Slide 1:

Good morning. I am Casey, Patrick, Jacky. Today, we are going to present our fyp project blueprint. Before entering the main course to introduce our “product”, we would like to first share some problems we have observed that bring us the idea of this “product”.

Slide 2:

First of all, we have realized that students got diverse problems and questions about their school lives. However, they always ask the inappropriate individuals for answers. Take me as an example, I have asked a professor about the application of scholarship. Turns out, the professor actually doesn’t know the answer to this question. In this scenario, we have discovered that inconvenience is brought to different stakeholders. Moreover, the absence of online support after office hour. Urgent inquiry from student cannot be handled.

Slide 3:

As an Engineering student, seeing these situations. We would like to solve the real-life problems with our knowledge. Thus, our goal to successfully provide a solution to the institution and students through software application.

Slide 4:

There are two major objectives that our “product” can achieve. First, provide a 24/7 online platform for student’s inquiry. Second, provide valid and meaningful information back to students. With the application of our “product”, the frequency that students need to ask a real person and the rate of asking the inappropriate individuals are reduced. Hence, the current inquiry issues can be improved. Furthermore, our “product” can reduce teachers and staffs’ unnecessary workload.

Slide 5:

Now, we would like to introduce our state-of-the-art “product”: Spacebot.

Slide 6:

So what is Spacebot? It is an AI chatbot. It simulates conversations with a user in natural language through messaging applications. Indeed, the mechanism behind is a Question Answering system leveraging Natural Language Processing (NLP). In addition, it is a platform to provide real-time interaction for HKUSPACE students.

Slide 7:

Our Spacebot aims to cover the following areas. We hope to implement a chatbot that can perform interaction with student and provide valid and useful response regarding “School facilities and services”, “Non-jupas application”, “Scholarship and financial support”, “Online platform issues”, and also “School administration affairs”. According to the response data, this scope may further extend.

Slide 8:

As a chatbot, how can a machine understand the questions from a human? Natural Language Processing (NLP) is the key. So, here comes the second question: What is NLP? Taking this question “What is the weather tdy” as an example. In general, a machine can’t identify questions, sentences and even the meaning of the words from human.

Slide 9:

To let a machine understands this question. Specific keywords, grammar, syntax, sentence structures and patterns are created by human, all these elements are combined in sections to form a sentence. Thus, a database of sentences is created. The role of the machine is to match the sentence structures of the users’ input. Matching the question example with the database, the machine divides this sentence structure into three sections. First, the machine recognizes this is a question through the “wh” keyword. Then, the keyword “the weather” implies the information user asking for. At last, “today” is the keyword to represent the time of information.

Slide 10:

Indeed, it is believed that there can be numerous and various sentence structures and natural language data in terms of processing and analyzing.

Slide 11:

In short, NLP categorize the messages through identifying the keywords in the sentence and categorizing into different sentence structures. Through processing and analyzing, the chatbot is able to preform interaction with users. If sufficient conditions meet, the chatbot can further provide appropriate and valid response. Else, the chatbot may ask for extra information from the user for clarification.

Slide 12:

How we implement? We utilize Python, Pipenv, Ngrok, Olami and Telegram.

Slide 13:

We have picked Python as our development language because it contains machine learning algorithms in the library. More importantly, our group members are familiar with this language. Besides, we use Pipenv as a dependency manager for the Python projects.

Slide 14:

Ngrok is used as a localhost webhook development tool for our testing purpose, since we do not have a real server or cloud server at the moment. Also, we choose Olami as our AI software development tool to customize the NLP modules. Lastly, Telegram is chosen to deploy our Spacebot.

Slide 15:

The details of our schedule are shown in this slide. In short to summarize, we have started the research and drafted a project plan in Sep. Then, we have implemented a test server and deployed a chatbot prototype in Oct. We are going to finish our first NLP module in Nov and begin the module testing. From Dec on to Mar, we aim to complete all the additional functions, NLP modules and ready for demonstration. Due to time limit, you may refer to this slide again after the presentation.

Slide 16:

This slide shows our division of work. We aim to distribute the work evenly.

Slide 17:

At the moment, we don’t need to purchase for any resources. However, we may need to rent a real server or a cloud server such as Amazon cloud for chatbot deployment in the future.

Slide 18:

First problem that we encountered during testing, there may be intermittent response from the Spacebot with respect to the complexity of the modules. As we cannot better Olami NLP server, we can only put our effort on generalizing the keywords into the same pattern to reduce sentence structures duplication in NLP database. Since there is no GUI to import our customized keywords to database for data validation, it is not so user friendly. But we are able to import them by sending programmable request to the NLP server.

Slide 19:

For the prospect of this project, we hope to take our traditional chatbot to the level of Machine Learning. We look forward to discovering some useful patterns through analysis of the collected data. In addition to train our chatbot through Machine Learning algorithms with this data to achieve AI.