**GRADUATE CERTIFICATE: Intelligent Reasoning Systems (IRS)**

**PRACTICE MODULE: Project Proposal**

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| **Date of proposal:**  5 March 2023 |
| **Project Title:**  ISS Project – Improved NUS-ISS Chatbot |
| **Sponsor/Client:** *(Name, Address, Telephone No. and Contact Name)*  Institute of Systems Science (ISS) at 25 Heng Mui Keng Terrace, Singapore  NATIONAL UNIVERSITY OF SINGAPORE (NUS)  Contact: Mr. GU ZHAN / Lecturer & Consultant  Telephone No.: 65-6516 8021  Email: [zhan.gu@nus.edu.sg](mailto:zhan.gu@nus.edu.sg) |
| **Background/Aims/Objectives:**  The current NUS-ISS website seems to be targeted at prospective students rather than existing students. It is difficult to search for related information and data pertaining to non-curriculum (such as nearest canteen, nearest facilities) or student guides (student handbooks).  According to [Gartner](https://www.gartner.com/en/newsroom/press-releases/2022-07-27-gartner-predicts-chatbots-will-become-a-primary-customer-service-channel-within-five-years#:~:text=STAMFORD%2C%20Conn.%20July%2027%2C%202022%20Gartner%20Predicts%20Chatbots,a%20quarter%20of%20organizations%2C%20according%20to%20Gartner%2C%20Inc.), chatbots can improve customer experience and drive positive customer emotion at a lower cost than live interactions.    Statistics captured from http://outgrow.co  It has been identified that there are already existing NUS-ISS chatbots developed. These NUS-ISS chatbots cannot provide accurate responses to queries and are confined to fixed responses. They only accept limited follow-up questions. These chatbots are also outdated and do not provide easy means for extension. Frequent changes to the NUS-ISS curriculum or information could not be easily updated into the chat system.  The proposed intelligent chatbot is going to address these gaps of the current NUS-ISS chatbots. The delivery of the MVP (Minimum Viable Prototype) is going to demonstrate the chatbot’s capability of delivering accurate and up-to-date information. In addition, a report will be produced comparing our improved NUS-ISS Chatbot with the existing chatbots in terms of its accuracy, response time and extensibility.  In this chatbot, we also aim to provide means to parse and understand documents/FAQs found in Microsoft SharePoint /directories. This provides an easy means for lecturers to update the knowledge base of the chatbot without the need for manual intervention. Additionally, a screenshot of the document with the section that is relevant to the answer will be attached, to provide proof of the accuracy of the answer. |
| **Requirements Overview:**   * Programming ability * Data analytics ability * System integration ability |
| **Resource Requirements (please list Hardware, Software and any other resources)**  Software proposed for consideration:   * Chat-bots: Azure Language Studio * Chatbot Client: Telegram, Chat within website * Cloud computing/server: Microsoft Azure * Document Understanding: TBD (UiPath, Microsoft…) |
| **Number of Learner Interns required: (Please specify their tasks if possible)**  A team of four project members   |  |  |  |  | | --- | --- | --- | --- | | Name | Matriculation | Roles & Responsibilities | Remarks | | LEE KAH WAI | A0019705H | Project Lead | Development tasks will be further split among the 4 team members | | SANKALP | A0226756W | Configuration Manager | | SEOW TECK HAN, MICHAEL | A0270178B | Business Manager | | WEE DE LI, DARREN | A0269370X | Technical Manager | |
| **Methods and Standards:**  The NUS-ISS Chatbot is both a learning and reasoning system.  It is a reasoning task because existing content (knowledge) could be found in the existing website. However, we cannot assume that it is only a reasoning task because NUS ISS is constantly updating its curriculum. It needs to also be a learning task (something that is missing from previous chatbots)    Note: Regarding KPI, the actual percentage of accuracy will be compared against improved chatbot and a sample of existing chatbots.  Documents in  SharePoint/  directories  Document Understanding  The Internet  Mobile Phone (Telegram)  ISS web page (Integrated chatbot)  Azure Learning Studio  JSON web API queries & responses  Web endpoint to processed text queries.  Student questions in form of JSON web API queries.  Inference system  Knowledge base  Formulation of JSON response  JSON web API responses.  Inference system within Azure Learning Studio   |  |  |  | | --- | --- | --- | | **Procedures** | **Objective** | **Key Activities** | | **Requirement Gathering and Analysis** | The team should capture the requirements specifications in Scrum board provided in Notion. | 1.        Gather & Analyze Requirements  2.        Define internal and External interfaces  3.        Prioritize & Consolidate Requirements  4.        Establish Functional Baseline | | **Sprints** | To incrementally develop the Chatterbot in several iterations. However instead of providing the MVP in each sprint, the MVP will only be delivered after an obvious prototype is developed. These modules could be done in parallel or sequentially.   * Simulating the training data (Possible Q&A) * Development of the backend web API endpoint * Development of the front-end | 1. Setup Development Environment in Server/Client 2. Installation of appropriate tools 3. Coding and implementation | | **Delivery & Acceptance of MVP** | Metrics to validate that the current chatbot has a better accuracy than listed chatbots found in [https://github.com/IRS-CGS](https://github.com/IRS-CGS/IRS-CS-2019-04-27-IS1PT-GRP-ISSChatBot)  To deploy the MVP system into production environment. | 1. Summary report of evaluation   Free-Play / Evaluation results   1. Software must be packed by following ISS’s standard. 2. Deployment guideline must be provided in ISS production (ISS standalone server) format. 3. Production (ISS standalone server) support and troubleshooting process must be defined. | |

**Team Formation & Registration**

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| Team Name: Two.AI |
| Project Title (repeated):  Improved NUS-ISS Chatbot |
| System Name (if decided):  ChattyISS |
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| Team Member 1 Name:  Lee Kah Wai |
| Team Member 1 Matriculation Number:  A0019705H |
| Team Member 1 Contact (Mobile/Email):  94510840 / E1111840@u.nus.edu |
|  |
| Team Member 2 Name:  Wee De Li, Darren |
| Team Member 2 Matriculation Number:  A0269370X |
| Team Member 2 Contact (Mobile/Email):  83827015 / e1112241@u.nus.edu |
|  |
| Team Member 3 Name:  SEOW TECK HAN, MICHAEL |
| Team Member 3 Matriculation Number:  A0270178B |
| Team Member 3 Contact (Mobile/Email):  91370145 / e1117140@u.nus.edu |
|  |
| Team Member 4 Name:  Sankalp |
| Team Member 4 Matriculation Number:  A0226756W |
| Team Member 4 Contact (Mobile/Email):  96622754 / sankalp@u.nus.edu |
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| Team Member 5 Name: |
| Team Member 5 Matriculation Number: |
| Team Member 5 Contact (Mobile/Email): |
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| Team Member 6 Name: |
| Team Member 6 Matriculation Number: |
| Team Member 6 Contact (Mobile/Email): |
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| **For ISS Use Only** | | |
| **Programme Name:** | **Project No:** | **Learner Batch:** |
| **Accepted/Rejected/KIV:** | | |
| **Learners Assigned:** | | |
| **Advisor Assigned:**  Contact: Mr. GU ZHAN / Lecturer & Consultant  Telephone No.: 65-6516 8021  Email: [zhan.gu@nus.edu.sg](mailto:zhan.gu@nus.edu.sg) | | |