Hue University Journal of Science: Economics and Development
pISSN 2588-1205;eISSN 2615-9716
Vol. 134, No. 5D, 2025, pp. 05–26, DOI: 10.26459/hueunijed.v134i5D.7650

CUSTOMER PERCEPTION AND ACCEPTANCE OF CHATBOTS IN CUSTOMER SERVICE: CASE STUDY AT VNPT HUE

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(*Submitted: October 10, 2024; Accepted: March 6, 2025*)

Abstract. The authors conducting this research aim to explore consumer acceptance of chatbots in customer service in VNPT Hue. Based on data collected from 185 users through a convenience sampling approach, the study utilized SPSS 20.0 software to perform descriptive statistical analysis. The results indicate that consumers have a relatively positive perception of chatbots, and there are four factors influencing the chatbot adoption. Certain administrative implications are proposed to help increase awareness and use of chatbot services in the telecommunications industry.

Keywords: perception, chatbots, telecommunications

1 Introduction

In an era defined by rapid technological advancements and evolving consumer expectations, businesses are constantly seeking innovative solutions to enhance customer service and streamline operations. One such solution that has gained significant traction in recent years is the chatbot. Chatbots are computer programs designed to simulate human conversation through text or voice interactions, enabling businesses to provide 24/7 support, automate tasks, and personalize customer experiences. Chatbots are being implemented in various industries, including tourism, banking, education, marketing, and retail [1, 2]. Several famous chatbots are acknowledged by companies such as Siri of Apple, Alexa of Amazon, Kik of Facebook.

The increasing popularity of chatbots can be attributed to several factors. Firstly, consumers are becoming more tech-savvy and accustomed to instant gratification. Consumers prefer to get real-time responses more than ever before [3, 4]. Thanks to the pre-programmed system, chatbots are able to reply to the enquiries more quickly than human agents at anytime and anywhere. In addition, up to a quarter of customers aged 18 to 34 use chatbots for individual shopping, indicating that the age of those engaging with and interested in technological changes is getting younger [5]. Furthermore, a study by We Are Social in 2024 reveals that a staggering 66% of the global population has Internet access, highlighting the Internet's integral role in modern life [6]. This trend creates a fertile ground for online services, including chatbots. A number of consumers tend to engage in a chatbot conversation for productivity, entertainment,

and the social-relational benefits they provide [7]. Secondly, businesses are facing mounting pressure to reduce costs and improve efficiency. Chatbots offer numerous advantages for companies, including continuous service availability, enhanced customer interaction, data collection and personalization capabilities, individualized communication, and cost reductions in service and support [8].

Studies on chatbots were conducted to explore the various aspects of implementing this smart technology. Some authors have studied consumer satisfaction and loyalty towards chatbot services. According to [9], service recovery quality and the quality of chatbot conversations significantly affect user satisfaction, while the core service quality of chatbots has a positive relationship with loyalty. Additionally, research on chatbots has also focused on the important aspect of acceptance. The study by [10] shows that user acceptance of chatbots is determined by various factors such as the authenticity of the conversation, perceived usefulness, and perceived enjoyment. Furthermore, some studies analyze consumer experiences with chatbots, with [11] suggesting that user experience is influenced by interaction design. Next, the search for human-like aspects has also been a focus to help users have a better experience with chatbots. The study by [12] shows that the politeness of chatbots affects the experience in both positive and negative ways. Politeness can be perceived as care, support, and encouragement, but it can also be understood as excessive apologizing, condescension, and unreliability, encompassing both positive and negative aspects. According to [13], the empathy and friendliness of chatbots have a positive impact on trust.

Research on chatbots in Vietnam has also received attention and focused on exploring the acceptance of chatbots in the banking and retail sectors [14–17]. For example, the study by [14] suggests that the intention to reuse a chatbot is significantly impacted by trust, user satisfaction, and perceived usefulness. Furthermore, service quality has the highest impact on customer trust, while system quality has a lower impact. As customer trust increases, the frequency of purchasing goods or using services in subsequent instances also rises [17].

Following the global trend of chatbot adoption, businesses across various sectors in Vietnam, including VNPT Hue, have also been actively implementing chatbots in customer service. With the potential to improve customer satisfaction, increase efficiency, and reduce costs, chatbots are poised to play an increasingly important role in the Vietnamese market. However, several challenges hinder the widespread acceptance and effective implementation of chatbots. One key challenge is the lack of awareness and understanding among consumers about the capabilities and benefits of chatbots. Another challenge is the chatbot's acceptance among users in the context of customer service when consumers are too familiar with and dependent on the service supported by humans.

Our study aims to investigate how consumers perceive and accept using chatbots in the context of VNPT Hue's customer service. Specifically, the research seeks to assess the level of awareness and understanding among VNPT Hue's customers about chatbots and how factors impact the users' intention to reuse this new technological application. Then, we provide recommendations to VNPT Hue on how to improve its chatbot implementation to encourage greater adoption. This research focuses on VNPT Hue's customer base, particularly young consumers who are considered early adopters of technology. The research is limited to the context of customer service and does not explore other potential applications of chatbots. This paper is structured into five distinct sections. Following the introductory and theoretical overview sections, the methodology employed in the research is detailed. The subsequent section, Part 4, delves into the research findings and their implications, culminating in a concluding section that summarizes the key takeaways and their broader implications.

2 Theoretical background

2.1 Overview of Chatbots

Chatbot definition

The concept of chatbots originated in the 1950s, and by 2016, their implementation had become a significant technological trend globally [18, 19]. According to [19], "a chatbot is a computer program that simulates human conversation with an end user." Advanced chatbots have a tendency to use conversational AI methods, for example, natural language processing (NLP) to comprehend the inquiries and give the feedback to consumers [19]. At their core, chatbots are designed to simulate human conversation to effectively address customer inquiries and provide assistance. They serve as virtual assistants, available across various communication channels, to greet customers, answer questions, and offer support. As technology continues to advance, chatbots are poised to play an even greater role in shaping the future of customer interaction and communication.

Advantages and limitations of Chatbots

Chatbots offer a wealth of benefits for both businesses and customers. They enable companies to provide round-the-clock service, ensuring customer inquiries are addressed promptly, regardless of the time or day [20]. This enhances customer satisfaction while simultaneously reducing personnel costs. Moreover, chatbots facilitate personalized interactions and enable businesses to gather valuable customer data, which can be leveraged to tailor offers and marketing strategies. Thus, chatbots can be considered as smart services since they do "real-time collection, continuous communication, and interactive feedback" [21]. From the customer's perspective, chatbots offer

instant support and cater to the growing preference for real-time interaction, particularly among millennials who favor chat-based communication [3]. This accessibility and responsiveness were previously unattainable through traditional customer service channels [4]. However, despite the numerous advantages, chatbots face challenges. Limited user awareness and comprehension difficulties in handling complex requests can hinder their effectiveness and adoption. Furthermore, concerns surrounding data privacy and security may deter some users [8]. Successfully addressing these challenges, including improving chatbot comprehension and ensuring robust data protection measures, will be crucial for fostering greater acceptance and realizing the full potential of this technology.

Application of Chatbots in customer service

Chatbots have rapidly become indispensable tools across a multitude of industries, demonstrating remarkable versatility in their applications. Customer service has been significantly enhanced by chatbots. Chatbots are transforming customer service by offering businesses efficient and cost-effective solutions like 24/7 availability for instant support, handling simple queries to free up human agents, providing personalized recommendations to enhance customer experience, generating and qualifying leads, offering multilingual support for a global reach, and improving response times for increased efficiency. This not only saves time and resources but also improves customer satisfaction by providing prompt and efficient support [22]. By leveraging these applications, businesses can enhance customer satisfaction, improve operational efficiency, and drive business growth.

2.2 The concept of Perception

Perception is a process through which individuals select, organize, and interpret information to form a meaningful picture of the world around them [23,24]. The perceptual process is how we take in information from our environment and make sense of it, involving three key stages including the initial stage, organization stage and interpretation stage. The process of perception is influenced by stimulating factors from the surrounding environment and the subject itself, including personal characteristics, stimulus characteristics and situational factors. Perception plays an important role in shaping consumers' beliefs, attitudes, actions, buying habits, and purchasing decisions [23,24]. Understanding consumer perception is essential for businesses to develop effective marketing strategies and create positive customer experiences.

2.3 The concept of Acceptance in the technology context

The technology acceptance model (TAM) proposed by Davis aims to predict users' attitudes towards technology by considering and examining perceived usefulness (PU) and perceived ease of use (PEOU) [25]. Later, [26] argued that PU and PEOU have a direct impact on behavioral

intention and that it is unnecessary to consider additional attitude factors. PU and PEOU are defined as users' beliefs that their experience will be improved by the technology usage [27]. PU focuses on performance improved by the new technology, while PEOU emphasizes the reduced effort [28]. Using a chatbot can bring joy, as it can suggest quick and accurate responses, minimizing waiting times compared to human support services. Perceived enjoyment (PE) is another essential determinant of primary relevance to technology acceptance behavior [29]. Furthermore, trust (TR) is a significant factor influencing the continued use of chatbots [30]. In addition, in a technological environment, the need for interaction with a service employee (NFI-SE) remains an important demand that influences the choice of technology-related services. Therefore, in this article, perceived enjoyment, trust, and the need for interaction with a service employee are introduced as factors that have the potential to influence the intention to continue using a chatbot.

2.4 Research model and Hypotheses

Perceived usefulness: Perceived usefulness reflects users' belief that using technology brings benefits to themselves [27]. [29] argue that PU and PEOU are two important factors influencing consumer satisfaction and behavioral intention. Indeed, adopting new technology is not easy for many customers as they face various barriers such as time and effort to learn how to use it. However, when technology provides significant benefits to users, they are likely to overcome these barriers and continue using it. This is also true for chatbots, as interacting with a machine or software that is still new can lead to perceived usefulness from users, which contributes to the repeated use or acceptance of this technology. Specifically, some notable benefits of chatbots include quick feedback, 24/7 service, and personalized experiences [3, 4, 8]. Research by [10, 14, 27] shows that PU has a positive relationship with satisfaction and the intention to continue using new technologies, including chatbots. Therefore, the proposed hypothesis is as follows:

H1: Perceived usefulness positively influences consumers' intention to continue using chatbots.

Perceived ease of use: According to Davis and colleagues' technology acceptance model (1989), PEOU is an important factor in determining consumer acceptance of new technology [25]. Perceived ease of use is the degree to which an individual believes that using a specific system will not require much effort [28]. Increasing PEOU can reduce the perception of difficulty and complexity in using technology [31]. New technologies are still unlikely to be well accepted if they do not provide good user support during operation. Thus, service providers must be capable of eliminating consumer doubts and hesitations when using Internet-based services by focusing on enhancing perceived ease of use [4]. [32] argue that PEOU has a positive relationship with the intention to use. However, [10, 33] did not find a relationship between these two factors when some technologies, such as chatbots, are easy to use. Hence, we hypothesized that:

H2: Perceived ease of use positively influences consumers' intention to continue using chatbots.

Perceived enjoyment: A product can provide consumers with both functional and emotional values. Positive emotional values such as joy, excitement, and happiness during consumption are important as they influence satisfaction and the intention to continue using the product [29]. Perceived enjoyment is defined as the perception that using a system is enjoyable for the functional benefits it provides [34]. Some studies have found the impact of PE on the preference for technology choices such as computers, websites, phones, and e-commerce; for example, perceived enjoyment has a positive relationship with customer satisfaction when shopping online [35]. In the context of chatbot applications, consumers may find joy in using it when it responds quickly, offers answers that exceed the expectations of a machine, or provides humorous responses. Therefore, PE is considered a factor influencing the intention to continue [10, 36]. Thus, the hypothesis is proposed:

H3: Perceived enjoyment positively influences consumers' intention to continue using chatbots.

Trust: For products and services that utilize new technologies like chatbots, it is essential to create factors that encourage consumers to overcome barriers to acceptance, including the element of trust. Trust is defined as an individual's willingness to accept the risk or harm associated with the actions of another party [37]. Or according to [38], trust is also defined as "the perception of confidence in the reliability and integrity of the exchange partner." Trust plays a crucial factor in the context of online services [39]. Interacting with a chatbot means that users may share some personal information to receive answers related to their service usage. This also leads to the risk of personal information leakage if the security measures are inadequate, causing consumers to hesitate in using chatbots. Therefore, [40] suggests that using chatbots raises concerns regarding privacy and security. A lack of trust in chatbots can lead to a refusal to interact with them, affecting technology acceptance and satisfaction [41]. Conversely, consumers will continue to share with and use chatbots when they perceive trust in this type of application. [30] found that trust is a significant factor influencing the continued use of chatbots. Therefore, the proposed hypothesis is:

H4: Trust in chatbots has a positive impact on the intention to continue using chatbots.

Need for interaction with a service employee (NFI-SE): In the context of technology, consumers are increasingly exposed to various types of services based on technology platforms or self-service. However, one of the essential needs of humans is interaction with others [42]. Moreover, [43] argued that the need for interaction with people is still considered a genuine and important need in the service sector. Customers with a high need for human interaction tend to choose self-service options less frequently [44]. According to [32], chatbot users have a high

demand for interaction with service staff, preferring human-to-human interaction over human-to-machine interaction, as negotiating with staff provides a more comfortable and convenient experience. Furthermore, the need for interaction with an employee is significant to purchase intention [45]. Hence, we hypothesized that:

H5: Consumers' need for interaction with a service employee has a negative impact on the intention to continue using chatbots.

3 Research Methods

The article employs a methodology that combines qualitative and quantitative research. The qualitative research phase begins with conducting unstructured interviews with a group of experts, including staff from VNPT regarding the application of chatbots in customer service. Additionally, a group of five consumers is invited to discuss chatbots, characterized as young individuals (three aged 18 to 24 and two aged 25 to 34), with a decent level of education (holding high school and university degree), and with average to above-average income (over 5 million). The consumers are free to discuss chatbots, including their understanding of chatbots, famous chatbots, the benefits and limitations of chatbots, and the factors influencing the acceptance of chatbots. Based on the results of the qualitative data, the author adjusts the measurement scale and designs a questionnaire for the quantitative research. The quantitative research phase uses a questionnaire designed with three main parts: screening questions to determine participant eligibility, main questions pertaining to the core research objectives, and demographic questions to gather background information on the participants. To ensure the questionnaire's effectiveness and relevance for both the research topic and participants, a pilot study was conducted with a sample of fifteen consumers. Based on the feedback obtained, the final version of the questionnaire was developed and implemented in the main study.

The scales used in the investigation of consumers' perception and acceptance towards chatbot use a 5-point Likert scale, in which 1 means strongly disagree and 5 means strongly agree. The scale was constructed and developed based on theoretical foundations, drawing from previous studies and adjusted in quantitative research. The scales of understanding about chatbots (definition, benefits, limitations) are derived from the research of [14, 46–49]. The scales to estimate the factors influencing the intention to reuse chatbots are modified from [10, 26, 43, 50, 51]. Specifically, PU includes three items: "With AMI, I can work productively", "With AMI, I can work more effectively", "I find AMI to be useful for customer services". PEOU has three items, such as "I find AMI to be easy to use", "The interaction with AMI is clear and understandable", "I find it easy to do with AMI what I want". Three items measure PE, for example, "Using AMI is entertaining", "Using AMI is fun", "Using AMI is exciting". Trust was estimated by four items, for instance, "I feel that the chatbots are trustworthy", "I feel that

chatbots are secure", "I do not think that chatbots will act in a way that is disadvantageous to me", "I trust in chatbots". NFI-SE is evaluated by 4 items: "Human contact in providing services makes the process enjoyable for me", "Personal attention by the service employee is very important to me", "I like interacting with the person who provides the service", "It bothers me to use a chatbot when I could talk to a person instead".

The study approached the sample conveniently, conducting surveys at VNPT's transaction points. They are customers who have used VNPT's chatbot. As Exploratory Factor Analysis (EFA) is applied in this research, the formula for identifying the sample size provided by [52]: n = 5 x 20 = 100 (20 is the number of observed variables). A total of 230 questionnaires were released, and 185 valid responses were collected. The analysis involved employing descriptive statistical methods, which aim to summarize and describe the main features of the dataset. This approach provides a clear and concise overview of the responses, enabling researchers to identify key trends and patterns. Moreover, by employing EFA and multiple regression analysis, the authors could effectively analyze and figure out the key findings of the study, providing a foundation for further analysis and interpretation.

4 Research results and Discussion

4.1 Chatbot applications in customer service at VNPT

As a leading technology corporation pioneering digital transformation in Vietnam, VNPT has always prioritized customer care, considering it a key factor in customer retention, satisfaction, and sustainable market development. Embracing global trends and leveraging its technological advantages and skilled workforce, on June 5, 2021, VNPT officially introduced "VNPT AMI Virtual Assistant" – a chatbot capable of natural language processing, contextual awareness, automatic connection to customer management systems, and multi-channel integration across various customer touchpoints [53].

Based on advanced technologies and platform models, VNPT AMI can analyze and predict user intent based on their conversation, subsequently engaging in natural language dialogue. VNPT AMI can even understand casual user input to analyze, filter requests, and identify relevant keywords, eliminating the need for users to follow rigid processes or scripted questions. The artificial intelligence (AI) powering VNPT AMI analyzes conversations and user intent, overcoming limitations faced by previous chatbot generations. As a result, customers interacting with VNPT AMI can directly address their concerns without navigating through predefined buttons, receiving the most relevant responses. This virtual assistant possesses self-learning capabilities, enabling it to recognize, analyze, evaluate, and make decisions in customer support. By simply asking questions or using keywords like "Number porting," "SIM replacement," or "Promotion," customers receive immediate answers with a single "touch," eliminating the need

for time-consuming multi-step searches. VNPT also launched a Callbot system capable of interacting with customers through phone channels, similar to a VNPT call center agent. With its multitasking capabilities and automatic connection to customer management systems, Callbot can quickly fulfill customer requests with a high degree of personalization, accurately identifying their needs, responding effectively, and guiding conversations like a human agent. With VNPT AMI Chatbot and the Callbot system, all customer needs and concerns related to VNPT services are promptly addressed, ensuring a satisfying experience even for the most demanding customers.

VNPT continues to invest in and develop its "intelligent virtual assistants" to further enhance their effectiveness. Currently, VNPT AMI handles approximately 200,000 chat sessions nationwide each month, accounting for nearly 80% of VNPT's total customer interactions across multiple channels [54]. In addition, VNPT AMI supported nearly 4,000 chat sessions in the last month of 2023, generating substantial mobile and fixed broadband orders, notably handling nearly 1,300 sessions for subscriber information retrieval/updates, a task that would be unmanageable with the limited human resources in the area. Besides the 24/7 direct customer support channels of VNPT AMI Chatbot and hotlines 18001166/18001091, VNPT offers various other support channels, such as the My VNPT self-care app, Vinaphone Plus, VNPT Pay, and integrated automated support on platforms like vnpt.com.vn, shop.vnpt.vn, onesme.vn, VNPT Vinaphone's Facebook page, Zalo, and Telegram. These digital transformation initiatives by VNPT ensure swift customer consultation and support, alleviating congestion on traditional channels.

4.2 Sample characteristics

According to the survey results, the number of males is 76, accounting for 41.1%, while females number 109 (58.9%). In terms of age, the largest group of survey participants is those aged 25 to 35, with 89 individuals, equivalent to 48.1%, followed by the age group of 18 to 24 with 81 individuals (44.3%). Regarding the education, over 80% of consumers in this survey hold a university or college degree. In terms of occupation, more than 50% of respondents work in office jobs and in business. Additionally, freelancers and students also represent a significant proportion, with about 40% for both of these groups. In terms of income, over 50% of respondents earn more than 5 million VND per month, followed by those earning between 3 to 5 million VND at 26.7%. Thus, it can be said that the survey participants are young individuals with relatively high educational levels, average income, and flexibility in their work. This profile suggests a technologically-savvy demographic comfortable with digital tools and services like chatbots.

4.3 Customer perceptions of Chatbots

Customer definition to Chatbots

The survey results in Table 1 show that a high percentage of young people understand what a chatbot is as "a software designed to create intelligent conversations between computers and humans" at 38.4%, and "an automated response system based on pre-existing questions" at 22.7%, and "a tool that helps answer customer questions anytime" at 18.4%. This reflects a general understanding among people about chatbots as basic utilities that allow for use anytime and anywhere without waiting for a call center representative. However, the responses are limited due to being pre-set, and this represents intelligent conversation between humans and computers, which is quite novel for young people. The remaining understandings that young people are less familiar with include "a tool that uses artificial intelligence (AI)," "a virtual assistant on the Internet," and "a robot that can converse" with respective rates of 11.4%, 5.9%, and 3.2%. This is because these concepts require a deeper grasp of information technology and the evolving capabilities of artificial intelligence. This knowledge gap may stem from a lack of exposure to or education about the underlying technologies driving chatbot development.

Customer awareness of the benefits of Chatbots for businesses

The survey indicates that the benefits of chatbots for businesses that implement them are significant, with a very high selection rate for "Handling multiple customer requests simultaneously" and "Saving on personnel costs," both at 95.1%. This outcome is also found in Germany, where respondents thought that there is no time pressure for staff (41%) and no assistance costs and fees (40%) with the chatbot adopting [47]. In fact, chatbot usage can lead to potential savings of $23 billion in the U.S [55]. Moreover, the advantage of "Quick responses to customer questions/requests" has a proportion of 89.7%, which is essential for businesses to promptly engage with customers and avoid situations where customers do not receive answers,

Table 1. Customer definition of Chatbots

Consumer definition to chatbot	Number (N)	Percentage (%)
An automated response system based on pre-existing questions.	42	22.7
A software designed to create intelligent conversations between computers and humans.	71	38.4
A tool that helps answer customer questions anytime.	34	18.4
A tool that uses artificial intelligence (AI).	21	11.4
A robot that can converse.	6	3.2
A virtual assistant on the Internet.	11	5.9

Source: Authors' data processing, 2024

Table 2. Customer awareness of the benefits of Chatbots for businesses

Benefits	Number (N)	Percentage (%)
Saving on personnel costs.	176	95.1
Quick responses to customer questions/requests.	166	89.7
Meeting each customer's needs/requests.	131	70.8
Collecting customer data.	72	38.9
Increasing the customers' engagement.	20	10.8
Handling multiple customer requests simultaneously.	176	95.1
Keeping the continuous data during the conversation to each customer.	84	45.4
Keeping the consistency in the answers to customers.	54	29.2

Source: Authors' data processing, 2024

leading to loss of clientele. The results of this study are consistent with the reasons why users continue to use chatbots in [46, 49]. Specifically, in a survey of 2,046 people, 37% of users felt that they could always access the chatbots, and 26% of users received answers from the chatbot faster than if they searched for the information themselves [46].

The next benefit is "Meeting the needs/requirements of each customer" with a high rate of 70.8% because the tasks in the chatbot are pre-programmed and the entire workflow is systematized, allowing the chatbot to address specific customer requests, leading to high customer satisfaction. According to a study by [56] involving over 6,000 users, 50% of them believe that chatbots can answer specific questions sent to customer service centers. Therefore, it can be said that robots can manage human tasks to some extent. Furthermore, 45.4% of users think that chatbots are useful to "keep the continuous data during the conversation to each customer." In addition, chatbots can support to "keep the consistency in the response to customers" (29.2%) since they get the prepared answers in the system. These findings are also found in the research of [49], in which 64% of respondents can approach 24-h chatbot service. The remaining benefit is increasing the customers' engagement (10.8%).

Limitations/ barriers of Chatbots

The study results in Table 3 confirm that while chatbots offer numerous benefits, they still face significant limitations. The predominant limitation is "limited response" (97.8%) as the answers are pre-programmed. Thus, it restricts the chatbot's ability to respond. This outcome is similar to the study of [48, 57], in which users doubt chatbots' usefulness (24%) or their capability of handling the individual (55%) and complex enquiries (54%). The next is "Interaction language is not as natural as human language" has a rate of 94.1% because the machine's language reads each

Table 3. Limitations/ barriers of Chatbots

Limitations/ barriers	Number (N)	Percentage (%)
Interaction language is not as natural as human language.	174	94.1
Undetailed answer	141	76.2
Limited response	181	97.8
Unsolved questions	70	37.8
Lack of data protection	147	79.5
Others	8	4.3

Source: Authors' data processing, 2024

word separately and lacks fluency due to the slow processing speed of the computer system, making it less pleasant to hear than human speech; thus, this is a limitation of chatbots. [58] argue that chatbot conversations have shorter text and a limited vocabulary compared to conversations with humans. This is the problem of consumers in Germany when there is a failure to distinguish between human and machine (32%) [48]. Therefore, users believe that humans can better meet customer needs, have higher reliability, and greater empathy [47] and have no desire to communicate with a computer [46, 59].

Moreover, "Lack of data protection" with the proportion of 79.5% is also the concern of consumers when making the conversation chatbot. In fact, some personal information can be collected by a chatbot, then might be used for different purposes, including the good and bad. This problem is the worry of customers in studies such as [48, 60]. "Answers are not detailed" has a rate of 76.2% because the responses are pre-programmed and need to be concise, so they are not as detailed as those from a call center staff member, which is why people tend to choose this option quite frequently. This situation was found in the United States and the United Kingdom, where the rate of people not receiving detailed answers is 41% in the U.S. and 47% in the U.K. [61]. "Unsolved questions" accounts for 37.8%, indicating that chatbots have not managed to resolve customer issues to a significant extent. Thus, 47.5% of people state that chatbots give too many unhelpful responses [60]. Striking a balance between automated efficiency and human-like interaction will be key to overcoming these limitations and fostering greater user acceptance of chatbots as valuable tools for communication and service delivery.

4.4 Customer acceptance of Chatbots

Scale Reliability Testing

The result in Table 4 indicates that the measurement scales for this research have high reliability and are suitable for the next analyses because the Cronbach's Alpha coefficient is equal to 0.634 (> 0.6) and the total correlation coefficient is greater than 0.3 [62].

Table 4. Cronbach's Alpha Reliability Analysis Results

Variables	Cronbach's Alpha
Perceived usefulness (PU)	0.631
Perceived ease of use (PEOU)	0.634
Perceived enjoyment	0.723
Trust (TR)	0.699
Need for interaction with a service employee	0.924
Intention to reuse (IR)	0.645

Source: Data analysis conducted by authors

Examining Variables through Exploratory Factor Analysis (EFA)

From Table 5, the results of the EFA indicate the validity and reliability of the measurement model. The KMO coefficient of 0.681 ranging from 0.5 to 1 and a significant Sig. level (< 0.05) show that EFA is suitable for this data [52]. Bartlett's Test of Sphericity with Sig. with 0.000 means that variables in this dataset do not form an identity matrix and are suitable for factor analysis.

Five factors emerge, explaining a total variance of 65.551%, exceeding the 50% benchmark with an Eigenvalue threshold of > 1 (Table 6). In other words, these elements effectively explain the data's variability. These results collectively provide strong evidence for the construct validity and appropriateness of the factor structure when investigating consumer intention to reuse VNPT's Chatbot AMI.

According to the result in Table 7, EFA for the dependent variable is with three observed variables. KMO figure is over 0.5, and the significance of Barlett's Test of Sphericity is 0.000. Furthermore, explaining a total variance of 63.70% (> 50%) and factor loadings more than 0.5 confirm that the factor analysis is satisfied.

Table 5. Assessing the suitability of factor analysis for the independent variable using KMO and Bartlett's Test

KMO Measure of Sampling Adequacy		0.681
Barlett's Test of Sphericity	Approx. Chi-Square	1218.217
	Df	136
	Sig.	0.000

Source: Data analysis conducted by authors

Table 6. Rotated Factor Matrix

Observed variables	Component Factor Loadings				
	1	2	3	4	5
NFI-SE4	0.911				
NFI-SE3	0.898				
NFI-SE1	0.889				
NFI-SE2	0.878				
TR4		0.793			
TR3		0.722			
TR2		0.671			
TR1		0.652			
PE1			0.825		
PE3			0.791		
PE2			0.770		
PEOU3				0.800	
PEOU1				0.734	
PEOU2				0.724	
PU1					0.818
PU3					0.732
PU2					0.657
Eigenvalues					**1.396**
Cumulative Total Variance Extracted (%)					**65.551**

Source: Data analysis conducted by authors

Table 7. EFA findings for the dependent variable

KMO Measure of Sampling Adequacy	0.637
Measure of Sampling Adequacy (Sig.)	0.000
Cumulative Total Variance Extracted	58.619
Eigenvalues	1.579
IR2	0.799
IR3	0.792
IR1	0.700

Source: Data analysis conducted by authors

Correlation analysis and regression results

From the correlation matrix, the dependent variable and five independent variables have a linear relationship. Pearson correlation analysis shows that there is a significant relationship. An adjusted R square of 0.628 indicates that the model accounts for 62.8% of the variance in consumer acceptance. Moreover, there is no autocorrelation as the Durbin-Watson statistic is 2.019 in the

Table 8. Regression results

Model	Unstandardized Coefficients		Standardized Coefficients	t-statistic	Sig.	VIF
	B	Std. Error	Beta			
Constant	0.828	0.334		2.477	0.014	
PU	0.642	0.049	0.629	13.182	0.000	1.125
NFI-SE	-0.126	0.024	-0.244	-5.171	0.000	1.110
PE	0.027	0.043	0.029	0.634	0.527	1.027
PEOU	0.085	0.042	0.092	2.011	0.046	1.041
TR	0.154	0.047	0.156	3.288	0.001	1.120
a. Dependent Variable: IR						
Adjusted R square = 0.628						
Durbin-Watson = 2.019						

Source: Data analysis conducted by authors

range from 1.802 to 2.198. ANOVA results (p = 0.000) confirm the significance of the model. In addition, multicollinearity is in acceptable limits as the VIF figures for independent variables are less than 10. These outcomes collectively confirm the substantial influence of the identified factors on consumer adoption.

The t-test independent variables including TR, PU, PEOU, and NFI-SE have low p-values with Sig. < 0.05. This means that the regression model is suitable and the relationship among factors is significant. The regression equation can be shown as follows:

$$Y = 0.629 \times PU - 0.244*NFI\text{-}SE + 0.092*PEOU + 0.156*TR \quad (1)$$

The outcomes from the multiple regression analysis indicate that hypotheses H1, H2, H3, H4 and H5 are supported (Table 9).

Table 9. Hypothesis Testing Results

Hypothesis	Relationship	Standardized Coefficient (Beta)	p-value	Result
H1	PU → IR	0.629	0.000	Supported
H2	PEOU→ IR	0.092	0.046	Supported
H3	PE → IR	0.029	0.527	Not supported
H4	TR → IR	0.156	0.001	Supported
H5	NFI-SE →IR	-0.244	0.000	Supported

Source: Data analysis conducted by authors

From the multiple regression equation, consumer acceptance of chatbots is influenced by four main factors. Perceived usefulness has the most positive impact on the intention to reuse chatbots among service users. This result is consistent with [10, 14, 27]. In fact, the benefits of using an application are always a motivation for users to engage with it. For chatbots in services, this may mean receiving quick responses, 24/7 availability, and increased work efficiency. Similarly, this research indicates that trust and the intention to use continuously have a positive relationship, a finding emphasized by [14, 17, 30]. The use of technology-based services today always carries risks for customers, such as the leakage and theft of personal information or being monitored. Therefore, to persuade and maintain the use of the application, it is necessary to create and sustain trust in the service. In fact, some studies have shown that establishing initial trust in chatbot services plays a crucial role in increasing the intention to use chatbots [63].

Moreover, our results show that perceived ease of use positively influences the users' adoption, which is in line with [32]; when the authors suggest that users find using chatbots easy, user-friendly, and without any difficulties, they are more likely to continue using them. However, the results of this study differ from those of [10, 33], as these studies did not find a relationship between perceived ease of use and the intention to continue using. This can be explained by the fact that the research sample focused on young people, who are very tech-savvy, so for them, using chatbots poses no challenges. Therefore, this factor is not perceived by customers as strong enough to influence their intention to use.

Finally, the factor of the need for interaction with service staff negatively impacts the intention to continue using the service. Currently, chatbots still have limitations in serving customers in the service sector, such as limited responses and mechanical conversations [48, 57, 58]. As a result, sometimes chatbot applications cannot serve customers without human intervention, as humans can provide a better customer experience [33]. Therefore, some customers still prefer to interact with humans. The more customers need interaction with service staff, the less they prefer to use chatbots. Our results are supported by [44, 64] as the authors also found that NFI-SE and the intention to reuse have an inverse relationship in technology-based services.

5 Conclusion and Implications

This study examines how consumers perceive chatbots and what factors influence the users' acceptance in the context of VNPT Hue's customer service. The findings reveal that consumers generally have a good understanding of chatbots. However, there is a knowledge gap regarding the advanced capabilities of chatbots, such as AI integration and virtual assistance. While consumers acknowledge the benefits of chatbots, such as quick responses and 24/7 availability, they also identify limitations, including the inability to handle complex requests and the lack of

natural language processing. The findings of this chatbot perception study align with previous studies, confirming findings like the desire for quick responses and concerns about complex queries and data privacy. The outcome also confirms the role of the TAM model in the explanation of the users' adoption in the chatbot service context. Perceived usefulness and perceived ease of use show their positive impact on the reusing intention. Additionally, the factor of trust is identified as contributing to the promotion of user acceptance. Finally, our research contribution is also reflected in identifying the role of the need for interaction with service staff in relation to the intention to continue using chatbots in the context of customer service applications.

To enhance chatbot implementation and adoption in VNPT Hue's customer service, several implications emerge from the research findings. Firstly, VNPT Hue should prioritize improving the chatbot's AI and natural language processing capabilities to address limitations identified in the study and to decrease the need for interaction with service employees, such as enhancing its ability to understand complex queries and personalize interactions. Secondly, addressing data privacy concerns is crucial to increasing the users' trust, which can be achieved through robust data protection measures like encryption and clear communication of data privacy policies. Thirdly, actively promoting the chatbot's advanced features and benefits, such as quick responses and 24/7 availability, can raise consumer awareness and understanding. Fourthly, integrating the chatbot with popular platforms like Facebook and Apple can enhance accessibility and familiarity, potentially increasing usage and adoption. Fifthly, continuously gathering user feedback through surveys and analysis of user interactions can identify areas for improvement and enhance the chatbot's capabilities. By addressing these implications, VNPT Hue can enhance its chatbot implementation, improve customer satisfaction, and encourage greater adoption of this technology.

It is important to acknowledge that this study has certain limitations. Firstly, its convenience sampling method, focused on VNPT Hue's customer base and young consumers, may not represent the broader population's views. Secondly, the research model primarily relies on a well-known model to explain perception and acceptance. In the future, studies could experiment with other models and theories such as U&G and UTAUT to examine additional factors that may influence user acceptance. Finally, the research overlooks certain factors of chatbots that have been identified as helping to create a more human-like interaction, as these factors could improve the chatbot service experience and, in turn, affect the intention to continue using it. Therefore, future studies could integrate these factors to provide a clearer explanation of the elements influencing user acceptance.

Acknowledgments

The authors would like to express their gratitude to the Science and Technology Department of Hue University for supporting the implementation of this research with project code DHH2023-06-120.

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