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Antecedents and role of trust in chatbot use intentions : an Indian perspective

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ANTECEDENTS AND ROLE OF TRUST IN CHATBOT USE INTENTIONS: AN INDIAN PERSPECTIVE

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Abstract: *The digital age has changed the way businesses are run today. Technology is not just a privilege but also a necessity. The recent pandemic has given important lessons to business to be proactive and advanced in technology. Customers occupy the centrestage in any business and giving them solutions promptly for their queries can leave a positive impression and lead to long term customer enagagment. For this, a trained team of employees are required who can give their services incessantly. However, the rising employee retention costs have impacted the profit margins of organisations and more human intervention becomes a hurdle in standardization of processes. Therefore, organisations are roping in artificial intelligence to be more efficient and cost effective. Chatbots are artificial intelligence softwares that have enabled organisations to give answers to customer queries online. The study intends to examine the significant factors in determining customers' intentions to use chatbots. This paper aims to understand the role of user experience, performance expectancy, effort expectancy, and trust in customer chatbot use intentions from the Indian point of view. A structured questionnaire was utilized to gather data for testing the proposed model, which was conceptualized based on extant literature on technology acceptance and consumer behavior. A survey response of 354 respondents was taken. In order to test the constructs, the collected data was analyzed through AMOS 21. The research findings depicted the positive impact of user experience, trust performance expectancy, and effort expectancy on customer intention to use chatbots, which influences actual usage. This paper empirically demonstrates the relationship among various variables affecting customer intentions to use chatbots. Since the paper uses data collected from a sample not randomly selected, it may regulate the generalization of the results. This study intends to add to the current research gap in the existing literature about customer intention to use chatbots, mainly in the Indian context. The research examined how positive user experience, performance, effort expectancy, and trust affect customer intentions to take support from chatbots.*

Keywords: user experience, performance expectancy, effort expectancy, trust, customer intention.

JEL Classification: M30, M31, M37

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Introduction. Digitalization and automation have become indispensable parts of modern-day businesses. The global pandemic (COVID-19) led to lockdowns in many countries. Due to the lesser availability of customer care executives, the companies depended heavily on chatbots to reduce the load of customer queries. Organizations in India have adopted artificial intelligence (AI) in their working systems, like customer support services, to achieve efficiency in processes and thus reduce costs. Customer satisfaction, in businesses today, is considered the key to gaining success through achieving long-term competitive advantages, and customer satisfaction is dependent on the company's services. AI enables companies to handle multifarious customer queries and facilitate seamless customer technology experiences. Chatbot, an artificial intelligence software, has become commonplace in almost all service web portals. During the pandemic, chatbots provided useful information to millions of people about the disease and the precautions to take. The World Health Organisation also launched its chatbot to alert people. Chatbots can be understood as computer programs that use natural languages to interact with humans (Shawar and Atwell, 2007). In the era of artificial intelligence, different modern changes like deep learning, machine learning, and artificial intelligence created a revolution in the industry. Many conversational software agents like chatbots have been made functional by natural learning. Chatbots have gained the huge interest of users because of being available as a popular platform to get solutions to different issues. The channel gives power to businesses to reach their target audience anywhere and anytime using this platform. Various developments in artificial intelligence and machine learning have equipped chatbots with algorithms to train, guide, and implement solutions for increasing the capabilities of users. Chatbots have been implemented for various purposes, such as providing information, social and emotional support, entertainment, or linking users to other humans or machines (Brandtzaeg and Folstad, 2017). Moreover, the specific cause for people to utilize chatbots is productivity, meaning quicker answers with less effort. The paper intends to ascertain the impact of user experience, performance expectancy, effort expectancy, and trust on chatbot use intention.

Literature Review. The different technological platform allows the modeling of product ecosystems and AI to replicate the business scenarios of economy, market, and individual situations. The demand for various artificial intelligence capabilities to create an interface with customers have been increased since it removes human beings between customers and the company and provides services 24 hours. Modern chatbot software has been constructed to imitate human communication capabilities to interact with users automatically. It represents an innovative, modern way to provide customer assistance enabled by artificial intelligence. A chatbot is based on artificial intelligence techniques that understand natural language and recognize concepts, emotions, and constructs to provide meaningful responses.

With the never-ending technological development and its incorporation into user's life, the importance of different technological models has increased. Extant literature has reported various theories and models to explain the use intention concerning technologies. One of the most popular models relating customers' attitudes to technology is the technology acceptance model (TAM). This model helps in understanding the determinants of human behavior for acceptance and rejection of the potential of technology. TAM is considered an extension model of TRA (theory of reasoned action). This model replaced the theory of reasoned action attitude toward behavior and discusses perceived ease of use and perceived usefulness for technology acceptance. TRA has undergone three phases: adoption, validation, and extension. Brandtzaeg and Folstad, 2017 opine that the most commonly stated motivations for using chatbots were efficiency and convenience. Moreover, they state that user experience, sense of newness, and social aspects can also be significant motivators. Factors like user experience, effort expectancy, and performance expectancy are considered to influence customer intention directly. Among them, user experience is considered the most influential factor in the user's interface service design system (Venkatesh et al. 2003). User experience examines the customer's reaction to new technology, which is critical to measure. Performance expectancy is one of the key factors of the UTAUT model, i.e., the Unified theory of acceptance and usage of the technology model. This model has attracted the substantial attention of many researchers in various fields of human behaviors (Venkatesh et al., 2003, Bugembe, 2010; Tossy, 2014). User experience examines the customer's reaction to new technology, which is critical to measure. Hartmann et al. (2008) presented a model of decision-making to determine how people assess user interface aesthetics and quality. Numerous studies have compared the measures of experience gained after observing but before utilizing a product to examine the gained after use (Hassenzahl, 2004). This study proposes the following hypothesis:

H1: The user's experience significantly impacts users' intention to use chatbots.

The technology acceptance model (TAM) considers that perceived ease of use and perceived utility of technology are the main determinants of users' attitudes towards the utility of technology, the resultant behavioral intentions, and the actual use of technology. PEOU also influences the perceived utility of

technology. Perceived utility (PU) is measured as the degree to which someone considers that using this technology would modify performance. Perceived ease of use defines how easily that technology can work in day-to-day life. These factors directly influence users' attitudes toward technology (Sanayei, Ansari; Ranjbarian, 2010). Performance expectancy is the level to which a person identifies system benefits to achieve job accomplishment (Venkatesh et al., 2003). The performance expectancy finds out the eventual usage and acceptance of information systems. Various indicators include intrinsic and extrinsic motivation, perceived usefulness, relative advantage, and output expectations of information technologies. Venkatesh et al. (2003) stated that performance expectancy is considering the level to which a person trusts that utilizing the technological technique would benefit the user for job performance. It is observed as a unique, significant, and positive determinant of an individual's intention to recognize and utilize the information technology system (Venkatesh et al., 2003). Performance expectancy is understood by reliability, integrity, and identity assurance (Ho et al., 2003). Since the use of chatbots could be influenced by the expected performance, this study recommends the undermentioned hypothesis:

H2: Performance expectancy positively affects users' intention to use chatbots.

Efforts expectancy is also considered one of the major factors that examine the ease level of using information technology. It is because a positive relationship is present between achieved performance and put effort (Ghalandari, 2012). Efforts expectancy is the extent of acceptance related to using any system in decision-making (Venkatesh et al., 2003). Efforts expectancy is referred to as efforts needed to apply the system irrespective of its simple or complex. Effort expectancy is an enormously significant determinant in influencing the user intention to use (Giesing, 2003). McLeod et al. (2008) demonstrated that performance expectancy and trust in software logic are loaded on the same factor. Like other artificial intelligence software, chatbots intend to reduce human efforts. Therefore, this study proposes the hypothesis as follows:

H3: Effort expectancy positively affects users' intention to use chatbots.

Trust is essential for deciding the user's intent to adopt mobile technologies (Alalwan et al., 2017). Trust has a substantial effect on the behavioral intention for the use of mobile learning. Although Kabra et al. (2017) didn't get any significant association between user trust and behavioral intention. Madsen and Gregor (2000) described trust as the degree to which a customer is assured and eager to act based on suggestions, events, and judgments. Trust of the buyer reduces the perceived risk, decreasing the buyer's intention for transactions in business to the consumer market (Pavlou and Gefen, 2004). Trust negatively influences the perceived risk that affects consumer intent to use the information interchange in the business environment (Nicolaou and McKnight, 2006). Perceived risk is a facilitating determinant in the relationship between behavioral intention and trust (McLeod et al., 2008). Trust is a critical factor in the success of the online business (Corritore et al., 2003). The purpose of chatbots is to simulate a human conversation in response to natural language input through text or voice (Dale, 2016). As the usage of the network for e-commerce and information gain access continues to grow, user faith in websites has come under examination. Chatbots are expected to play a crucial role in customer assistance. Users' trust in this kind of chatbot is vital for their uptake. As for innovative technology like chatbots, trust is considered as the main component to rely on technology. Therefore, the following hypothesis is proposed:

H4: Trust has a significant impact on users' intention to use chatbots.

A person's intention to use technology is considered as a behavioral intention in the system of user acceptance (Dillon and Morris, 1996). Knowledge of consumer behavioral intention toward using the internet-based system has become very popular in recent years. Attitude is considered as an individual feeling to use the technology, and the intention of using technology in the future will affect the actual utilization of a technology-based system (Othman et al., 2019). Artificial intelligence-based advanced products would be formulated in many ways and evaluated by consumers frequently as per technology evolution. However, the development of technology and its relevance in different fields are not sufficient to confirm consumer utility and search for potential advantages. Since use intention is reported to be a strong predictor of user behavior. Therefore, the following hypothesis is proposed:

H5: User's behavioral intentions to use chatbots positively affect the usage of chatbots.

Table 1 presents the summary of the hypotheses.

Table 1. Summary of hypotheses

| Hypothesis | Effect Type | Relationship between construct (Direction) |
|------------|-------------|---|
| H1 | Direct | User's past experience → users' intention to use chatbots |
| H2 | Direct | Performance expectancy → users' intention to use chatbots |

Continued Table 1

| Hypothesis | Effect Type | Relationship between construct (Direction) |
|------------|-------------|--|
| H3 | Direct | Effort expectancy → users' intention to use chatbots |
| H4 | Direct | Trust → users' intention to use chatbots |
| H5 | Direct | User's behavioral intentions → usage of chatbots |

Sources: developed by the authors.

Methodology and research methods. The key objectives considered in this research are to study user experience and trust's impact on customer intention to use chatbots. In order to study the influence of performance expectancy and effort expectancy on customer intention to use chatbots and to ascertain the relationship between customer intention and chatbot usage. The paper uses a structured questionnaire to collect data for testing the proposed model. The questionnaire includes items related to user experience, effort expectancy, trust, performance expectancy, and use intentions. Demographic details of the respondents were also captured. Research items were calculated using a Likert scale of five points ranging from strongly disagree (1) to strongly agree (5). A research questionnaire in Delhi and Jaipur included respondents with experience interacting with chatbots. The online survey was arranged and was then sent to the respondents. After comprehensive data cleaning, 354 responses were considered fit for analysis. Table 2 gives a sample profile.

Table 2. Respondents profile

| Demography particular | No. of respondents | % |
|----------------------------------|--------------------|-----|
| Gender | Male | 189 |
| | Female | 165 |
| | Total | 354 |
| Age in years | Below 21 | 56 |
| | 21-30 yrs. | 134 |
| | 31-40 yrs. | 123 |
| | 41-50 yrs. | 41 |
| | Total | 354 |
| Chatbot usage experience (years) | Less than 1 | 52 |
| | 1-2 | 173 |
| | More than 2 | 129 |
| | TOTAL | 354 |

Sources: developed by the authors.

Figure 1 depicts the proposed model.

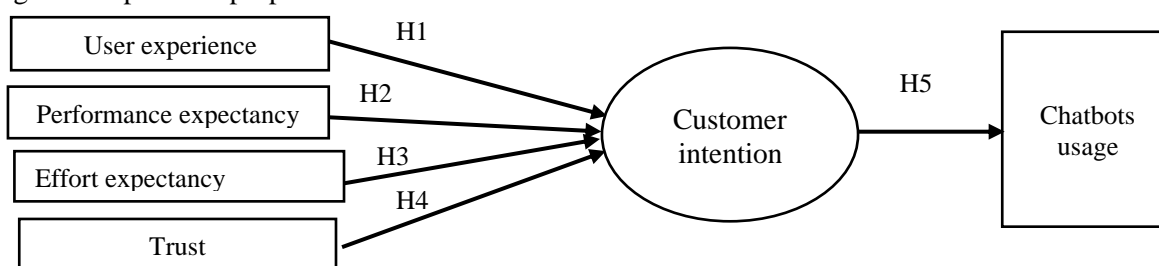


Figure 1. Hypothesized research model

Sources: developed by the authors.

The study has derived four variables related to performance expectancy from Venkatesh et al. (2012), four items from Venkatesh et al. (2012) for effort expectancy, three items from Corritore et al. (2005) for trust, and three items from Venkatesh et al. (2012) for behavioral intention.

Results. Reliability is related to the extent to which the survey instrument constantly assesses constructs across various instances. Reliability reflects the capability of numerous items to determine a single construct. Cronbach's α assessed to decide whether the items reliably calculate the particular construct, 0.60 as the threshold value (Cohen, 1960; Cohen, 1988; Nunnally, 1967). Reliabilities for every construct were calculated using SPSS. If a 0.60 threshold value was not encountered, items were eliminated until the threshold of 0.60 had been gained. The reliabilities relate to all multi-construct items. All items of the proposed model exceeded

loadings 0.60, which is acceptable, having good construct reliability. Table 3 displays a summary related to measurement scales.

Table 3. Measurement scales summary

| Construct | Variable | Mean | Cronbach Alpha |
|-------------------------------|--|-------|----------------|
| User experience | UE1: My experience with chatbots has been satisfying. | 3.348 | 0.80 |
| | UE2: During my usage, I found chatbots reliable. | | |
| | UE3: I always get my issues resolved through chatbots. | | |
| Performance expectancy | PE1: I find chatbots useful in my everyday life. | 3.522 | 0.79 |
| | PE2: Using chatbots increases the likelihood of attaining things that are important to me. | | |
| | PE3: Using chatbots aids me in accomplishing things more quickly. | | |
| | PE4: Using chatbots increases my productivity. | | |
| Effort expectancy | EE1: Learning to use chatbots is easy for me. | 3.426 | 0.76 |
| | EE2: My interaction with chatbots is clear and understandable. | | |
| | EE3: I find chatbots easy to use. | | |
| | EE4: It is easy for me to become skillful at using chatbots. | | |
| Trust | T1: I believe that chatbots are trustworthy | 2.387 | 0.74 |
| | T2: I trust chatbots | | |
| | T3: I believe that chatbots will not act in a way that will be harmful to me | | |
| Behavioral intention | BI1- I intend to continue using chatbots in the future. | 2.457 | 0.72 |
| | BI2- I will always try to use chatbots in my everyday life. | | |
| | BI3- I plan to continue to use chatbots. | | |
| Chatbots usage | CU1: I often use chatbots to get my queries answered. | 3.698 | 0.83 |
| | CU2: I always use chatbots as a preferred mode for interacting with websites. | | |
| | CU3: I like to use chatbots. | | |

Sources: developed by the authors.

Table 4 depicts factor analysis. All eighteen items of dependent and independent variables demonstrated loadings higher than the 0.60 threshold, which is acceptable and considered for model fit.

Table 4. Factor analysis

| Items | User's past experience | Performance expectancy | Effort expectancy | Trust | User's intention | Chatbots usage |
|-------|------------------------|------------------------|-------------------|-------|------------------|----------------|
| UE1 | 0.723 | | | | | |
| UE2 | 0.680 | | | | | |
| UE3 | 0.683 | | | | | |
| PE1 | | 0.712 | | | | |
| PE2 | | 0.659 | | | | |
| PE3 | | 0.750 | | | | |
| PE4 | | 0.767 | | | | |
| EE1 | | | 0.609 | | | |
| EE2 | | | 0.743 | | | |
| EE3 | | | 0.815 | | | |
| EE4 | | | 0.727 | | | |
| T1 | | | | 0.724 | | |
| T2 | | | | 0.709 | | |
| T3 | | | | 0.507 | | |
| BI1 | | | | | 0.702 | |
| BI2 | | | | | 0.670 | |
| BI3 | | | | | 0.733 | |
| CU1 | | | | | | 0.796 |
| CU2 | | | | | | 0.870 |
| CU3 | | | | | | 0.746 |

Sources: developed by the authors.

Table 5 indicates a significant correlation between the variables. It is also evident that there is a significant and positive correlation as the value of Pearson correlation is above 0.425 of all the variables.

Table 5. Correlation matrix

| Construct | User's past experience | Performance expectancy | Effort expectancy | Trust | User's intention | Chatbots usage |
|------------------------|------------------------|------------------------|-------------------|---------|------------------|----------------|
| User's past experience | 1 | | | | | |
| Performance expectancy | 0.491** | 1 | | | | |
| Effort expectancy | 0.583** | 0.587** | 1 | | | |
| Trust | 0.578** | 0.425** | 0.579** | 1 | | |
| User's intention | 0.522** | 0.679** | 0.470** | 0.517** | 1 | |
| Chatbots usage | 0.452** | 0.539** | 0.598** | 0.580** | 0.544** | 1 |

Sources: developed by the authors.

The application of Structural Equation Modelling (SEM) has gradually expanded in the literature. The SEM method starts with a version description that links up the variables to assume the effect of different variables and the directivities of their effects (Kline, 2005). In order to evaluate the measurement model, AMOS 21.0 was utilized. Evaluating the measurement model is a three-step process comprising the calculation of two types of validity and consistency. Before proceeding with model fit measurement, the three steps were performed to assess the accuracy better, i.e., by performing AVE (Average variance explained) for each identified construct. 0.50 threshold is acceptable, suggested by Fornell (1981) as shown in Table 6. The results table shows that the received values exceeded the applicable threshold 0.50, indicating that convergent validity is acceptable. The average variance extracted has exceeded the accepted threshold .50 for each construct, indicating that the convergent validity has been satisfied.

Table 6. AVEs and CRS

| Construct | No. of items | AVEs | CR |
|------------------------|--------------|------|------|
| User's past experience | 3 | 0.82 | 0.86 |
| Performance expectancy | 4 | 0.73 | 0.80 |
| Effort expectancy | 4 | 0.78 | 0.89 |
| Trust | 3 | 0.65 | 0.62 |
| User's intention | 3 | 0.77 | 0.81 |
| Chatbots usage | 3 | 0.64 | 0.60 |

Sources: developed by the authors.

After performing discriminant validity in assessing model fit, the next step is to conduct discriminant validity. It helps to confirm that the identified construct is not similar (Messick, 1987). AVEs square root is larger than correlations, so discriminant validity is fully satisfied (Chin, 1998). Table 7 explains the correlations and AVEs identified. Based on the measurement model, the values were acceptable and suitable for further analysis.

Table7. Correlations of constructs and AVEs

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------|------|------|------|------|------|------|
| 1. User's past experience | 0.78 | | | | | |
| 2. Performance expectancy | 0.67 | 0.88 | | | | |
| 3. Effort expectancy | 0.44 | 0.67 | 0.79 | | | |
| 4. Trust | 0.15 | 0.27 | 0.19 | 0.83 | | |
| 5. User's intention | 0.27 | 0.29 | 0.38 | 0.22 | 0.76 | |
| 6. Chatbots usage | 0.50 | 0.36 | 0.37 | 0.26 | 0.22 | 0.88 |

** Significance value of correlation at the 0.05 level (2-tailed). Overall measurement model fit related to the structural model and hypothesis testing.

Sources: developed by the authors.

The model with observable and unobservable variables with the overall model measurement was then checked. The goodness fit indices (Table 8) related to the structural model suggest the hypothesized model that sufficiently fits the definitive model has satisfactory values.

Table 8. Measurement model

| Goodness of fit-indices | Initial | Final |
|-------------------------|---------|-------|
| CMIN/DF | 3.819 | 1.548 |
| GFI | 0.579 | 0.911 |
| TLI | 0.499 | 0.935 |
| CFI | 0.605 | 0.935 |
| RMS | 0.070 | 0.040 |
| IF | 0.410 | 0.921 |

Sources: developed by the authors.

The reported SEM results are evaluated based on the projected path coefficient β value, p -value ≤ 0.05 applied here to decide the path coefficient's importance. The β value for the constructs is above 0.3 (Table 9), which is acceptable.

Table 9. Significance test

| Summary of hypothesis testing and model parameters | | | | | |
|--|------------------------|-------------|----------------------|---------|-----------|
| Hypothesis | Paths | Effect type | Results | | |
| | | | Standardised β | p Value | Result |
| H1 | UE \rightarrow I (+) | Direct | 0.359 | <0.01 | Supported |
| H2 | PE \rightarrow I (+) | Direct | 0.323 | <0.01 | Supported |
| H3 | EE \rightarrow I (+) | Direct | 0.471 | <0.01 | Supported |
| H4 | T \rightarrow I (+) | Direct | 0.451 | <0.01 | Supported |
| H5 | I \rightarrow CU (+) | Direct | 0.305 | <0.01 | Supported |

Sources: developed by the authors.

Conclusions. The research adopted a conceptual framework developed based on earlier research. The research analyzed the impact of user experience, performance expectancy, effort expectancy, and trust on customer intention to use chatbots keeping the Indian perspective in the backdrop. Effort expectancy and trust have emerged as the most significant factors affecting the intentions to use chatbots. Positive user experience substantially impacts customer intention to utilize chatbot services. If customers have positive and pleasant direct and indirect experiences with chatbot services, they will consider using this platform for future purposes. Performance expectancy positively affects customer intentions. A positive and significant impact of effort expectancy is also found in chatbot services. Customers are believed to always look for benefits against their efforts to use technology services. If they get maximum benefits, they will use chatbot services, which will recommend them to others. The overall positive customer intention developed on different behavioral dimensions would increase the use of chatbot usage for taking services to resolve many technological and non-technological issues. The research attempted to understand the factors affecting chatbot usage among consumers. The artificial intelligence-based chatbot application system, considered an advanced dialogue system, would automate the complete business processes. Therefore, it is imperative to understand the antecedents of chatbot use intentions. The digital environment in India has developed manifold over the past few years. A modern and developed system is required to develop the industry mechanism for companies to gain effective advantages and to make business processes functional. This system should have processing subsystems to make the chatbot application more advanced.

The chatbot is useful in responding to customer queries and claims, selling products and services, and making customers aware of the company's offers. A chatbot can more accurately analyze the data than human beings to predict market forecasts and customer risk. Companies need to realize that trust in technology encourages its usage. Therefore, the interface should be designed to interpret the users' inquiries and requests correctly. Also, research on the subject matter reports that another key factor that affects trust in chatbots is their ability to provide helpful and informative responses. Therefore, web designers and businesses should work on this aspect without fail. A chatbot responds to customers' various queries comfortably without wasting the customer's time waiting in phone queues or sending repeated emails, reducing the customers' efforts. The customers' efforts are lowered. Chatbot provides many benefits to companies, like reducing the number of customer calls, lessening the cost of customer care handling, etc. A chatbot can offer an alternative

to render customer services in a standardized way for standard or general queries while seeking human help only when required for a customized solution. Embedding a chatbot service on a company's webpage benefits the company and the customer. However, the use of a chatbot depends upon the amount of trust it commands, the effort, the performance expectancy, and the experience the customers have had regarding its interactions. Future studies on chatbots can also be conducted considering customer-related factors, like demographics and personality traits. Comparative studies could also be undertaken between chatbots based on consumer preferences and chatbot features.

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Використання чат-ботів у цифровому суспільстві: роль довіри

Цифрофізація спровокувала лавиноподібні зміни у всіх секторах економіки. Наразі впровадження технологічних рішень у бізнес-діяльність є необхідною умовою забезпечення конкурентоспроможності. Крім того пандемія коронавірусу інтенсифікувала поширення цифрових технологій у бізнес секторі. Зокрема, використання інтерактивних програмних платформ (чат-ботів) дозволяє полегшити комунікаційні процеси компанії, а також мінімізувати витрати на комунікацію зі споживачами. Тому організації використовують штучний інтелект, щоб бути більш ефективним і економічно вигідним. Чат-боти – це програмне забезпечення зі штучним інтелектом, яке дозволяє організаціям давати своєчасні відповіді на запити клієнтів в Інтернеті. Основною метою проведеного дослідження є визначення впливу досвіду, очікуваної результативності, витрачених зусиль та довіри споживачів на їх наміри використовувати веб-застосунки (чат-боти) для покупки товарів та послуг. Підґрунтям для перевірки висунутих в роботі гіпотез стали результати анкетування 354 респондентів з Індії. Структу анкети розроблено на основі наявних наукових напрацювань, присвячених питанням сприйняття інноваційних технологій та поведінки споживачів. Аналіз отриманих даних здійснено за допомогою програмного забезпечення AMOS 21. Емпіричні результати дослідження засвідчили позитивний вплив користувацького досвіду, очікуваного рівня довіри та очікуваних зусиль на наміри клієнтів використовувати чат-боти, що, своєю чергою, впливає на їх фактичне використання. Дослідження емпірично підтверджує та теоретично доводить взаємозв'язок між різними змінними, які впливають на наміри клієнтів використовувати чат-боти. Наведено основні обмеження інтерпретації отриманих результатів дослідження та подальші напрямки їх усунення. Отримані результати мають теоретичний внесок у заповнення прогалин наукових напрацювань, присвячених дослідженню факторів, які впливають на наміри клієнтів використовувати сучасні інноваційні веб-застосунки компанії, переважно, в Індії.

Ключові слова: користувацький досвід, очікувана результативність, очікуване зусилля, довіра, наміри клієнта.