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FACTORS INFLUENCING CONSUMER ACCEPTANCE OF CHATBOTS: EVIDENCE FROM AZERBAIJAN

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Abstract

The rise of digital communication has prompted businesses to adopt innovative tools such as chatbots to enhance consumer engagement. Using the Technology Acceptance Model (TAM), this study investigates Azerbaijani online consumers' attitudes and intentions toward chatbot adoption. Survey data from 325 respondents indicate that perceived usefulness significantly shapes positive attitudes, whereas perceived ease of use and perceived risk were not statistically significant. Additionally, consumer attitudes significantly predict their behavioural intentions toward chatbot use. The findings suggest that emphasizing the practical benefits of chatbots can drive greater consumer acceptance and usage. The study extends TAM to a new cultural context and provides practical insights for businesses seeking to leverage chatbots effectively.
Keywords: *Chatbots, Consumer attitudes, Technology Acceptance Model, Perceived Usefulness, Perceived Risk, Behavioural Intention.*
JEL: *M31, O33*

Introduction

In the contemporary consumer-centric environment, brands are compelled to enhance their customer communication strategies to effectively address the evolving demands and expectations of consumers. The optimisation of customer communication is pivotal for brands, offering advantages such as increased speed, cost efficiency, and the strengthening of brand loyalty (Oetama, 2022). Traditional marketing communication methods, which rely heavily on physical customer service representatives, have proven inadequate in today's digital age. The reliance on human intermediaries often introduces challenges related to response time, emotional engagement, and operational costs (Yadav & Pavlou, 2020).

With advancements in technology, particularly in artificial intelligence (AI), brands are increasingly integrating AI-based chatbots into their customer communication frameworks. The core premise of this integration lies in AI's capability to mimic human intelligence, facilitated by developments in machine learning and natural language processing (NLP) (Xia & Shannon, 2025). Chatbots,

which are text or voice-driven programmes designed to simulate human-like interactions, offer brands substantial benefits, including enhanced speed, elevated efficiency, reduced costs, and improved reliability (Adamopoulou & Moussiades, 2020 a).

Despite their potential, chatbots, as a relatively new technology, face challenges in terms of user acceptance and recognition. This research seeks to explore consumer attitudes and behaviours towards chatbots, especially in light of the limitations associated with traditional customer service representatives and the growing adoption of chatbots as a primary communication tool by brands. The study employs the Technology Acceptance Model (TAM) to evaluate consumer perceptions of new technologies

Literature review

Chatbots

The advent of Industry 4.0, characterised by the integration of information technologies within industrial frameworks, has ushered in an era marked by heightened productivity, speed, cost-efficiency, and reliability (Liao et al., 2017). Within this paradigm, artificial intelligence (AI), automation systems, and robotics play a pivotal role in the industrial economy. Chatbots, as an extension of AI technologies, derive their nomenclature from the amalgamation of "Chat" (conversation) and "Bot" (robot) (Adamopoulou & Moussiades, 2020b). They represent a significant manifestation of AI technologies in the realm of human-computer interaction, acting as technological innovations that enhance user productivity. The societal acceptance of this technological innovation is imperative for its market implementation. While universal acceptance of new technologies cannot be presumed, identifying individuals inclined towards adoption is crucial for practitioners of chatbot technologies (Abu Shawar & Atwell, 2007).

With the proliferation of e-commerce and advancements in AI technologies, chatbots have become integral consumer communication tools across various sectors such as healthcare, banking, and travel (Pillai & Sivathanu, 2020). Chatbots are recognised as the most technologically advanced commercial tools among contemporary consumer communication channels. They facilitate interactions on online platforms, mitigating negative consumer perceptions that may arise from human interactions. By eliminating time constraints, chatbots enable consumers to swiftly access desired information (Lee, 2020).

The genesis of chatbots can be traced back to the Turing test, which evaluated initial human-information interaction assumptions (Adamopoulou & Moussiades, 2020 b). The evolution of chatbots has paralleled developments in AI technologies, expanding their usage and impact. For instance, AI technologies influence product development, customisation based on consumer needs, and supply chain logistics (Belhadi et al., 2024). In pricing strategies, AI assists businesses in forecasting future prices using machine learning methodologies (Yaiprasert & Hidayanto, 2024). In promotional activities, AI provides businesses with tools to better understand consumers by analysing historical data and delivering targeted messages through optimal channels (Mariani et al., 2022) consumer research, and psychology literature. By leveraging a systematic literature review using a data-driven approach and quantitative methodology (including bibliographic coupling.

A review of literature on the impact of AI-based chatbots in marketing reveals pertinent studies. For example, For instance, Shahzad et al., (2024) show that, for Chinese consumers of luxury fashion brands, superior AI-chatbot service quality (the "stimulus" in their S-O-R framework) boosts e-brand loyalty by enhancing user trust, enriching the chatbot experience, and generating favourable electronic word-of-mouth. Van den Broeck et al., (2019) posits that the effectiveness of chatbot-delivered advertising on Facebook Messenger hinges on how intrusive the ads feel: when users perceive the bot itself as helpful and useful, those ads seem less intrusive, are accepted more readily, and ultimately lead to stronger purchase and recommendation intentions. As such, developing chatbots as effective consumer communication channels is a prerequisite for their interaction with advertising. In this context, chatbots are employed as communication tools in marketing, progressively improving their communication skills with each interaction, and subsequently generating more personalised outcomes. Consequently, chatbots offer brands and companies opportu-

nities to organise tasks, reduce errors, collect extensive data, enhance brand loyalty, and create new brand images (Savastano et al., 2024).

Conceptual phramework

Technology Acceptence Model (TAM)

The Technology Acceptance Model (TAM), initially formulated by Davis in 1989, serves as a framework to forecast the attitudes and behaviours of individuals interacting with computers. In contemporary settings, characterised by the swift advancement of information technologies, TAM is extensively employed to evaluate consumer intentions regarding the utilisation of these technologies (Liu et al., 2024; Mohebbi et al., 2012) which can be classified into two categories: technological and behavioral perspectives. In this paper, the authors propose an integrated household Internet adoption model combining both perspectives to provide a holistic view on the subject. For this purpose, the three primal models of technology acceptance and usage behavior, the technology acceptance model (TAM).

Central to this model are three constructs: perceived usefulness (PU), perceived ease of use (PEOU), and perceived risk (PR), each playing a pivotal role in shaping consumers' attitudes and behaviours towards information technology. Perceived Ease of Use (PEOU) pertains to the extent to which an individual believes that using a particular system would be free of effort. When a consumer perceives a technology as straightforward and user-friendly, it significantly enhances their behavioural intention to use the technology (Luo et al., 2011).

Conversely, Perceived Risk (PR) encapsulates the uncertainty consumers may feel regarding the outcomes of using new technology, particularly concerning data privacy and financial transactions. Literature suggests that heightened perceived risk can adversely affect consumer attitudes and intentions (Joo & Sang, 2013).

Finally, Behavioural Usage (BU) denotes the frequency and intensity with which consumers engage with a new technology, further influencing overall adoption rates (Joo & Sang, 2013). The interplay of these components within TAM offers valuable insights into consumer behaviour, providing a robust theoretical foundation for examining technology adoption within diverse contexts.

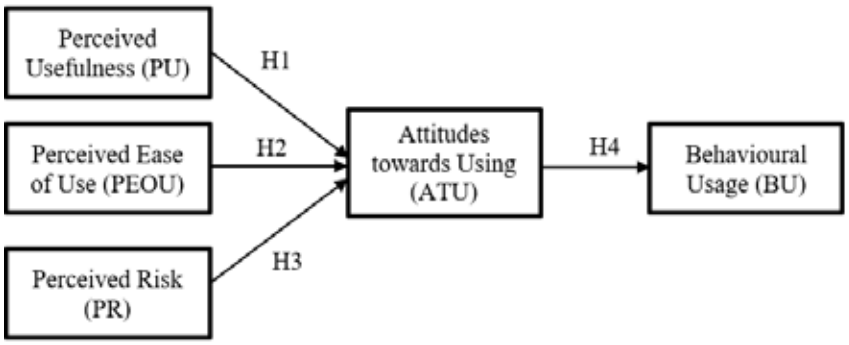
Methodology

Following the introduction of a novel technology, consumers invariably form opinions, be they favourable or unfavourable, irrespective of the technology's inherent benefits. For both consumers and businesses, understanding the market's reception of a new technology is paramount. Insights into consumer attitudes and behaviours regarding technology provide invaluable guidance for established businesses and prospective market entrants alike. This research seeks to ascertain the attitudes and behaviours of online shoppers concerning the adoption of chatbots.

In this study, we employed a quantitative research method, aligning with the research objective of examining relationships between variables from a holistic viewpoint. This approach allows for a structured analysis suitable for drawing statistically significant inferences.

We posit that the constructs of the Technology Acceptance Model (TAM) exert a positive influence on attitude towards use, subsequently driving behavioural use. Drawing upon established research in the Technology Acceptance Model (Candela, 2018), we propose the conceptual model illustrated in Figure 1.

Figure 1. *Research model (own elaboration)*



The following hypotheses, grounded in the Technology Acceptance Model (TAM) were formulated to guide the research:

H1: Perceived usefulness exhibits a positive relationship with attitude towards using chatbots.

H2: Perceived ease of use exhibits a positive relationship with attitude towards using chatbots.

H3: Perceived risk exhibits a negative relationship with attitude towards using chatbots.

H4: A positive attitude towards chatbots exhibits a positive relationship with behaviour intention towards using chatbots.

The data for this research were gathered via an online survey. The target population comprised individuals aged 18 years or older, residing in Azerbaijan, who possess prior experience with chatbots.

To ensure a robust statistical foundation, the research design prioritised maintaining a confidence level exceeding 94% across the entire scope of the investigation. Consequently, the Z-value was set at 1.96, and the alpha value was established at 0.05. Based on these parameters and the application of the appropriate sample size calculation formula, the minimum required sample size was determined to be 290 participants. The actual data collection process involved surveying 325 individuals who had prior experience interacting with chatbots, thereby exceeding the calculated minimum and bolstering the statistical power of the analysis.

To facilitate the attainment of the research objectives, a criterion sampling methodology was implemented. This approach, as described by Patton (2015), entails the deliberate selection of participants, objects, or situations that demonstrably possess specific characteristics directly relevant to the research problem under investigation. Within this study, the selection criteria mandated that participants possess a foundational understanding of chatbots and have direct, prior experience with their use.

The survey instrument employed in the data collection process was structured into three distinct sections. The initial section presented participants with a voluntary participation consent form and included items designed to capture relevant demographic information. Critically, this section also contained questions designed to ascertain the participants' existing knowledge of chatbots and whether they had previously interacted with them. Individuals responding negatively to these screening questions were systematically excluded from the final research sample to ensure the validity and relevance of the collected data.

Results

In this section, demographic characteristics of the participants, factor and regression analysis results are presented.

In this study the demographic characteristics of respondents and the results of the factor and regression analyses are presented in plain text. Among the participants, 52.4% were female and 47.6% were male. Age distribution shows that 54.6% were 18––24 years old, 40.5% were 25–35 years old and 4.9% were 36–49 years old. With respect to education, 2.5% had completed primary school, 14.4% held a high-school diploma, 17.8% possessed an associate degree, 52.5% a bachelor's degree and 12.8% had undertaken postgraduate study. Regarding frequency of chatbot use, 10.1% interacted with chatbots daily, 23.6% weekly, 44.6% monthly and 21.7% only once a year.

Suitability of the Technology Acceptance Model (TAM) scale for factor analysis was confirmed with a Kaiser–Meyer–Olkin value of 0.94 and a Bartlett's test result of $\chi^2 = 5\,651.121$, $p < 0.05$. Factor analysis extracted four factors. The first, perceived benefit, comprised six items with loadings between 0.489 and 0.878 and accounted for 13,9% of the total variance. The second, perceived ease of use, included six items with loadings from 0.830 to 0.984 and explained 50,9% of the variance. The third, perceived risk, contained four items with loadings between 0.848 and 0.905 and explained 6,04% of the variance. The fourth, attitude toward use, comprised three items with loadings from 0.427 to 0.985 and explained 5,3% of the variance. Together, these results demonstrate that the TAM structure is appropriate for analysing online consumers' attitudes toward and behavioural intentions regarding chatbot use.

To test whether the behavioural-use scale was appropriate for factor analysis, Kaiser–

Meyer–Olkin and Bartlett's statistics were examined. The analysis returned a KMO value of 0.86, confirming adequate sampling adequacy (KMO > 0.50). Bartlett's test produced $\chi^2 = 1593.167$, $p < 0.05$, indicating that the correlation matrix was factorable.

Testing Hypotheses

In the preliminary analysis of the data, normality, reliability and factor analysis were performed and it was seen that there was no problem in testing the hypotheses. In the study, multiple regression analysis was used to measure the cause and effect relationship between the dependent and independent variables and the hypotheses formed within the framework of the research model were tested.

Impact of TAM components on attitude toward using chatbots

Multiple regression analysis was used to determine the effect of technology acceptance model components on the attitude towards using chatbots.

As can be seen in Table 1, the independent variables which are the components of the technology acceptance model; perceived usefulness, perceived ease of use and perceived risk affect 14.3% of the variance in online consumers' attitude towards using chatbots ($R_2 = 0.143$). The independent variables PU, PEOU and PR explain the dependent variable CIT in a statistically significant way according to the absence model ($F = 17.27$; $p < 0.001$; $T = 0.27$; $VIF = 3.7$). Although the R_2 value expresses a low bond, the suitability of the variables used in the model for regression analysis was analysed with Tolerance and VIF values and it was determined that it was within acceptable limits. In other words, it is understood that there is a regression relationship between the independent variables in the model and the dependent variables and the model is meaningful as a whole (Pallant, 2020).

Table 1. *The effect of technology acceptance model components on attitude towards using chatbot*

	Dependent Variable Attitude towards using (ATU)					
Independent Variables	Std β	t	p	R	Adj. R^2	F
Factor 1. Perceived Usefulness (PU)	0,24	4,1	0,01**			
Factor 2. Perceived Ease of Usage (PEOU)	0,03	0,30	0,7	0,37	0,143	17,27
Factor 3. Perceived Risk (PR)	0,07	1,24	0,2			
Fixed		16,45	0,01**			
*p< 0,05; p** < 0,01						

Multiple regression analyses were performed in order to affect the dependent variable of CWB by using the independent variables of PU, PEOU and PR. As a result of the analysis, a significant regression model was established ($F = 17.27$; $p < 0.001$). Accordingly, perceived usefulness (PU) positively and significantly affects attitude towards using chatbots (ATU) ($\beta = 0.24$; $t = 4.1$; $p < 0.01$) (H1). Perceived ease of use (PEOU) affects the attitude towards using chatbots (ATC) positively but not statistically significant. ($\beta = 0.03$; $t = 0.30$; $p = 0.7$) (H2). Perceived risk (PR) affects the attitude towards using chatbots negatively but not statistically significant ($\beta = 0.07$; $t = 1.24$; $p = 0.2$) (H3). Candela (2018) concluded that the perceived risk level is effective in determining Italian consumers' attitudes towards chatbots. This situation, which we think is due to the frequency of experiencing chatbots, differs from the literature.

The impact of attitude towards using chatbots on behavioral usage

Attitude towards using chatbots on the use of chatbots linear regression analysis was used to determine the effect of the regression analysis. In the analysis phase, firstly the assumptions of regression analysis were tested. When the correlation coefficients were examined to determine whether there was a multicollinearity problem, it was found that the coefficient was below 0.80 and multiple. It was determined that there was no linearity problem (0,27). Tolerance and VIF values (Tolerance = 1,00; VIF = 1,00) were determined. When the Mahalanobis value was examined to determine whether there were outliers, the most extreme value was determined as 12.3 and it was determined that participants 1 and 2 could be outliers. However, as stated by Pallant (2020), Cook's value should be checked before excluding these values from the research. If Cook's value is 1 and greater than 1, it should be excluded from the research. In this context, it is seen that Cook's value is 0.03 and there is no need to exclude the data from the research.

As seen in Table 2, a linear regression model was established between attitude towards using chatbots and behavioural use. The SDT explains 0.7% of the variance in behavioural usage (R2=0.071) and this is significant according to the null model (F=24.8; p<0.01). Accordingly, attitude towards using chatbots positively and statistically significantly affects behavioural use (β =0.27; t=4.9; p<0.001) (H4). When the Tolerance (1.00) and VIF (1.00) values were examined, the significance of the model as a whole was supported.

Table 2. *The effect of attitude towards using chatbots on behavioural use.*

	Dependent Variable Behavioural Use (BU)					
Independent Variables	Std *β*	*t*	*p*	*R*	Adj. R^2	*F*
Factor 1. Attitude towards using (ATU)	0,27	4,9	0,01**	0,271	0,071	24,81
Fixed		4,8	0,01**			
* p < 0,05; p ** < 0,01						

Conclusion

Marketing practitioners increasingly use chatbots as alternatives to human customer-service agents. In a competitive global market, integrating chatbots into consumer strategies is becoming standard. Research confirms chatbots positively impact customer attitudes and behaviours, offering operational advantages such as reduced costs, faster responses, and stronger loyalty.

Reducing consumer hesitation about chatbots accelerates acceptance. Understanding adoption drivers helps firms precisely target consumers and design effective marketing strategies. Thus, identifying factors influencing chatbot usage is strategically important for digital businesses.

This study applied the Technology Acceptance Model (TAM) to evaluate consumer perceptions and adoption of chatbots. TAM proposes that perceptions shape attitudes, influencing usage behaviour. Regression analysis showed TAM constructs explain 14.3% of chatbot-related attitudes. Perceived usefulness (PU) significantly influenced attitudes, meaning consumers recognizing clear benefits have more positive attitudes. Perceived ease of use (PEOU) and perceived risk (PR) showed expected trends but lacked statistical significance, possibly due to limited user experience in Azerbaijan. Attitudes explained 7% of behavioural intentions, suggesting attitudes partially drive usage but other factors also contribute.

Perceived usefulness emerged as the strongest factor influencing attitudes and chatbot adoption. Consumers valuing speed, convenience, or personalisation are more inclined to use chatbots. Ease of use and risk perceptions were less influential.

Managerially, advanced chatbot technologies employing natural-language processing and machine learning should be

prioritised over basic scripted solutions to enhance loyalty, profitability, and operational efficiency.

Future research could enrich TAM with additional variables, investigate across cultures, demographics, or sectors, and employ longitudinal designs to capture evolving user experiences.

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