

# A Study on Chatbots and Their Impact on Customer Service: With Reference to D-Mart in Nagpur City

Dr Bharti R. Deshmukh

Assistant Professor,

Department of Commerce,

Dr S. C. Gulhane Purna College of Commerce, Science & Arts, Nagpur, Maharashtra.

## ABSTRACT

This study investigates customer perceptions of D-Mart's chatbot service in Nagpur city and examines the chatbot's impact on customer service outcomes. Using a simulated dataset of 120 respondents who had recent exposure to the chatbot, the research reports descriptive statistics (frequencies, percentages) and mean scores for perception items across six dimensions: Responsiveness & Availability, Accuracy & Usefulness, Ease of Use, Empathy & Interaction Quality, Trust & Security, and Outcomes & Satisfaction. Findings show generally positive perceptions (mean scores around 3.8–3.9/5), with high adoption among regular shoppers. Recommendations include improving accuracy and natural language understanding while maintaining responsiveness. Limitations and directions for future research are discussed.

**Keywords:** Chatbot, Customer Service, D-Mart, Perception, Customer Satisfaction, Nagpur.

## I. Introduction

Retailers increasingly deploy chatbots to handle customer queries, provide product information, track orders, manage returns, and deliver promotions. Chatbots promise 24/7 availability, quick responses, and reduced load on human agents. This study explores how D-Mart's chatbot is perceived by customers in Nagpur city and whether it positively influences satisfaction and repurchase intention.

## Research objectives

1. To measure customers' perceptions of the D-Mart chatbot across key service-quality dimensions.
2. To describe usage patterns and demographic characteristics of chatbot users in Nagpur.
3. To provide practical recommendations to improve chatbot effectiveness and customer outcomes.

## 2. Literature Review

Chatbots constitute an important automation tool in customer service and e-commerce. Prior literature has examined chatbot service quality using frameworks adapted from technology acceptance and service quality<sup>[1]</sup>. Firms need to develop chatbots with low customer effort high procedural and interactional justice and a high quality of the service solution, if they are to enhance customer satisfaction and decrease service costs<sup>[2]</sup>. To make a chatbot more personal, companies can alter the language style. Human-like chatbots lead to greater satisfaction and trust among customers, leading to greater adoption of the chatbot. The results of this study showed that a connection between chatbots and customer loyalty is very likely<sup>[3]</sup>. Chatbots rapidly is leading to significant improvements in service quality. First, based on their key features and functionalities underlining the relevance of chatbots for customer service. Second, based on their functional dedication, i.e. "improvement of service performance" and "fulfillment of customer's

expectations”<sup>[4]</sup>. Customer experience is a core component in marketing studies; firms need to create strong and enduring customer experiences. To achieve this goal, enterprises can use technology, especially since it reshapes the nature of service, customers’ experiences, and customer relationship management <sup>[5]</sup>.

bots with low customer effort, high procedural and interactional justice and a high quality of the service solution, if they are to enhance customer satisfaction and decrease service costs.

firms need to develop chatbots with low customer effort, high procedural and interactional justice and a high quality of the service solution, if they are to enhance customer satisfaction and decrease serv influence of chatbots on customer loyalty. System quality, service quality, and information quality are crucial dimensions that a chatbot must meet to give a good customer experience. To make a chatbot more personal, companies can alter the language style. Human-like chatbots lead to greater satisfaction and trust among customers, leading to greater adoption of the chatbot. The results of this study showed that a connection between chatbots and customer loyalty is very likely

### **3. Methodology**

#### **3.1 Research design**

This study uses a cross-sectional survey design. For demonstration and pedagogical purposes, a simulated sample dataset (n = 120) was generated that mimics realistic user responses. The questionnaire follows a standard structure:

#### **3.4 Analysis**

- Part A — Screening & Demographics (used chatbot in last 12 months, age, gender, education, shopping frequency, device)
- Part B — Usage patterns (frequency of use, purpose of use)
- Part C — Perceptions (5-point Likert) across items Q9–Q23 (1 = Strongly disagree ... 5 = Strongly agree)
- Part D — Open-ended (qualitative suggestions — not used in simulated quantitative summary)

#### **3.2 Sample**

Simulated sample size n = 120 respondents. Screening logic: respondents who reported “Never” using the chatbot were allowed in the dataset but perception items for non-users were set to missing (NaN) to mimic real screening.

#### **3.3 Variables and measures**

- Categorical/demographic variables: Gender, Education, Device, Shopping frequency.
- Usage variables: Chatbot use frequency (Never / Rarely / Sometimes / Often / Always), purposes (multi-response).
- Perception items (Likert 1–5):
  - Responsiveness: Q9 (response speed), Q10 (availability)
  - Accuracy & Usefulness: Q11–Q13
  - Ease of Use: Q14–Q15
  - Empathy & Interaction Quality: Q16–Q17
  - Trust & Security: Q18–Q19
  - Outcomes & Satisfaction: Q20–Q23

Basic descriptive statistics were computed: frequencies and percentages for categorical variables and means for Likert items. Composite scores can be formed by averaging relevant items per construct; here we report item-level means for transparency.

## 4. Results

### 4.1 Sample profile (n = 120)

(Table 1: Demographics — counts & percentages)

Below are the summarized counts (simulated data):

- **Used chatbot in last 12 months:** Yes = 113 (94.2%), No = 7 (5.8%)
- **Gender:** Female = 60 (50.0%), Male = 56 (46.7%), Other = 4 (3.3%)
- **Device used to contact chatbot:** Mobile = 68 (56.7%), WhatsApp = 22 (18.3%), App = 19 (15.8%), Desktop = 6 (5.0%), Other = 5 (4.2%)
- **Shopping frequency at D-Mart:** Weekly = 48 (40.0%), Fortnightly = 30 (25.0%), Monthly = 30 (25.0%), Less often = 12 (10.0%)

### 4.2 Chatbot usage patterns

- **Chatbot use frequency:** Often = 52 (43.3%), Sometimes = 26 (21.7%), Always = 22 (18.3%), Rarely = 13 (10.8%), Never = 7 (5.8%)
- **Common purposes (multi-response):** Product availability, Price queries, and Order tracking were the most frequently simulated purposes.

### 4.3 Perception items — means (1–5)

(Table 2: Mean scores for each Likert item)

From the simulated dataset, item means (rounded to two decimals):

Item (short)	Mean
Q9_Responsive (responded quickly)	3.84
Q10_Available (available when needed)	3.88
Q11_Accurate (provided accurate info)	3.94
Q12_Resolved (helped resolve my issue)	3.79
Q13_SavedTime (saved time vs calling/visiting)	3.86
Q14_EaseOfUse (interface easy)	3.81
Q15_FindNeeded (could find what needed)	3.87
Q16_Understood (understood questions)	3.88
Q17_Polite (polite/helpful)	3.78
Q18_Comfortable (comfortable sharing details)	3.88
Q19_Trust (trust the information)	3.93
Q20_Satisfied (satisfied with service)	3.88
Q21_ResolvedSatisfactorily (resolved satisfactorily)	3.97
Q22_UseAgain (would use again)	3.91
Q23_LikelyToShopAgain (more likely to shop again)	3.92

**Interpretation of means.** All item means are comfortably above the neutral midpoint (3.0), clustering near 3.8–3.9. The highest means are Q21\_ResolvedSatisfactorily (3.97), Q11\_Accurate (3.94), Q19\_Trust (3.93), indicating generally positive perceived outcomes/accuracy/trust. Slightly lower means (but still positive) appear on Q12\_Resolved (3.79) and Q17\_Polite (3.78), suggesting some room for improvement in handling complex issues or perceived interaction politeness/naturalness.

## 5. Discussion

### 5.1 Adoption and usage

The simulated data suggest strong adoption among regular D-Mart shoppers in Nagpur: 43% report using the chatbot often and 18% always — together forming a majority of active users. Mobile (56.7%) and WhatsApp (18.3%) are the dominant access channels, highlighting the importance of mobile-first and WhatsApp-integrated design.

### 5.2 Perceptions and outcomes

Overall perceptions are positive. High means for accuracy (Q11) and trust (Q19) suggest the chatbot is perceived as reliable for routine informational tasks. Responsiveness and availability also score well, which aligns with chatbot strengths (speed, 24/7 access). The strongest single item (Q21\_ResolvedSatisfactorily) implies many users feel their issues are resolved — a key win for operational efficiency.

However, the relatively lower scores for interaction politeness/quality and some resolution items indicate that for complex complaints the chatbot may still escalate to human agents. This is consistent with expected chatbot limitations on complex problem solving and nuance in customer emotion.

### 5.3 Practical implications

1. **Focus on backend integration** (real-time stock, order data) to maintain and improve accuracy.
2. **Enhance NLP/localization** to improve understanding and interaction quality (multilingual support for Marathi/Hindi/English).
3. **Maintain response speed** while adding clearer escalation paths to human agents for complex issues.
4. **Privacy reassurance** (clear messaging about data use) to sustain trust levels.

### 6. Limitations

1. **Simulated data:** The data used are simulated to illustrate analysis; real-world results may differ. This paper should be re-run with real respondent data collected from D-Mart customers.
2. **Cross-sectional design:** Captures perceptions at one point in time; does not track longitudinal changes or long-term loyalty effects.
3. **Limited scope of measures:** The instrument focuses on perceptions; objective performance metrics (response time logs, resolution times) from system logs would complement and validate findings.
4. **Generalisability:** Findings are specific to Nagpur context and the simulated sample; replication across regions and larger samples is recommended.

### 7. Conclusion

This simulated study demonstrates that D-Mart's chatbot (as modeled here) performs well on key service quality metrics, with generally positive customer perceptions in Nagpur. Responsiveness, availability, accuracy, and trust are strengths; interaction quality and complex-issue resolution merit

attention. For practical deployment, investments in data integration and advanced NLP will further enhance customer service impact.

## **8. References**

- [1]. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- [2]. Alexander Rossmann, Alfred Zimmermann, Dieter Hertweck, The Impact of Chatbots on Customer Service Performance, July 2020, Advances in Intelligent Systems and Computing, Advances in the Human Side of Service Engineering (pp.237-243).
- [3]. Liss Jenneboer, Carolina Herrando, Efthymios Constantinides, The Impact of Chatbots on Customer Loyalty: A Systematic Literature Review, *J. Theor. Appl. Electron. Commer. Res.* 2022, 17(1), 212- 229.
- [4]. Chiara Valentina Misischia, Flora Poecze, Chatbots in customer service: Their relevance and impact on service quality, *Procedia Computer Science*, Volume 201, 2022, Pages 421-428.
- [5]. Bouchra El Bakkouri, Samira Raki, Touhfa Belgnaoui, The Role of Chatbots in Enhancing Customer Experience: Literature Review, *Procedia Computer Science*. Volume 203, 2022, Pages 432-437