UNISEL Bot: Designing Simple Chatbot System for University FAQs

Nahdatul Akma Ahmad, Mohamad Hafiz Che Hamid, Azaliza Zainal, Zirawani Baharum

Abstract*: *The UNISEL Bot system was developed for helping marketing department in order to help on giving information in interactive mode for marketing purpose. The current problem is the information are not served in interactive ways, manually serving information using portal and paper are complicated and there is no real-time customer support to help on question and answer. In the era of technology, the information should be served in an interactive platform. The interactive information tends to gather more user attention. Therefore, this project aims to develop marketing assistant Chatbot system for a private academic institution which known as UNISEL Bot. The Chatbot system development is expected to assist the marketing department to use smarter marketing and interactive ways, for instance; to receive FAQs from student and provide real-time feedback whilst encourage people to engage with latest technology. Agile methodology was used in the development of this Chatbot system. Qualitative data gathering using interview method with students and University staffs was implemented. Multiple diagram is presented in this paper to describe the process flow of UNISEL Bot system. UNISEL Bot system was made up of seven main modules including the Ask Question, Feedback, Registration, Event, Appointment, Survey and Map. In future, this Chatbot system can work effectively to replace the traditional method of manual customer service and can also helping people in capturing user data for building analytic data.

Index Terms*: *Artificial Intelligence Markup Language (AIML), Chatbot, Instant Messaging, Pattern Matching.

I. INTRODUCTION

In general, bot is the computer system that can perform automated task and Chatbot refers to the normal messaging application which the receiver is a robot [1]. In an easy word, the situation is like when human is chatting with the robot (computer). According to [2] Chatbot is the computer system that can communicate with human in the form of messaging app.

They can understand multiple question requested by human. They also have the ability to differentiate between uniqueness of word including emoticons.

The conversation could happen through voice commands, test chats, graphical interfaces or graphical widgets [3]. Recently, Chatbots has been used in various industries to deliver information or perform tasks, such as telling the weather, for education [4], making flight reservations, or purchasing products. These technologies also are used by various famous application such as Telegram, Cortana, Slack, WeChat, Facebook Messenger, Google Assistant and Siri. In business for instance, since Chatbots can provide real-time customer support 24/7, therefore it has been used widely in customer service for marketing purpose. The use of Chatbots are meant to help and deliver immediate actions where humans cannot reach due to timing or budget. Chatbots will capture the user's questions and give feedback fast rather than manually searching for enormous list of FAQs [5].

II. RELATED WORKS

A. Chatbot Development

A. In previous paper, we have explained about several techniques that can be used in developing a Chatbot system. Most chatbots search for patterns, keywords, phrases, and examples that have been customized into their databases, yet some use more propelled strategies [6]. A review of several chatbots system such as Chat.io, Collect.chat and Cleverbot is also provided to explain the different way how each chatbot works [7]. In this paper, Chatbot is implemented to meet the academic needs of the visitors who wants to know about university's programs offered and any other information pertaining university operation and background.

B. Technology Used for Chatbot Development

There are many ways to develop the Chatbot System. The process of developing Chatbot System may be different depending on the purpose of the development. These are the tools used in the development of UNISEL bot system:

Widget Flow: Widget flow is the flow of widget including images, button and form that help in building Chatbot system. This will give multiple options to the user to select in conversation flow. Nowadays the used of widget flow system in Chatbot conversation can make the conversation flow interactive and straight forward.

The use of picture as in Figure 1 and multiple choices of options button in conversation flow as in Figure 2 can attract human eye and will help as a medium for interactive marketing
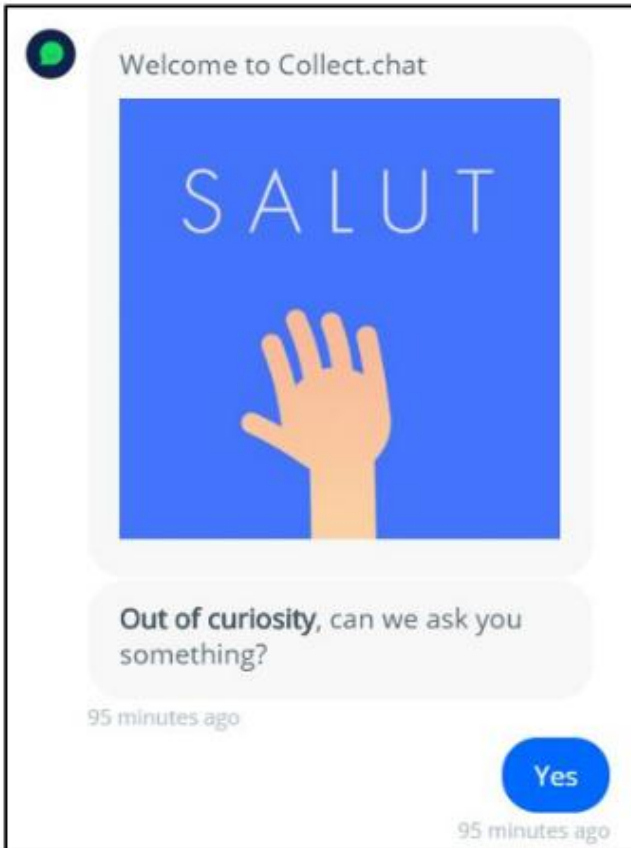
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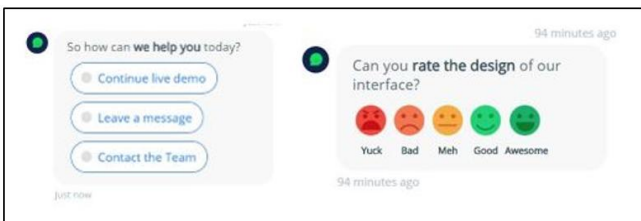**Fig. 1 The use of image in Chatbot conversation**

Fig. 2 The use of multiple options button in the Chatbot conversation

JavaScript Object Notation (JSON): JSON is a language-independent data interchange format in form of text-based. JSON is lightweight and suitable for processing database data. The structure of the JSON is easy to understand by human eye.

PHPmyAdmin: PHPmyAdmin is the software coded with PHP (Hypertext Pre-processor). PHPmyAdmin is function to manage MySQL database through website. Create database, add, edit, delete tables, execute SQL queries and make table relationship are some the features.

MySQL: MySQL is the very common open source database software that very suitable for developing application for website and easy to use. MySQL also have a good pair with PHP.

III. DESIGN OF CHATBOT SYSTEM

A. Use Case Diagram

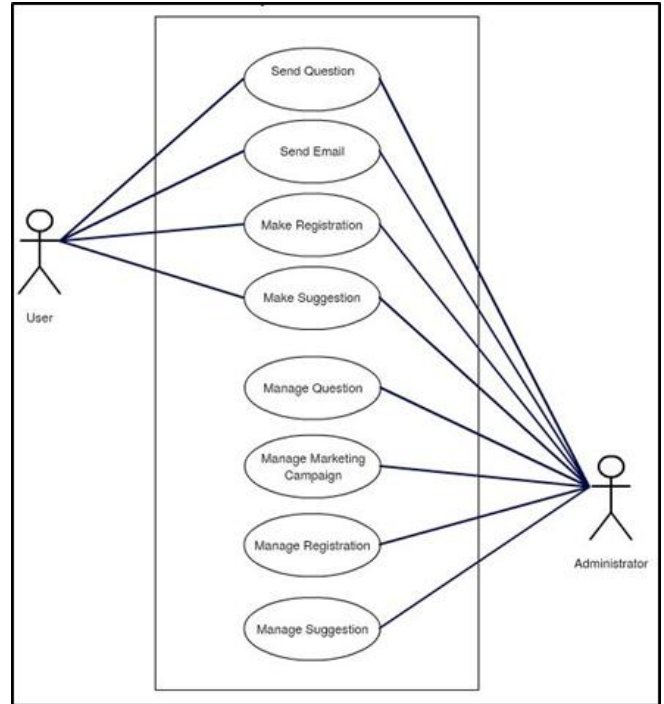The following Fig. 3. depicts the use case diagram of detail operation of the UNISEL Bot system.

Fig. 3 The Use Case Diagram for UNISEL Bot

B. How Chatbot Works

Fig. 4 illustrates the processes of Chatbot system. Firstly, user must have computer in order to access the chatbot user interface (UI). A text console will appear on the chatbot UI where user can pass text input through the console.

Secondly, the text input which entered by user in a sentence will then be chunk. Chunking here means the process of splitting text into separate words for tagging. The output from the chunking process is several meaningful phrases which are going to be used later in the matching process. This phrases will act as keyword in the matching process.
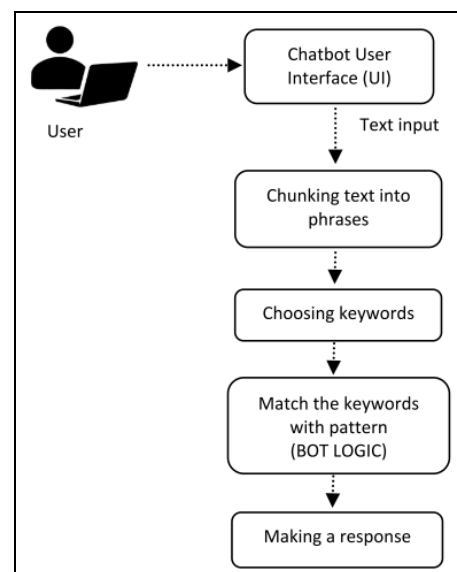

Fig. 4 How Chatbot Processing Data

Finally, the keywords resulted from the chunking process are then matched with the pattern in the chatbot system. The process of matching the keywords with patterns is called BOT LOGIC. The output from the chatbot system is the programmed response, which will be, for instance, any other text or a template web form.

C. User Interface (UI) Design

The following Fig. 5 shows the UNISEL Bot system interface which was plugged on University's website.

Fig. 5 UNISEL Bot interface plug on University's website

UNISEL Bot looks like a normal messaging app, it has the application layer, a database working at the background. User interface represent the interface to make easy contact with user. This system will look for keywords that match with user's input. If the keyword was found, then the corresponding response will be displayed. For the keywords that is not being registered in the UNISEL Bot database, the corresponding response is enabled to continue the conversation with the user. Consider the following case to see how this would function.

User: aaabbbccc?

At this point UNISEL Bot could not recognize keyword results for "**aaabbbxxx?**" but will continue with the next conversation.

UNISEL Bot: Sorry, I did not quite get that. I'm still very experimental and make a lot of mistake. If you type "feedback" you can leave me some advice.

UNISEL Bot cannot respond as intended but will be supported by a feedback form which allow users to add new keyword to the system. UNISEL Bot will give standard answers if the keyword is not found.

The *IF-ELSE* statement is used in UNISEL Bot system to follow a set of specific instructions based on results. This concept is the same as in real life when you want to decide based on certain circumstances.

"In case of rain, you will use an umbrella; otherwise you will not."

In this statement, you will decide to use an umbrella based on the rainy state. In UNISEL Bot system, these results and conditions are explicitly stated to provide feedback based on certain keyword. The condition in the bracket of the *IF* statement is assessed. If the test results are correct, the instructions in the *IF* body are executed. If the outcome of the situation is wrong, then the statement is overlooked. The following Fig. 7 are an example of program fragment using *IF*

statement in UNISEL Bot system.

```
If (msg == 'hi' || msg == 'hello' || msg == 'hey') {
    generate_message('Hi there! welcome to UNISEL BOT ',
    'user');
    setTimeout(function() {
     generate_message('a marketing assistant chatbot for
     UNISEL', 'user');
    }, 2000);
     setTimeout(function() {
     generate_button_message_UNISEL('please choose either
     one', buttonsUNISEL)
    }, 4000);}
else{
    generate_message('Sorry, I did not quite get that.', 'user');
     setTimeout(function() {
     generate_message('Im still very experimental and make a
     lot  of mistakes', 'user');
    }, 2000);
    setTimeout(function() {
    generate_message('If you type "feedback" you can leave
    me some advice.', 'user');
    }, 4000);
}
```

Fig. 6 Example of *IF-ELSE* statement in UNISEL Bot System

- Generate_message() function:

Multiple functions for generating messages are used in the UNISEL BOT system. These functions are written using the Javascript method which is an object-oriented computer programming language commonly used to create interactive effects in a web browser. The JavaScript function is a code block designed to perform certain tasks. Generate_message() function is used to display the corresponding sentence based on the input given and also enable the fade in animation to display the message.

- setTimeout() function:

To create animated animation in messenger way. the setTimeout function is used to decrypt the impression of delay. setTimeout allows the function to run after an interval. A pause before running, in milliseconds (1000 ms = 1 seconds), by default 0. For example, this code calls the sayHi() function after one second:

```
function sayHi () {
warning ('Hello');
}
setTimeout (sayHi, 1000);
```

UNISEL Bot also shows the widget buttons to give users the option of services. This widget button function provides services such as ask question, appointment, registration, survey, feedback, map and event. These functions are displayed in the form of buttons. The code to call services button is as below:

```
setTimeout(function() {
generate_button_message_SERVICE('You may choose
any service below', buttonsSERVICE)
}, 8000);
```

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IV. RESULTS AND ANALYSIS

If the conversation starts with greetings like hi! or hello! you will be presented with seven main options as Fig. 7 such as Ask question, Appointment, Registration, Survey, Feedback, Map and Event.
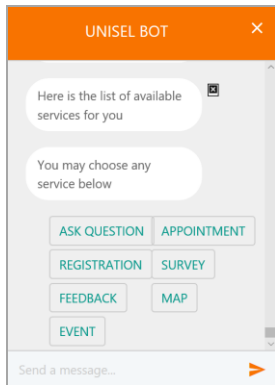

Fig. 7 Seven Main Modules in UNISEL Bot

- Ask Question Module

Fig. 8 shows the interface of the user messaging in UNISEL Bot. The system will answer user's question which only related to university. This module provides live conversation that makes it look as if users are talking directly to the university's agent in which users will acquire prompt answer to the question without having to wait.
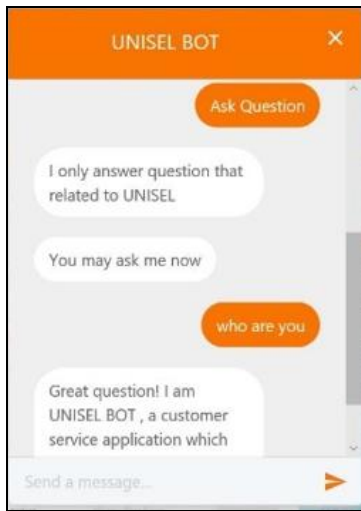

Fig. 8 Ask Question Module Interface

- Registration Module

This module is meant for a user who wants to register as a new student in the university. Once the user clicks on the REGISTRATION button, the chatbot will navigate user the online registration form in the university's web.

- Feedback Module

This is a module is a medium where user can provide comments and feedback regarding university. User will be navigated to the form in order to fill-up their comments. Successfully alert message will appear and the data is recorded into the server.

- Event Module

For event module it will give info about list of University's upcoming events. Once the user selects event button, user will be navigated to university's event page which consists of the

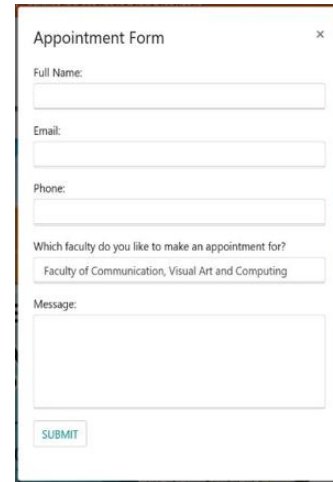events details like the poster, contact number and so on.

Fig. 9 Appointment Module Interface

- Appointment Module

Fig. 9 shows the appointment form module interface. The pop-up form will automatically appear when user click on the APPOINTMENT button. User need to fill up the form for making appointment with dedicated lecturer. This module is used for the outsider to make appointment with specified person such as the faculty top management, program coordinator or the lecturer.

- Survey Module

This survey module was built to help the admin to create a simple survey. User will be assisted to go the survey page in university's website when they click on the SURVEY button.

- Map Module

Figure 8 shows the interface of the map in UNISEL Bot. The system will reply appropriate message related to university's map when the user clicks on the map button. The university map window will pop-up and user can interact with the map, for instance, user can find the location of faculty, mosque, hostel or cafe.
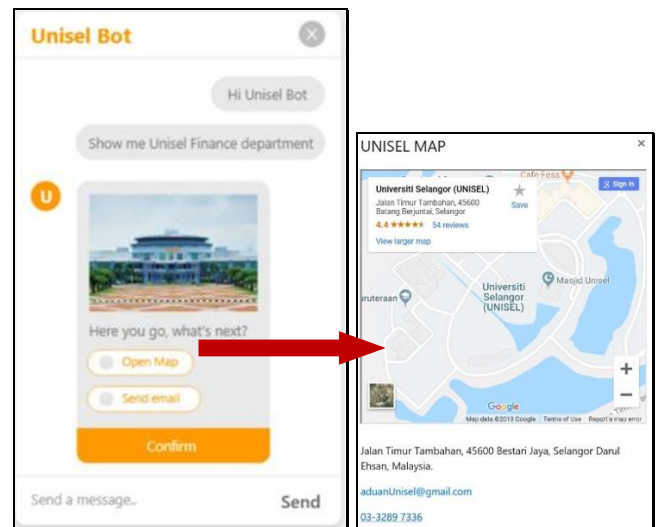

Fig. 10 Map Module Interface

First picture (on the left) in Fig. 10 depicts UNISEL Bot page displayed after the user click on the MAP button. Two options will appear which are Open Map and Send Email. If user click on Open Map option, the university's map will appear on the first layer of the UI and user can drag and zoom control of the map.

V. CONCLUSIONS

The UNISEL Bot is expected to give a new breath to help university's marketing department to promote UNISEL with new approach. The implementation of multiple widget function works seamlessly and the data is successfully transferred and stored into the database.

In the future, many improvements can be made to the UNISEL Bot to make the system more knowledgeable and user-friendly. Artificial Intelligent and machine learning can be implemented in the UNISEL Bot to make the system more intelligent and can mimic as human chatting behaviour.

The voice recognition also can be implemented in the UNISEL Bot to make the system able to decode the human voice without having to use a keyboard. This is because the system is intended to publicly use for the inside and outside UNISEL, so it need such as advance technology to attract user for marketing purpose of UNISEL.

REFERENCES

1. J. Masche and N. Le, "A Review of Technologies for Conversational Systems," Adv. Intell. Syst. Comput., vol. 629, pp. 212–225, 2018.
2. L. Ciechanowski, A. Przegalinska, M. Magnuski, and P. Gloor, "In the shades of the uncanny valley: An experimental study of human–chatbot interaction," Futur. Gener. Comput. Syst., vol. 92, no. January, pp. 539–548, 2019.
3. S. A. and D. John, "Survey on Chatbot Design Techniques in Speech Conversation Systems," Int. J. Adv. Comput. Sci. Appl., vol. 6, no. 7, pp. 72–80, 2015.
4. B. Heller, M. Procter, and D. Mah, "Freudbot: An investigation of chatbot technology in distance education," Proc. World Conf. Educ. Multimedia, Hypermedia Telecommun., no. March 2016, pp. 3913–3918, 2005.
5. B. R. Ranoliya, N. Raghuwanshi, and S. Singh, "Chatbot for university related FAQs," 2017 Int. Conf. Adv. Comput. Commun. Informatics, ICACCI 2017, vol. 2017–Janua, pp. 1525–1530, 2017.
6. S. Reshmi and K. Balakrishnan, "Implementation of an inquisitive chatbot for database supported knowledge bases," Sadhana - Acad. Proc. Eng. Sci., vol. 41, no. 10, pp. 1173–1178, 2016.
7. N. Akma, M. Hafiz, A. Zainal, M. Fairuz, and Z. Adnan, "Review of Chatbots Design Techniques," Int. J. Comput. Appl., vol. 181, no. 8, pp. 7–10, 2018.