IAI Proposal - G15.pdf

by SIEW SHENG YAO .

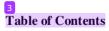# Artificial Intelligence (AI) – Cover Sheet
PROJECT PROPOSAL

Instruction:
- Marks will be awarded for good presentation and thoroughness in your approach.
- Referencing Code: If you use some code, or ideas for code, which are taken or adapted from another source (book, magazine, internet, discussion forum, etc), then this **must** be cited and referenced using the APA convention within your source code. Failure to reference code properly is considered as plagiarism.
- Complete this cover sheet and attach it to your project.
- This project is to be attempted by a group of 3 students.

Student declaration:

I declare that: *We understand what is meant by plagiarism.*
- *The implication of plagiarism have been explained to us by our lecturer*
- *This project is all our work and we have acknowledged any use of the published or unpublished works of other people.*

Group Leader's Signature:		Date: 10th January 2024
	Siew. (signature)	

Project Title:	APU Live Chatbot	Intake: UCDF2204ICT(SE)

Role	Name	Signature
Team Leader	Siew Sheng Yao TP068174	(signature)
Knowledge Engineer	Sin Boon Leon TP068552	(signature)
Knowledge Engineer	Yong Lee Wai TP068636	(signature)
Knowledge Engineer	Ting Zi Qing TP067667	(signature)
Programmer	Teo Jun Jia TP067775	(signature)
Programmer	Chong Kah Jun TP067165	(signature)

Table of Contents

1.0 Problem Statement

The significance of having access to accurate and updated information cannot be emphasized enough in today's data-driven environment. Precise information is required for the foundation of effective decision-making and the daily operations of an organization, especially in a university like APU where technological advancements, facility developments, courses and intakes variety may result in a rise of information due to the exponential growth of student population. This covers important information such as transportations, bursary, library, rules and regulations, and many more.

This vast amount of information can be quite overwhelming, not only resulting in a less efficient way for users to locate exact and relevant information, but it is also challenging for the university to manage and handle these information. It can also have an adverse effect on academic planning and advancement, as well as the efficient use of university resources and services (Liu et al., 2021). Therefore, it is essential to address this issue and build strong solutions to ensure both the reliability and accessibility of information is present within APU.

2.0 Solution

In this situation, the use of artificial intelligence to develop an expert system, particularly a chatbot, can be extremely beneficial towards the stakeholders of APU. The chatbot can allow interested users to look for their desired information through a simple text conversation with this AI-powered technology, which receives text input in English language and has the ability to respond back with the essential information using sophisticated and efficient algorithms. This results in a fast and productive way for accurate and specific intel to be found. Furthermore, the chatbot is simple to utilize and interact with, in comparison to navigating through the knowledge base which contains more than a hundred webpages.

Recognizing these advantages, the development team decided to develop a chatbot using Python programming language and SpaCy library to answer the problems raised above. SpaCy is a well-known open-sourced Python module for advanced Natural Language Processing (NLP). The extensive natural language processing (NLP) features in SpaCy can develop a proficient and reliable expert system, capable of serving as an information repository and consultant to provide accurate solutions to problems (*SpaCy 101: Everything You Need to Know · SpaCy Usage* Documentation, 2015).

In our case, a SpaCy-based chatbot in the university setting can handle and extract precise information from massive amounts of data, by responding to user inquiries in a timely and accurate manner (Arunachalam B, 2023).

3.0 Why Are We Creating This AI ChatBot?

This AI Chatbot is functioned to provide information regarding APU's services and facilities including the resources from APU's knowledge base, which consists of a plethora of information. With this chatbot present within APU, students no longer have to manually find information through the APU Knowledge Base or even refer to the APSpace application for further information.

With this newly presented information chatbot, information can be accessed with just one question and a tap of a button. Students do not need to go through the hassle of looking through each section of the knowledge base to find the information they require, which takes a lot of time and results in inefficiency. Therefore, this chatbot serves to provide higher productivity by sending direct and accurate information to users immediately when prompted with questions any time of the day, which reduces the need for staffs to work overtime, but also reduces their workload with minor problems that students commonly face.

In addition, the AI Chatbot will be deployed as a bot in Discord, an instant messaging social platform which is widely used. Thus, the users do not need to install additional software or application in their devices and they can easily access the AI Chatbot to look for the information they need, if they have Discord installed previously.

4.0 Project Scope

The domain of this expert system is the facilities, services and information in Asia Pacific University of Technology and Innovation (APU). An AI Chatbot will be developed as the final product of this project, with the capability of interacting with users on the Discord instant messaging platform. The AI Chatbot is designed to assist the students and staffs in APU to find information through simple text conversations.

1. Availability of 24 hours a day
   a. Users are able to ask questions at any time of the day and get immediate response from this AI Chatbot.
   b. The AI Chatbot can respond within 30 seconds or lesser, depending on the quality of internet connection and complexity of question

2. Natural Language Processing:
   a. The AI Chatbot is able to translate and understand human language inputs.
   b. The AI Chatbot will detect crucial keywords to present the related information for the users, with the support of Python SpaCy library.
   c. Despite having spelling or grammar errors within the queries written by users, the AI Chatbot will be able to identify the mistakes and understand the context of the question before displaying its corresponding response. This technique involves using the Python autocorrect library.

3. Parallel User Assistance
   a. Assistance can be provided simultaneously to multiple users.
   b. Responses will still be received immediately since this is an AI Chatbot, and it doesn't run on a queue system basis.

4. User-Friendly Interface
   a. The AI Chatbot can integrate seamlessly within Discord, which is a widely used communication platform that most shall be familiar with, providing a more user-friendly experience for users as there shall be no learning curve required.
   b. The user can input a brief text for the AI Chatbot to respond.

5. User Access

   a. AI Chatbot can be used by anyone, ranging from students, staff or even outsiders who might be interested in APU.

   b. Authorized staff are needed to proceed with regular data updates and maintenance of the AI Chatbot to ensure it presents the newest information of the knowledge base for the users.

6. Accurate and Direct Responses

   a. The AI Chatbot will always provide users with accurate information according to the knowledge base.

   b. Responses provided from this AI Chatbot should be clear, concise, easy to understand, as well as making sure it is directly related to the user's query.

   c. The AI Chatbot searches its memory for possible queries that bears the highest similarity to the user input and then provides the corresponding response. Therefore, the AI Chatbot can respond accurately although the user input does not match the questions bank in its memory.

   d. Exception handling is implemented. An apology message is returned if the AI Chatbot fails to find any related response for the user input, and the user needs to attempt asking the question in a different way.

7. Additional feature – Consumption of public APIs to cover a broader range of topics

   a. The AI Chatbot consumes two Application Programming Interfaces (API): the holidays API and bus schedules API.

   b. These APIs are sourced from APSpace Web, capable of providing updated data, including details about upcoming shuttle trips and holidays.

   c. With the support of the APIs, the information provided by the AI Chatbot regarding the selected topics will be up-to-date and consistent with the data displayed in APSpace.

   d. The AI Chatbot will process the API response to find the latest information for the user.

Workload Matrix

Name & TP	Workload
Siew Sheng Yao TP068174	• Poster • Knowledge Engineer
Teo Jun Jia TP067775	• Chatbot Programmer
Chong Kah Jun TP067165	• Chatbot Programmer • Problem Statement • Proposed Solution
Sin Boon Leon TP068552	• Knowledge Engineer
Yong Lee Wai TP068636	• Knowledge Engineer
Ting Zi Qing TP067667	• Knowledge Engineer • Reason Why This AI • Project Scope

References

Arunachalam B. (2023, June 26). *NLP using spaCy – How to Get Started with Natural Language Processing.* FreeCodeCamp.org; freeCodeCamp.org. https://www.freecodecamp.org/news/getting-started-with-nlp-using-spacy/

Knowledge Base - APU Knowledge Base. (2024). Atlassian.net. https://apiit.atlassian.net/wiki/spaces/KB/overview

Liu, J., Wang, C., & Wu, Y. (2021, August 4). Research on the Management Information System of College Education and Teaching Based on Web. *Security and Communication Networks*, *2021*, 1–8. https://doi.org/10.1155/2021/5090813

OpenAI. (2023). ChatGPT (Mar 14 version) [Large language model]. https://chat.openai.com/chat

spaCy 101: Everything you need to know · spaCy Usage Documentation. (2015). SpaCy 101: Everything You Need to Know. https://spacy.io/usage/spacy-101/

IAI Proposal - G15.pdf

PRIMARY SOURCES

1	**Submitted to Asia Pacific University College of Technology and Innovation (UCTI)** Student Paper	**9**%
2	**global.oup.com** Internet Source	**2**%
3	**www.coursehero.com** Internet Source	**1**%
4	**cnqzu.com** Internet Source	**1**%
5	**spectrum.library.concordia.ca** Internet Source	**1**%

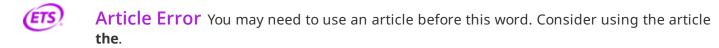|			
Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		

IAI Proposal - G15.pdf

Article Error You may need to use an article before this word. Consider using the article **the**.

Article Error You may need to use an article before this word.

Missing "," Review the rules for using punctuation marks.

Article Error You may need to use an article before this word.

Article Error You may need to use an article before this word.

Missing "," Review the rules for using punctuation marks.

S/V This subject and verb may not agree. Proofread the sentence to make sure the subject agrees with the verb.

P/V You have used the passive voice in this sentence. You may want to revise it using the active voice.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Proofread This part of the sentence contains an error or misspelling that makes your meaning unclear.

Wrong Form You may have used the wrong form of this word.

Wrong Article You may have used the wrong article or pronoun. Proofread the sentence to make sure that the article or pronoun agrees with the word it describes.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Article Error You may need to use an article before this word. Consider using the article **the**.

Proper Nouns You may need to use a capital letter for this proper noun.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Prep. You may be using the wrong preposition.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Proofread This part of the sentence contains an error or misspelling that makes your meaning unclear.
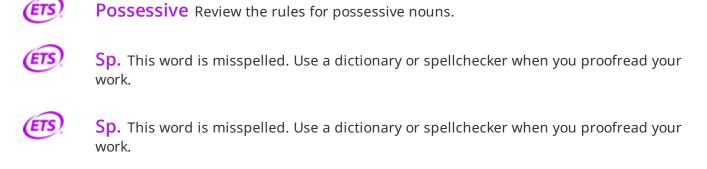
Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Article Error You may need to remove this article.

Missing "," Review the rules for using punctuation marks.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Article Error You may need to use an article before this word. Consider using the article **the**.

Article Error You may need to use an article before this word.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Article Error You may need to use an article before this word.

Article Error You may need to use an article before this word. Consider using the article **the**.

Article Error You may need to use an article before this word.

Garbled This sentence contains several grammatical or spelling errors that make your meaning unclear. Proofread the sentence to identify and fix the mistakes.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Article Error You may need to use an article before this word.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Missing "," Review the rules for using punctuation marks.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Article Error You may need to use an article before this word.

Missing "," Review the rules for using punctuation marks.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Article Error You may need to remove this article.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Possessive Review the rules for possessive nouns.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.

PAGE 8

PAGE 9