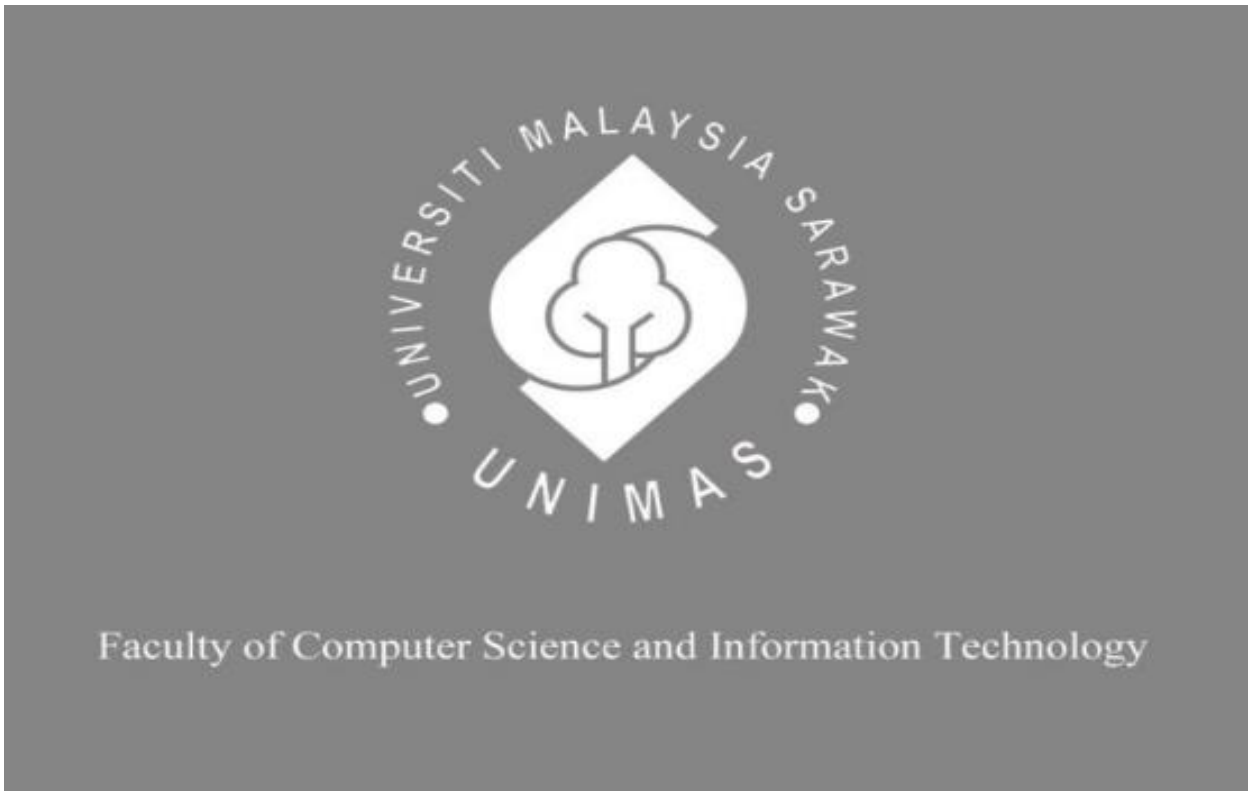

A FCSIT WHATSAPP CHATBOT

Teo Kuo Hong

(58127)

Bachelor of Computer Science with Honors
(Software Engineering)
2020

A FCSIT WHATSAPP CHATBOT

TEO KUO HONG

This project is submitted in partial fulfillment of the requirements for the degree of Bachelor of Computer Science with Honors

Faculty of Computer Science and information Technology
UNIVERSITI MALAYSIA SARAWAK 2020

CHATBOT UNTUK FSKTM

TEO KUO HONG

Projek ini merupakan salah satu keperluan untuk
Ijazah Sarjana Muda Sains Komputer dan
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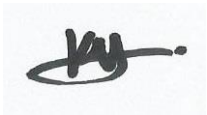

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(TEO KUO HONG) (15 JULY 2020)

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ABSTRACT

WhatsApp Messenger is one of the most used instant messaging applications used among university students. WhatsApp is widely use in communication among students in the form of both personal messages and group chats. However, individuals nowadays must consult others or search the Internet to obtain the process to apply for any services offered by the faculty and it takes a long time to obtain the accurate information but sometimes the answers received are inconsistent. Also, overloading of information in group chats often caused overlooking of important messages. In response to this, this project aimed to develop a WhatsApp chatbot to solve these problems by offering a centralized platform for both faculty personnel and students to carry out information sharing and message delivering. According to the literature review, there are three existing chatbot system that provides automated chat services and two research articles that discussed about the revolution of chatbots. The methodology used throughout the development is Agile Kanban Methodology which promotes the use of a Kanban board to visualize the development stages. A questionnaire was distributed to gather opinions and suggestions from targeted users which is the FCSIT community. Finally, logical and physical designs are produced to enable stakeholders to have an overall view of the structure and the flow of the system.

ABSTRAK

WhatsApp Messenger adalah salah satu aplikasi pemesejan segera yang paling banyak digunakan dalam kalangan pelajar universiti. WhatsApp digunakan secara meluas dalam komunikasi dalam kalangan pelajar dalam bentuk kedua-dua mesej peribadi dan sembang kumpulan. Walau bagaimanapun, individu sekarang harus berunding dengan orang lain atau mencari Internet untuk mendapatkan proses untuk memohon mana-mana perkhidmatan yang ditawarkan oleh fakulti dan ia mengambil masa yang lama untuk mendapatkan maklumat yang tepat tetapi kadang-kadang jawapan yang diterima tidak konsisten. Selain itu, terlalu banyak maklumat dalam sembang kumpulan sering menyebabkan mesej penting diabaikan. Sebagai tindak balas kepada ini, projek ini bertujuan untuk membangunkan chatbot WhatsApp untuk menyelesaikan masalah ini dengan menawarkan platform terpusat untuk kedua-dua kakitangan fakulti dan pelajar untuk menjalankan perkongsian maklumat dan menyampaikan mesej. Menurut kajian literatur, terdapat tiga sistem chatbot yang sedia ada yang menyediakan perkhidmatan perbualan automatik dan dua artikel penyelidikan yang membincangkan mengenai revolusi chatbot. Metodologi yang digunakan sepanjang pembangunan adalah Metodologi Agile Kanban yang mempromosikan penggunaan papan Kanban untuk memvisualisasikan peringkat pembangunan. Soal selidik diedarkan untuk mengumpulkan pendapat dan cadangan daripada pengguna yang disasarkan iaitu komuniti FCSIT. Akhirnya, reka bentuk logik dan fizikal dihasilkan untuk membolehkan pihak berkepentingan mempunyai pandangan keseluruhan tentang struktur dan aliran sistem.

CHAPTER 1: INTRODUCTION

1.1 Background

WhatsApp is an instant messaging application which serves the purpose of replacing SMS (short message service) with a cross-platform mobile messenger application that's works whenever devices are connected to the internet (Yeboah & Ewur, 2014). In university, WhatsApp is widely used in informal communication between students, group discussions about various projects or assignments, as well as information sharing among lecturers, faculty admins and students. (Joicy & Sornam, 2018).

Due to the rapid development of technology, a chatbot is introduced to simulate human conversation in the form of text and sound. Companies nowadays such as Spotify and Sephora utilized chat bot as their virtual assistant to answer customers' queries and learn every customer's behavior based on conversations from time to time (Kim, 2018). The presence of chatbot supports automation of replies for similar queries, managing human resources on more important and qualitative tasks as well as improvement of business with the least effort ("Top 10 Reasons: Why Your Business Need A Chatbot Development", 2018).

This project proposes to integrate both WhatsApp and the development of chatbot by creating a WhatsApp chatbot for FCSIT community. The chat bot will serve the purpose of providing a centralized platform to answer queries and delivering messages to users. Furthermore, this project will develop a website to provide a medium for authorized personnel to program that chatbot, such as changing query's answer, delivering messages to related users and modify the chatbot's reply when an input is received. Upon successful implementation of the project, the chatbot aims to replace the current system and grows into the main source of information for FCSIT community.

1.2 Problem Statement

As a part of FCSIT community, one deserves to obtain the latest and relevant information available without any obstacle in the least amount of time. Information must reach out to users immediately whenever it's necessary. To assist the delivery of information and messages, WhatsApp is widely used among FCSIT community.

However, there exists some flaws in information sharing among FCSIT community. Individuals nowadays must consult others or search the Internet to obtain the process to apply for any services offered by the faculty. Furthermore, it takes a long time to obtain the accurate information but sometimes the answers received are inconsistent. Moreover, a significant amount of effort is required for faculty personnel to answer similar students' queries as students will face similar problems every academic semester. As for information regarding lectures and events happening around, there exists a WhatsApp group which every related user is included to ease the sharing of information. Yet, the overloading information shared in a WhatsApp group caused users having troubles to keep track of the latest information shared in the group chat, and there exists a huge number of unimportant messages which caused the overlook of important information.

In response to these problems, this study proposes to create a personalized WhatsApp chatbot. The chatbot will simulate the actions and response of faculty admins or lecturers to deliver the accurate information in the form of WhatsApp personal messages. Hence, this will solve the overlook of important messages, as well as providing a medium for users that are afraid to ask question in the group chat to insert queries without worrying of asking the wrong question. This project is inspired by AVA (AirAsia Virtual Allstar), a chatbot which assist the company's staff in responding different inquiries from customers all around the world.

1.3 Aims and Objectives

The aim of this project is to develop a WhatsApp chatbot and a website to allow authorized users to program the chat bot. The objectives are:

- To analyse requirements and design a WhatsApp chatbot for FCSIT community.
- To develop a WhatsApp chatbot that delivers announcements, answers users' queries based on selections provided by the chatbot.
- To provide a web template for faculty admins and lecturer to program the chatbot.

1.4 Scope

This project will develop a WhatsApp chatbot for FCSIT community. The WhatsApp chat bot will consist of the chat bot itself in the form of WhatsApp messages, and a Content Management System-like website to program the chat bot. The initiative of the project is to increase and optimize the performance of information sharing (For example: class announcements, events happening around and Frequently Asked Questions) among FCSIT community. The limitation of the WhatsApp chatbot would be the chatbot can only receive input in English language and users are advised not to report the chatbot messages as spam message as WhatsApp will ban the WhatsApp number if the number of reports exceeded certain limits. The assumptions of the project would be every user have installed WhatsApp on their smartphones, as well as the WhatsApp Application Programming Interface can be integrated with the backend of the chatbot. This project will focus on FCSIT community, and will be including a dedicated website to program the chat bot.

1.5 Methodology

The software development methodology that will be used throughout the project is Agile Kanban methodology. An online Kanban board will be used to manage the entire workflow. The reason behind choosing an Agile Kanban Methodology is that the presence of Kanban board eases the management of the entire workflow, as well as visualizing and categorizing different stages of the WhatsApp chatbot development.

There are three main principles that will be applied in this software methodology. First, the entire development will be visualized in a Kanban board, this helps in managing the status and progress of each part of the work. Next, limiting WIP (Work in Progress) is essential to prevent overloading of work, as well as idleness of current active parts. Continuous measure and improvement will be applied in this methodology as changes can be made immediately whenever there is change in requirements.

In the Kanban Board, different development stages can be determined. In this project, the software development processes are divided into:

- Product backlog

  Product backlog consist of different categories, depending on the current progress of the chatbot development. Items that are in the backlog are usually phases that are not directly related to the current development process. Any changes will be recorded into the backlog to prevent overlooking when the development stages change.

- Requirements

  The requirements consist of the basic requirement of the chatbot. Also, requirements from every stakeholder will be recorded for future referencing. Requirements are important as it will always be referred during the development process.

- Design

  The design part will include every design aspect of the project. The included designs will be the design of user interface for administrator's website, the design of the flow of the chat bot, as well as the static and behavioural diagrams.

- Development

  Development stage will include every technical part of the project. The main features will be separated into different parts, and there will be subtasks linked to every parent issue, to ensure the consistency of the development process. Errors such as bugs will be recorded to keep the tasks in view.

- Testing

  Testing stage will record every commend from users to keep track of feedbacks, as well as recording problems and bugs encountered during the testing phase. Stakeholders can view each test cases and make comments the project's refinement.

- Done

  Completed tasks will be moved into this section, to indicate the completion of an item. The records in this section will act as a medium to update the stakeholders about the progress, thus easing the stakeholders in keeping track of the overall progress.

1.6 Significance of Project

Upon successful implementation of the project, the WhatsApp chatbot will become the main source of information regarding class, events and FAQ for the FCSIT community. It will bring benefits to every stakeholder such as students, lecturers and faculty staffs/ administrator.

The WhatsApp chatbot will benefit the users in terms of consistency in accurateness of queries answer, and ensuring the messages are delivered parallelly to every user in the same time. Hence, it will solve the overlooking of important messages. In terms of announcement from lecturers, faculty lecturers can utilize the website provided to update the latest status regarding respective lectures, as well as delivering important messages such as exam dates and assignment submission date to every related student that is registered to the course. As for faculty admins/ staffs, the chatbot will help them by reducing their effort to answer repeating queries from student every semester. Other than that, the admins can log into the website to modify the chatbot's replies and insert new queries' keywords and answers to the chatbot so that the chatbot can answer students' queries.

In conclusion, the WhatsApp chatbot aims to become the main communication medium between students and faculty admins, lecturer and staffs. Moreover, the chatbot will improve and enhance the efficiency of information sharing and message delivering among FCSIT community.

1.7 Project Schedule

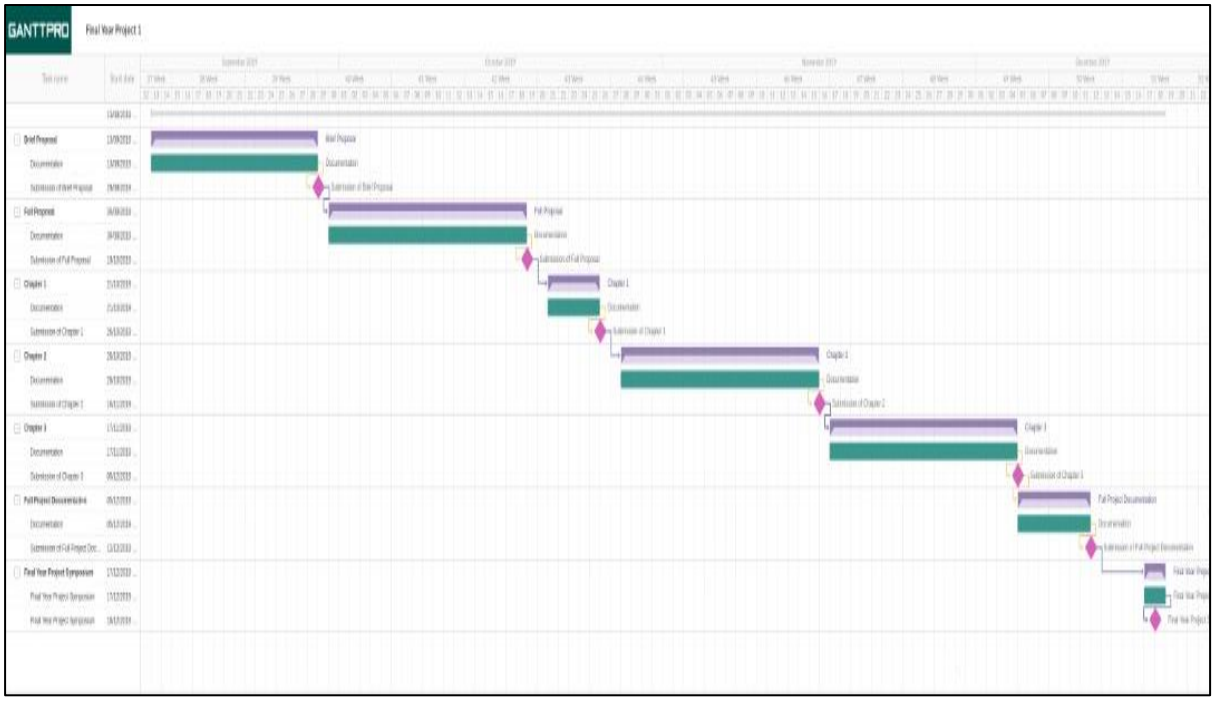

Figure 1.1 Project Schedule

Figure above shows the overall schedule of the first half of the project. The planning of the project will take about 4 months to ease the implementation of the project. In the planning phase, there are several critical parts to be completed.

In brief proposal documentation, brief idea of the project is noted down and discussed with supervisor. Ideas are then refined and improved after the discussions with supervisor. The documentation will take about 2 weeks, started from 13th September 2019 and submitted on 29th September 2019. The full proposal will include the full introduction/ background of the project, problem statement, methodology and so on. Every aspect is included in the full proposal and will be reviewed by supervisor. The documentation will take about 3 weeks, started from 30th September and submit on the 19th of October.

After the full proposal is submitted, add-ons and refinement will be added into Chapter 1. Chapter 1 will consist of several elements from the full proposal, with some fine-tuning after feedbacks from supervisor and examiner. The documentation for Chapter 1 will start from 21st

October and submit on 26th of October. Chapter 2 will be the literature review of other projects that are similar with the WhatsApp chatbot proposed in this project. The descriptions of the reviewed chatbot will be included in Chapter 2 and compared with the WhatsApp chatbot project. The documentation for Chapter 2 will start from 28th October and submit on 16th November.

Chapter 3 will be the research methodology of the project. System design will be included in the documentation, and questionnaire will be prepared for data gathering for the project. The documentation for Chapter 3 will start from 17th November and submit on 5th of December. The final project documentation will include all the chapters with refinements. The documentation will start from 5th December and submit on 12th December. Finally, the FYP Symposium will be held on the 23rd and 24th of December 2020.

1.8 Expected Outcome

The outcome of the project would be:

- A WhatsApp chatbot that answers users' queries in the form of natural language based on information provided to the chatbot.
- A web page that allows faculty admins and lecturers to update the latest information so that the chatbot can provide the latest and accurate answer to users.
- A WhatsApp chatbot that can deliver WhatsApp messages containing useful information to the related users.

1.9 Project Outline

This project consists of five chapters which are introduction, literature review, requirement analysis and design, implementation and testing, conclusion and future work.

1.9.1 Chapter 1: Introduction

Chapter 1 provides the overview of the project and consists of background, problem statement, aims and objective, brief methodology, scope, significant of project, project schedule, expected outcome, project report outline and summary.

1.9.2 Chapter 2: Literature Review

The literature review will include the review of existing systems that are similar with this project. Analysis will be carried out to determine the strengths and weaknesses of the reviewed systems. Comparison will be made to differentiate between the existing project and the WhatsApp chatbot.

1.9.3 Chapter 3: Requirement Analysis and Design

In Chapter 3, requirements gathering will be carried out to construct the design of the WhatsApp chatbot. Detailed information about the methodology used which is Agile Kanban Methodology will be included in Chapter 3. Furthermore, the logical and physical design will be included in Chapter 3 to present the entire system flow and structure of the WhatsApp chatbot.

1.9.4 Chapter 4: Implementation

The implementation will be included in Chapter 4. Every function included in the system design will be coded out and tested from time to time. Also, the implemented system interface will be included in Chapter 4.