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RESEARCH ARTICLE

Consumers' behavior in conversational commerce marketing based on messenger chatbots [version 1; peer review: awaiting peer review]

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Abstract

Background: The increasing penetration of smartphones and the Internet in developing countries caused the rise of e-retail. Conversational commerce is highly increasing via interaction through messengers. To extract the benefits of both trends, companies have adopted messenger chatbots. These chatbots use Artificial intelligence and natural language processing to give live responses to the customer and assist online shopping on the messenger interface. This research aims to discover the factors that affect the use of messenger chatbots and their influence on attitude and behavior intention.
Methods: The research methodology includes the Technology Acceptance Model (TAM) with the variables of perceived usefulness, perceived ease of use, consumer trust, and anthropomorphism. The authors used an online survey for collecting the responses from 192 respondents and analyzed structural equation modelling.
Results: Customer trust has shown the most decisive influence on customer attitude followed by Perceived Usefulness, Perceived Ease of Use. Also, the use of chatbots to make online shopping faster significantly affects the use of messenger chatbots for online shopping in the future. The authors explore various factors resulting in consumers' favor of accepting chatbots as an interface for m-commerce.
Conclusions: The findings indicate that organizations should design strategies to improve interaction with the customer by developing messenger chatbots for more trusting conversations. Further

research could include a theoretical digital marketing approach to conversational commerce based on anthropomorphic digital technologies.

Keywords
Messenger Chatbots, Conversational Commerce, M-Commerce, Technology Acceptance Model, Artificial Intelligence, Online Shopping Experience, Anthropomorphism

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Introduction

Chatbots are computer programs that can "converse" with users via voice or text and mimic human conversation. Voice assistants and chatbots operate due to speech recognition technologies, a decision-making service, and conversion into a voice message. ELIZA was the first kind of chatbot introduced in the 1960s, although in the 1960s, the awareness of chatbots among the public was limited. Corporations have now adopted this technology to enhance customer service and develop consumer-brand solid relationships with the growing awareness. The IT giant companies conduct research and developments in automated communications, and the robots are getting more and more intelligent every day. Authors suppose that by 2025, the global market for speech recognition technologies should exceed $30 billion. More than 8 billion chatbots will be operating (for comparison, in 2018 — 2.5 billion). Chatbots seem to have a bright future as the industry predicts that 90% of banking and 75% of health care customer interactions will involve chatbots without human intervention by 2022. The underlying fact supports millennials' natural affinity for technologies.[1] These young, tech-savvy consumers are expected to adopt chatbots for multiple purposes, including shopping for products, customer service, or making reservations.

As of January 2021, GlobalWebIndex reports that 76,8% of Internet users in the world aged 16 to 64 make online purchases every month, 55,4% do it from mobile devices. Similar indicators in developing countries are not far behind. Developing countries are making efforts to reduce the backlog. For example, Russia has a "Digital Economy" program to distribute digital services. Driven by the digital India initiative, there is a significant increase in India's number of internet connections. In Russia, the share of Internet users is 60% (32% for m-commerce), in India – 74% (55% for m-commerce). The chatbot is a promising means of solving marketing problems of interaction with consumers and increasing the response rate to solve current consumer problems. At the same time, it is necessary to understand how consumers in developing countries react to interaction with chatbots what consumer requirements chatbots should meet. Therefore, the topic of this study is relevant. Chatbots have already been widely accepted and have risen for several years. Various companies associate messenger apps with providing services in response to this trend. Chatbots enhance customer experiences and fulfill expectations through real-time interactions.[2] They bring forth the concept of conversational commerce and offer new ways of communication between the companies and their customers. They constitute a channel through which companies can connect with their customers anytime through commonly used social messenger platforms like Facebook Messenger, WhatsApp, etc. The latest trend in artificial intelligence is utilizing applications that interact with consumers in a casual setting, mimicking human conversation "chatbots, conversational agents, or simply bots".[3]

The use of messenger chatbots can shorten the stages in the buying process, and is thus; companies are inclined towards it as it can be a "one-stop shopping" channel. Chatbots do not require a separate platform as they rely on the interface of the messenger platform, and there is no need to download other apps. They also cost less than actual humans for customer support.[4] Retailers are increasingly using conversational artificial intelligence (chatbots) to serve customers due to this new technology's perceived benefits and reduced operating costs.[5] However, our understanding of how consumers perceive interaction with chatbots and how this interaction may affect other consumer service programs remains limited.

The main results show that reliability and perceived usefulness are the most important criteria influencing the intention to reuse a chatbot. Contrary to expectations, empathy had no significant effect. The study suggests that when interacting with a chatbot for a purpose that may include an economic transaction, customers prefer the chatbot for its practical value since reliability and usefulness are considered more important than empathy. In addition, tangible elements play an essential role in increasing the perceived ease of use.

Since this concept is still new, there is insufficient research on chatbots for trading. This study aims to determine how users agree with using messenger chatbots for e-commerce. This study aims to determine whether consumers will use messenger chatbots for online purchases and what factors influence messenger bots.

The growth of the chatbot market relates to high Internet penetration and the E-commerce and m-commerce industry development. As of January 2021, more than 4.66 billion people already use the Internet (60% of the world's population), 92% of them connect to the Internet using mobile devices.

The development of chatbots as a way of communication is directly related to the deep penetration of social networks and messengers. In the context of a pandemic, consumers use social networks as a tool for interacting. The use of social networks and messengers as communication channels remains high. GlobalWebIndex reports that as of January 2020, the average person in the world spends 2 hours 24 minutes a day on social networks. This time is close to the average (2 hours 26 minutes in Russia and India 2 hours 24 minutes).

As of January 2021, WhatsApp has 2 billion active users, followed by Facebook Messenger with 1.3 billion users, followed by WeChat and Instagram with 1.2 billion users each (We Are Social 2020).

According to Mediascope, 73% of the population uses social networks in Russia, 49% daily. According to PWC, in 2020, 86% of global consumers plan to use social networks frequently in the future, and 91% of them use messengers (in Russia, this trend continues: 86% and 89%, respectively).

The usage of voice interfaces has grown by more than 9% over the past year, according to GlobalWebIndex2020. Globally, 43% of Internet users aged 16 to 64 use voice search and voice commands on any device every month. In India, the share of such users is 54%, and in Russia, only 25%. However, today chatbots are already actively used by businesses — about 57% of companies in Russia plan or use chatbots to interact with consumers. For example, at Tinkoff Bank, the voice assistant «Oleg» solves 35% of all customer requests without human intervention. Users find this communication format convenient — 34% prefer to interact while asking and answering questions with chatbots or virtual assistants.

For humans to feel they are talking to an actual human being or make them experience anthropomorphic chatbots, they are programmed using natural language processing with human-like dialogue.[6,7]

Han[8] obtains results confirming that anthropomorphism positively shapes consumers' intentions to purchase using chatbots. Anthropomorphism is beneficial for transaction results, but it also leads to a significant increase in consumers' sensitivity to the amount of offer. As the chatbot becomes more human-like, consumers move on to evaluating fairness or negotiating.[9]

Consumers' perception of both empathy and friendliness of a chatbot positively influences their trust in it.[10] The anthropomorphic design of brand chatbots and communication strategies of social presence can improve the outcomes of consumer evaluation.[11]

Folstad and Taylor[12] give an idea of critical drivers of user experience, including the relevance of responses and the usefulness of the dialogue. The privacy issues on the Internet negatively affect the relationship between the attitude towards chatbots and the behavioral intention to use this technology.[13]

Zarouali et al.[14] propose and test a model based on consumer acceptance of a technological model (CAT model), including three cognitive dimensions (i.e., perceived usefulness, perceived ease-of-use, and perceived helpfulness) and three affective determinants (pleasure, arousal, and dominance; PAD-dimensions).

The perceived usefulness and ease of use of chatbots have positively affected the attitude of online consumers, leading to impulse buying and the repurchase intention behavior of customers.[15]

Alt et al.[16] identify the factors influencing consumers' intention to use chatbot technology applied in the banking industry. Researchers used the measurement based on the technology acceptance model extended with compatibility, customers' perceived privacy risk, and service awareness. The findings highlight the importance of perceived compatibility and usefulness in adopting banking chatbot technology. Understanding the service affects perceived ease of use and perceived privacy risk, and it indirectly affects usage intention of banking chatbots through perceived usefulness. Also, perceived ease of use influences perceived benefit, and perceived compatibility affects perceived ease of use and service. Perceived ease of use and perceived privacy risk show no effect on intention.

Soni[17] presents Technology Adoption Model (TAM) and states that chatbots have an excellent influence on the modern generation "z," which has grown in the current conditions of widespread mobile communications. The youngsters adopt chatbots as a communicating agents. The analysis outcomes demonstrate chatbots as effective in building customer relationships.

Meyer-Waarden et al.[18] examined consumer acceptance and intention to reuse the chatbot in the context of automated customer service in the airline industry.

The authors use the TAM as the primary model considering it as one of the most widely used models for understanding adoption and use by users in various fields. TAM is among the most commonly applied model for understanding user acceptance and usage in multiple domains.[19–21] The TAM is empirically supported through validations, applications, and replications. TAM considers two beliefs to impact the customer's behavioral intention to use technology. First, is perceived Usefulness (PE), which is the extent to which user feels the use of specific technology will increase their job performance. Second, Perceived ease of use (POEU), which is a user's probability that the use of particular technology will be free of effort. As per TAM, higher PU and PEOU positively influence users' attitudes towards this system.

Attitude is an individual's positive or negative feelings about performing the target behavior.[22] Further, attitude leads to a higher intention to use the system, which has a cascading effect on the actual use of the system.[23,24]

Authors describe intention to use as "the strength of one's intention to perform a specified behavior".[22]

So,the authors have made the following hypothesis:

H1: Perceived usefulness (PE) influences the attitude of the customers.

H2: Perceived ease of use (POEU) will affect the attitude of the customers.

Anthropomorphism assigns human features to non-human beings or things like products, brands, and nature.[25] It usually makes people more connected and increases engagement. It enhances the quality of discussions by making them more exciting and influences consumers' decision-making behaviors. According to research, products that show more human-like traits are more trustworthy. Empirical studies indicate that people are more inclined to engage with websites as humans through anthropomorphic esthetic cues. Anthropomorphic website design (e.g., a website with human-like eyes) has helped increase the trust and intentions of a potential customer to purchase from such sites.[26] Social presence is when a person feels a personal human contact within a medium as if other humans are present too.[27] E-commerce considers the lack of human warmth and connection compared to offline commerce. Previous research suggests that social presence is an essential factor influencing users' trust and intention to use or make an online purchase.[28,29] So it is hypothesized that:

H3: Anthropomorphism & Social presence (AS) will influence the customers' attitude.

As per various studies and research conducted in the past and numerous information systems (IS) studied, authors suppose that, in e-commerce sets, trust and purchase behavior have a powerful link.[28] Many researchers have also claimed that belief becomes a significant factor for predicting machine/technology success. Researchers have started to believe that it is essential to investigate the consumers' confidence in this new technology as the adoption of chatbot usage depends on trust. Disclosing the full potential of chatbots considers the customers' trust. It is logical now to state:

H4: Customer Trust (CT) influences the attitude of the customers.

Several authors considered the dependence of the behavioral intentions from the general attitudes.[30–33] So, the authors assume that:

H5: The attitude of the customers will influence their Behavioral intentions.

Methods

A quantitative research approach was adopted in the study. An online survey[35] was conducted through Google forms, through which 192 responses were recorded. A judgmental sampling method is employed to identify the respondents. As the concept of messenger chatbot is relatively new, the respondents were first shown a video of a conversation with messenger chatbot, after which there were asked to answer specific questions related to chatbots. There are two sections in the questionnaire; the first section included questions to understand the demographics of the respondents, insights on their mobile phone usage, and frequency of online shopping. The second section had queries based on the factors in the technology acceptance model. These questions were designed as 5 point scale (1 = strongly disagree and 5 = strongly agree).

The authors selected a Structural Equation Modeling (SEM) approach to analyze the cause-effect relationships among constructs. Using SEM allows assessing causal relationships based on statistical data and qualitative causal assumptions.

Institutional review board permission was taken for this study (Approval Number F-2-Q1-2022). All the participants of this study were informed and written consent was taken. Participation in the study was solely based on the voluntary consent of the participants.

Results

The data[34] collected was from people above 16 years of age. Most of the respondents were of 16 to 35 years of age (82.8%) as they were the main focus of the research. 59.9% of the respondents were male, and 40.1% were female. 65% of the respondents had completed their post-graduation or even higher studies, and nearly 35% had completed their education until graduation. 33% of the respondents were heavy mobile phone users who used it for more than 5 hours.

Also, another 33% of the respondents used it for 3 to 5 hours a day. So more than three-quarters of the respondents are regular mobile users, and 95.5% used mobile messenger chats. 24.6% of respondents were heavy online shoppers who shopped more than once a month, and 38.7 % of them shopped at least once a month.

The SEM technique consists of two parts: the structural model that describes the latent variables and their relationships among themselves and the measurement model that describes the indicators to be measured. All the parameters associated with the measurement and structural models need to be calculated using appropriate estimation methods to estimate the model. The research was analyzed using the Partial Least Square (PLS) software, Warp PLS 7.0.

The PLS regression algorithm with the bootstrapping method of re-sampling was used to estimate the model that maximizes the variance explained in the latent variable scores by the latent variable indicators. The estimates included path coefficients with 'p' values, indicators' weights, loadings, and factor scores.

The validity and reliability criteria vary depending on the nature of the construct. The guidelines are shown in Table 1. After estimation, it is recommended to load/weight measurements above 0.5 and compute p values less than 0.01. Causality assumptions were verified only based on a valid model. The pre-processing of data as part of Warp PLS 7.0 analysis confirmed the data quality for further research about missing values zero variance.

The estimated model with path coefficients and corresponding 'p' values are illustrated in Figure 1.

Different fit indices were used to evaluate the model's validity. The 'p' values for both the average path coefficient (APC) and the average R-squared (ARS) should be below 0.05. Moreover, the average variance inflation factor (AVIF) should be below 5. As the model was well-represented data, all three fit criteria were satisfied, and the model had acceptable predictive and explanatory qualities. Each reflective indicator had factor loadings greater than 0.5 with a 'p' of less than 0.01. The composite reliability, Cronbach alpha, and average variance extracted (AVE) were above the threshold limits. Model parameters included R-squared and Q-squared that were satisfying for predictive validity. The square root of AVE for all constructs was more significant than any correlation involving the latent variable. All these observations confirm reliability and validity and allow for causal inference (Tables 2, 3).

Discussion

The authors suggested discussion over the relevant influencers of philosophy concerning the online purchase. They identified Perceived Usefulness (PE), Perceived ease of use (POEU), Anthropomorphism & Social presence (AS), Customer Trust (CT) as the primary influencers. Of the four variables, customer trust has shown the most decisive influence on customer attitude ($\beta = 0.42$), followed by perceived ease of use ($\beta = 0.40$) and perceived usefulness

Table 1. Validity/reliability criteria adopted in this study.

| Consideration	Guideline (WarPLS 7.0)	
	Reflective constructs	**Formative constructs**
Cronbach alpha coefficient	>0.7	NA
Composite reliability	>0.7	NA
Average variance extracted	>0.5	>0. 5
Convergent validity	p values associated with the loadings be lower than 0.05; and that the loadings be equal to or greater than 0.5; cross-loading less than 0.5	VIF<5:all indicator weights should be with p < 0.05
Discriminant validity	The square root of the average variance extracted should be higher than any of the correlations involving that latent variable	
Effect sizes of path coefficient	Effect sizes (f-squared) of 0.02, 0.15, and 0.35, respectively for small, medium, or large effect	
Predictive validity	A positive value of Stone-Geisser Q-squared coefficients	
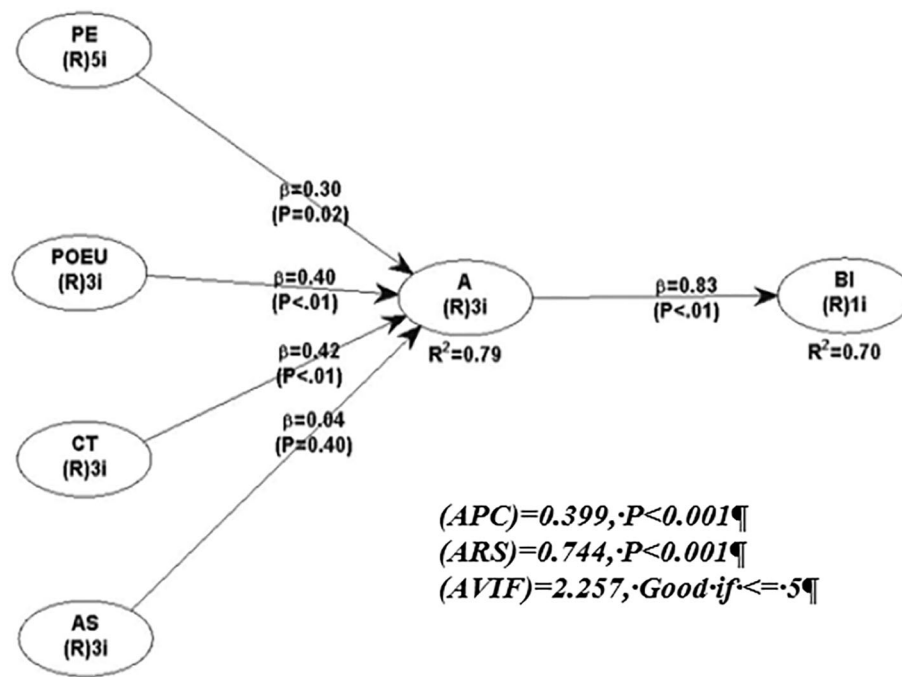
Figure 1. The estimated model with attitude and behavioral intention constructs.

Table 2. Details of critical considerations regarding validity.

No	Consideration	PE	POEU	AS	CT	A	BI
1	Cronbach alpha coefficient	.927	.847	.887	.937	.921	1.000
2	Composite reliability	.945	.923	.930	.960	.950	1.000
3	Average variance extracted	.774	.800	.817	.888	.864	1.000
4	Effect sizes of path coefficient (For paths ending at A)	.207	.308	.027	.250	NA	NA
5	Effect sizes of path coefficient (For paths ending at BI)	.149	.182	.016	.242	.659	NA
6	Convergent validity	Established as all 'p' values <0.05; loadings >0.5; cross loadings <0.5 for reflective measures					
7	Discriminant validity	Established as the square root of average variance extracted was found higher than any of the correlations involving that variable					
8	Predictive validity	Established a Q-squared coefficient of.799 for A and.695 for BI					

PE – Perceived Usefulness, POEU – Perceived ease of use, AS – Anthropomorphism & Social presence, CT – Customer Trust, A –Attitude, and BI – Behavioral Intention.

Table 3. Result of hypothesis testing.

No	Hypothesis	β value	Sig.	Result
1	Perceived usefulness (PE) influences the attitude of the customers	0.30	0.02	Accepted
2	Perceived ease of use (POEU) will influence the attitude of the customers	0.40	<0.01	Accepted
3	Anthropomorphism & Social presence (AS) will influence the attitude of the customers	0.04	0.40	Rejected
4	Customer Trust (CT) influences the attitude of the customers	0.42	<0.01	Accepted
5	The attitude of the customers will influencetheir behavioral intentions	0.33	<0.01	Accepted

(β = 0.30). Authors suppose that the research could not establish the significance of the relationship between Anthropomorphism & Social presence and the customer's (p = 0.40). This study highlights the positive influence of the customer's attitude on their behavioral intentions (β = 0.33).

Conclusions

The research highlights the importance of trust, ease of use, and usefulness of chatbots. Authors consider anthropomorphic chatbots to act as intermediaries of parasocial interaction and perceived dialogue. Chatbots potentially influence consumer attitudes towards chatbot-providing brands and their likelihood of using and recommending a chatbot. These findings indicate that organizations should design strategies to improve customer trust with messenger chatbots.

The authors tried to achieve the results by providing relevant and truthful customer queries. Authors suppose the customer profiling with improved precision. Researchers could anticipate possible objections and confusion of the customer in advance. This study also indicates that consumers prefer the ease of use of the chatbots and evaluate their usefulness. This finding suggests that the firms can incorporate user-friendly features and interfaces in the platform, enhancing customer involvement and providing a joyful experience.

This study suggests that educated young people show a positive attitude towards mobile messenger chatbots usage and are likely to shop. Thus, consumers will adopt the concept of messenger chatbots for m-commerce. Brands can think of it as the next big thing in the e-retail space and potential expansion to reach more consumers. As most consumers are heavy internet users, social media and messengers are lucrative spaces to do business. Various companies are already adopting chatbots in the customer service domain; messenger chatbots to help people find products online and shorten their purchase time will benefit the brands. While designing the messenger chatbots, the brands need to consider the rising concern of internet privacy as it affects consumers' the most. Also, the chatbots need to be easier to use and help consumers find products faster, make their shopping convenient, and make it easier for customers to follow up and provide personalized support to consumers.

Data availability

Underlying data
Figshare: Responses.xlsx, https://doi.org/10.6084/m9.figshare.19626882.v1.[34]

Extended data
Figshare: Questionnair Chatbot.docx, https://doi.org/10.6084/m9.figshare.19626879.v1.[35]

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

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