

Design and Build Chatbot Application for Tourism Object Information in Bengkulu City

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ABSTRACT

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As technology develops and the number of new arrivals to the city of Bengkulu increases, the need for information regarding information related to tourism in Bengkulu is also increasing. The growth of Bengkulu tourism increases very rapidly every year as many local and foreign tourists visit the city of Bengkulu. Therefore, the author intends to build a chatbot that functions as a Virtual Assistant for Bengkulu tourists and those outside the city of Bengkulu. This chatbot is able to provide information to tourists through data stored in the system. The implementation and design of this software produces a chatbot that is built using the Extreme Programming (XP) method. Chatbots are also able to answer questions according to the abilities embedded in them. The application of chatbots provides fast information in a relatively short time to obtain information because the questions asked can be answered directly.

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1. Introduction

The development of the world of information systems is currently increasingly rapid, especially in human life. One of the rapid technological developments currently is artificial intelligence. With artificial intelligence, computers can perform certain tasks like those performed by human chat robots (chatbots). A chatbot is a computer program that can carry out conversations through writing. Chatbots have been used for more practical purposes such as online assistance, personal services, or information acquisition. In this case, the function of the program can be seen as a type of conversational agent (Rahayu et al., 2020).

Chatbot itself comes from the word chat, which means communication activities that use written media, and chatbot, which means a program that has a certain amount of data that is input as a question and produces output as an answer (Dharmawan et al., 2022). Chatbot is a system that can reply to messages sent by users (Paliwahet et al., 2017; Salisah et al., 2020). Chatbots are also one of the developments in creating machine-human conversation simulators. So that conversations can be established between chatbots and users, information can be obtained more easily, even though it is still far from normal conversations between humans (Fitri Andri Astuti, 2021; Smith-waterman & Khozaimi, 2020). The way a chatbot works is similar to a telephone answering machine which is widely used in offices with dial up facilities (Junadhi & Mardainis, 2019).

With chatbots, it can increase or facilitate the increasing potential of tourists and with this chatbot technology, it is very developed and even makes it easier for tourists to access information to plan their holidays and even prepare the accommodation they need during their holidays, they can book tickets and search for information online without any hassle. or need to come to a place to order tickets manually (Puška et al., 2020; Salisah et al., 2020). Based on the problems of tourists in the city of

Benkulu, researchers chose one problem, namely the lack of information regarding services at tourist attractions in the city of Bengkulu. Regarding existing services, visitors still get information by asking people around the tourist attraction so that the information they get is less accurate and effective (Smith-waterman & Khozaimi, 2020). Thus, it is important to develop information technology to deal with the problems faced today by creating intelligent chatbot applications so that they can be a solution that can be used as a tool or conversation that can provide answers to users regarding the information they want to ask (Dwi R et al., 2018). Therefore, chatbots can be used as a substitute for customer service in the form of creating chatbot applications (Rismanto et al., 2019).

With a chatbot application, it can work by interpreting messages given by the user, then after that processing the meaning of the message, and then determining and executing what the chatbot needs to do based on commands from the user, and finally conveying the results of the execution to the user or in the form of answers asked (Herwin, 2019). Based on what is explained above, the author conducted research as outlined in the title Design and Development of a Chatbot Application for Information on Tourist Attractions in the City of Bengkulu (El Rahma et al., 2021). And the result of this research is an application that is able to carry out conversations with humans using natural language and answer questions given by users, and search for answers using internet technology (Castor et al., 2021).

Based on research on chatbots that have been made previously, generally making chatbots using Dialog flow tools applies the design and development of keyword recognition-based chatbots using the NLP method, but there is a weakness in not providing a suggestion button on the chatbot so that users are confused about how to use it and do not know the complete contents of the feature. provided on the chatbot. Based on these weaknesses, this research applies a button-based chatbot as a menu suggestion button so that users can more easily understand the navigation and content of the chatbot. Of course chatbots can also be used with keyword recognition-based chatbots which can recognize keywords from long sentence input with appropriate word search algorithms that have been taught to the chatbot (Dharmawan et al., 2022).

2. Literature Review

A chatbot application operates by parsing user messages, analyzing their meaning, executing appropriate commands based on user instructions, and conveying the results as responses. The author did research as described in the title "Design and Development of a Chatbot Application for Information on Tourist Attractions in the City of Bengkulu" based on the information provided above (Herwin, 2019). The outcome of this study is a software application capable of engaging in conversations with humans using natural language, responding to user queries, and utilizing internet technologies to search for solutions (El Rahma et al., 2021). Previous research on chatbots indicates that the design and development of chatbots using Dialog flow tools typically involves creating keyword recognition-based chatbots using the NLP method. However, a weakness of this approach is the absence of a suggestion button on the chatbot interface (Castor et al., 2021), which leads to user confusion regarding its usage and incomplete understanding of its features. Given by the chatbot. Given these limitations, this study implements a button-based chatbot that serves as a menu suggestion button, enhancing users' comprehension of the chatbot's navigation and content. Keyword recognition-based chatbots have the ability to identify terms from lengthy sentences using specific word search algorithms that have been trained into the chatbot (Dharmawan et al., 2022).

3. Research Methods

The data collection method used in this research is as follows:

- a. Observation Observation is a data collection method that is carried out by directly observing or reviewing the research object to obtain the data and information needed in the research. In this research, the observation method is an activity carried out through direct observation of conversations commonly used in online buying and selling and Frequently Asked Question (FAQ) data.
- b. Literature Study (Literature) The literature study in this research was carried out by searching for and studying theories contained in literary sources, such as journals, e-books and previous

research related to the design of the chatbot application that will be carried out. (Astuti & Fatchan, 2019).

The system development method used is the Extreme Programming methodology. Extreme Programming (XP) is a software development method that is included in agile development. Extreme Programming (XP) uses an object-oriented approach and includes a set of rules that occur within 4 activity frameworks: planning, design, coding, and testing.

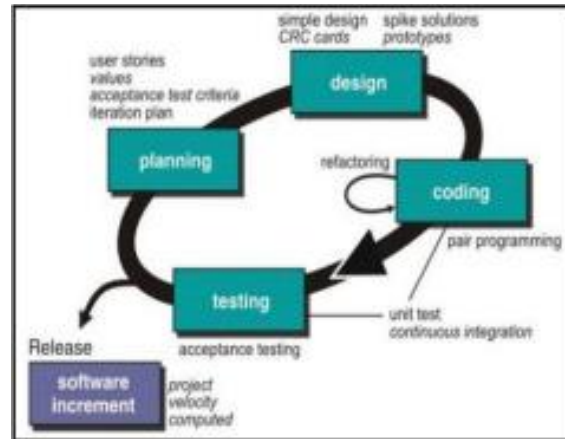


Fig.1. Extreme Programming Method (XP)

- a. Planning, starting with gathering requirements that enable members of the XP team to understand the business context of the software to be created and gain broad insight into what output is required and the main features of the software. This stage will lead to the creation of "stories" that describe the required output, features and functions of the software to be created.
- b. Design, XP method follows KIS (Keep It Simple) rules. Simple designs always take precedence over complex representations. If there is a difficult design, XP will apply SpikeSolution, where the design is made immediately, and made directly to its destination. XP also supports refactoring where we can make changes to the program code to simplify it without changing the way the code works.
- c. Coding, After the "stories" have been designed and the initial design has been completed, the team does not immediately start coding, but first designs several unit tests that are used to run the "stories" and are included in the software release at that time. After that, developers focus on implementing it. XP also implements Pair Programming, which is a program development process carried out in pairs. Two people work together on one computer to write code. This provides real-time problem solving and real-time quality assurance.
- d. Testing, code testing is carried out on unit tests that have been created previously. In the XP method, an acceptance test is carried out or what is usually called a customer test. This test is given to customers who will use the features and functions of the system that will be created (Dwi R et al., 2018).

The method used is as follows:



Fig.2. Problem method flow

1. Problem Identification This method is used to identify what problems are occurring and how we can overcome these problems. In this research we are trying to solve the problem of there being no media that provides relevant information related to tourism in Bengkulu so that tourists no longer need to worry about whether the information they get is valid or not.

2. **Data Collection** The next thing to do is collect some data related to Bengkulu tourism. This data collection is carried out to obtain data that is useful for creating chatbots later. The data that has been collected is obtained from direct observation or experience of the author, information obtained from local people and several trusted blogs and websites on the internet.
3. **Analysis**
After identifying and collecting data, we analyzed the data that had been obtained. In addition, we analyze the old and new systems used. The analysis results obtained will be helpful in designing a system(Salisah et al., 2020).
4. **System planning**
The following is the form of a chatbot system workflow diagram.

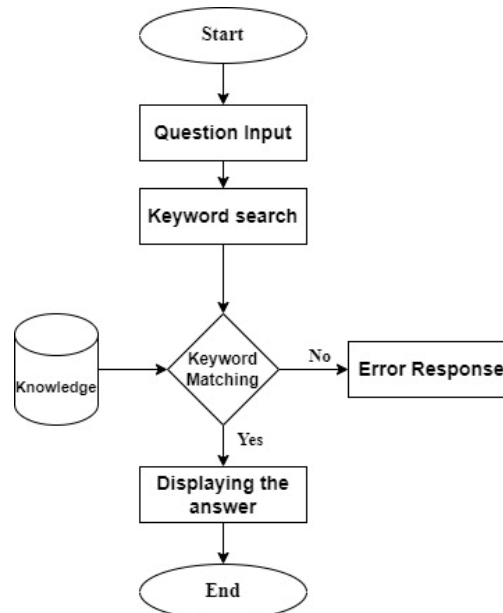


Fig.3. Flowchart of system flow

Based on Figure 1, it can be explained that the flow of the system starts with inputting questions, so that later there are keywords that can be used to search. Furthermore, there is a keyword matching process that has obtained knowledge, if the keyword matching is not appropriate, an error response will appear, while if it is appropriate, it will display the answer to the keyword being searched and finish.

4. Results and Discussions

Based on the problems explained in the introduction, an intelligent system capable of communicating with humans is deemed necessary to help tourists and make it easier for tourists to get the information they need. A chatbot is basically a chat used to obtain information that can be run on a personal computer or cellphone. The characters entered will be reviewed by the system because an intelligent system has been embedded in it. The resulting chatbot will continue to be improved and developed so that the resulting chatbot is able to communicate with users like the user is chatting with a human(Salisah et al., 2020). In designing this chatbot system, researchers built a system that is able to provide answers to questions that are often asked by visitors when looking for tourist attractions in the city of Bengkulu itself (Ramadhan, 2020). The following is a table of test responses from the Chatbot.

Table 1. Bengkulu Chatbot Response Trial

No	Question	Response	Information
1	Typical Bengkulu Food	Lepek Binita Cake, Pendap, Tat Cake, Lempuk Durian, Lemang Tapai, Bagar Hiu, Banana Curry, Bolu Koja.	In accordance
2	Where to Eat Bengkulu	Sari Eco Restaurant, RM Inga Naya, Panorama Resto Bengkulu Aloha Resto, Pindang 77 Restaurant, RM Marola.	In accordance
3	Bengkulu souvenirs	Pendap. Pendap, a typical Bengkulu culinary delight, Tat Cake. Perut Punai Cake, Kalamansi Syrup, Bolu Koja, Bengkulu Coffee, Besurek Batik, Lantung Leather Crafts.	In accordance
4	Bengkulu educational tourism	Fort Marlborough. 215. Architectural Buildings, Panjang Beach. 192. Beach, Enggano Island. Island, Bung Karno's Exile House, Special Objects Museum, Linau Bintuha Beach, Laguna Beach, Suci River Beach. Beach, House of Mrs. Fatmawati Soekarno, Museum of Objects, Specialty, History Museum.	In accordance

The appearance of the Android-based Bengkulu city tourist attraction information chatbot application is as follows:

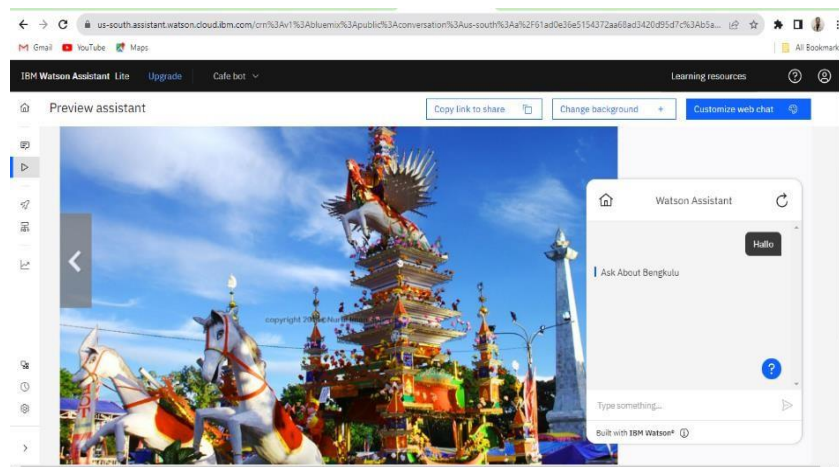


Fig.4. Display of calling a chatbot

When you click hello, the display will be as above and you can start the chatbot application and the chatbot will automatically reply automatically.

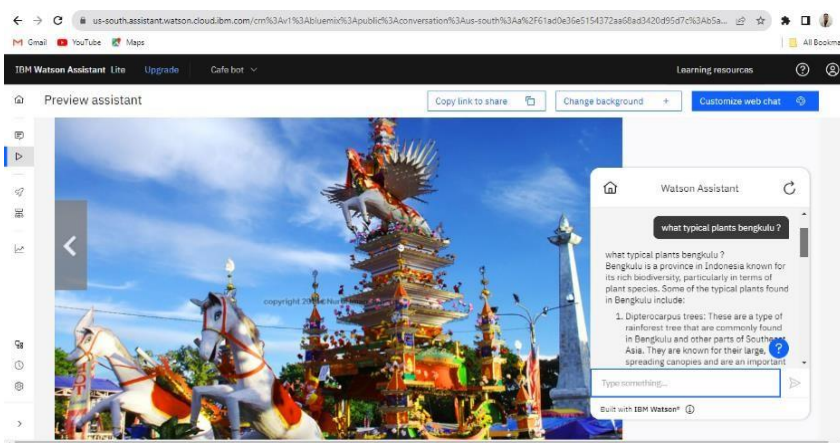


Fig.5. Chat Delivery and Response Display Chatbot Application

From the explanation of the image above, it is about the question about typical plants in Bengkulu and the chat application automatically answers the question because it has been set in the lab section so that when you want to find out about Bengkulu, it automatically answers the important thing when you want to ask according to what has been input in it. section of the lab, when asking questions outside of the questions that have been entered. And above input question number 1.

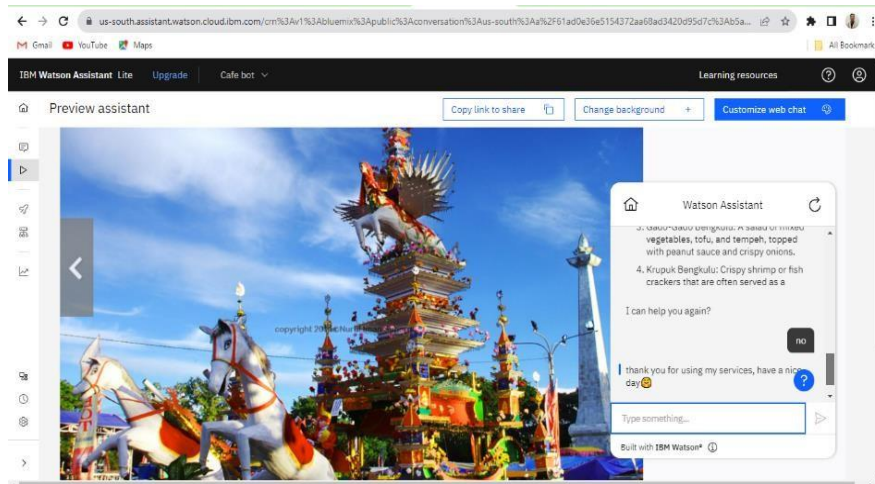


Fig.6. Final appearance of the Chatbot application

The final appearance of the chatbot is when it is finished. If you have a question you want to ask, just chat on the number and the chatbot will automatically reply, thank you for using it.

5. Conclusion

The conclusions that can be drawn based on the results of implementation and testing of the Bengkulu City Tourism Chatbot are as follows. 1) The design of a chatbot as a guide in daily activities in Bengkulu city tourism applies chatbot development and uses the Extreme Programming (XP) method. Chatbots are designed to carry out interactive conversations by providing responses in the form of text. 2) The chatbot implementation has been integrated with several features in the form of tourist information and interactive navigation buttons. 3) Chatbot testing is able to receive input and provide output responses with testing accuracy of 87%, which means that almost all output is appropriate and able to fulfill information searches interactively and efficiently. The chatbot's ability to respond depends on the strength of the server and even the user's internet connection.

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