questions and enquire in a more relevant manner. Chatbot features should also facilitate bidirectional communication between customers and service providers. In other words, chatbots should enjoy a high level of interactivity that allows both customers and service providers' two-way communication without any restrictions. This, in turn, would help immediately address all consumer enquiries and questions. Such responses and information should accurately and closely match customer needs and expectations. Therefore, the content stored in chatbots must be reviewed periodically and developed in line with consumer requirements and needs. Even though chatbots seem to be more automated customer service centres, there is still a need to have a human service support centre to deal with any dilemma that chatbots may be unable to deal with, especially in the early stages of providing chatbot services (Alalwan et al., 2020).

The results confirmed the important role of ubiquitous connectivity in shaping the customer flow experience with chatbots. Therefore, further research should be conducted to enhance aspects pertaining to ubiquitous connectivity. For example, chatbot designers should work more on the level of adaptability and flexibility of using chatbots using different platforms (e.g. smartphones, personal computers, tablets) or internet browsers (Google Chrome, Internet Explorer, Firefox, and Safari) (Alalwan et al., 2020). This in turn empowers customers to access chatbots whenever and wherever they need. Furthermore, chatbot service providers should guarantee the sustainability of such channels without disconnection or downtime, and accordingly, continuous maintenance and improvement of chatbot channels is highly recommended.

6.3. Limitations and future research directions

This study represents a worthwhile attempt to test the impact of virtual agents (i.e. AI-powered chatbots) on customers' virtual experience. However, several areas could not be fully addressed, which would be worth considering in future research. This study tested the related issues of AI-powered chatbots from the customer perspective, but does not sufficiently cover the service providers. Therefore, future studies should concentrate more on the aspects related to the service provider perspective to build a comprehensive picture covering the main factors governing the success of such applications. Further, this study examines the main enablers of customers' virtual flow experience with chatbots; yet, it has not tested the key inhibitors (i.e. need for human interaction; perceived risk; technology anxiety; privacy and security concerns). Therefore, future studies should consider the use of such inhibitors. Personal factors (i.e. technology readiness, self-efficacy, attitudes) and demographic factors (i.e. age, gender, income level, and educational level) were likewise considered and validated in the current study model. Therefore, these factors must be subject to careful study and analysis in future research to provide a clear and comprehensive explanation of the consumer's experience with chatbots. Further, the study's participants were actual users of chatbots; however, there is still a need to consider the perspective of non-users of chatbots to know how they could be motivated to experience chatbots. Finally, this study was conducted in Saudi Arabia and did not account for the role of cultural factors (collectivism and individualism). Hence, future studies could consider the related issues of chatbots across different countries, considering the impact of cultural dimensions such as collectivism and individualism.

7. Conclusion

Customer service areas have improved tremendously, especially in aspects pertaining to customer contact and communication. In using more updated and smart interfaces (i.e. virtual agents and chatbots), customers are able to have live chat and interactions with their service providers, and therefore, better and faster service quality. In fact, virtual agents (i.e. chatbots) have increasingly replaced the role of humans and traditional methods of customer service. Using natural language powered by artificial intelligence (AI) systems has made customer–company conversations smarter, as customers can obtain a wide range of information they want or have the help they need. However, based on a careful review of the main body of literature on chatbots, we noticed that there is still a lack of understanding regarding certain aspects that could shape customers' virtual experience in such applications. In addition, there is a need to see how such virtual agents (i.e. chatbots) could accelerate communication quality with the targeted customer. Aspects related to conversation language and readability were also identified to require testing as these have not been fully covered by prior chatbot studies. To provide an accurate view of the customer experience with chatbots, the conceptual model was based on the flow theory perspective (Csikszentmihalyi and LeFevre, 1989; Csikszentmihalyi, 1988; Csikszentmihalyi, 1990; Koufaris, 2002). Specifically, two main dimensions of the flow customer's experience, concentration and enjoyment, are proposed in the current study model. Based on the technology interactivity model (Lee, 2005), the factors of personalization, ubiquitous connectivity, and responsiveness were also considered in the study's model. Taking into account the textual nature of chatbot conversations, other factors (i.e. text language readability and transparency) are proposed as key drivers of a customer's virtual flow experience. Due to its sensitive nature and the lack of sufficient studies in this sector, this study has conducted an empirical analysis of courier, package delivery, and express mail service setting. The data were collected using a questionnaire survey administered to customers who actively use chatbot channels. The collected data were then tested using the SEM method, and the results largely supported the role of readability, transparency, responsiveness, personalisation, and ubiquitous connectivity in predicting customers' virtual flow experiences with chatbots. The empirical results also support the impact of customers' virtual flow experiences with chatbots on both communication quality and satisfaction.

CRediT authorship contribution statement

Abdullah M. Baabdullah: Conceptualization, Methodology, Investigation, Data curation. **Ali Abdallah Alalwan:** Data curation, Formal analysis. **Raed S. Algharabat:** Data curation, Formal analysis. **Bhimaraya Metri:** Data curation, Validation. **Nripendra P. Rana:** Methodology, Investigation.

Appendix A. Measurement items

Construct		Items	Reference	Mean	Std. deviation
Virtual flow experience:	CONRT1	I was absorbed intensely in the conversation	Chani et al. (1991)	5.76	1.08
Concentration/attention focus	CONRT2	My attention was focused on the conversation		5.72	1.10
'While using chatbots'	CONRT3	I concentrated fully on the conversation		5.66	1.16
	CONRT4	I was deeply engrossed in the conversation		5.69	1.131
Virtual flow experience:	ENJ1	I found my conversation with chatbots interesting	Chani et al. (1991)	5.49	1.09
Enjoyment	ENJ2	I found my conversation with chatbots enjoyable		5.49	1.07
'While using chatbots'	ENJ3	I found my conversation with chatbots exciting		5.49	1.08
	ENJ4	I found my conversation with chatbots fun		5.48	1.05
Readability	READ1	I understand the conversation text posted by chatbots	Lock and Seele (2017);	5.70	1.13
	READ2	The conversation text posted by chatbots is clearly written	Hoozée et al. (2019)	5.72	1.12
	READ3	The conversation text posted by chatbots is written in an understandable way		5.70	1.14
	READ4	I understand the meaning of the conversation text posted by chatbots		5.78	1.24
Personalization	PRS1	The information and answers that chatbots send to me are tailored to my request and questions.	Kim and Ko (2012); Krishnaraju et al. (2016).	5.63	1.01
	PRS2	Chatbots systems make me feel that I am a unique customer.		5.33	1.04
	PRS3	Personalised information is given by chatbots.		5.15	1.10
	PRS4	Chatbots offer customised information search.		5.51	1.02
Ubiquitous connectivity	UBQS1	I can access chatbots anytime for the necessary information or service.	Lee (2005)	5.69	0.94
	UBQS2	I can use chatbots anywhere, anytime at the time of need.		5.81	0.91
	UBQS3	I can access chatbots anywhere, anytime for the necessary information or service.		5.73	0.91
	UBQS4	I can easily access chatbots regardless of the device (Laptop, Tablet, and smart phone) I use.		5.34	1.18
Responsiveness	RSPV1	The chatbots have the ability to respond to my specific questions relevantly.	Jiang et al. (2010); Johnson et al. (2006)	5.34	1.26
	RSPV2	Chatbots facilitates two-way communication between the customers and the firms.		5.55	1.10
	RSPV3	The information shown when I interacted with the chatbots meet my expectations.		5.43	1.174
	RSPV4	Chatbots have the ability to respond to my specific questions quickly.		5.63	1.25
	RSPV5	When I use chatbots, I can always count on getting a lot of responses to my questions and comments.		4.34	1.25
Transparency	TRANS1			5.67	1.13

(continued on next page)

(*continued*)

Construct		Items	Reference	Mean	Std. deviation
		I think that the statements in the chatbot conversation text are accurate	Lock and Seele (2017); Hoozée et al. (2019)		
	TRANS2	I think that the claims made in the chatbot conversation text are correct		5.67	1.139
	TRANS3	I am confident that the information in the chatbots conversation text are true		5.67	1.165
	TRANS4	The chatbots conversation text reflects the genuine intentions of the company		5.49	1.084
	TRANS5	I think that the company's intentions correspond with the chatbots conversation text.		5.54	1.071
Customer–company communication	COMQ1	Timely 1 2 3 4 5 6 7 untimely	Mohr and Spekman (1994)	6.01	1.05
Quality	COMQ2	Accurate 1 2 3 4 5 6 7 inaccurate		5.80	1.02
'To what extent do you feel that your communication using chatbots with your service provider is'	COMQ3	Adequate 1 2 3 4 5 6 7 inadequate		5.88	1.04
	COMQ4	Complete 1 2 3 4 5 6 7 incomplete		5.85	0.98
	COMQ5	Credible 1 2 3 4 5 6 7 not credible		5.85	0.97
Satisfaction	SATIS1	I am generally pleased with chatbots.	Wang et al. (2019); and Lee and Chung (2009)	5.80	1.06
	SATIS2	I am very satisfied with chatbots.		5.81	1.04
	SATIS3	I am happy with chatbots.		5.84	1.04
	SATIS4	Overall, I was satisfied with chatbots.		6.24	0.81

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