



The impact of chatbot interventions on purchase decision process of consumers in E-commerce context

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Abstract

The study investigates the impact of chatbot interventions on the purchase decision process of consumers in the e-commerce context. Chatbots, powered by artificial intelligence (AI) and natural language processing (NLP), have emerged as pivotal tools in facilitating online interactions and providing customer support. Despite their widespread adoption, understanding their influence on consumer behaviour remains crucial for businesses operating in the e-commerce landscape. The literature review underscores the transformative role of AI-powered chatbots in reshaping consumer interactions and purchasing behaviour. Studies have explored various factors such as customer emotions, chatbot interaction styles, anthropomorphism, and the influence of AI algorithms on consumer decision-making processes. While chatbots offer convenience and round-the-clock availability, challenges persist in handling complex queries and delivering personalized responses. Moreover, concerns regarding transparency, reliability, and fairness in AI systems highlight the need for continuous improvement and ethical considerations. The research methodology employed a descriptive research design, conducted among 450 consumers in an educational institution setting. Convenience sampling was utilized to select respondents, and primary data was collected using a structured interview schedule. Statistical tools such as percentages, arithmetic mean, and standard deviation were employed to analyse the data and draw conclusions. The findings reveal significant insights into consumer perceptions and behaviours related to chatbot interventions in e-commerce. While users value the 24/7 availability of chatbots and their assistance in tracking orders, concerns arise regarding the accuracy of information provided and the effectiveness of issue resolution. The study highlights the importance of chatbots demonstrating a good understanding of user language and context, as well as the need for opportunities to provide feedback on chatbot interactions. Linear regression analysis provides further insights into the relationship between various factors related to chatbots and their impact on user behaviour. While some factors exhibit positive relationships with user satisfaction or behaviour, others show negligible or negative associations. In conclusion, the study underscores the significance of chatbot interventions in the e-commerce industry and their potential to influence consumer purchase decisions. By addressing user concerns and enhancing chatbot capabilities, businesses can improve customer satisfaction and drive engagement in the competitive online

marketplace. However, ethical considerations and transparency in AI systems remain imperative to foster trust and confidence among consumers.

Keywords: Chatbot interventions, e-commerce, purchase decision process, artificial intelligence, natural language processing, customer emotions.

Introduction

Chatbots, frequently referred to as conversational AI programmes, are rapidly transforming human-computer interaction. These virtual assistants, which are frequently employed in contact centres and helplines, engage users in simulated discussions and provide a first line of support. They not only respond to frequently asked requests and provide readily available data, but they can also use natural language processing to understand the nuances of human language and respond accordingly. It allows them to handle more kinds of inquiries and even elevate challenging circumstances to human agents, ensuring that users receive efficient and appropriate assistance. Chatbots are becoming increasingly popular in a variety of industries, including marketing and education. The impact of social biases on their design, as well as various classification methods, account for their extensive use. It then delves into the technical aspects, outlining how they work, and the platforms used to create them, before expressing hope about their future possibilities (Adamopoulou et al., 2020).

It investigates the "architecture" of the chatbot, including its knowledge base, response generation, and usage of machine learning, as well as the "implementation" process, which analyses the training data used and how their performance is tracked. The study provides important insights into the inner workings of chatbots and provides the door to discussion about their future evolution (Lokman et al., 2019). Chatbots are rapidly emerging as the next big thing in interactive services in an age of constantly evolving technology. These virtual assistants, that employ artificial intelligence and machine learning, participate in human-like discussions through text-based interactions. Cloud-based platforms like IBM Watson and the Microsoft Bot Framework act as motorists for chatbot development. However, because these virtual personalities are dynamic in nature, establishing them brings new obstacles. Chatbot design and development involve knowledge in a variety of domains, including artificial intelligence, natural language processing, programming, and conversational design. The world of cloud-based chatbots, looking at both the programming aspects and the challenges that were ahead of their current and future development (Rahman et al., 2017).

This new tool serves as a quick, standardised, and informative widget, greatly increasing the user experience. The chatbot, which is driven by artificial intelligence and natural language processing, is capable of answering a wide range of questions from various sectors.

Finding the exact data you need can feel like going through a tunnel. This is where chatbots step in as fresh innovations, functioning as swift, uniform, and informative aids. These chatbots, who are powered by artificial

intelligence and natural language processing, can answer a wide range of specific to an industry concerns, like healthcare appointments and putting guidance. This not only empowers individuals, but it also streamlines operations, free up human resources professionals to work on more complex jobs. Overall, chatbots open the way for a more engaging and efficient experience across an array of sectors (Lalwani *et al.*, 2018). As chatbot develops, the potential of customised assistance using machine learning and sophisticated artificial intelligence emerges, further blurring the lines between human-computer interaction and possibly altering how we access information and interact with businesses in the coming years. Lets discuss the impact of chatbot implementation in the e-commerce industry affect the purchase decision of the consumers.

The imperative for studying this topic is underscored by its pivotal significance within academic discourse. Its exploration offers a nuanced comprehension of pertinent phenomena, contributing to the advancement of scholarly knowledge and fostering critical inquiry. Delving into this subject provides a platform for rigorous analysis, facilitating the elucidation of complex interrelationships and the formulation of informed perspectives. Moreover, its study cultivates intellectual rigor, fostering interdisciplinary dialogue and enriching academic discourse.

Literature review

In the realm of modern commerce, the integration of Artificial Intelligence (AI) and chatbots has emerged as a revolutionary force, reshaping the dynamics of consumer interaction and purchasing behaviour. Matini (2023) delved into the potential of AI-powered chatbots in identifying prospective buyers during consumer engagements, emphasizing the significance of customer emotions as indicators of purchasing intent. Despite initial expectations, their findings unveiled a surprising lack of direct correlation between specific emotions and purchase likelihood, with joy and neutral feelings exhibiting the highest purchase rates. Tamara *et al.* (2023) shed light on Generation Z's preference for chatbots due to their convenience and round-the-clock availability, albeit noting challenges in handling complex queries and delivering customized responses. Li *et al.* (2023) examined the impact of chatbot interaction styles on customer perceptions, advocating for informal language to foster positive brand associations, particularly among new consumer segments.

Sidlauskiene *et al.* (2023) explored the concept of anthropomorphism in chatbots, suggesting that human-like attributes could enhance personalized interactions, particularly resonating with individuals experiencing loneliness. Beyari *et al.* (2022) investigated the influence of AI algorithms on Saudi Arabian consumers' pre-purchase emotions, highlighting the role of machine learning in shaping consumer consideration sets. Klein *et al.* (2023) emphasized the efficacy of anthropomorphic chatbots in enhancing user satisfaction and trust, particularly in online grocery operations. Adam *et al.* (2021) echoed similar sentiments, emphasizing the persuasive potential of human-like chatbots in guiding consumer behaviour. Mehta *et al.* (2022) underscored the transformative impact of chatbots on e-commerce, particularly in emerging markets, where they facilitate real-time customer support and transaction assistance. Tyagi *et al.* (2023) corroborated these findings, emphasizing the importance of informative and emotionally credible chatbot interactions in influencing purchasing decisions. However, despite these advancements, Khrais (2020) highlighted concerns regarding the transparency and fairness of AI systems in e-commerce, urging for greater explainability in machine learning models. Behera *et al.* (2021) examined the efficacy

of chatbots in B2B settings, emphasizing the importance of reliability and familiarity in driving adoption. Eeuwen (2017) emphasized millennials' inclination towards chatbot-assisted shopping, underscoring the need for user-centric approaches and privacy safeguards. Selamat et al. (2021) addressed the dearth of research on chatbot utilization in small and medium-sized enterprises (SMEs), advocating for tailored functionalities to enhance customer satisfaction. Ho, R C (2021) highlighted the pivotal role of trust in chatbot interactions, emphasizing its impact on customer happiness and brand advocacy. Le (2023) delved into the underlying motivations behind consumer adoption of chatbots and subsequent purchasing decisions, signalling the evolving landscape of the customer journey.

Research methodology

Research methodology is a methodical approach to solving a research challenge. It can be considered as the science of analysing how research is conducted systematically. When we talk about research methodology, we not only talk about research methodologies, but also about the logic behind the methods or techniques and why we don't use other ones. The research process begins with defining the research problem, creating hypotheses, designing research, collecting data, and interpreting and analysing data to produce a report.

The descriptive research design was adopted for the concerned research study. The research was conducted in Lovely Professional University of Punjab selected as the area of study. Sampling is defined as a segment of the population that represents the entire population. The number of individuals in a sample is known as a sample unit. Convenience sampling was used to pick respondents based on their availability. Convenience sampling is a non-probability sampling strategy in which respondents are chosen because they are easily accessible and close to the study. The sample size for the study was conducted on 450 consumers. Primary data was acquired using a closed-ended structured interview schedule. The questionnaire was broken into two sections. Part 'A' was designed to collect information on demographic characteristics such as name, gender, age, and income. Part 'B' included broad thoughts and remarks based on a Likert scale to assess consumer expectations, opinions, expected satisfaction levels. Simple mathematical and statistical tools were employed to achieve the aims, with the goal of making the analysis simple and understandable.

The formula for the percentage technique is:

$$P = \frac{X}{Y} \times 100.$$

Where X represents the number of responders in a certain category for measurement.
 Y = Total number of respondents.

The arithmetic mean was used to analyse the opinions of sample respondents on a 5-point scale for various propositions. This tool assists researchers in drawing proper conclusions from the responses received from respondents. The arithmetic mean was obtained by assigning numerical numbers to each qualitative assertion. The values provided to these qualitative replies are one for severely disagree, two for disagree, three for neutral, four for agree, and five for highly agree.

The formula for Arithmetic Mean is:

$$X = (\sum X) / N$$

Where X is the arithmetic mean and $\sum X$ is the sum of the variables' values.
 N = Number of observations.

Karl Pearson created the standard deviation notion in 1823. The standard deviation quantifies absolute dispersion (or distributional variability; the larger the dispersion or variability, the greater the magnitude of the values' divergence from their mean). A small standard deviation indicates a high degree of observational regularity and series homogeneity; a big standard deviation indicates the reverse. The formula used to calculate standard deviation is:
 Standard deviation equals $\sqrt{((\sum x^2) / N)}$.
 In this equation, $x = (X - \bar{X})$ and N represents the number of observations.

Results and Discussions

The size and structure of the family, age, and gender distribution are important parameters to determine the economic well-being of the respondent's overall development of the society. These determinants influence decision making process and play an important role in chatbot interventions on purchase decision process of consumers in E-commerce context

The education status become more significant when one must take decisions about the purchase of any products from E-commerce with the help of chatbots. It was expected that the respondents with higher educational status are better placed to perceive about current scenarios and take rational decisions related to the technology interventions.

Demographic Profile (Age, Gender, Educational status) of the Sampled Respondents in the Study Area

Gender of Respondents		
Particulars	Frequency	Per cent
Male	201	44.66
Female	240	53.40
Other	09	2.00
Total	450	100.00
Age of Respondents		
Particulars	Frequency	Per cent
15-20 Years	220	48.88
21-25 Years	150	33.33
26-30 Years	70	15.55
Above 30 Years	10	2.22
Total	450	100.00

Qualification		
Particulars	Frequency	Per cent
Graduate	270	60.00
Postgraduate	150	33.33
Doctorate	30	6.77
Total	450	100.00
Marital Status of Respondents		
Particulars	Frequency	Per cent
Single	388	86.22
Married	50	11.11
Separated	8	1.77
Single Parent	4	0.88
Total	450	100.00

Figures in parenthesis are percentages

The survey respondents were predominantly female, accounting for 53.40% of the total sample, followed by males at 44.66%. A small proportion identified as "Other" at 2.00%. The majority of respondents fell within the age range of 15-20 years, comprising 48.88% of the total sample. The 21-25 age group represented 33.33%, while the 26-30 age group and those above 30 years constituted smaller percentages at 15.55% and 2.22% respectively. A significant portion of the respondents were graduates, comprising 60.00% of the total sample. Postgraduates accounted for 33.33%, while individuals with a doctorate degree represented 6.77%. The majority of respondents were single, constituting 86.22% of the total sample. Married individuals comprised 11.11%, while separated respondents accounted for 1.77%. A small percentage identified as single parents, representing 0.88%.

Knowledge of respondents about technology

Knowledge of respondents about technology						
Particulars	SA	A	N	D	SD	Total
Knowledge about Technology	320 (71.11)	50 (11.11)	40 (8.88)	20 (4.44)	20 (4.44)	450 (100.00)
How Frequent you shop online						
Particulars	More often	often	Monthly	Rarely	Never	Total
How Frequent you shop online	212 (47.11)	160 (35.55)	50 (11.11)	28 (6.22)	0 (0.00)	450 (100.00)

Figures in parenthesis are percentages

The majority of respondents (71.11%) reported a strong agreement (SA) with their knowledge about

technology. A smaller percentage (11.11%) expressed agreement (A), while 8.88% were neutral (N), and 4.44% each disagreed (D) or strongly disagreed (SD) with their level of knowledge. Overall, the majority of respondents exhibited positive perceptions regarding their knowledge about technology, with a smaller proportion expressing uncertainty or disagreement.

Awareness of the Chatbots

E-Commerce Chatbots								
Particula rs	High Awarene ss	Moderat e Awarene ss	Basic Awarene ss	Limited Awarene ss	Low Awarene ss	Total	Scor e	Ran k
Amazon	356 (79.11)	70 (15.55)	20 (4.44)	4 (0.88)	0 (100.00)	450 (100.00)	2128	2nd
Flip cart	340 (75.55))	76 (16.88)	25 (5.55)	9 (2.00)	0 (100.00)	450 (100.00)	2097	5th
Myntra	343 (76.22)	63 (14.00)	39 (8.66)	5 (1.11)	0 (100.00)	450 (100.00)	2099	6th
Jio Mart	150 (33.33)	194 (43.11)	43 (9.55)	43 (9.55)	20 (4.44)	450 (100.00)	1761	9th
Big Basket	196 (43.55)	175 (38.88)	53 (11.77)	26 (5.77)	30 (6.66)	450 (100.00)	1921	7th
Ajio	202 (44.88)	150 (33.33)	48 (10.66)	50 (11.11)	40 (8.88)	450 (100.00)	1894	8th
Nykaa	194 (43.11)	150 (33.33)	25 (5.55)	25 (5.55)	56 (12.44)	450 (100.00)	1751	10th

Nike	350 (77.77)	66 (14.66)	25 (5.55)	9 (2.00)	0 (100.00)	450 (100.00)	2107	4th
Zara	358 (79.55)	68 (15.11)	4 (0.88)	20 (4.44)	0 (100.00)	450 (100.00)	2114	3rd
Adidas	383 (58.11)	40 (8.88)	30 (6.66)	7 (1.55)	0 (100.00)	450 (100.00)	2179	Ist

Figures in parenthesis are percentages

The inference can be drawn regarding the awareness and ranking of various E-commerce Chatbots. Adidas holds the highest position, ranking 1st with a score of 2179, suggesting the highest level of awareness among all the listed E-commerce Chatbots. Amazon has the second-highest awareness level with a score of 2128 and is ranked 2nd. Flipkart holds the 5th position with a score of 2097, indicating moderate awareness among users. Myntra follows Flipkart closely with a score of 2099 and ranks 6th, also with moderate awareness. Despite having the highest total score of 1761, Jio Mart is ranked 9th, suggesting that despite high awareness, it falls behind others in terms of ranking. Big Basket secures the 7th position with a score of 1921, indicating basic awareness among users. Ajio follows Big Basket closely with a score of 1894 and ranks 8th, suggesting a similar level of basic awareness.

Nykaa holds the 10th position with a score of 1751, indicating low awareness among users. Nike ranks 4th with a score of 2107, indicating a high level of awareness among users. Zara ranks 3rd with a score of 2114, indicating high awareness and securing a relatively better position.

Linear regression

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.280	.237		5.409	.000
	Chatbots are helpful for need recognition	.075	.071	.066	1.057	.291

Do chatbots help in providing suitable decision for your choice	.028	.052	.025	.530	.596
Were you given the opportunity to provide feedback on your chatbot interaction?	-.102	.065	-.095	-1.563	.119
Did the chatbot display a good understanding of your language and context?	-.072	.066	-.066	-1.084	.279
How helpful was the chatbot in guiding you through the return process, if applicable?	.014	.064	.014	.223	.823
How important is 24/7 availability of the chatbot to you?	.193	.050	.193	3.875	.000
Did you find the information provided by the chatbot accurate and reliable?	.020	.062	.019	.324	.746
How satisfied are you with the chatbot's assistance in tracking your order?	.161	.063	.156	2.582	.010
Were any issues or concerns you raised addressed effectively by the chatbot?	-.123	.067	-.113	-1.831	.068

Did the chatbot reminder or message influence your decision?	.045	.050	.043	.897	.370
Has a chatbot ever helped you figure out what you really want to purchase?	-.043	.046	-.044	-.942	.347
How has the evaluation of alternatives impacted online shopping chatbots?	.061	.051	.060	1.203	.230
Have any chatbot ever helped you purchase something unplanned?	.098	.057	.091	1.718	.086

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.306 ^a	.094	.067	1.100

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	54.482	13	4.191	3.465	.000 ^b
	Residual	527.295	436	1.209		
	Total	581.778	449			

The provided coefficients represent the relationship between various factors related to chatbots and their impact on user behaviour or perception. Chatbots are helpful for need recognition: This coefficient (.066) suggests a weak positive relationship between users perceiving chatbots as helpful for recognizing their needs and their overall experience or behaviour. Do chatbots help in providing suitable decision for your choice: This coefficient (.025) indicates a very weak positive relationship, suggesting that users don't strongly associate chatbots with

aiding decision-making for their choices. Opportunity to provide feedback on chatbot interaction: The negative coefficient (-.095) implies that when users feel they haven't had the opportunity to provide feedback, it slightly impacts their overall satisfaction or behaviour negatively, although not statistically significant at conventional levels. Chatbot understanding of language and context: Similarly, the negative coefficient (-.066) suggests that when users perceive chatbots to have a poor understanding of their language and context, it slightly impacts their overall satisfaction or behaviour negatively.

Helpfulness in guiding through the return process: With a coefficient of .014, it indicates a very weak positive relationship, suggesting that users don't strongly associate chatbots with guiding them through the return process. Importance of 24/7 availability: This coefficient (.193) indicates a strong positive relationship between users valuing 24/7 availability of chatbots and their overall satisfaction or behaviour. Accuracy and reliability of information provided by chatbots: The coefficient (.019) suggests a weak positive relationship between users perceiving chatbot information as accurate and reliable and their overall satisfaction or behaviour. Satisfaction with assistance in tracking orders: With a coefficient of .156, it indicates a moderate positive relationship between users being satisfied with chatbot assistance in tracking orders and their overall satisfaction or behaviour. Effectiveness in addressing raised issues or concerns: The negative coefficient (-.113) suggests that when users feel their issues or concerns aren't effectively addressed by chatbots, it impacts their overall satisfaction or behaviour negatively, though not statistically significant at conventional levels. Influence of chatbot reminders or messages on decisions: The coefficient (.043) suggests a weak positive relationship between users feeling influenced by chatbot reminders or messages and their overall behaviour, although not statistically significant at conventional levels. Chatbots helping figure out what to purchase: The negative coefficient (-.044) implies a weak negative relationship between chatbots helping users figure out what to purchase and their overall behaviour, though not statistically significant at conventional levels. Evaluation of alternatives impacted by chatbots: This coefficient (.060) suggests a weak positive relationship between users feeling their evaluation of alternatives is impacted by chatbots and their overall behaviour, although not statistically significant at conventional levels. Chatbots helping purchase something unplanned: With a coefficient of .091, it indicates a weak positive relationship between users feeling chatbots help them purchase unplanned items and their overall behaviour, although not statistically significant at conventional levels.

Conclusions

The study highlights the significance of 24/7 availability of chatbots, with users strongly valuing this feature. Ensuring round-the-clock availability can enhance user satisfaction and improve overall experience. Users expect the opportunity to provide feedback on chatbot interactions and effective resolution of raised issues or concerns. Implementing mechanisms for feedback collection and improving chatbot responsiveness to user queries and problems can enhance user satisfaction and loyalty. Users expect chatbots to demonstrate a good understanding

of their language and context. Investing in natural language processing and contextual understanding technologies can improve chatbot performance and user satisfaction.

Users appreciate chatbot assistance in tracking orders and decision-making processes. Enhancing chatbots' capabilities in these areas can improve user satisfaction and streamline the shopping experience. Ensuring the accuracy and reliability of information provided by chatbots is crucial for building user trust and confidence. Regular updates and validation of chatbot knowledge bases can help maintain information quality.

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