

Career Counselling Chatbot on Facebook Messenger using AI

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Abstract: We have increasingly seen that new graduates have difficulty finding a job, which they often work in different jobs than the ones they graduated from, and that employees are not satisfied with their career choices. One reason for this may be the lack of practical, useful education when a person is in college or has just graduated from college. Chatbots are very useful and a topic of interest in the field of computer science and artificial intelligence due to their ability to emulate experts in different applications and replicate human interaction on multiple levels. Research shows that using chatbots to provide career advice can be an effective way to provide these services in an environment where counselors work. The lack of good and appropriate vocational training means that young people begin to look for jobs that their parents have chosen for them, or jobs chosen only for high wages. These decisions will be made regardless of whether; they are in the person's best interests and interests. This can cause a person to be dissatisfied with their job, which affects not only their personal health but also the overall efficiency of their work. Therefore, the development of chatbots will better inform users and help them choose jobs. This will enable them to consider jobs that they do not expect to be more fulfilling and fulfilling than jobs that do not align with their interests. Research and development software was used in this study. According to the research method, the research was conducted to collect information about people's thoughts about their career choices and what kind of job training they want from the system. In addition, the latest research on career guidance was taken into account when creating the basis of the survey. This information is used to develop a chatbot on the Facebook Messenger platform using objects powered using tools such as the Facebook SDK, Messenger Platform API and JavaScript, as well as the Wit.ai API that supports natural language usage smart technology. Chatbots can understand user input and provide relevant and appropriate responses reliably and instantly. Overall, it is hoped that the results obtained will create a positive impression of the implementation of the system and thus become a valuable asset for any school or institution wishing to use the system.

Keywords: Chatbot, Career Counseling, Natural language processing.

INTRODUCTION

This study examines the current state of career counseling and finds that the lack of adequate career counseling at university and beyond makes it difficult for employees to find jobs and be dissatisfied with their jobs. This study provides solutions for using chatbot career advice that students and graduates can use to help them find career opportunities. Every student's concern after graduation is to find a job they love. However, it turned out that graduates had difficulty finding jobs and workers were less interested in the workplace. According to a study by Universum SA, 47% of professionals plan to leave their current workplace and the average job satisfaction rate is 6/10 of 20,000 researchers [1].

Choosing a job that suits your interests is important for you to enjoy your job and maintain this interest. But most people from African families choose only well-paying jobs that their parents chose. A dissatisfied employee or poor performance is a cause of job dissatisfaction. Proper vocational training is crucial to helping students choose the right career they love. The use of artificial intelligence (AI) can be efficient and effective in providing these services. Artificial intelligence is “the ability of a digital computer or computer to perform tasks usually associated with artificial intelligence, such as information about vision, speech, language, decision-making, etc.” [2]. One of its applications is the chatbot, which is defined as a type of artificial intelligence (AI) software that can attempt to communicate (or chat) with a user in language through messaging apps, websites and mobile apps, or over the phone [3]. They were designed to enable human communication by allowing users to chat with them across various applications. They achieve this by using language processing, defined by [4] as a way for computers to manipulate natural language in text or speech to perform required tasks. This makes them useful in areas such as career counseling. This research focuses on using a chatbot and its ability to analyze user input patterns and provide appropriate responses.

LITERATURE REVIEW

In the research conducted by [5], the authors aimed to create a chatbot that uses artificial intelligence for teaching tasks. The system uses several tools when building chatbots, including Dialog Flow [6] and Hidden Markov Model (HMM), which is described as “a Google API module to process natural queries and return a dataset that meets utility requirements.” Speech recognition. When processing user input, both systems use pattern matching and classification techniques to understand user input. The purpose of classification involves “dividing users into categories” and from these categories the NLP algorithm can understand what the purpose of certain ideas is. The resulting chatbot can provide career counseling to both 12th grade students and graduates. However, their system is used as a standalone application; this chatbot system is used on the Facebook Messenger platform for easy access and use. Additionally, they made use of HMM and Dialogflow to process and understand user input, while the implemented system makes use of Wit.ai’s NLP capabilities to understand user input and provide a response. This was favored over [5] selection as it was easier to integrate with the chatbot system.

In this article [7], the author tries to create a chatbot that can provide users with physical learning and demonstrate intelligent behavior. They pull information from many chatbot systems, such as ELIZA, one of the first chatbots created. Created by Joseph Weizenbaum in 1966, the chatbot acts like a doctor, “reformulating the user's words and asking them as questions.” ELIZA helps writers understand how creative ideas can make conversations more human. They also learned how to use ALICE (Artificial Language Internet Computing Entity) (a chatbot inspired by ELIZA) and Siri (virtual personal assistant), Powered by Apple Development in Artificial Intelligence Markup Language (AIML) technologies - Helps. Understand the limitations of speech-to-speech speech processing. This research paper uses text-to-speech using various tools such as Google Speech Recognition using APIs to convert input speech to text, speech understanding modules and semantic recognition body to extract question meaning, and Google text-to-speech synthesis. It passes the output back to the speech. However, the proposed system will only choose to complete the text for several reasons; The first is to reduce the complexity of the system. Second, using fewer APIs and processes can process data faster, allowing chatbots to respond more quickly when processing speech to text and vice versa. Third, the chatbot application is easily accessible on smartphones; Many of these come with speech-to-text capabilities, allowing users to interact with the chatbot using the feature here on their phones. Their smartphones will be able to convert messages to text and send them to chatbots without needing to create speech-to-text functionality. The chatbot used in this research article is an Android operating system that receives voice feedback and sends the relevant responses back to the user by voice. Although the content of the system differs from the use of chatbots, this study still provides important information about how chatbots are designed and allows researchers to identify key aspects that are not necessarily effective. Research paper [8] shows the demonstration of an intelligent chatbot that can use text and voice to chat with users.

To create bots, artificial intelligence algorithms are used to identify and understand user queries and provide useful results. Their systems use natural language processing and pattern matching algorithms to generate appropriate responses to user queries. Similar to this study, the system also produces using natural language processing and matching models that find important words in user input. This simplified the process of developing and implementing the system. In addition, it reduced possible errors that might be introduced by accents that may make speech input hard to process. The selection section on the use of cognitive tests to help users choose future jobs was developed based on the analysis of this article. This study [9] describes the design and implementation of a university consultation chatbot that answers questions related to the field of engineering. It includes many applications, including questions about college admissions, available courses, job placement, and more. NLP technique was applied to the collected data created in JSON format and trained using feedforward neural models. The application is sent via the Facebook Messenger interface. Similarly, due to its popularity and usefulness, the request process is also used in the Facebook Messenger app and uses NLP and JSON data to store responses. Additionally, the planning process will become the only test for the end user. In this study, the authors conducted a two-phase end-user testing in which testing was completed after initial development and again after the functionality was added to the system. This will be used in the study to measure how well the job is being done as it should be.

The system developed in this study uses the principle of collaborative neural network to train the model instead of using the pre-trained NLP model available in the Wit.ai API. Its physical requirements include "62 target tags and 1059 question patterns" that must be stored in a JSON file, and all incoming questions must be checked. Check this file to identify matching patterns. However, the implementation process only requires the creation of six target tags in the Wit.ai interface, and query models are managed without needing to be created they. Moreover, the methodology developed in this study covers a wide range of applications but is limited to the engineering activities of a particular organization. The scope of the advice will be limited to career advice but will be useful in many workplaces. The research paper [10] focused on creating artifacts designed to help users find jobs. The developed system leverages AIML and NLP to create a chatbot that interacts with the user. It is also worth noting that this study also used a speech-to-text system that can record the user's voice and convert it into text without the user using the keyboard. To develop the chatbot, Google API, Java programming language and AIML library specially designed for job posting are used. This article covers how to design and build systems, such as using agile development. The software has developed and identified some recommended research practices when processing corporate data. Similar to this study, the technique uses NLP to process user input and determine appropriate responses. The system developed in this study also uses AIML and Google APIs. On the other hand, the use of chatbot communication uses the existing capabilities of the Facebook platform. This is because Facebook's tool is more powerful because it has a larger chatbot process compared to the Google API. While the system in this article is used as a standalone offline system, the proposed system will be available online. This will make the system easily accessible to users worldwide. Finally, this study uses a speech-to-text task similar to the one listed above [9]. However, the API can slow down response time and sometimes crash after overuse. For this reason and to simplify the development process as mentioned above, chatbot conversation is used to create simple text messages and report very fast response time. In this study [11], a chatbot that offers questions about universities via text or voice chat is described. Among them, they focus on the process of the chatbot model, as shown in the working map in Figure 1.

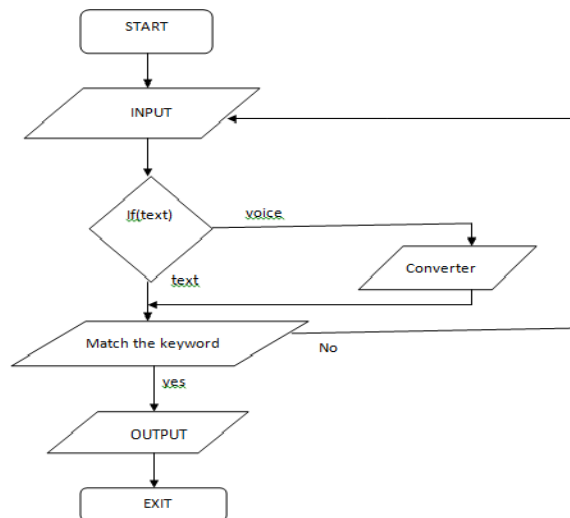


Figure 1: Flow Chart Design

Because the system uses mostly text, the flowchart in Figure 1 has been modified and simplified to eliminate verbal feedback. This does not mean that voice cannot be used, as many smartphones have a speech-to-text function that converts voice messages into text before sending them to the chatbot. This can then be removed from the chatbot's flowchart. They leverage the Dialogflow API for database management and NLP capabilities to understand user-provided input. To create the interface, they used Unity, "a gaming platform that supports 2D and 3D game graphics"[11], which will run the application on Android devices. But the mentoring program uses Facebook Messenger, is accessible from any device, and is more interactive than a chat session. The research paper [12] presents the design and development of a chatbot used in the management of universities to answer frequently asked questions by students, with the aim of reducing the high level of stress of administrative staff and making the work of students easier. Researchers have found that students often feel uncomfortable paying to go to school and then waiting in line to access information. robot developed inthisresearchIt is designed to solve these problems, especially in cases where students have many questions in their minds, such as during registration. To support this research, the chatbot application took a similar NLP API to process user input and was sent to the Facebook Messenger platform. The research uses features and development methods that include using JavaScript to code the bot and using JSON data to store requests from developers. However, the researchers used Dialogflow as the main NLP API, while the process used Wit.ai. This is because Wit.ai comes from Facebook and makes it easy to integrate with code. Additionally, researchers have used agile software development methods that have been found to be suitable for the development of such systems. The report shows the effectiveness of this system on the Facebook Messenger platform, which expands the user horizons to everyone who has a Facebook account and access to the internet.

Similar to the interactive question chatbot mentioned above, research by the author [13] also described the development and creation of a chatbot to answer questions frequently asked by students at the University of Namibia. But this article presents another way to do this using a custom website using XAMPP instead of Facebook Messenger. The development method used is also different; This article uses rapid changes, similar to the agile process, but focuses on quickly releasing prototypes and iterating on them until the final design is completed. For the process of processing the answer and generating the answer, the researchers used the data generation algorithm and the content comparison algorithm. The document creation process involves manually adding the FAQ twice (different words) along with the answer. The algorithm then splits each question into separate words, extracts content from the questions, and creates the questions by saving the different questions, extracting the content, and the answer is like a database in MySQL. Then, when running the chatbot, the keyword matching algorithm will take the user's query, retrieve the data stored by MySQL, and compare each word of the user's query with the content in the dataset. When a match is found, it returns the response that is stored and displayed to the user. However, the article reports that the algorithm cannot solve complex problems. In contrast, the interactive chatbot uses a more powerful model comparing the algorithm Available in Wit.ai API. The algorithm involves manually setting the target of some user input and then encoding the desired response. With minimal attention from the developer, the API can determine the intent of the user's query and understand the intent even if the query language is different. Despite these differences, this article provides information about the types of chatbots and their features that are important to start research in this field. The article [14] designed and developed an interactive application that allows students, teachers, and other users to interact with the cognitive process that provides information about school performance. The bot is used as an Android application and has an interactive interface where users can request information from the bot and receive alerts when new events occur. Similar to this article, the discipline study process is also text-based and uses a similar NLP algorithm. NLP tools are used in their research to remove ambiguous words from user input and identify targets and relationships in the remaining words of the question. Compare the objectives with the information stored in the management information system and select the appropriate response. The process according to [14] is shown in Figure 2. This report was included in the study. However, in this study, the responses were stored in a database, while the information used in performance feedback was stored on the device using NLP (e.g., Wit.ai itself). Additionally, while the NLP tool removes unnecessary words from the query, Wit.ai's feature automatically detects keywords in the query without removing extra words. When compared to the job description or job shown in Figure 2, this process was found to meet the needs of the job and was therefore included in the research..

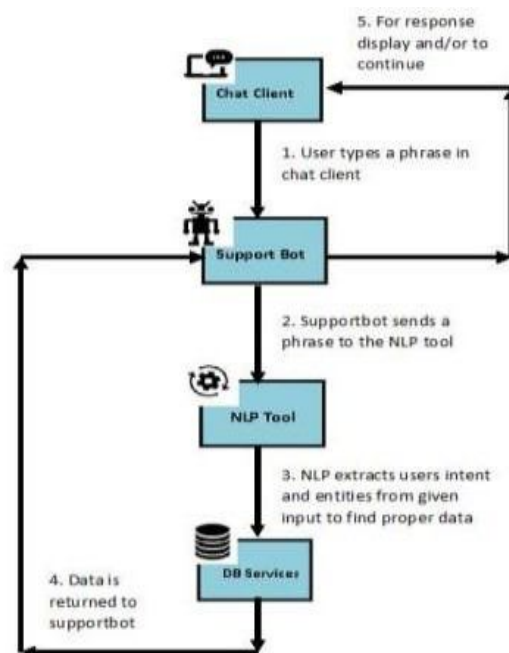


Figure2: The Working flow of Support Bot

III. METHODOLOGY

This chatbot system is built on the Facebook Messenger platform using tools such as the Facebook SDK, Messenger Platform API, JSON archives, and JavaScript, as well as artificial intelligence using natural language. The system is designed using intelligent algorithms that analyze user responses and provide appropriate responses. The app uses the artificial intelligence of the Facebook Messenger platform and the Wit.ai platform to perform this task. Users can request resume templates, intelligence tests, etc. from the chatbot.

It can request different resources such as and the chatbot can request NLP to understand the message and return the answer. The system architecture is shown in Figure 3.

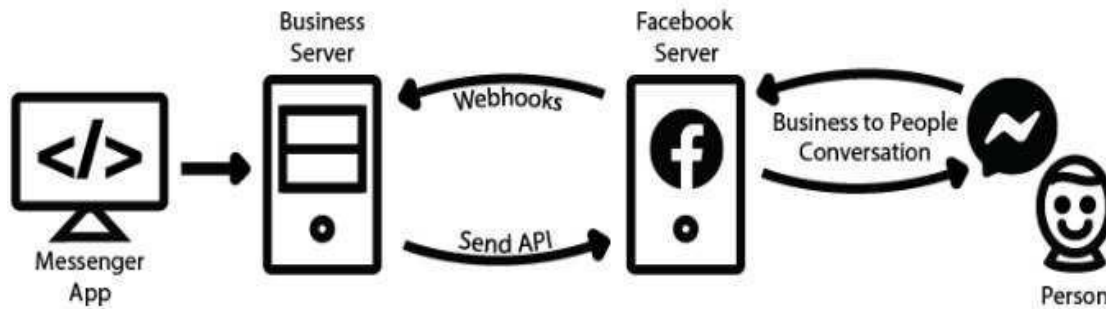


Figure.3: System Architecture

The system was developed using agile development methods. The data collected from the model during the research process was used for written requirements, called “user stories” in this article, which served as models for software development iterations. The first important step is to choose which user stories will be the basis of development in a particular iteration, or “sprint.” In the second stage, user stories are divided into parts. The purpose of this phase is to identify user stories and turn them into a list of tasks that need to be done. The three phases after planning, building and releasing the software include implementing the activities in the second phase. This key is the release of a particular iteration of the software. The next phase involves evaluating the system and obtaining feedback from users to determine whether the functionality is working as expected. The main focus of this phase is user feedback. Since it was not possible to receive feedback from all participants in the research, some participants were selected as testers for the system during the development phase. Once the iteration is published and evaluated, another user story is chosen to drive the next sprint, and so on until the final release is completed.

IV. RESULTS

This section provides a brief overview of the research results and software product development. The installation is complete and the chatbot system appears to be working. It can be accessed through Facebook Messenger and its services are available to anyone who has an account and uses the Internet. It currently responds to user input and provides resources such as resume templates, interview preparation materials, job listings, and aptitude tests. Screenshots of future workings and functionality of the features shown in Figures 8 through 13 below show the chatbot in action and how it responds to user messages.

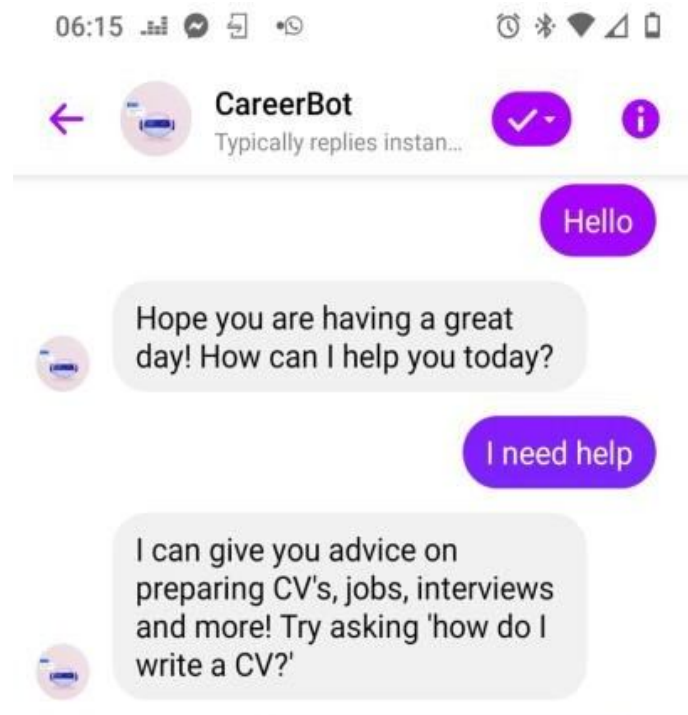


Figure 4: Initiating Conversation with the Chatbot

V. CONCLUSIONS

In summary, the aim of this study is to create a chatbot that will provide career counseling to undergraduate and graduate students. This is the main purpose of the research on the design of the application. Research was conducted by students and graduates to determine what features should be included in chatbots. At the end of the development phase, several research participants were recruited to test the robot to determine whether the system produced satisfactory results. Also the goal of creating an automated process that accepts questions from customers and provides them with the necessary resources once the product is finished. Various tools are used to achieve this, including the Facebook Messenger platform and natural language processing. The result is a chatbot that responds very quickly to users' messages and offers useful services based on the user's questions. In addition, the bot can understand the user's purpose in sending a message and give appropriate responses. By using this technique, users can better understand the tasks required to find a job they do not understand. In general, robots show good potential for integration into existing institutions, such as universities and other institutions of higher education, to provide services that many people have not used for a long time. The following are some things that can be further developed and integrated into the chatbot system to make it more powerful. This list is not comprehensive and many other jobs are available.

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