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Narrative literature review: Efficiency enhancement - user trust in chatbots as a tool for improving service quality by humans

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ABSTRACT

Chatbots have become efficient and reliable tools for instant and real-time information dissemination. Despite their effectiveness, user trust in chatbot systems remains relatively low. A holistic approach is necessary, integrating user emotional experiences, trust-building strategies, and continuous technological refinement to maximize chatbot benefits across various sectors. This research explores the potential for selective information dissemination based on user preferences using chatbots combined with artificial intelligence. Through a narrative approach, the study reviews literature and analyzes eight articles related to chatbots' application in information dissemination. The results indicate that chatbots are efficient in providing information and can be customized for various needs, such as population services, reminder notifications, and book processing. Chatbots have the potential to enhance services and can be integrated into information systems to improve service quality. However, challenges such as reliance on high-quality data and machine learning, difficulties in understanding non-formal language or slang, and limitations in handling complex questions need to be addressed for chatbots to reach their full potential.

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1. INTRODUCTION

In everyday life, chatbots have evolved into intriguing virtual assistants that offer real-time responses to assist students in meeting their informational needs [1]. Chatbots also have the potential to substitute conventional information channels such as TV and radio, which are time-consuming and require additional effort for access. This underscores the developmental potential of chatbot technology to provide ease of access to information rapidly and in real time without requiring extra effort [2].

Despite the potential of chatbots to quickly fulfill information needs, user satisfaction is not always guaranteed. A survey by Huang et al. [3] reveals that users generally prefer services provided by human representatives. This preference stems from users' lack of trust in chatbot performance, as indicated in the study by Wang et al. [4], which is further corroborated in an ERP study. User distrust in chatbots is associated with the findings of Glikson and Woolley [5], highlighting the relevance of trust in human-AI relationships due to

perceived risks, particularly arising from the complexity and nondeterministic behavior of artificial intelligence (AI). In the context of chatbots, user trust can be influenced by various factors, including the chatbot's ability to comprehend and accurately respond to user queries.

In 2021, Universitas Brawijaya's Faculty of Computer Science launched HaloFilkom as an online platform to enhance the quality of both academic and non-academic services. However, the questions received by the staff were repetitive and required instant responses, leading to a phenomenon of staff delays in addressing questions and complaints due to the increasing volume of inquiries, particularly at the beginning and end of the academic year. Academic service chatbots for students are expected to be responsive and constantly vigilant in answering questions posed by Ranoliya, Raghuwanshi, and Singh [6], especially in the field of customer service [7]. A study by Bahartyan et al. [8] supports the existence of responsive and vigilant customer service through the integration of chatbots into the Edu4Indo.com system as virtual assistance. Additionally, chatbots have significant impacts in various fields, including population services. In a study by Adiyoko et al. [9] titled "Population Letter of Introduction Service System Using Telegram Bot," Ngipik Village utilized chatbots to provide population letter of introduction services anytime and anywhere.

Although chatbots have great potential to support the improvement of service quality, especially in the customer service field, they have not yet fully gained user trust. Huang D et al. [3] mention that users prefer services provided by human representatives because users lack understanding of chatbot capabilities, face limitations in understanding natural language, and experience less satisfying user experiences Huang D et al. [3]. Furthermore, AI ethics and privacy protection also influence user trust in chatbots [10]. Therefore, solutions are needed to address user distrust in chatbots, as the most significant challenge in implementing chatbots lies in the user perspective [11]. To identify the relevance of human-bot interactions in information service quality, the author uses a literature review method based on the theory proposed by Wolfswinkel [12].

2. METHOD

A narrative literature review is an approach to research that focuses on the examination of a user and gathers and analyzes various sources of literature to construct a coherent story or narrative regarding a specific topic [13]. This approach is often used to explore various aspects of a phenomenon or to provide an in-depth understanding of an issue.

This study analyzes writing related to the implementation of chatbots to realize quality service and its impact on user trust. Article searches were carried out based on the publication years 2019-2024 using Google Scholar, Emerald, Elsevier, and Link Springer databases. The search criteria were centered around the keyword "chatbots".

Table 1. The research result with keyword “chatbot”

No.	Article Identify
1.	Wang, C., Li, Y., Fu, W. & Jin, J. (2023). Whether to trust chatbots: Applying the event-related approach to understand consumer emotional experiences in interactions with chatbots in e-commerce. Journal of Retailing and Consumer Services, 73. https://doi.org/10.1016/j.jretconser.2023.103325
2.	de Andrés-Sánchez, J., & Gené-Albesa, J. (2023). Explaining Policyholders’ Chatbot Acceptance with an Unified Technology Acceptance and Use of Technology-Based Model. Journal of Theoretical and Applied Electronic Commerce Research, 18(3), 1217–1237. https://doi.org/10.3390/jtaer18030062
3.	Ramdani, N. A., Asriyanik, . null ., & Apriandari, W.. (2023). Implementasi Azure Cognitive Services dalam Pengembangan Chatbot Layanan Informasi Skripsi. 15(1), 160–172. https://doi.org/https://doi.org/10.51903/pixel.v16i2
4.	Manullang, E. B., Hartati, R. & Nasution, R. D. (2023). Utilization of chatbot Telegram AI to Promote Students’ Creative and Innovative Entrepreneurship of Students in Learning Context. SALTeL Journal (Southeast Asia Language Teaching and Learning), 6(2), 27–35. https://doi.org/10.35307/saltel.v6i2.111
5.	Nguyen, V. T., Phong, L. T., & Chi, N.T. K. (2023). The impact of AI chatbots on customer trust: an empirical investigation in the hotel industry. Consumer Behavior in Tourism and Hospitality, 18(3), 293–305. https://doi.org/10.1108/CBTH-06-2022-0131
6.	Haqimi, N. A., Kusuma, R. T., Azizul, N., & Oktaviantoro, H. (n.d.). Journal of Soft Computing Exploration Timeline Reminder System Bot and telegram assistant chatbot for a University Student and lecturer. https://doi.org/10.52465/joscex.v4i4.221

The data collection technique involved analyzing several articles from four journal publications. Google Scholar, Emerald, Elsevier, and Link Springer. The data collection technique was conducted in two stages, consisting of screening titles and abstracts and removing articles that did not meet the eligibility criteria. Subsequently, 45 articles were found, and six relevant journals were selected to meet the research needs. Finally, the author performed data analysis techniques on these six journals according to the topics, research methods, findings, and research implications. Data extraction was carried out by categorizing and entering data into a table.

3. RESULTS AND DISCUSSIONS

The improvement of service quality through the use of chatbot technology as a virtual assistant in various institutions can aid human roles in responding to public information needs. Chatbots are designed as tools to assist humans, particularly in the realm of customer service. They can replace human roles in answering user queries, acting as conversational agents operated by robots or virtual entities capable of engaging in automated conversations with users [14]. Chatbots serve as communication aids that can respond quickly without waiting in queues, and their vigilant performance allows them to respond to chats around the clock, allowing users to receive immediate responses [15]. With the advent of systems that provide convenience, people are increasingly shifting towards AI-based technology by developing chatbots due to their real-time and accurate response rates, continuous active hours, and user-friendly nature.

In the realm of academia, the efficiency of chatbots can optimize the productivity of academic communities. The easy accessibility of chatbots from various locations is particularly crucial for students with busy schedules or people in different time zones [16]. Reduction of Administrative Burden: Chatbots responding to queries automatically can decrease the number of questions handled by administrative personnel. This can alleviate their workload and enhance the overall efficiency of campus administrative processes [17]. Beyond the academic sphere, chatbots play a significant role in public activities, such as in the economic and business sectors. In creative entrepreneurship, chatbots can function to offer and promote products and services.

Table 2. The references cover various research topics

No.	Author (s)	Topic	RQ
1.	Cuicui Wang, Yiyang Li Weizhong Fu, Jia Jin	Whether to trust chatbots: Applying the event-related approach to understand consumers' emotional experiences in interactions with chatbots in e-commerce	How Emotional Experience and Consumer Trust in Interactions with Chatbots Compare to Humans in E-Commerce
2.	Jorge de Andrés-Sánchez, and Jaume Gené-Albesa	Explaining the Acceptance with a Unified	What is the current level of consumer acceptance regarding the use of conversational robots to interact with insurance companies and seeks to identify factors that influence individual behavioral intentions to engage with chatbots
3.	Nur Asiah Ramdani, Asriyanik, Winda Apriandari	Implementation of Azure Cognitive Services in the Development of a Thesis Information Service Chatbot	This research aims to produce a chatbot application that utilizes Microsoft Azure Cognitive Services technology that can assist students and stakeholders in obtaining thesis information effectively, accurately, and efficiently within a specific timeframe.
4.	Elisa Betty Manullang, Rita Hartati & Rafika Dewi Nasution	Utilization of Chatbot Telegram AI to Promote Students' Creative and Innovative Entrepreneurship in Learning Context	To promote student creative and innovative entrepreneurialism, the use of chatbots is one of the rights
5.	Van Thanh Nguyen, Le Thai Phong, and Nguyen Thi Khanh Chi	The impact of AI chatbots on customer	Van Thanh Nguyen, Le Thai Phong, and Nguyen Thi Khanh Chi

6	Nur Azizul Haqimi & Rendra Tri Kusuma	Timeline reminder system bot and Telegram assistant chatbot for a university student and lecturer	How can we create chatbot applications that can assist and remind both students and lecturers in their academic activities

On the basis of the above table, the analyzed references cover diverse research topics. For instance, Wang et al.'s study indicates that consumers exhibit varying levels of trust between chatbots and human agents. The interaction between humans and technology in e-commerce is crucial for establishing trust between buyers and human seller agents. Wang mentions that the trust experienced by buyers will influence the efficiency of collaboration between chatbots and human e-Commerce workers.

In terms of customer services, buyers tend to prefer to be served by human workers rather than machines. Previous research has examined various consumer attitudes towards artificial intelligence agents (AI) and humans using various explanations from different perspectives, such as uniqueness [18]. Chatbots can only provide instant service without offering emotional support to users. Previous research also indicates that consumer attitudes towards AI services tend to vary significantly with perceived objectivity or subjectivity of tasks [19]–[21].

Each reference has a unique focus. The study by Wang et al. aims to analyze consumers' emotional experiences during interactions with chatbots in the e-commerce context. Andrés-Sánchez & Gené-Albesa focus on investigating the level of consumer acceptance of conversational robot utilization in insurance companies. The study by Nguyen et al. [22] mentions the impact of AI chatbots on customer trust in the hotel industry.

Another study by Ramdani et al. [23] involves the development of a chatbot application using Azure Cognitive Services, designed to provide support and information for students working on their theses. Then, Manullang et al. [24] study explores how AI-powered Telegram chatbots can be used to enhance the creativity and innovative entrepreneurship of students in the learning process. Finally, the study by Haqimi & Kusuma [25] involves creating a timeline reminder system and a Telegram assistant chatbot specifically designed for students and lecturers.

Based on the six articles above, three articles focus on user trust in chatbots and the other three articles focus on the role of chatbots in services. User trust in chatbot services and the system's performance play a crucial role in achieving the efficiency of service quality. Efficiency is achieved when users are satisfied with the services provided by the collaboration between chatbots and human performance.

Table 3. The difference between previous research

No.	Author (s)	Method
1.	Cuicui Wang, Yiyang Li Weizhong Fu, Jia Jin	Event-related potential approaches (ERP)
2.	Jorge de Andrés-Sánchez, and Jaume Gené-Albesa	Model structural equations based on the Unified Theory of Acceptance and Use of Technology (UTAUT)
3.	Nur Asiah Ramdani, Asriyanik, Winda Apriandari	Prototype
4.	Elisa Betty Manullang, Rita Hartati & Rafika Dewi Nasution	Research and development (R&D)
5.	Van Thanh Nguyen, Le Thai Phong, and Nguyen Thi Khanh Chi	Probability sampling method to develop research samples.
6.	Nur Azizul Haqimi & Rendra Tri Kusuma	Waterfall

Based on the references above, the employed methods differ from one another. Unlike the references of Andrés-Sánchez & Gené-Albesa (2023) and Mullang et al. (2023) that share a commonality in technology development, Andrés-Sánchez & Gené-Albesa (2023) utilized structural equation modeling (SEM) and UTAUT methods. SEM is used to test relationships among variables in the model and understand the extent to which these variables contribute to user behavior. UTAUT, on the other hand, is used to depict factors that influence the acceptance and usage of technology. In contrast, Manullang et al. (2023) employed the Research and Development (R&D) method, aiming to enhance knowledge, skills, and develop new products, services, or technologies. This involves experiments, research, and the development of new concepts.

Unlike the two methods, Ramdani et al. (2022) used the prototype method to test and evaluate concepts before full development. In reference of Nguyen et al. (2023), probability sampling was used to ensure that the sample taken is representative of the larger population, allowing the generalization of research results. Haqimi & Kusuma (2023) used the waterfall method, which helps ensure that the produced application aligns with the goals and specifications.

Wang et al. [4] used the Event-Related Potentials (ERP) method. This approach seeks to understand how specific events or situations can influence individual behavior or responses. The ERP approach is valuable for understanding the context in which a lack of trust arises and identifying specific events that may impact user perceptions of chatbots. However, ERP alone may not be sufficient to provide a direct solution to improving trust. Therefore, other methods, such as the R&D method, can be used as an additional or complementary approach. The R&D method can be employed to improve features that can improve user trust in chatbots.

There is no single method definitively suitable to address the lack of trust in chatbots. Combining multiple methods, such as integrating ERP to understand the context and R&D for the development of new technology, can be an effective approach in addressing user trust challenges with chatbots. Additionally, the use of the UTAUT model can help understand acceptance and usage factors, including trust, in the context of chatbot development.

Table 4. Result of previous research

No.	Author (s)	Results and Implications
1.	Cuicui Wang, Yiyang Li Weizhong Fu, Jia Jin	The results of this study highlight the importance of emotional experience and consumer trust in chatbot interactions in e-commerce. These findings impact electronics retailers by improving emotional service experiences and using them strategically for a variety of customer service tasks.
2.	Jorge de Andrés-Sánchez, and Jaume Gené-Albesa	The results show significant resistance to chatbot technology in the insurance industry. However, the study also highlights the importance of social influence, effort expectations, and trust in influencing people's intentions to engage with chatbots. The findings have implications for insurers and developers of chatbot technology, highlighting the need to address these factors to increase the adoption and use of chatbots in the insurance industry.
3.	Nur Asiah Ramdani, Asriyanik, Winda Apriandari	The chatbot used by the UMMI IT study program managed to identify questions and provide information in real time even though there was a miswritten word and could provide linked answers (recommendations related to the information sought such as links and images). However, the chatbot created by the UMMI IT study program does not understand slang to understand human interaction.
4.	Elisa Betty Manullang, Rita Hartati & Rafika Dewi Nasution	Chatbots provide support materials, compile learning schedules, provide exercises such as quizzes, provide input in ideas and suggestions, provide an overview of planning in making a product or service as a final project, and provide feedback and evaluation. On the other hand, chatbots have shortcomings to bot tools that require a lot of effort, and sometimes errors or bugs can occur. However, compared to traditional marketing methods, chatbots can be a cost-effective solution to engage potential users and promote products.
5.	Van Thanh Nguyen, Le Thai Phong, and Nguyen Thi Khanh Chi	The study found that empathy, anonymity, and customization have a significant impact on interactions with AI chatbots in the hospitality industry. The empathetic response was identified as the strongest influence on the interaction. The findings have implications for hotel providers in developing countries, helping them plan for the implementation of chatbots and prioritize implementation issues.
6.	Nur Azizul Haqimi & Rendra Tri Kusuma	The implementation of telegram bots integrated with the information system of the Informatics Engineering study program has proven effective in helping to manage academic schedules and answer student questions

References by Wang et al. (2023), Andrés-Sánchez & Gené-Albesa (2023), and Nguyen et al. (2023) highlight similar aspects concerning trust in chatbots. In Wang et al. (2023), the emphasis is on the importance of emotional experience and consumer trust in chatbot interactions in e-Commerce. In subjective tasks, the difference between chatbots and human agents in emotional experience and trust becomes more significant, indicating that subjective tasks may have a greater impact on consumer emotional responses and trust in chatbots. This finding has implications for electronic retailers in enhancing emotional service experiences with chatbots and strategically using them for various customer service tasks. It underscores the importance of improving emotional service experiences with chatbots and suggests that chatbots may be more suitable for objective tasks in customer service.

In Andrés-Sánchez & Gené-Albesa (2023), significant rejection of chatbot technology is observed in the insurance industry, where social influence emerges as the most influential variable. To gain acceptance as a technology, chatbots must improve usability, build trust, and enhance social acceptance among users to improve adoption and usage in the insurance industry. Nguyen et al. (2023) find that empathy responses, anonymity, and customization significantly impact interactions with AI chatbots in the hotel industry. This suggests that AI chatbots that provide empathetic responses, maintain anonymity, and offering customization options are more likely to have positive interactions with customers. Empathetic responses are identified as the strongest influence on interactions. This finding has implications for hotel providers in developing countries, helping them plan the implementation of chatbots and prioritize the resolution of issues.

In contrast to the three previous references focusing on user trust in chatbots, the references of Ramdani et al., Manullang et al., and Haqimi & Kusuma focus on the roles of chatbots in services. Ramdani et al. (2022) indicate that chatbots successfully identify questions and provide real-time information despite misspelled words and can offer linked answers. However, this chatbot cannot interpret slang, a limitation also present in the chatbots created by Haqimi and Kusuma (2023). This limitation is also observed in the chatbots referenced by Manullang et al. (2023), as these chatbots often experience errors or bugs. This can be a hindrance that causes user discomfort and leads to distrust in chatbots.

In conclusion, the reviewed literature on chatbots presents a multifaceted perspective, encompassing both user trust and the functional roles of chatbots in various domains. Wang et al. (2023), Andrés-Sánchez & Gené-Albesa (2023), and Nguyen et al. (2023) collectively underscore the importance of emotional experiences, consumer trust, and social acceptance in the adoption and success of chatbots. These studies reveal that subjective tasks, social influence, and empathetic responses significantly impact user perceptions, emphasizing the need for strategic implementation and improvement in emotional service experiences with chatbots.

On the functional side, Ramdani et al. (2022), Manullang et al. (2023) and Haqimi & Kusuma (2023) dive into the operational capabilities of chatbots in providing real-time information and linked responses. However, challenges such as the inability to interpret slang and frequent errors or bugs highlight the importance of continuous refinement and development in chatbot technology to address user discomfort and distrust.

Various references to chatbots highlight their role in enhancing service quality in various sectors, particularly in customer service, education, and the business sector. The use of chatbots can help efficiency, reduce workload, and provide accurate and responsive services. However, many still do not trust chatbots and prefer services represented by humans. Thus, to ensure the success of chatbot implementation, building user trust in chatbots is crucial. The proposed solutions in the literature involve integrating chatbot systems with human performance, combining multiple methods for system success, and implementing various aspects such as transparency, responsiveness, understandable language use, performance evidence, control options, privacy and security protection, user feedback, ethical considerations, and user education. These approaches aim to improve service quality and build user trust in interactions with chatbots. Opportunities to improve services depend on human knowledge to control chatbots and enhance user trust. Building trust in chatbots is essential to increase adoption and success.

4. CONCLUSION

Collaboration between chatbots and humans in various domains determines the quality of service experienced by users. Chatbots offer convenience in information retrieval and service provision, but user trust in chatbot systems remains relatively low. Despite providing quick experiences that can be conducted anywhere, the quality of service offered by chatbots often falls short of user satisfaction. A holistic approach is required, one that integrates user emotional experiences, trust-building strategies, and continuous technological refinement to maximize the benefits of chatbots in diverse sectors. Additionally, the effectiveness and efficiency of services can be achieved when chatbots are used as tools to assist humans in their tasks. Therefore, it is imperative to establish and maintain user trust for the long-term implementation and acceptance of chatbots in service-oriented contexts. The conclusion of the research on chatbots indicates that this

technology has great potential to enhance service efficiency and productivity in various contexts, including customer service and academia.

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