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Application of Fuzzy Matching in chatbot development to improve user experience on e-commerce sites (Case study: Cutiw Fashion Store)

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Abstract

Purpose: In the rapidly developing digital era, e-commerce websites face challenges in providing responsive and personalized customer service. This study aims to develop a web-based chatbot for the Fashion Cutiw Store by implementing the Fuzzy String Matching method to enhance user experience.

Methods: The research involves designing and implementing a web-based chatbot integrated with the Fuzzy String Matching method. This approach enables the chatbot to understand and respond to customer inquiries despite variations in wording or typographical errors, thereby improving the accuracy and relevance of responses.

Results: The evaluation results indicate that the chatbot employing Fuzzy String Matching successfully improves user satisfaction through more natural and efficient interactions. The chatbot is able to deliver product information quickly and accurately while handling diverse user input formats.

Conclusions: The implementation of a web-based chatbot using the Fuzzy String Matching method effectively enhances customer service performance in e-commerce. It reduces reliance on manual customer support and provides faster, more reliable responses to customer inquiries.

Limitation: This study is limited to a single e-commerce platform and focuses primarily on text-based interactions. The chatbot's performance may vary when handling complex queries or expanding to other product categories without further training and development.

Contribution: This research contributes to the development of adaptive automated customer service systems in the e-commerce sector, demonstrating the effectiveness of Fuzzy String Matching in improving chatbot responsiveness and user experience.

Keywords: *Chatbot, E-Commerce, Fashion Cutiw Store, Fuzzy String Matching, User Experience*

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1. Introduction

The massive digital transformation over the past decade has revolutionized the retail industry landscape, particularly through the adoption of e-commerce platforms that enable unrestricted interaction between businesses and consumers (Suwarningsih & Nuryani, 2024). However, communication dynamics within this digital ecosystem present new challenges, especially in delivering

customer service that is responsive, adaptive, and capable of understanding the nuances of users' natural language usage. Chatbots, as a representation of artificial intelligence (AI) implementation, have emerged as a strategic solution for automating customer service (Adamopoulou & Moussiades, 2020). Nevertheless, limitations in understanding linguistic variations, typographical errors, and informal language expressions often hinder the effectiveness of interactions between chatbots and users. To address these challenges, the Fuzzy String Matching method is adopted to enhance chatbots' ability to recognize and match user inputs that are not literally exact but exhibit semantic similarity (Balachandran & Mohammadian, 2015).

The Fuzzy String Matching method enables systems to identify similarities between two text strings despite differences in spelling, such as typographical errors or word variations. In the context of chatbots, the application of this method can improve accuracy in understanding user queries, thereby generating more relevant and satisfactory responses (Khadija, Widyawan, & Edi Nugroho, 2023). Toko Fashion Cutiw, as a business entity in the fashion e-commerce sector, faces challenges in providing fast and accurate product information services to customers (Chen, Le, & Florence, 2021). By implementing the Fuzzy String Matching method in chatbot development, the system is expected to deliver more relevant responses to user inquiries, even when variations in spelling or question formulation occur. This approach aims to enhance user experience in interacting with the e-commerce platform while reducing the manual workload of customer service operations (Antonio, Tyandra, Nusantara, & Gunawan, 2022).

This study aimed to develop and evaluate a web-based chatbot integrated with the Fuzzy String Matching method for Toko Fashion Cutiw, focusing on improving user query understanding, response accuracy, and overall user experience within the e-commerce environment. The primary focus of this research is on improving the accuracy of user query understanding and the relevance of the responses provided by the chatbot (Jacko, 2007). This approach is expected to create more natural and efficient interactions between users and the system and contribute to the development of adaptive automated customer service solutions in the e-commerce sector (Ashfaq, Yun, Yu, & Loureiro, 2020).

2. Literature Review and Hypothesis Development

Research on the design of a web-based student violation point information system at SMK Ki Hajar Dewantoro using the Extreme Programming method is expected to effectively address existing problems in recording student violation points. The system aims to improve data accuracy, transparency, and accessibility, while supporting faster monitoring, evaluation, and decision-making by teachers and school administrators.

2.1. Chatbot

A chatbot is a computer program or an artificial intelligence (AI)-based system designed to simulate human conversation (Kaponis, Kaponis, & Maragoudakis, 2023). Chatbots are widely used on messaging platforms, websites, and mobile applications to automatically respond to user questions or commands through text or voice interactions. They enable real-time communication, improve service efficiency, reduce operational costs, and provide users with quick, consistent, and accessible information anytime. Through this technology, chatbots can assist customers, provide information, and independently complete specific tasks (Hoy, 2018).

2.2. Fuzzy Matching

In artificial intelligence systems, fuzzy logic is an approach that allows truth values to exist not only as "true" or "false," but also within a range from 0 to 1. Fuzzy logic is particularly important in the development of chatbots for e-commerce websites because it helps identify and interpret diverse and ambiguous user inputs (Khennouche, Elmir, Himeur, Djebari, & Amira, 2024). By applying fuzzy logic, chatbots can deliver more flexible and context-appropriate responses, thereby improving their accuracy and user comfort. One application of fuzzy logic is enabling chatbots to understand user context and preferences in e-commerce interactions, resulting in smoother and more enjoyable user experience (Cui et al., 2017).

2.3. Similar Text Function

In the context of fuzzy matching for chatbots, the similar text method focuses on the system's ability to identify and match user inputs that may not correspond exactly to existing data. One effective method for enhancing user interaction with the system is fuzzy matching through the similar_text function (Widyastuti & Tarumingkeng, 2025). By applying this method, chatbots can recognize and match user inputs that may contain typographical errors, word variations or non-standard phrases. This approach allows chatbots to understand the context and meaning of user queries, despite differences in formulation (Shimichev & Rotanova, 2023). This method is essential for improving the user experience, as it enables chatbots to provide accurate and relevant responses, even when the input does not perfectly match the available data (Hamilton et al., 2014).

2.4. Website

Chatbots can be accessed through websites as the primary user interfaces. A well-designed website should ensure a user-friendly and responsive experience for chatbots that use fuzzy matching. Using HTML, CSS, and JavaScript, developers can create engaging and interactive web interfaces (Billah, Wulandari, & Auliya, 2023). Furthermore, integration with a backend developed using PHP or Python allows chatbots to process user input and perform fuzzy matching using methods such as similar_text() or other fuzzy-matching libraries. Chatbots can generate recommendations based on user interactions and product data stored in databases connected to websites. Therefore, websites not only serve as platforms for content presentation but also support more effective chatbot–user interactions through the integration of fuzzy logic technology (Huang & Benyoucef, 2013).

2.5. User Experience

User experience plays a critical role in determining the success of e-commerce platforms. Smooth, responsive, and intuitive interactions between users and systems enhance customer satisfaction, build trust, and foster loyalty. A positive experience also increases engagement, encourages repeat purchases, and supports the long-term sustainability of online businesses. A positive user experience also encourages repeat purchases, increases engagement, and strengthens long-term relationships between customers and online businesses. Gao and Jiang (2021) highlighted that interactivity and perceived human-like characteristics in chatbots significantly impact user trust, which in turn influences the intention to adopt chatbots in e-commerce environments.

2.6. Related Studies and Research Gap

everal studies have explored the application of fuzzy matching techniques in chatbot systems across various domains to enhance query interpretation, response accuracy, and overall interaction effectiveness. For instance, Fadhlurohman et al. (2023) developed a chatbot for library services capable of understanding user queries despite spelling errors. The results indicated a 20% increase in user satisfaction compared with the previous system. However, research specifically examining the application of Fuzzy Matching in chatbots for e-commerce, particularly within the fashion sector, remains limited.

3. Research Methodology

3.1. Data Collection

This study employed a qualitative research method. Data were collected through interviews, observations, and a literature review. The interview was conducted with the owner of the Cutiw fashion store to obtain in-depth information related to business needs and customer service practices. Observation involved the direct monitoring of the research object, particularly how users accessed the website, made product-related decisions, and interacted with various components of the website. Furthermore, a literature review was conducted by examining references in the form of articles, journals, and books relevant to the conducted research.

3.2. Similar Text

The similar_text function in PHP was used to calculate the level of similarity between two strings by identifying the number of matching characters between them. This function returns the number of matching characters, and if a third parameter is provided, it also calculates the percentage of similarity

based on the average length of the two strings. For example, consider the following two strings: String 1: “sepatu wanita” String 2: “sepatu wanitta” The calculation steps are as follows:

1. Identify the Longest Common Substrings:
   - The first matching substring: “sepatu ” (7 characters)
   - The next matching substring: “wanita” (6 characters)
2. Total Matching Characters:
   - 7 (from “sepatu ”) + 6 (from “wanita”) = 13 characters
3. Length of Both Strings:
   - String 1: 13 characters
   - String 2: 14 characters
4. Average Length:
   - (13 + 14) / 2 = 13.5
5. Similarity Percentage:
   - (13 / 13.5) × 100% ≈ 96.3%

If the similarity percentage is equal to or greater than 70%, the strings are considered sufficiently similar and accepted as valid matches by the system; otherwise, they are rejected, indicating that the input does not adequately correspond to the predefined data or intent patterns.

3.3. Use Case Diagram Design

A use case diagram was used as a modeling tool for the chatbot software to be developed. The proposed use case diagram involves three actors: user, admin, and chatbot, as illustrated in figure.

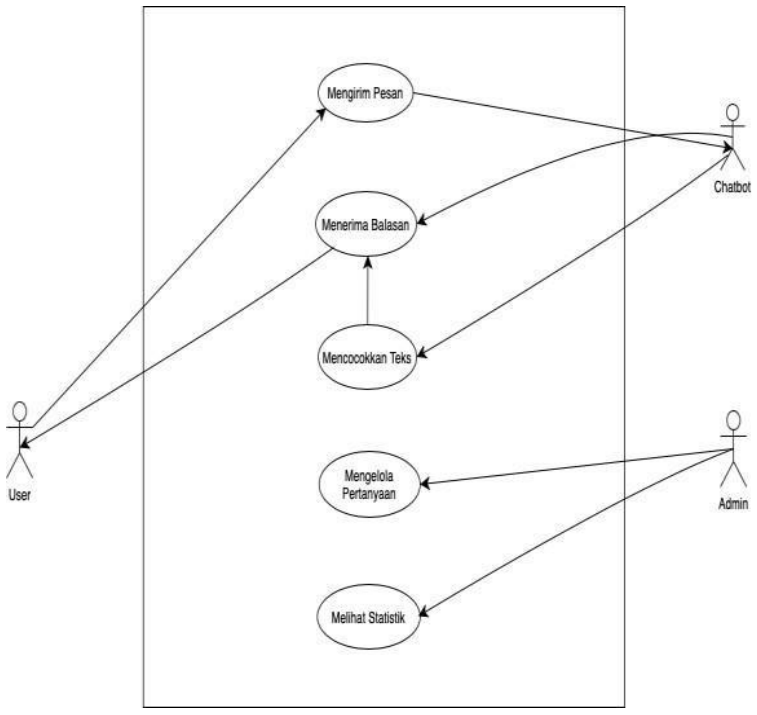

Figure 1. Use Case Diagram

3.4. Activity Diagram Design

An activity diagram is a type of diagram used to illustrate workflows or business processes within a system (Priyanto & Armin, 2025). This diagram represents the sequence of activities performed, the decisions made at each stage, and the logical flow connecting these activities throughout the system process. It provides a clear visual representation of how inputs, processes, and outcomes interact to support the overall functionality of the system.

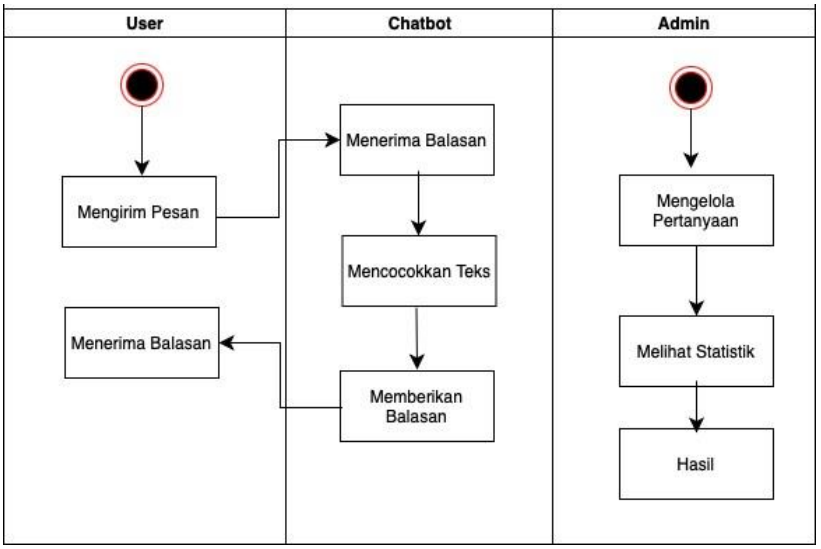

Figure 2. Activity Diagram

3.5. User Interface Design

User interface design refers to the visual and interactive layout of a system or application that determines how users interact with the available features and functionalities.

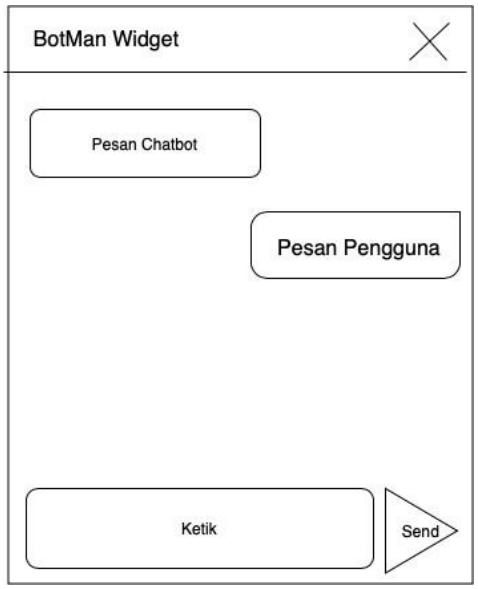

Figure 3. User Interface

4. Results and Discussion

4.1. Implementation of Fuzzy Matching Using the Similar Text Function

In the development of the chatbot for the Toko Fashion Cutiw e-commerce website, a fuzzy matching algorithm was implemented using the PHP similar_text() function. This function compares two strings and calculates a similarity percentage that represents the degree of resemblance between user input and predefined intent patterns. A higher similarity percentage indicates a greater likelihood that the user's query matches a specific intent within the chatbot's knowledge base. By applying this approach, the chatbot can better interpret variations in user input, including different word choices, spelling errors, and informal expressions, thereby improving response accuracy and interaction efficiency.

4.2. Results of the Similar Text Function Implementation

In this implementation, PHP provides a built-in function, similar_text(), which can be used to compare two strings and calculate the similarity percentage based on the number of matching characters in the

correct sequence. The similar_text() function compares two strings and returns the similarity percentage. If the result was ≥ 50%, the chatbot displayed the corresponding product. The implementation was tested using various input variations, such as spelling differences, mixed language usage, and synonymous terms. The test results were evaluated based on user feedback regarding search accuracy and ease of use, as well as the chatbot's success in delivering appropriate and timely product recommendations.

Table 1. Results of the Similar Text Function Implementation

No	Username	Input	Organized Product	Result	Success (Yes/No)	Similarity (%)
1	Nadila	Top Slara	Clara Top	Clara Top	Yes	92%
2	Renatha	Top Tali Panjang	Long Ribbon Top	Long Ribbon Top	Yes	92%
3	Acha	Sabrina Simetris	Asymmetric Sabrina Top	Asymmetric Sabrina Top	Yes	92%
4	Anna	Celana Highwaist	High-waist Pants	High-waist Pocket 1	Yes	92%
5	Azzura	Celana Plisket	Knit Pleated Culottes	Knit Pleated Culottes	Yes	92%
6	Lala	Top Knit	Premium Rib Knit Top	Premium Rib Knit Top	Yes	92%
7	Nurmah	Dress Kemben	Tube Dress	Tube Dress	Yes	92%
8	Ara	Tangtop	Zarah Tank Top	Zarah Tank Top	Yes	92%
9	Dhea	1set	One Set Top	-	No	50%
10	Oliv	KnitPremium	Premium Rib Knit Top	Premium Rib Knit Top	Yes	92%
11	Zahra	Top Sarina	Asymmetric Sabrina Ribbon Top	Asymmetric Sabrina Ribbon Top	Yes	92%
12	Melda	Top Solder	Top Off Shoulder	Top Off Shoulder	Yes	92%
13	Monika	Dress Lengan	Arm Dress	Arm Dress	Yes	92%
14	Wuri	Rok Duyung	Mermaid Span Skirt	Mermaid Span Skirt	Yes	92%
15	Fauziah	One Set	One Set Top	One Set Top	Yes	92%
16	Andin	Highwais Pocket	Highwaist Pocket	Highwaist Pocket	Yes	92%
17	Aza Kamella	Baju Pita	Long Ribbon Top	-	No	50%
18	Aulia Putri	Baju Sabrina	Asymmetric Sabrina Ribbon Top	-	No	50%
19	Nurhasanah	Dress Levis	Dress Denim Premium	Dress Denim Premium	Yes	92%
20	Yessi	Top Kattina	Karina Strap Top	Top Karina Tali	Yes	92%
21	Suniasna	Baju Satu Set	One Set Top	One Set Top	No	50%

4.3. Analysis of Implementation Results

1. Of the 21 users involved in the testing process, 17 successfully found products that matched their expectations, indicating an overall success rate of approximately 90%. This result demonstrates the effectiveness of the chatbot in assisting users during product searches.
2. One of the lowest similarity percentages was recorded for the input "1set," which reached only 50%. As a result, the chatbot failed to recognize the intended query and did not display any relevant product outputs.
3. The chatbot still requires further improvement in handling word variations and synonymous expressions. For instance, the input "1set" may represent "one set" or "complete package" in the context of fashion e-commerce, indicating the need for enhanced synonym recognition and contextual understanding mechanisms.

Overall, the results demonstrate that despite the presence of typographical errors or the use of synonymous terms in search inputs, the application of fuzzy matching using the similar_text function remains sufficiently effective in assisting users in locating their desired products within the database. This approach enables the system to tolerate input variations, improve search relevance, and reduce user effort, thereby enhancing search efficiency and supporting a more user-friendly and responsive application experience.

4.4. Chatbot Interface Display Results

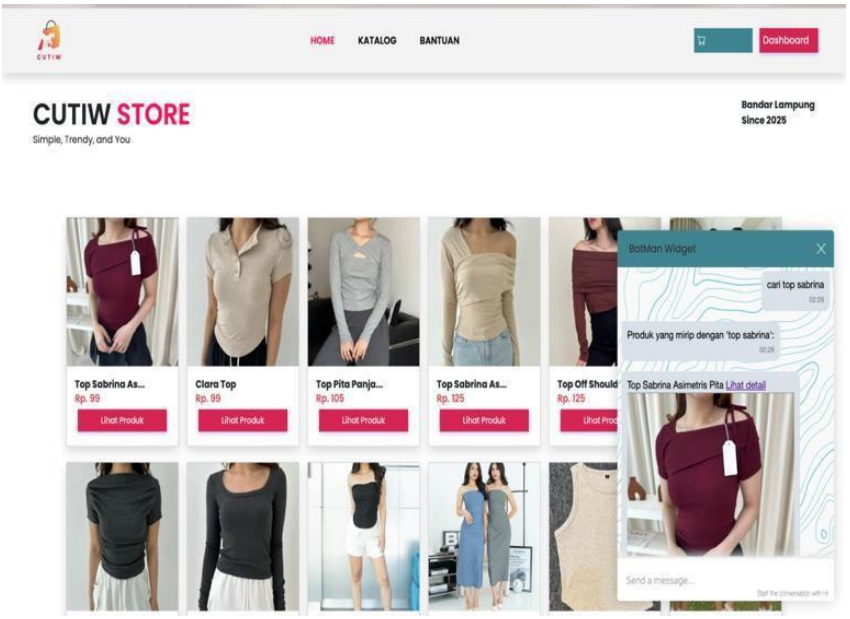

Figure 4. Display Chabot

4.5. Testing

Testing was conducted to evaluate the chatbot's performance in recognizing user intent using a fuzzy matching algorithm based on the PHP similar_text function. The testing process involved inputting 21 user sentences that varied in sentence structure, vocabulary, and expression style to reflect realistic user interactions. Each input sentence was systematically compared with a predefined dataset of questions representing known user intents stored in the chatbot's knowledge base. The similarity percentage between the user input and each predefined question was calculated using the similar_text function. When the similarity percentage exceeded the predefined threshold of 50%, the chatbot was considered to have successfully recognized the user's intent and generated an appropriate response. This threshold was selected to balance sensitivity and accuracy in intent recognition. The results of this testing process indicate that the fuzzy matching approach enables the chatbot to effectively handle variations in user input, including minor typographical errors and alternative wording, thereby supporting reliable and responsive user interactions.

5. Conclusions

5.1. Conclusion

The implementation of the fuzzy matching method in the chatbot of the Cutiw fashion store demonstrates significant potential for enhancing the quality of the user experience. This method enables the system to understand and process user requests more flexibly, even in the presence of synonyms, typographical errors, or variations in natural language phrasing. With these capabilities, the chatbot can generate more relevant and accurate product search results, thereby assisting customers in finding products that match their needs and preferences.

The research findings indicate that chatbots equipped with fuzzy matching methods can respond to user queries more quickly and effectively than conventional search systems can. Users are no longer required to input exact keywords or perform time-consuming manual search. Instead, the system can

automatically adapt to and interpret user intent, thereby reducing the likelihood of misunderstandings. This condition contributes to increased customer satisfaction and greater efficiency in terms of time and effort during the online shopping process.

Moreover, the application of fuzzy matching has a positive impact on customer interaction patterns on e-commerce platforms. The chatbot becomes more interactive, adaptive, and responsive in serving the users. The system functions not only as a search tool but also as a recommendation engine that suggests products based on user preferences, search histories, and specific requests. This capability increases purchase intention, creates a more personalized and engaging shopping experience, and encourages customers to explore a wider range of products. Overall, the integration of fuzzy matching methods into the Cutiw fashion store chatbot has proven effective in improving the search system performance, enhancing the user interaction quality, and increasing customer satisfaction. Therefore, this technology can serve as an effective strategy for improving competitiveness and service quality on chatbot-based e-commerce platforms.

5.2. Implications

The findings of this study provide important implications for the development of intelligent customer service systems in the e-commerce sector. The successful implementation of fuzzy matching using the similar_text() function demonstrates that relatively simple text similarity algorithms can significantly enhance chatbot responsiveness and overall user experience. This finding implies that small and medium-sized e-commerce businesses can adopt cost-effective chatbot solutions without relying on complex natural language processing models, while still achieving meaningful improvements in service quality and interaction efficiency.

From a managerial perspective, the results suggest that integrating fuzzy matching–based chatbots can reduce reliance on manual customer service, accelerate information delivery, and improve customer satisfaction and engagement. Enhanced chatbot performance also supports more personalized shopping experiences, which may positively influence purchase intention and customer loyalty. Furthermore, this study indicates that fuzzy matching techniques can serve as a practical foundation for the development of more advanced conversational systems, supporting scalable, adaptive, and user-centered e-commerce platforms in increasingly competitive digital markets.

5.3. Suggestions

Based on the results and conclusions presented, several recommendations are proposed for future development and research in this area. First, future studies should explore and compare various fuzzy matching algorithms that may offer more optimal performance in handling textual data, particularly fashion product descriptions. Algorithms such as Levenshtein Distance, Jaro–Winkler, and n-gram–based approaches may be considered, as each has distinct characteristics and accuracy levels in addressing typographical errors, word variations, and string similarity. A comparative performance analysis of these algorithms is expected to produce a more accurate and efficient search system.

Second, future research is recommended to further investigate the development of chatbot functions as a more proactive customer support tool. Rather than solely responding to user inquiries, chatbots can be enhanced to actively provide information on the latest promotions, relevant product recommendations, and assistance in determining appropriate clothing sizes based on user preferences and data analysis. The development of these features is expected to improve service quality, enhance user convenience, and foster greater customer loyalty and purchase intentions on e-commerce platforms.

References

Adamopoulou, E., & Moussiades, L. (2020). An overview of chatbot technology. *Paper presented at the IFIP international conference on artificial intelligence applications and innovations* https://doi.org/10.1007/978-3-030-49186-4_31.

Antonio, R., Tyandra, N., Nusantara, L. T., & Gunawan, A. A. S. (2022). Study Literature Review: Discovering The Effect of Chatbot Implementation In E-Commerce Customer Service System Towards Customer Satisfaction. *Paper presented at the 2022 International Seminar on*

Application for Technology of Information and Communication (iSemantic) https://doi.org/10.1109/iSemantic55962.2022.9920434.

Ashfaq, M., Yun, J., Yu, S., & Loureiro, S. M. C. (2020). I, Chatbot: Modeling the determinants of users' satisfaction and continuance intention of AI-powered service agents. *Telematics and informatics, 54*, 101473 https://doi.org/10.1016/j.procs.2015.08.186.

Balachandran, B. M., & Mohammadian, M. (2015). Development of a fuzzy-based multi-agent system for e-commerce settings. *Procedia Computer Science, 60*, 593-602 https://doi.org/10.1016/j.procs.2015.08.186.

Billah, A. M., Wulandari, D. A. R., & Auliya, Y. A. (2023). Rancang Bangun Chatbot Pengaduan Kekerasan Perempuan Anak Dengan Metode Fuzzy String Matching Dan Enhanced Confix Stripping Stemmer. *INFORMAL: Informatics Journal, 8*(2), 101-109 .

Chen, J.-S., Le, T.-T.-Y., & 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 https://doi.org/10.1108/IJRDM-08-2020-0312.

Cui, L., Huang, S., Wei, F., Tan, C., Duan, C., & Zhou, M. (2017). Superagent: A customer service chatbot for e-commerce websites. *Paper presented at the Proceedings of ACL 2017, system demonstrations* https://doi.org/10.18653/v1/P17-4017

Fadhlurohman, A., Sulasikin, A., Nugraha, Y., Husna, N. L. R., Aminanto, M. E., & Kanggrawan, J. I. (2023). Development of Indonesian Language Intelligent Chatbot for Public Services in JAKI Application. *Paper presented at the 2023 IEEE International Smart Cities Conference (ISC2)* https://doi.org/10.1109/ISC257844.2023.10293514.

Gao, Z., & Jiang, J. (2021). Evaluating human-AI hybrid conversational systems with chatbot message suggestions. *Paper presented at the Proceedings of the 30th ACM International Conference on Information & Knowledge Management* https://doi.org/10.1145/3459637.3482340.

Hamilton, D., Lane, J. V., Gaston, P., Patton, J., Macdonald, D., Simpson, A., & Howie, C. (2014). Assessing treatment outcomes using a single question: the net promoter score. *The bone & joint journal, 96*(5), 622-628 https://doi.org/10.1302/0301-620x.96b5.32434.

Hoy, M. B. (2018). Alexa, Siri, Cortana, and more: an introduction to voice assistants. *Medical reference services quarterly, 37*(1), 81-88 https://doi.org/10.1080/02763869.2018.1404391.

Huang, Z., & Benyoucef, M. (2013). From e-commerce to social commerce: A close look at design features. *Electronic Commerce Research and Applications, 12*(4), 246-259 https://doi.org/10.1016/j.elerap.2012.12.003.

Jacko, J. A. (2007). *HCI Intelligent Multimodal Interaction Environments*.

Kaponis, A., Kaponis, A., & Maragoudakis, M. (2023). Case study analysis of medical and pharmaceutical chatbots in digital marketing and proposal to create a reliable chatbot with summary extraction based on users' keywords. *Proceedings of the 16th International Conference on PErvasive Technologies Related to Assistive Environments* https://doi.org/10.1145/3594806.3604765.

Khadija, M. A., Widyawan, & Edi Nugroho, L. (2023). Deep learning Indonesian chatbot using PyTorch for customer support automation. *The Proceedings of the 5th International Conference on Maritime Education And Training (The 5th ICMET) 2021* https://doi.org/10.1063/5.0115529.

Khennouche, F., Elmir, Y., Himeur, Y., Djebari, N., & Amira, A. (2024). Revolutionizing generative pre-traineds: Insights and challenges in deploying ChatGPT and generative chatbots for FAQs. *Expert Systems with Applications, 246*, 123224 https://doi.org/10.1016/j.eswa.2024.123224.

Priyanto, D. A., & Armin, A. P. (2025). Pengembangan Media Pengenalan Produk UMKM Makanan Khas Tegal Berbasis Augmented Reality. *Jurnal Ilmu Siber dan Teknologi Digital, 3*(2), 111-130. https://doi.org/10.35912/jisted.v3i2.5094

Shimichev, A. S., & Rotanova, M. B. (2023). Chatbot Technology as an Artificial Intelligence Tool in Foreign Language Education. *2023 International Conference on Quality Management, Transport and Information Security, Information Technologies (IT&QM&IS)*, 97-100 https://doi.org/10.1109/ITQMTIS58985.2023.10346566.

Suwarningsih, W., & Nuryani, N. (2024). Generate fuzzy string-matching to build self attention on Indonesian medical-chatbot. *International Journal of Electrical and Computer Engineering (IJECE* https://doi.org// 10.11591/ijece.v14i1.pp819-829

Widyastuti, L. A., & Tarumingkeng, R. C. (2025). The effect of Artificial Intelligence (AI) and Customer Experience (CX) use in telemedicine on customer satisfaction moderated by service duration. *Advanced in Artificial Intelligent and Machine Learning, 1*(1), 1-20. https://doi.org//10.35912/aaiml.v1i1.3763