

EFFICACY OF CHATBOT FOR PERSONALIZED CUSTOMER ENGAGEMENT IN ERODE DISTRICT

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ABSTRACT:

Chatbots have emerged as a transformative technology in the realm of customer engagement, offering businesses the opportunity to interact with their customers in a more personalized and efficient manner. This paper explores the potential of chatbots for personalized customer engagement, focusing on the development and implementation of advanced techniques to tailor interactions to individual preferences and behaviours. A comprehensive review of existing literature on chatbots, artificial intelligence (AI), natural language processing (NLP), and personalized engagement sets the foundation for this research. Key components and features necessary for enabling personalized customer engagement in chatbot systems are identified, including user profiling, context awareness, recommendation algorithms, and adaptive learning mechanisms. Leveraging advancements in AI and machine learning, innovative personalization techniques are developed and integrated into a prototype chatbot system. Analysis of user feedback and behavior provides insights into user preferences, patterns, and sentiments regarding personalized engagement with the chatbot. The findings of this research contribute to the advancement of chatbot technology and provide valuable insights for businesses seeking to enhance their customer engagement strategies in the digital age.

Keywords: chatbot, customer service, Systematic review.

In an increasingly digitalized marketplace, businesses are constantly striving to adapt and innovate their customer engagement strategies to meet the evolving needs and expectations of consumers. Artificial intelligence (AI) in marketing leverages machine learning and other AI technologies to analyse data, automate tasks, and personalize customer experiences, ultimately enhancing marketing performance and efficiency. AI can automate content creation, optimize ad spend, personalize customer interactions, and provide data-driven insights for better decision-making. Central to this endeavour is the integration of artificial intelligence (AI) technologies, particularly chatbots, which have emerged as powerful tools for facilitating real-time interactions between businesses and customers. While traditional chatbots have provided automated responses to generic inquiries, the paradigm is shifting towards a more personalized approach to customer engagement.

The concept of personalized customer engagement entails tailoring interactions and experiences based on individual preferences, behaviours, and past interactions. This personalized approach not only enhances customer satisfaction but also fosters stronger brand loyalty and drives business growth. Recognizing the potential of AI-driven chatbots in delivering personalized experiences, businesses across various industries are increasingly investing in advanced chatbot systems capable of understanding context, interpreting intent, and providing tailored recommendations.

However, despite the growing adoption of chatbots for customer engagement purposes, there remains a notable gap in research and implementation concerning personalized interactions. While conventional chatbots excel in handling routine queries, their ability to deliver truly personalized experiences is often limited. Addressing this gap requires a deeper understanding of the mechanisms and algorithms necessary to imbue chatbots with the intelligence and adaptability required for personalized engagement.

Despite the widespread adoption of chatbots for customer engagement purposes, there exists a significant gap in the capability of existing chatbot systems to deliver personalized interactions tailored to individual customer preferences and behaviors. Conventional chatbots predominantly rely on pre-defined responses and rules-based algorithms, limiting their ability to understand nuanced customer queries and provide personalized recommendations. This deficiency impedes businesses from fully leveraging the potential of AI-driven chatbots to enhance customer satisfaction, foster brand loyalty, and drive revenue growth. The researcher try to find the answer for the following questions?

1. What is the level of customer perception towards chatbots?
2. What will be the most preferred online platform?
3. What is the primary purpose of using chatbots in customer engagement?

SCOPE OF THE STUDY:

The present study is confined to Erode district of Tamilnadu. The increased mobile phone usage and development in the internet and communication technology have boosted the growth of such business in Erode. Erode district is facing a increasing technological influence, particularly in the areas of software services, digital transformation, and the adoption of new technologies in traditional industries. The district is witnessing increased entrepreneurship in the IT sector, driven by a skilled workforce and government support, and businesses are embracing digital tools to improve efficiency and reach.

REVIEW OF LITERATURE:

(Konya-Baumbach et al., 2023)¹ Big data analytics, artificial intelligence (AI), advances in data storage technologies, increasing speed of microprocessors and other important developments in information technologies are reshaping processes and practices in marketing as in other fields. All these technologies are helping businesses come up with new technological solutions that will dramatically change the way they interact with their customers. These technologies are transforming the company-customer interface from being people-oriented to being technology-oriented.

(Chen et al., 2021)² Chatbots are an excellent choice for businesses looking to improve customer service and sales efforts since they allow for tailored customer interactions, offer easily accessible service, and keep costs in check. The emergence of these smart interactive bots has changed the way online customers interact with businesses regarding products and services. Chatbots have many advantages for businesses as well as online customers. Chatbots offer an alternative to human services representatives for online businesses to interact with their customers, advertise new products, and assist customers with their various inquiries.

According to (Cheng and Jiang 2020)³, The study consisted of three parts in which they viewed how chatbots employ AI to influence user experience in many ways, paying close attention to which gratifications, how much risk, how satisfying, and how loyal the chatbots are, as well as how long users will stick with using them for. The research sees a surge in the using of chat bots in client relationships and the significance of having a better grasp of their impacts. The assistants bots perform multiple tasks simultaneously with their speed and digital nature, which boost up the overall levels of ease, convenience, and efficiency. This survey is a virtual representation of the features that existed in AI enabled customer service by taking the audio, video, sentiment analysis, privacy risk perception, customer satisfaction, commitment and continuous use.

¹ Konya-Baumbach, E., Biller, M., & von Janda, S. (2023). Someone out there? A study on the social presence of anthropomorphized chatbots. *Computers in Human Behavior*, 139, 107513. doi:10.1016/j.chb.2022.107513.

² Chen, J. S., Tran-Thien-Y, L., & Florence, D. (2021). Usability and responsiveness of artificial intelligence chatbot on online customer experience in e-retailing. *International Journal of Retail & Distribution Management*, 49(11), 1512–1531. doi:10.1108/IJRDM-08-2020-0312

³ JOURNAL OF BROADCASTING & ELECTRONIC MEDIA, How Do AI-driven Chatbots Impact User Experience? Examining Gratifications, Perceived Privacy Risk, Satisfaction, Loyalty, and Continued Use
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According to (Sidaoui et al, 2020)⁴, discuss the “AI-customer care” field by developing a new assessment technique of customer relations via chatbots questions. At the stage when customer experience means everything, monitoring what is happening in the market and conducting surveys that qualify its real gauging is extremely critical for those organizations looking to set themselves apart. The topic of study will deal with the idea that it is possible to understand customer experiences by carrying out different types of interviews with chatbots. For instance, chatbots are unique in the sense that they can effectively manage several interactions at the same time (Sidaoui et al, 2020). This in effect, allows companies with capable chatbots systems to collect a wide range of client feedback.

(Sands et al., 2021; Van Pinxteren et al., 2020)⁵ Accessible and effective service is made possible while preserving cost effectiveness through clever automation of customer service and sales procedures. A growing number of businesses are making substantial use of chatbots to interact with clients on company websites, social media platforms, and messaging applications in today’s cutthroat business environment.

(Agarwal, R., & Wadhwa, 2020)⁶ These chatbots have limitations in comprehending and reacting to natural language, and their replies might be somewhat repetitive. Rule-based chatbots excel in specific tasks or delivering uncomplicated responses to user inquiries. However, their capacity to understand and react to complex or natural language input is limited, making them less adaptable and intelligent than other chatbot types. Rule-based approaches work well when conversations are focused on a specific topic or task but become less effective as input becomes more natural or strays from the defined domain.

(Rietz et al. (2019)⁷ investigated the influence of both anthropomorphic and functional features on the acceptance of chatbots within enterprise applications. The research found that anthropomorphic features (those that make the chatbot appear more human-like) had a significant positive impact on user acceptance, particularly on perceived usefulness, and this effect was stronger than that of functional features.

OBJECTIVES OF THE STUDY

1. To identify the key components and features that aids chatbot personalized customer engagement.
2. To evaluate the user satisfaction in usage of chatbot.

⁴ AI feel you: customer experience assessment via chatbot interviews July 2020 Journal of Service Management 31(4):745-766 DOI:10.1108/JOSM-11-2019-0341, Sidaoui, K., Jaakkola, M. and Burton, J. (2020) “AI Feel You: Customer Experience Assessment via Chatbot Interviews” Journal of Service Management, DOI: 10.1108/JOSM-11-2019-0341

⁵ Sands, S., Ferraro, C., Campbell, C., & Tsao, H.-Y. (2021). Managing the human–chatbot divide: How service scripts influence service experience. Journal of Service Management, 32(2), 246–264. doi:10.1108/JOSM-06-2019-0203

⁶ Agarwal, R., & Wadhwa, M. (2020). Review of state-of-the-art design techniques for chatbots. SN Computer Science, 1(5), 1–12. doi:10.1007/42979-020-00255-3

⁷ Rietz, T., Benke, I., and Maedche, A. (2019): the impact of Anthropomorphic and functional chatbot design features in enterprise collaboration systems on user acceptance. Proceedings of the 14th International Conference on Wirtschaftsinformatik(2019).

HYPOTHESES OF THE STUDY:

On the basis of the framed objectives, the following hypotheses have been framed.

H₀₁: There is a association between Gender and Chatbot tone and Communication style.

H₀₂: There is a no association between Gender and Chatbot tone and Communication style.

RESEARCH DESIGN AND METHODOLOGY:

The present study is analytical research based on the survey method. The study is chiefly based on the primary data. Requires primary data have been collected by adopting convenience sampling technique by distributing the questionnaire through google forms. The questionnaire prepare in Google form. The questionnaire prepared in Google form has been distributed to various users of chatbot through e-mail and WhatsApp. Thus, data have been collected from 88 people of efficacy of personalised customer engagement.

FRAMEWORK ANALYSIS:

The collected data for the present study from the primary source through Google forms have been analysed with reference to each of the objectives with various statistical tools like Mean, Median, Standard deviation, and percentage analysis have been used to group the collected primary data. Factor Analysis and Chi-Square test has applied. Analyses have been made with the SPSS 31.0 and MS-Excel.

The principal Component Analysis has been used to extract the factors since the objective is to summarise most of the original information

TOTAL VARIANCE OF FACTORS

COMPONENT	Initial Eigenvalues			Extraction sums of squared Loadings			Rotation Sums of Squared loadings		
	TOTAL	% OF VARIANCE	CUMULATIVE %	TOTAL	% OF VARIANCE	CUMULATIVE %	TOTAL	% OF VARIANCE	CUMULATIVE %
1	10.141	63.382	63.382	10.141	63.382	63.382	6.995	43.716	43.716
2	1.180	7.376	70.758	1.180	7.376	70.758	4.327	27.042	70.758
3	.765	4.783	75.541						
4	.643	4.016	79.557						
5	.568	3.550	83.107						
6	.510	3.185	86.292						
7	.385	2.405	88.696						
8	.316	1.973	90.670						
9	.301	1.882	92.552						
10	.264	1.651	94.203						
11	.225	1.407	95.610						
12	.191	1.193	96.803						
13	.173	1.082	97.885						
14	.152	.949	98.834						
15	.096	.599	99.433						

From the above table it is clear that the model identifies 3 factors. The below table shows the component matrix for factors.

ROTATED COMPONENT MATRIX

Factors	COMPONENTS	
	1	2
The chatbot successfully understood my requests:	.859	.272
I would recommend this chatbot to others:	.813	.346
It adjusts to user's urgency/mood	.794	.378
It remembers you across email/chat/app	.791	.286
Compared to human customer service, chatbot services better	.791	.290
It anticipates your needs before you ask	.783	.294
The conversation flow felt natural and intuitive:	.775	.441
It provided accurate information/solutions:	.688	.384
The chatbot's response speed was satisfactory:	.672	.419
The chatbot's personality/tone was appropriate:	.670	.424
The is chatbot resolved my query without needing human assistance:	.664	.427
Recommends irrelevant products	.247	.867
Asks for redundant information (e.g., "What's your order #?"	.380	.776
Requires login/signup too early	.337	.766
It fails to identify local idioms, slang support	.344	.753
Overwhelms with options/long menus	.498	.593

Extraction method: Principal component Analysis

Rotation Method: Varimax With Kaiser Normalization

It is clear from the above table that each factor identifies itself with a few set of variables after 9 iterations. The variables which identify with each of the factor are sorted in descending order and are shown each column and row. The 16 factor are thus reduced to factors.

LIMITATION OF THE STUDY:

1. The responses collected from sample respondent cannot be generalised
2. The respondents were reluctant to fill the questionnaires.

FINDINGS OF THE STUDY:

The following are the findings of the study: While analyzing the variables of the sample respondent, it is found that:

- It is found that 48% of the respondent are between 18-24 years and Among 88 respondents 81% of the respondents are female.
- It is evident that majority (30%) of the respondents are earning Rs.10,001 to Rs.20,000.
- It is vivid that majority (60%) of the respondents are Private employees. Among 88 49% of the respondents reported shopping online on a monthly basis and 30% of the respondents use Amazon, 30% use Meesho respectively.
- It is vivid that 32% of the respondents use chatbot mainly for Product recommendations and Order tracking respectively.
- The most preferred feature of chatbot is "Natural Language Processing (NLP) (26%).
- Among 88 respondents 50% of them agreed that chatbots adapt to their tone, indicating a positive perception of tone-based personalization.
- It is vivid that the most influential factor, (31%) of the respondents is having a clear privacy policy, indicating that users highly value data security and transparency when interacting with chatbots.
- It is evident that the most favored style is light jokes or puns (e.g., *"Let's taco 'bout your order!"*), (32.5%).
- Thirty six percentage of the respondents reported issues in the most reported issue is "too many follow-up questions", selected by 36%.
- The calculated value of Cronbach's Alpha is 0.920 for 7 items used for the analysis. The value is under the excellent range (i.e., > than 0.90). Therefore it can be concluded that the factors used to measure the influence level are found to be reliable and have an highly acceptable level of internal consistency.
- The test value is 1264.064 at 1% level of significance. As the significance level is so small, it is clear that the correlation matrix is not an identity matrix. It implies that there exists correlation between the variables. It is also revealed that the value test statistic is 0.920 which is more than 0.5. This indicates that the factor analysis for the selected variables is appropriate to the data.

On the basis of the findings of the study and suggestions made by the sample respondents, the following viable suggestion have been given.

- Chatbots should be further optimized to utilize user data (purchase history, preferences) to deliver tailored experiences and also increase chatbot capability to remember past interactions and use user names, as these features are associated with greater satisfaction.
- Chatbot design should aim for concise, context-aware interactions and avoid over-prompting.

CONCLUSION:

In an era defined by rapid technological advancement and heightened customer expectations, businesses are increasingly leveraging artificial intelligence (AI) to transform the way they engage with their customers. This study examined the efficacy of chatbot systems in enhancing customer engagement, with a particular focus on the role of personalization in shaping user experiences and satisfaction. The analysis revealed that while chatbots are widely used and offer clear advantages in terms of efficiency, availability, and speed, their capacity to provide deeply personalized and contextually relevant interactions remains limited. Traditional rule-based chatbots are largely restricted to predefined responses, which restricts their ability to address complex or nuanced customer needs. This limitation presents a critical challenge in fully realizing the potential of chatbots as tools for meaningful customer engagement. A key insight from the study is the growing demand for personalization in chatbot interactions. Users increasingly expect chatbots to not only respond quickly but also to understand their preferences, remember past interactions, and tailor responses accordingly. The findings indicate that features such as natural language processing (NLP), personalized product recommendations, and tone adaptation are highly valued by users. Chatbots that can exhibit human-like qualities—such as empathy, humor, and adaptability—are more likely to foster positive interactions and build stronger customer relationships. Moreover, the study highlights that personalization contributes significantly to customer satisfaction, trust, and brand loyalty. Therefore, this study concludes that to effectively enhance customer engagement, businesses must move beyond conventional chatbot designs and adopt advanced, AI-powered systems.

JOURNALS:

1. JOURNAL OF BROADCASTING & ELECTRONIC MEDIA, How Do AI-driven Chatbots Impact User Experience? Examining Gratifications, Perceived Privacy Risk, Satisfaction, Loyalty, and Continued Use <https://doi.org/10.1080/08838151.2020.1834296> CONTACT Yang Cheng ycheng20@ncsu.edu Department of Communication, North Carolina, State University, Raleigh, NC, USA
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