

School of Computing

Year 4 Project Proposal Form

SECTION A

Project Title _____ DCU Personal Assistant Chatbot _____

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Project Supervisor Name _____ Gareth Jones _____

General area covered by the project:

The DCU Personal Assistant Chatbot (DCUPAChatBot) will be an app designed with the purpose is improving quality of life among DCU students. It will do this by providing them with key information that students often require during their time in college. The DCUAPChatBot will enable them to seek this information from a chat interface. The student will be able to ask the bot a question regarding DCU, the bot will process what the student is asking and then respond with the appropriate data. This information may include but is not limited to, the time of their next lecture, when their next bus will arrive, or a frequently asked question about the college itself.

Outline of the proposed project:

- **Background**

The idea of the chatbot was formed after finding a very large resource sheet for chatbots and other bots on a github repository online. The sheet contained a variety of content including bot newsletters, examples of popular bots, tutorials and guides, and links to online communities centred around bots.

DCU students also currently have difficulty with gaining answers to basic questions using the existing web services at DCU.

- **Achievements**

The chatbot will be specifically for students of Dublin City University. The goal of the chatbot will be to replace the need for students having to go to websites such the DCU website and the Dublin Bus website individually in order to look for their next lecture or bus. The chatbot will combine these and potentially other services into a single app.

- **Justification**

When a DCU student needs to find out when and where their next lecture will be, they need to google the DCU website, find the timetable search page, search and select their course, and then find the time of the lecture on timetable. This takes significant time among requiring the student to stop walking and possibly waste phone data. The chatbot plans to alleviate this by simply responding with the time and location of the lecture when the students asks something like "When is my next lecture?".

Programming language(s):

The chatbot will be written in Javascript which will allow the use of Node.js for connecting the bot with Luis for processing the user's text input.

Programming tools:

- **LUIS (Language Understanding Intelligence Service)**

LUIS will form the natural language processing part of the chatbot. It will be used to create a custom language model. The custom language model will be created with intents and entities that will correspond to activities in the bot's application. Its output will be a web service with a HTTP endpoint. LUIS will take the user input and extract intents which will refer to one of the app's activities. For example, the user might say "When is my next lecture?" and LUIS will find 'when' and 'lecture' and call for part of the app that finds the timetable from the DCU website.

- **Microsoft's Bot Framework**

The bot framework provides a Bot Builder SDK for the conversational logic of the chatbot. It uses restify to host the bot's logic as a web service and support the AI aspect of the chatbot from LUIS. The web service receives messages from the user and responds with a HTTPS Post. It can also save the state of the conversation such as the last question asked by the user.

- **Dublin Bus and Facebook APIs**

In order for my bot to interact and get information from the Dublin Bus website and from Facebook it will need to utilize the respective APIs of each site.

Learning Challenges:

The majority of the work required to make the chatbot will be new to me and provide significant challenges to me to successfully complete the project. Firstly, writing in javascript was something I have only touched on before and I will need to acquire a more in depth knowledge of the language before proceeding. Next will be the creation of the custom language model for the bot in LUIS. This requires full coverage on intents and entities for every feature of the chatbot in preparation for what the user will ask. The LUIS app will need to be trained before use and will need to be able to handle user requests in multiple forms.

The use of the bot framework also requires the creation of a restify connection between LUIS, the bot itself and chat interface that will be used. This means that I will need to learn how to use the bot framework API and also Node.js. Finally, I will also need to figure out ways to return the suitable data that the user asks for. For example, if the user asks for a bus time I will need to be able to get the bot to acquire bus times from the Dublin Bus website. This also means that the chatbot will also need to be able to remember bus routes or the user's college course so it does not prompt for the information each time.

Obtaining information from websites also poses a significant challenge. For Dublin Bus and Facebook, there are APIs available that I will need to learn and use. In the event that there is no API available for a site, I will also need to learn how to scrape information from the site.

Hardware Platform(s):

- Windows Computer for the development of the application.
- Android Phone for testing.