JOURNAL OF CULTURAL ANALYSIS AND SOCIAL CHANGE

Journal of Cultural Analysis and Social Change,
2025, 10(4), 2358-2367
ISSN: 2589-1316

A Framework for Enhancing Airline Chatbot User Experience

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Citation: Arreza, M. K. (2025). A Framework for Enhancing Airline Chatbot User Experience, *Journal of Cultural Analysis and Social Change*, 10(4), 2358-2367. https://doi.org/10.64753/jcasc.v10i4.3227

Published: December 13, 2025

ABSTRACT

Many businesses today including the airline industry have achieved newfound ways of providing service to consumers through chatbots which deliver quick efficient seamless interactions enabling better satisfaction for users and business operation streamlining. The research focuses specifically on examining the feedback of users of their dialogue with airline chatbots as the study aims to develop a Utilization Framework that provides all the necessary components to enhance the services of an airline chatbot system. It has been established in the created framework that the phases of the following components from Opening, Dialog Flow, Referrals, to Exit are necessary for a better experience of the chatbot services. Results from the thematic analysis reveal seven central themes: 1) Ease of Use and Accessibility, 2) Helpfulness and Effectiveness, 3) User Frustration and Difficulty, 4) Need for Improvement and Human Support, 5) Impersonal and Robotic Interaction, 6) Perception of Quality and Value and, 7) Specific Functional Feedback. System improvement relies on the critical feedback mechanism during the Exit phase to facilitate continuous improvement. The research delivers a crucial understanding of chatbot development, particularly for airlines and other similar industries which depend on customer satisfaction along with service quality to maintain client retention.

Keywords: Airline Chatbot, User Experience, Service Quality, Chatbot Framework

INTRODUCTION

There is this intensity of interest from many business organizations on chatbots because these chatbot systems allow user interactions through natural language interfaces and service and data access (Brandtzaeg & Følstad, 2017). The growing interest and the change in consumer behavior through chatbots have revolutionized the methods through which businesses communicate with their customers. Chatbots within digital agent roles find their way into e-commerce platforms and e-services which enhances business efficiency while creating new ways to enhance user experiences. The global economic transformation arising from digital industrialization receives direct demonstration through chatbots which exist among artificial intelligence subsets (Verganti et al., 2020). These systems operate without stopping and manage extensive amounts of queries to produce digital records that enhance service quality as time progresses.

Chatbot systems hold value in e-services because many businesses now implement chatbot integration through customer access points to deliver reduced waiting times and enhanced information collection with personalized help programs. Chatbot functions as a digital brand representative by conducting meaningful interactions with customers who no longer have to deal with lengthy phone queues and artificial system interfaces (Sujata et al., 2019; Silva et al., 2023). Artificial Intelligence (AI) functions across different disciplines to support technological developments throughout multiple business areas worldwide. AI drives organizational enhancement through dynamic processes and products which make organizations more flexible and intelligent and client-oriented systems. Chatbots operate as conversational systems to duplicate human dialogue via natural language communication which operates through either text-based or speech-based methods. Artificial Intelligence (AI) Chatbots are machine conversational systems that interact with human users using natural conversational language.

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They are also referred to as conversational agents and digital assistants or virtual helpers. These systems represent artificial structures that interact with human beings by using natural language to speak and understand commands allowing task-oriented interactions to become possible due to websites and applications showing their essential role (Davenport et al., 2019; De Andrade & Tumelero, 2022; Ranieri et al., 2024).

Chatbots have evolved significantly. These systems achieve simulations of human dialogue through computational-linguistic methods and natural language processing along with adaptive learning so they can present more realistic and helpful interactions (Mozafari et al., 2021; Ranieri et al., 2024). The advancements in Natural Language Processing (NLP) and Machine Learning (ML) have improved their ability to interpret and respond to complex user inputs, making them increasingly effective communicators (Misischia et al., 2022). The ability of AI to reason while modeling and predicting and describing data makes it an effective system for automatically producing customer support. The transformative capabilities of robotics alongside AI have intensive limitations because technology impedes performance while users exhibit resistance and users express distrust and usability concerns. The service sector keeps expanding its AI utilization to deliver quick precise and personalized customer support that produces better experiences and operational benefits (Alam, 2020; Prentice et al.,2020).

The rapid internet expansion during the digital economy requires this development to transform human interaction along with work practices and business process. Consumer behavior has completely changed toward e-commerce so it has become the primary transaction method. Online sales show average yearly growth of 20 to 25 percent while changing the market through fast delivery and wide product variety and convenient shopping (Misischia et al., 2022). The marketplace benefits from chatbots which give instant interactive support to improve online experiences by offering personalized service (Prentice et al., 2020).

The definition of smart technology lies in its ability to satisfy requirements that typically need human cognitive abilities (Ranieri et al., 2024). The broad field of artificial intelligence showcases chatbots as its leading application which delivers text-based conversations that users tend to find superior to other digital interfaces (Brandtzaeg & Følstad, 2017). Many digital agents now operate in customer service because they permit users to communicate through natural dialogue for product advice and order management and delivery status checks (Brandtzaeg & Følstad, 2017; Xu et al., 2017).

The development of chatbots enabled multiple tasks to be handled through these systems. At present chatbots operate as constant availability systems in place of regular support channels including call centers and web searches (Brandtzaeg & Følstad, 2017). The analysis of digital and robotic service interaction methods has become more important than face-to-face service evaluations (Chiang and Trimi, 2020). Also, the emotional quality between customers and service representatives becomes essential because it determines the customers perceptions. The capability of chatbots to detect and respond to emotional indications using fundamental expressions of communication and politeness (Yun & Park, 2022). Structured emotional interactions through chatbots produce better service quality while creating associations of authentic support between human-like systems and customers. The experiences of customers' focus on both emotional responses and attitudes during its design of AI-powered services. The current generation of chatbots analyzes real-time data and collects information from past exchanges then adapts their responses (Sujata et al., 2019; Xu et al., 2020).

Users adopt AI technologies at variable rates since their acceptance depends on factors that include both age and education level as well as digital proficiency (Arreza,2022). The COVID-19 pandemic accelerated the adoption of AI through commercial industry transformation where aviation began heavily using chatbots for sustaining customer relations (Ukpabi et al., 2019; Kim & Chang, 2020).

The key marketing functions of chatbots involve improving interaction between users and business entities and delivering entertainment content while addressing problems for customers and showing market direction and tailoring experiences to individual preferences. Service excellence depends primarily on functionalities which tackle the difficulties of remote customer care and enhance service delivery (Chung et al.,2018).

The design of successful chatbot interactions needs substantial knowledge of user experience (UX) principles that assess emotional together with cognitive responses that users display during their chatbot service encounters (de Sand et al., 2020). The field of chatbot UX produces sparse research findings across different domains of study in the Philippines and abroad. Studying the chatbot users' feedback and comments becomes vital to enhancing their service performance according to user expectations. More brands have now integrated chatbots into their operations across sectors like banking, information service and retail in addition to airlines thus requiring strategic chatbot design for usability (Arreza, 2022; Aboelmaged et al., 2024). This was expedited during the pandemic (Lubbe & Ngoma, 2021; Kim & Chang, 2020). The absence of traditional ticketing offices from airline customer options has made exceptional chatbot service quality essential for continuous user satisfaction (Chiang & Trimi, 2020).

Even though organizations extensively use chatbots they consistently provide users with experience quality issues. Global businesses show their increasing interest in chatbot systems since half of them either have already implemented these technologies or plan to do so in the future. The users react differently to automated systems

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with some users praising their fast operations yet others finding the technology unsatisfying due to incorrect answers and complicated interactions and missing personalized service (Arreza & Esguerra, 2022; Silva et al., 2023). User satisfaction demands an opposite balance from chatbots while maintaining their functional capabilities.

The total adoption of chatbots faces multiple obstacles that impede their widespread utilization. The main challenge stems from chatbot users' doubt regarding the replacement of human work by chatbots that invade tasks normally handled by human agents. Mistrust of the services provided by Chatbots stems from their skepticism about the systems' capacity to address complex cases thus jeopardizing their reliability levels. Chatbot users who lack an understanding of technology experience greater challenges when integrating chatbot systems with operational workflows (Fernandes & Oliveira, 2021; Crolic et al., 2022; Ranieri et al., 2024). The adoption and functionality of chatbots require solutions for both technological concerns and human factors because they create barriers to successful implementation.

Chatbot effectiveness depends both on technological strengths and the development of human-like interactions between them and users. Platform development needs social presence simulation alongside feedback mechanisms and meaningful interaction maintenance to attain trust and continued user engagement (Lim et al., 2022). User perception is substantially affected by chatbot limitations in problem-solving and emotion display as well as their inability to comprehend contexts according to (Ranieri et al., 2024).

The motivation of consumers using chatbots joint with emotion-driven interface design stands as a required development step toward effective chatbot implementation (Brandtzaeg & Følstad, 2017). The wide-ranging potential of chatbots encompasses better service efficiency along with customized experiences and expanding accessibility options to customers. Knowing human behaviors along with emotions and service expectations becomes essential for the successful adoption of the technology. The successful implementation of chatbot systems depends on both technical expertise and emotional connection to the user base so organizations can maximize their benefits in modern digital service models (Yun & Park, 2022).

This research examines the feedback and comments of airline chatbot users on their website and through social media. The findings served to create a utilization framework which aim to enhance chatbot service performance to achieve better user satisfaction during interactions.

METHODOLOGY

A qualitative research design was used in this study to examine airline chatbot user feedback and comments, from ninety-seven (97) participants of legal age who have given consent in participation in this study and who had interacted with a chatbot for not more than two (2) months were chosen using a purposive sample technique. Participants who provided had to have utilized a chatbot that provided services through websites or social media channels to guarantee relevancy by providing words or phrases that they felt best captured the essence and caliber of their interactions with the chatbot, participants were invited to describe their experiences. To capture more complex or unique reflections, participants were urged to add extra terms in addition to the carefully chosen list of adjectives that served as a guide for responses.

A word cloud visualization was created to show the most often referenced descriptors to aid in the interpretation process. The word cloud functioned as a heuristic tool that enabled a preliminary comprehension of the participants' prevailing impressions, although not statistically examined. The comments were further subjected to word frequency analysis using a word cloud tool to show which words were frequently used by the participants. The procedure was to transfer the verbatim comments into the word cloud generation tool worldcloud.com. This tool helped put the words into a picture where the size of the word was proportional to the number of times it was used.

The research collected data through user-supplied one-word and short-phrase responses and it incorporated free-form voluntary discussions from airline chatbot users for analysis purposes. used thematic analysis was used to evaluate user responses systematically before they organized them to discover underlying patterns then coding procedures on statements are grouped to discover fundamental themes that became the foundation of user chatbot viewpoints.

The thematic analysis yielded core themes that depict the user experience with airline chatbots as found in Table 1. These themes generate important data about users experience feedback and comments on airline chatbots and identify parts of the system function what need enhancement.

RESULTS AND DISCUSSIONS

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Figure 1. Word cloud created with https://www.wordclouds.com/ of responses in the final part of the comments about chatbots. As seen on the figure are the summarized answers of the participants on anything they found particularly frustrating or interesting about the chatbots.

The feedback and comments from participants were subjected to word frequency analysis using a word cloud tool to show which words were frequently used by the participants. The procedure was to transfer the verbatim comments into the word cloud generation tool https://www.wordclouds.com/. This tool helped put the words into a picture where the size of the word was proportional to the number of times it was used.

The word cloud included creative, easy, great, fast, powerful, helpful, accessible, reliable, and exciting as the positive comments. As shown in figure there is a fair share of positive and negative comments those in large fonts indicating more comments from users.

Thematic Analysis Results

Table 1. Thematic Summary Table

Core Theme	Subthemes	Discussion	Implications and Insights
Ease of Use and Accessibility	Easy, Accessible, Convenient, Simple, Fast	The theme addresses the crucial aspect of chatbots needing to be easy to use for users. User's value chatbots when they are simple to operate along with providing immediate efficient service which creates a positive interactive experience.	The importance of user satisfaction rests on making sure chatbots are smooth to use and navigate. Developers need to optimize user interface design together with response time improvements to increase chatbot accessibility and user convenience.
Helpfulness and Effectiveness	Helpful, Great, Smart, Fast Response, Innovative, Creative	This theme demonstrates how effective chatbots perform to boost user interface quality. Users appreciate helpful and swift chatbots that deliver innovative solutions which results in better overall chatbot capabilities.	User satisfaction improves substantially when an AI system achieves better problem-solving functions and develops innovative response strategies. Investing into upgraded AI training systems along with implementing innovative problem-solving approaches enables chatbots to function more efficiently.
User Frustration and Difficulty	Difficult, Frustrating, Limited, Limited Option, Problematic, Trouble processing request, Unable to process refund	Users experience negative aspects of their interactions with chatbots through this theme. People who use chatbots encounter trouble when using the system along with restricted capabilities and inadequate request processing that causes frustration together with dissatisfaction.	Increasing the capacity and stability of chatbots stands as a fundamental requirement to handle identified user problems. User experience improves when organizations hold regular feedback sessions with their users then use collected suggestions to drive product changes.

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Need for Improvement and Human Support	Needs Improvement, Need Human Support, Lack Support, Better, Almost Perfect	Users identify problematic areas with chatbot systems through this theme. Users demand both human assistance and general operational enhancements to achieve better performance from chatbots.	User trust and satisfaction increase when seamless human interactions are integrated with chatbot capabilities while continuous improvements happen to the capabilities. Organizations can effectively handle the challenge by human support in hybrid operational models.
Impersonal and Robotic Interactions	Robotic, Unfriendly, Generic, Basic, System Generated	The theme deals with how users experience impersonal experiences while interacting with chatbots. Different users express dissatisfaction with chatbots because they deliver robotic messages and show minimal interpersonal qualities that would enhance interaction quality.	The technical implementation of better natural language processing algorithms alongside empathetic response software makes interactions feel more like conversations with human beings. User engagement increases when chatbot responses match personal user specifications along with individual preference requirements.
Perception of Quality and Value	Great, Excellent, High End, Smart, Powerful, Good	The positive user perceptions about chatbots form the basis of this analysis theme. Customers who find value in high-quality chatbots tend to express positive feedback resulting from their interactions with these systems.	Positive user perceptions can be enhanced through high-quality standards and the effective demonstration of chatbot functionalities and superior features. Market emphasis on superior product features helps both acquire new consumers and foster customer retention.
Specific Functional Feedback	Ads, No Clear Response, Complex, Elementary, No Choice, Calls Are Expensive	Users have raised functional problems that form the content of this theme. User experience suffers from multiple obstacles that include advertisement issues, unclear responses and complex interface and expensive requirements.	User satisfaction and effective use of chatbots increases significantly when functional issues receive specific improvements that include ad intrusive reduction and clear response development and interface simplification and cost-management elements.

The findings from the thematic analysis of chatbot user experiences can be tied to relevant literature to provide a deeper understanding of the factors influencing user satisfaction, reuse intentions, and the overall success of chatbot-based customer service.

Ease of Use and Accessibility

Chatbots are found valuable when its simple to use and accessible while also providing fast responses. Research results validate the significance of user interface construction and chatbot response times because this theme matches with their findings. Users seek reliability with assurance from chatbots for their satisfaction (Arreza, 2022), and this matches users' preferences of easy-to-use quick response systems. Perceived ease of use enhances user attitudes toward chatbots alongside their adoption behaviors (Silva et al., 2023). User satisfaction depends heavily on both interface development quality and response speed which research confirms as vital elements for service reliability improvement in different business systems.

Helpfulness and Effectiveness

Chabot user's value helpful and quick chatbots with innovative solutions. User experience with chatbots along with their intention to continue using them stems directly from perceived usefulness. Excellent problem-solving abilities substantially enhance user satisfaction along with perceived usefulness regarding chatbots. customer satisfaction increases through continuous design innovation in chatbots which strengthens trust in the technology (Kasilingam, 2020; Silva et al., 2023).

User Frustration and Difficulty

The problems users encounter due to system limitations and the process difficulty users experience when working with the system. Supported user dissatisfaction through their findings which demonstrated users skip complex inquiries with chatbots because they doubt the reliability and accuracy of the system. When chatbot capabilities fall short of customer expectations it generates two undesirable outcomes: users will leave the system and fail to follow agreed protocols (Silva et al., 2023). The current study results confirm the need for chatbot system development to expand functionalities while enhancing reliability because both factors impact how users perceive frustration (Nguyen et al., 2021).

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Need for Improvement and Human Support

Users need to interact with humans after chatbots present unsatisfactory responses there should be a Hybrid Model introduced in the system which merges AI systems with human assistance through smooth agent transfers because this establishes better user trust and satisfaction in chatbots (Xu et al., 2020). Empathy-based and human-like characteristics in chatbots enhance user satisfaction and create perception of understanding and appreciation in users - findings which correspond with this research on human involvement and chatbot capability advancement (Chung et al.,2020; Sands et al. 2020).

Impersonal and Robotic Interactions

Users frequently complain about chatbots being not personable or robotic according to the Impersonal and Robotic Interactions theme. Empathy with active listening along with personalized responses create user-friendly interactions that resemble human contact (Rapp et al., 2021). Chatbot user satisfaction improves when emotional language and personalized responses are integrated (Chung et al., 2020).

Perception of Quality and Value

Reliability and assurance create positive chatbot satisfaction. Users experience better outcomes when their perceived value of chatbots remains high because such perceptions enhance both chatbot satisfaction and user engagement operating efficiency leads to user retention because customers remain loyal to the platform (Gümüş & Çark, 2021; Arreza & Esguerra 2022).

Specific Functional Feedback

The specific functional feedback theme targets user issues regarding system functionalities such as advertisements together with expensive calls. System improvements that reduce chatbot intrusiveness and enhance response clarity in chatbot interaction result in enhanced user satisfaction (Seitz et al., 2022).

User satisfaction with chatbots depends on integrating personalization through emotion words while implementing active listening and problem-solving functions alongside easy system usage. The fundamental drivers of user satisfaction along with intentions to reuse chatbots remain trust and perceived usefulness according to both (Sujata et al., 2019; Arreza, 2022; Hsiao & Chen et al., 2022). The effectiveness of chatbots requires organizations to overcome functional restrictions and implement humans for assistance while guaranteeing reliable and clear communication.

The findings make valuable contributions to the developing field of chatbot customer service while showing a utilized framework on how to advance current chatbot systems. The developed themes point out issues in the current chatbot framework thus need resolution when combined with existing research to make chatbot services more effective for improved user satisfaction and higher reuse willingness.

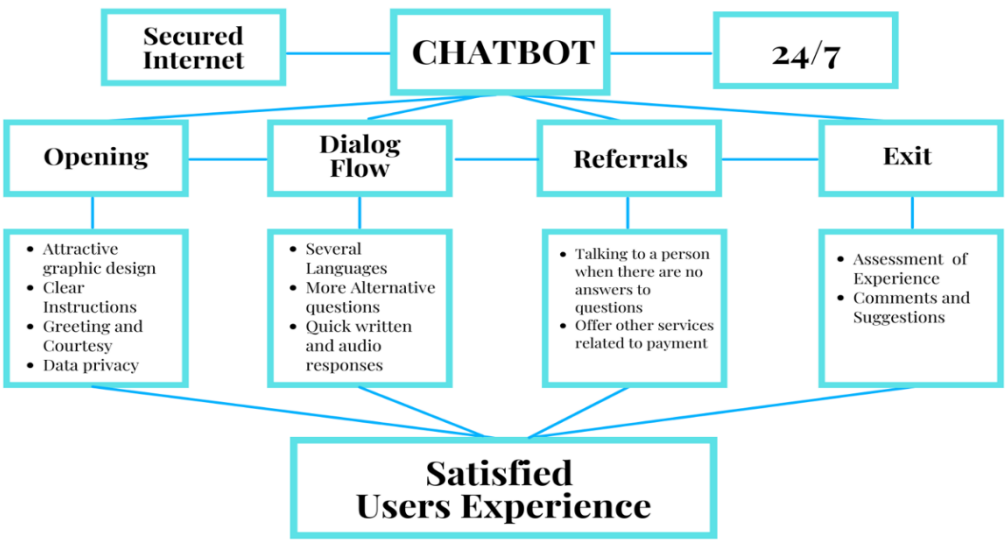

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Figure 2. Utilization Framework for an Airline Chatbot

The Utilization Framework for an Airline Chatbot, as outlined in Figure 2, consists of key components—Opening, Dialog Flow, Referrals, and Exit—each of which directly ties to the results and literature in this study. To achieve high satisfaction of service chatbot connection should be secured and available 24/7.

Opening

Users achieve more efficient transactions through streamlined navigation from engaging visual interfaces and straightforward relevant guidance which they encounter when using chatbots. Users emphasized the requirement of accessible and responsive interfaces. User engagement exhibits significant positive changes when systems receive high evaluations on perceived ease of use. Users should exercise personal data control because this directly affects their trust and satisfaction levels according to the framework. Proper management of data combined with transparency systems act as fundamental factors which build user security and respect when users communicate with chatbots (Gümüş & Çark 2021; Seitz et al. 2022).

Dialog Flow

The Dialog Flow component of the framework allows users to engage in smooth platform-based communication particularly through social media platforms such as Facebook Messenger. The system requires language independence in chatbots along with standardized professional conduct during all interactions. Users value chatbot systems that supply prompt and appropriate solutions. Users mostly evaluate the usefulness of their chatbot experience since it determines system satisfaction (Cardona et al., 2021). User satisfaction receives additional strength from multi-language communication capabilities which supports global accessibility and easy use the ongoing dialogue interface optimization for speed and accuracy satisfies system reliability and responsiveness criteria (Eren, 2021).

Referrals

The Referrals section enables users to receive human assistance by providing them with the option to transfer dialogue to a human operative. This functionality relates to the Need for Improvement and Human Support theme because users became frustrated when chatbots showed limitations in addressing complicated questions and generating inadequate answers. A hybrid system that allows chatbots to automatically shift users to human support for better user satisfaction and trust (Xu et al.,2020). Users who possess the ability to switch to a human agent demonstrate increased satisfaction. Empathy and human attributes make chatbots more fulfilling for users (Chung et al., 2018).

Exit

The Exit phase sets a direct link to User Frustration and Difficulty because it lets users express their opinions about their chatbot encounters. Through the feedback process users may express their problems with the chatbot as this feedback enables the identification of continued development needs. User needs and expectations from chatbot services require feedback loops combined with ongoing tests (Adam et al., 2020) Users primarily focus on both productivity requirements and information needs when seeking immediate effective help. Analysis results confirm these findings because users demand speed of response duration when achieving satisfaction with chatbots in customer service (Følstad & Brandtzaeg, 2020; Ngai et al., 2021).

Integration with User Motivation and Needs

The Utilization Framework confirms that productivity motivation requires immediate user feedback which matches the research outcomes. users now choose systems that enable goal-focused communication while delivering instant feedback thus confirming the study findings about users being drawn to chatbots due to their efficiency and productivity (Følstad & Brandtzaeg, 2020; Rapp et al., 2021). The instant need for feedback information (demonstrated in the framework) contributes to usefulness because effective time-efficient task execution directly affects user satisfaction and retention levels. Users in various contexts demand different levels of adaptability from their systems (Følstad & Taylor, 2021).

Framework Application to Chatbot Design

The results show user frustration affects the System Usability and Design Factors detected in the framework because unsatisfactory or difficult task completion with chatbots leads to abandonment and unfavorable perception. The research findings confirm usability plays a vital role in making effective human-machine interactions possible. The reliable design characteristics combined with simple forms of chatbots directly support user adoption and repeated use (Gümüş & Çark, 2021; Hsiao & Chen et al., 2022). The results demonstrate that it is essential for chatbots to accommodate various user profiles because this reflects a vital design consideration.

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Explained how users with different backgrounds demand unique usability expectations that the framework resolves directly through audience-focused output generation and feedback procedures (Seitz et al., 2022).

Competitive survival demands from service providers a continuous improvement of both service quality and customer satisfaction. The current business environment demands performance above basic customer expectation satisfaction. Users must evaluate their service quality and satisfaction during their airline chatbot experience to enhance their services. The innovative nature of chatbots gives businesses a way to help customers through service requests at any time and any location. The refinement of these systems depends on fundamental understanding of user perceptions together with the identification of key attributes because these represent an emerging technology. The evaluation of satisfaction stands essential in maintaining customer loyalty and retention because it demonstrates the success of service systems and leads to financial objectives (Arreza, 2022).

The research utilized three essential approaches known as user-generated descriptors in combination with word cloud analysis and thematic coding for triangulation. The combination of these methods provided comprehensive information about user experiences because it mirrored information between diverse data collection methods. The research results confirmed previous findings to develop a Utilization Framework for Airline Chatbots that requires Opening, Dialog Flow, Referrals, along with Exit components. These components exactly correspond to fundamental analysis-driven themes including user convenience, operational success and system requirements as well as support requirements paired with the identification of user dissatisfaction.

The study continues to hold value but faces constraints because it depends on subjective information without suitable numerical evidence and addresses only one particular scenario. Future research may add data from different sectors, behavioral measurements, and long-term research to make the framework more useful and deeper.

CONCLUSION

The study presents important information about chatbot usability experiences that uncover key operational areas that need development. User feedback was comprehensively studied. Findings revealed seven fundamental categories of chatbot user experiences consisting of *Ease of Use and Accessibility, Helpfulness and Effectiveness, User Frustration and Difficulty, Need for Improvement and Human Support, Impersonal and Robotic Interactions, Perception of Quality and Value and Specific Functional Feedback*. It has been recognized in the findings that chatbots must have simple usages to deliver effective assistance despite many service areas needing better development. Users get frustrated because they encounter limited system functions along with impersonalized exchanges that require human help for the essential support they need. There is a need to improve on ambiguous system suggestions and advertisement intrusion in social media feeds after the usage of the chatbot.

Chatbot design together with user experience directly depends on how clear and easy-to-understand responses are presented. All stages during user interaction starting from Opening through Exit need straightforward communications according to the Utilization Framework for Airline Chatbots to help users efficiently use the system. A structured message delivery system that peoples understand easily leads to higher user satisfaction levels. Several issues persist when dealing with multiple languages in addition to user queries which require adaptation to different contexts. Real-time adjustme nts required for the chatbot's conversational flow become difficult to accomplish because they need to work across different users and their interaction methods. The analytical framework experiences limitations through its requirement of generalized patterns since some user requirements might exceed its scalable nature. Researchers need to conduct more studies for developing better message structures and enhanced context adaptation capabilities for different users.

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