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A Study of Consumer Adoption of Chatbot in E-Commerce Sector in India

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ABSTRACT: With the advancement of technology, E-Commerce (ecom) can be an area of tremendous possibilities in terms of Artificial Intelligence (AI) driven application. In Ecom. Chatbots(cbots) are serving as flagbearers for revolutionizing accessibility and intervention, thereby addressing the growing need for customer service with a particular standard. This research documents the consumer adoption study that revolves around usage of cbots in the domain of ecom. The objective of the study is to find what the general public believes about the use of ecom Cbots as well as to identify any potential challenges or facilitators in the introduction of these Cbots. Primary research was conducted, wherein a survey had been drafted, and further analysis was done using descriptive statistics, it was found that, at present, the majority still see these cbots as a tool for seeking general information searching products and also for solving the general queries.

The Chatbot technology is in the development stage and a lot of are required to be done to replicate the conversation of a human being completely. The bot exchange still lacks empathy which makes it difficult for a computer to emulate. Users are still skeptical to trust these kinds of technology which leads to the low adoption process.

KEYWORDS: chatbots, consumer adoption of technology, E-Commerce chatbot users

1. INTRODUCTION

Over time, Human Computer Interaction and AI technology evolved quickly, and conversational systems like cbots got increasingly sophisticated and human-like. According to Abu Shawar and Atwell (2007), the word "chatbot" refers to software-based systems that emulates conversation encounters by using the capabilities of AI and natural language processing technology. Both consumers and businesses are benefiting from the use of cbots. Moreover, the reason why there is a need for investigation about the consumer's acceptance of chatbot technology is that without the insights on the interactive part, the technical developments for cbots are in vain. In fact, when customers have a bad opinion of a business, they also have a bad opinion of its products, which might hinder their adoption (Brown & Dacin, 1997). So that customers may develop a favorable attitude and be more inclined to accept their products, businesses constantly focus on building a positive impression of their brands (Halim & Christian 2013, Mittal 2020). The same logic may be used to determine if people would utilize or reject chatbot technology.

The study aims to examine the factors that influence the adoption process behind the chatbot usage of ecom consumers and their motivation to use it. The research contributes to the body of the study about the customers' usage of a Human Computer Interaction tool, focusing on the application of the chatbot as a virtual assistant during online shopping. At the moment, internet retailers assess whether their customers' experience could be enhanced by cbots, which are computer programs that communicate with consumers in natural language. In a

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retail setting, cbots let people ask inquiries about purchasing and get natural language responses without having to wait on a salesperson or use other automated communication methods. But up until now, it hasn't been apparent which clients are open to this new communication format or what factors influence that adoption.

Chatbot technology is still in its infancy, and a lot more work needs to be done before it can fully mimic human speech. The interaction between the bot and the consumer still lacks empathy, which is challenging for a machine to mimic. Customers continue to have doubts about the reliability of this technology, which slows down adoption. These problems highlight the need for greater information on how to communicate with cbots. Although using cbots is encouraged by good conduct, it is still not apparent what drives individuals to utilize this technology. As a result, although technology is developing, understanding of how users engage with cbots is not. As a result, little study has been done on how customers are using cbots, particularly in the ecom sector.

Despite previous research on user satisfaction and chatbot usage being available it has yet to be discussed how customers perceive cbots in terms of ease of use and usefulness, whether the chatbot makes them feel valued or if they find it fun to chat with. The consumer satisfaction with cbots in e-retailing is positively impacted by pleasant online consumer experiences. Additionally, chatbot usability raises client satisfaction.

The purpose of the study is to identify the factors that influence consumers' desire to adopt chatbot technology as it is currently applied in the marketplace.

The first part of the study is about the theoretical framework, wherein the literature reviews will present from previous research done by scholars in the subjects of consumers' adaptation to cbots technology. The second part is about methodology, where data collection method, analysis and results will be presented. A quantitative analysis is used to analyze the data taken from the online survey questionnaire and different hypotheses successfully were examined. The final part of the research consists of the conclusion where the summary of the findings will be stated.

2. LITERATURE REVIEW

Cbots, also known as chatter bots, conversational agents and virtual agents (Van Eeuwen, 2017). A Chatbot is software that reacts to natural language input and attempts to hold a conversation in the manner of a real person by means of auditory or textual inputs (Duijst, Sandberg, & Buzzo, 2017). The chatbot links the content that got from the user to a database in order to find possible answers (Crutzen, 2011). There needs to be a platform for cbots where users can type to get answers. Indeed, messaging apps like Telegram, Facebook Messenger and WhatsApp are all examples of chatbot platforms that are used by users on a daily base to make calls, chat with friends, consume content, interact with the brand or even book a hotel or restaurant (Radziwill, 2017).

Cbots receive natural language input which allows them to execute one or more related commands in a goal directed behavior. On the other hand, chatbot is software which interacts with real people based on automated systems. Cbots have been used in various sectors, such as healthcare, education, ecom, and entertainment, because of their ability to communicate easily with consumers (Io & Lee, 2018). Eliza, the first chatbot ever made by Joseph Weizenbaum at MIT in 1966, is where the history of cbots begins. With the advancement of smartphones and applications, cbots have grown stronger and more sophisticated. Facebook's debut of its bots on Messenger in 2016 was a crucial step towards the acceptance of cbots. This combination sought to boost client connection and loyalty.

There are two primary advantages why cbots can be considered an essential tool to improve customers' perception of the business (Chung et al. 2018, Jora et al. 2022). Firstly, cbots can instantly communicate with users and process natural language strings of text. This interaction speed remarkably improves the conversion rates. Secondly, by automating the customer service process, this technology can help companies lessen their labour costs (Bakhasi, 2018, Gupta et al., 2022). Indeed, cbots are expected to help companies save $9 billion in cost for their operational activities by 2023.

Modern cbots may be built using a variety of categories, including knowledge domains, design methodologies, and interaction styles. Task-oriented and non-task-oriented cbots may be categorized into two primary groups, according to study by Hussain et al. (2019). While non-task-oriented cbots are focused on providing original replies without repetition in order to keep the user interested, task-oriented cbots are built to handle complex. There are two main categories of cbots, according to Flstad and Brandtzaeg (2017): linguistic or rule-based cbots, and machine learning, or AI cbots. These two categories of cbots form the basis of the majority of contemporary cbots. Linguistic-based cbots offer versatility by basing talks on if/then logic. Language requirements for linguistic cbots are produced by taking into account the word order, typical question

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formulations, synonyms, and their fundamental capabilities.

Cbots are used in a variety of ways by the corporation H&M, such as when giving clients outfit and fashion advice (Hung Lo, 2022). By using this in AI experience, the cbots are made available on the firm website as well as through Kik (Hung Lo, 2022).

In an effort to lighten its workload, the furniture giant IKEA introduced a chatbot to their website, which was successful. (2021, Perfectbot) The cbots provide replies to inquiries about 400 different topics, including ordering, shipping, payment, complaints, refunds, promotions, and retailers. (2021, Perfectbot). By making it simpler for customers to shop, eBay is working to improve the customer experience (ebayinc, 2016, Mehta et al., 2022).

The underlying assumption is that, in the context of virtual shopping, consumers' perceptions of cognitive effort, positive affect, and choice outcome judgements are significantly influenced by the perceptual fluency of verbal information provided online (Mosteller, Donthu, & Eroglu, 2014; Reber, Schwarz, & Winkielman, 2004). Online businesses have been using a variety of tactics to draw in and keep customers. According to Salonen and Karjaluoto (2016), web customization has been acknowledged as a crucial component in the fields of marketing and information systems. Analysis of consumer behavior is essential to the success of e-business. However, as users acquire experience, their attitudes regarding developments in the online market alter (Gefen et al., 2003; Yu et al., 2005; Gavurova et al., 2018). According to Salovaara (2009), we may discuss a person's perception and response as it relates to the usage of a product, system, or service while monitoring the user experience.

The majority of the research that were looked at examined certain particular chatbot applications in various industries, including language learning, entertainment (Abu Shawar & Atwell, 2007), healthcare (Bickmore, Schulman, & Sidner, 2013), and education tool (Kerly, Hall, & Bull, 2007). The usage of cbots in ecom has also been investigated, although mostly from a technology and design perspective.

3. RESEARCH QUOTIENTS

To investigate participants' desire to interact with AI-powered ecom Cbots and to study the acceptance and engagement of cbots in retail sector and their relevance in the near future the RQs of the study are as follows: -

What is the consumer perception towards the adoption of cbots in the e- commerce industry and how is it influencing the consumer's behaviour?

Which parameters play an active role in the decision of the consumer to use the chatbot? This study focuses on the interaction aspect of human and chatbot relationships.

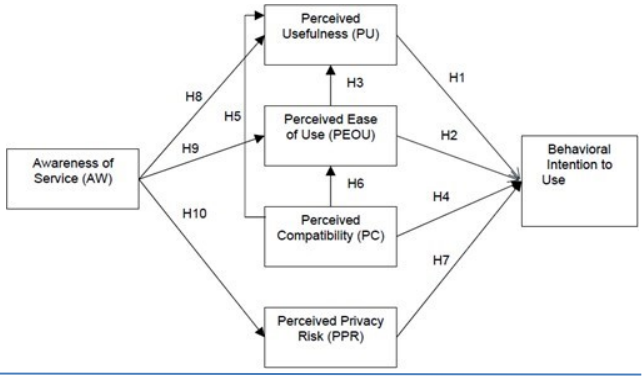
4. RESEARCH METHODOLOGY

To attain information about existing research on the topic of study, it involved analysis of blog posts, research papers, and articles from newspapers and magazines.

The evidence was gathered through a survey. The research is an experimental study based upon quantitative results to achieve the goals of this exploratory research. The exploratory research design was chosen as it tries to examine a phenomenon. Purposive sampling was used for this study. Descriptive statistics were used to analyze the data gathered.

The information from the respondents was gathered via a questionnaire. On a Likert Scale of 1 to 5, where 1 signifies a strong disagreement and 5 a strong agreement, each statement was evaluated. The instruments for assessing TAM constructs have been established as per the research framework already existing. The study's goal was to develop a model that will explain the influence of each key component on the user experience and return visits to the online store. In the second section, the original TAM model with additional elements used to show how e- commerce technology is used.

One of the most popular models that the system used to determine perceived utility and perceived ease of use is the TAM Model (fig 1). The probability that a potential user will believe that a certain program can improve user performance is expressed by perceived usefulness. The extent to which a prospective user anticipates being able to use the system with ease defines the perceived ease of use (Davis et al., 1989). According to Venkatesh et al. (2003), the majority of prior research has concentrated on comprehending the psychological and sociological elements that influence a person's behavioral intention to utilize technology.



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Before distributing the final questionnaire, the face validity of the questionnaire was confirmed by five Indian consumers. The respondents were asked for certain demographic data, including their age group, gender, and degree of education. The respondents were told to respond to each question in accordance with how they saw and understood cbots. Using social media messengers like WhatsApp and LinkedIn, the survey link was shared. There were 200 replies submitted, which were deemed complete and passed the reliability and usability tests.

Hypotheses based on the goals of the analytical phase and the specification of the study challenges.

There have been following hypotheses for which regression and correlation was conducted to determine how these variables are dependent on each other and also on

Main Hypothesis:

H1: The perceived utility of an ecom chatbot has a considerable and favourable impact on customers' intentions to use it.

Sub-Hypothesis

H1a: Perceived ease of use has a significant and positive effect on customers' intention to use e commerce chatbot.

H1b: Perceived ease of use has a significant and positive effect on perceivedusefulness.

H1c: Perceived compatibility has a significant and positive effect on customers'intention to use chatbot.

H1d: Perceived compatibility has a significant and positive effect on perceivedusefulness.

H1e: Perceived compatibility has a significant and positive effect on perceived ease of use.

H1f: Perceived privacy risk has a direct and negative effect on customers' intention to use ecom chatbot.

Main Hypothesis:

H2: Perceived usefulness is significantly and favorably impacted by service awareness.

H2a: Perceived ease of use is significantly and favorably impacted by service awareness.

H2b: Perceived privacy risk is significantly and negatively impacted by service awareness.

5. FINDINGS AND DISCUSSIONS

Cronbach's alpha is 0.843, which indicates a high level of internal consistency for the scale with this specific sample

Above all values are nearby to combined Cronbach alpha value and no question could be removed. And this also suggests that all questions are reliable.

Hypotheses Testing

H1: The perceived utility of an ecom chatbot has a considerable and favourable impact on customers' intentions to use it.

The study is majorly focused to analyse the customers orientation towards the use of chatbots especially in case of ecommerce sites, the detailed analysis of the results of survey is discussed below:

Table 2: **Regression Test for Hypotheses-H1**

Parameters	Analysis
R	.545 (the "R" Column), which indicates a high degree of positive correlation between perceived usefulness and behavioral intention to use.
R^2	.298 - indicates that 29.8% of total variation in BI_combined can be expressed by PU_combined.
P	p < 0.001, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable.
Regression Equation	BI_combined=.486* PU_combined + 2.030

H1a: Perceived ease of use has a significant and positive effect on customers' intention to use e commerce chatbot.

Table 3 Regression Test for Hypotheses-H1a

Parameters	Meaning
R	.584(the "R" Column), which indicates a high degree of positive correlation between perceived ease of use and behavioral intention to use.
R^2	.342, indicates that 34.2% of total variation in BI_combined can be expressed by PEOU_combined can be explained.
P	p < 0.001, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable.
Regression Equation	BI_combined=.576* PEOU_combined+ 1.607

H1b: Perceived ease of use has a significant and positive effect on perceived usefulness.

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Table 4: **Regression Test for Hypotheses-H1b**

Parameters	Meaning
R	.559 (the "R" Column), which indicates a high degree of positive correlation between perceived usefulness and perceived ease of use.
R^2	.313 - indicates that 31.3% of total variation in PU_combinedcan be expressed by PEOU_combined.
P	p < 0.001, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable.
Regression Eq	PU_combined=.618* PEOU_combined+ 1.266

H1c: Perceived compatibility has a significant and positive effect on customers' intention to use chatbot.

Table 5 Regression Test for Hypotheses-H1c

R	correlation between perceived compatibility and behavioral intention to use.
R^2	.151 - indicates that only 15.1% of total variation in BI_combined can be expressed by PC_combined.
P	p < 0.001, which is less than 0.05, and indicates that, overall, the regression model significantly predicts the outcome variable.
Regression Equation	BI_combined=.311* PC_combined+ 2.833

H1d: Perceived compatibility has a significant and positive effect on perceived usefulness.

Table 6 **Regression Test for Hypotheses-H1d**

Parameters	Meaning
R	.541 (the "R" Column), which indicates a high degree of positive correlation between perceived usefulness and perceived compatibility.
R^2	.293- indicates that 29.3% of total variation in PU_combined can be expressed by PC_combined.
P	p < 0.001, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable.
Regression Equation	PU_combined=.487* PC_combined+ 2.118

H1e: Perceived compatibility has a significant and positive effect on perceived ease of use.

Table 7: **Regression Test for Hypotheses-H1eTable 13 H6 Analysis Table**

Parameters	Meaning
R	.345 (the "R" Column), which indicates a low degree of positive correlation between perceived compatibility and perceived ease of use.
R^2	.119- indicates that 11.9% of total variation in PEOU_combined can be expressed by PC_combined.
P	p < 0.001, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable.
Regression Equation	PEOU_combined=.280* PC_combined+ 2.920

H1f: Perceived privacy risk has a direct and negative effect on customers' intention to use ecom chatbot.

Table 8 Regression Test Results for Hypotheses-H1f

Parameters	Meaning
R	.051 (the "R" Column), which indicates a lower degree of positive correlation between perceived privacy risk and behavioral intention to use.
R^2	.003 - indicates that .3% of total variation in BI_combined can be expressed by PPR_combined.
P	p < 0.562 which is more than 0.05, and indicates that, overall, the regression model statistically significantly doesn't predict the outcome variable.
Regression Equation	BI_combined=.049* PPR_combined+ 3.612

H2: Perceived usefulness is significantly and favorably impacted by service awareness.

Table: 9 **Regression Test for Hypotheses-H2**

Parameters	Meaning
R	.388 (the "R" Column), which indicates a low degree of positive correlation between perceived usefulness and awareness of service.
R^2	.151- indicates that only 15.1% of total variation in PU_combined can be expressed by AW_combined.
P	p < 0.001, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable.
Regression Equation	AW_combined=.380* PU_combined+ 2.397

H2a: Perceived ease of use is significantly and favorably impacted by service awareness.

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Table 10 **Regression Test for Hypotheses-H2a**

Parameters	Meaning
R	.291 (the "R" Column), which indicates a low degree of positive correlation between perceived usefulness and perceived ease of use.
R^2	.085- indicates that 8.5% of total variation in PEOU_combined can be expressed by AW_combined.
P	p < 0.001, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable.
Regression Equation	PEOU_combined=.257* AW_combined+ 2.959

H2b: Perceived privacy risk is significantly and negatively impacted by service awareness.

Table 11 **Regression Test for Hypotheses-H2b**

Parameters	Meaning
R	-.050 (the "R" Column), which indicates a low degree of negative correlation between perceived privacy risk and awareness of service.
R^2	.003, indicates that 0.3% of total variation in PPR_combined can be expressed by AW_combined.
P	P=.503, which is more than 0.05, and indicates that, overall, the regression model statistically significantly doesn't predict the outcome variable.
Regression Equation	PPR_combined=.054* AW_combined+ 3.632

Combined contribution of all independent factors-perceived usefulness, perceived ease of use, perceived privacy risk, awareness of service, perceived compatibility and behavioral intention to use can be expressed by following equation:

BI_combined=.077AW_combined+.234*PU_Combined+.384*PEOU_combined+.053*PC_combined+.068PPR_combined

The Results discuss that customers behave positively towards ecom cbots when they have a favourable opinion of the technology's usability and convenience of use. The theories underlying the association between perception and attitude towards cbots were investigated, and the results demonstrated that there is a positive association between the variables.

The study shows customers are positive towards ecom cbots and show a favourable opinion of the technology's usability and convenience of use. The association between perception and attitude towards cbots were analysed and the results stated that there is a positive association between the variablesit was found that, at present, the majority still see these cbots as a tool for seeking general information searching products and also for solving the general queries.

The Chatbot technology is in the development stage and a lot of are required to be done to replicate the conversation of a human being completely. The bot exchange still lacks empathy which makes it difficult for a computer to emulate. Users are still skeptical to trust these kinds of technology which leads to the low adoption process.

Table 11 **Cumulative Regression model (PU, PC,** PEOU, PPR, AW, BI)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.655[a]	.429	.407	.62817	.429	18.961	5	126	<.001	1.765

a. Predictors: (Constant), PPR_combined, PEOU_combined, AW_combined, PC_combined, PU_combined
b. Dependent Variable: BI_combined

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.410	5	7.482	18.961	<.001[b]
	Residual	49.719	126	.395		
	Total	87.129	131			

a. Dependent Variable: BI_combined
b. Predictors: (Constant), PPR_combined, PEOU_combined, AW_combined, PC_combined, PU_combined

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound
1	(Constant)	.852	.371		2.295	.023	.117	1.586
	AW_combined	.077	.070	.088	1.101	.273	-.061	.215
	PU_combined	.234	.082	.262	2.869	.005	.073	.395
	PEOU_combined	.384	.080	.389	4.766	<.001	.224	.543
	PC_combined	.053	.070	.066	.759	.450	-.086	.192
	PPR_combined	.068	.065	.071	1.052	.295	-.060	.196

6. CONCLUSIONS

This study sought to better understand how some retail businesses employ cbots to enhance customer experience. Two major and eight sub hypotheses were explored in light of the SPSS analysis. The dependency between perceived usefulness, perceived ease of use, perceived compatibility, awareness of service, and behavioral intention became obvious based on the evidence. Only the 200 customers who have used the ecommerce chatbot were familiar with all the features it offers to them were selected. Other factors that influence behaviour and chatbot usability include perceived disinterest, monotonous and repeated responses, time-consuming processes, and discrepancies between reality and perceived beliefs.

The Results reveal that customers behave positively towards ecom cbots when they have a favourable opinion of the technology's usability and convenience of use. The theories underlying the association between perception and attitude towards cbots were investigated, and the results demonstrated that there is a positive association between the variables.

Overall, the data analysis supported both hypotheses, showing that there is a positive relationship between consumer behaviour and perception of cbots.

7. LIMITATIONS OF THE STUDY

While we aimed an inclusive review of literature, it's essential to acknowledge potential drawbacks or

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limitations that may be associated with the study. The study fails to address concerns about perceived privacy risks and lack of service awareness. The data was collected from respondents residing in Delhi NCR region only. The study was based upon closed ended questionnaire-based survey and the Qualitative aspect was missing which could provide better insights. The last is that the study was cross sectional in nature

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