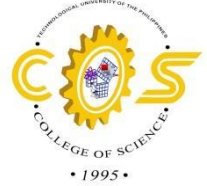TECHNOLOGICAL UNIVERSITY OF THE PHILIPPINES

COLLEGE OF SCIENCE

TUPSeek: AN INTERACTIVE TECHNOLOGICAL UNIVERSITY OF THE PHILIPPINES, MANILA QUERY ASSISTANT

A Project Presented to the

Faculty of the College of Science

Technological University of the Philippines – Manila

In Partial Fulfillment

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ABSTRACT

This study focuses on implementing the ***TUPSeek: An Interactive Technological University of the Philippines, Manila Query Assistant*** and what benefits it can give to the users (guest and students) and the University itself. TUPSeek is a chatbot tailored to answers queries about Technological University of the Philippines, Manila (TUP-M). And its key goal is to allow the users to have immediate answers to their queries or questions regarding TUP-M and what courses it offers, building locations like offices, staff and professors basic information, and rules and regulations. By generating all the information from the Student's Handbook and the University's website, TUPSeek will answer anything that is related to the University and its people, and the information will be updated monthly. Moreover, the developers created TUPSeek to help the University in accommodating guests' queries and it promotes effective communication that enriches the technical support system of the University.

Keywords—Query assistant, chatbot, interactive, communication, technical support, TUSseek

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CHAPTER 1

THE PROBLEM AND ITS BACKGROUND

This chapter discusses the study's background, problem statement, and significance. The general and specific objectives are outlined, as well as the scope and delimitations. This chapter will provide a summary of the research, including its social and personal implications, as well as a brief description of the themes covered in the study.

Introduction

In the dynamic landscape of education, where technology plays a pivotal role in shaping the learning experience, the Technological University of the Philippines, Manila (TUP-M), stands at the forefront of embracing innovative solutions to enhance the efficiency of information dissemination. As the academic demands on students and faculty continue to evolve, the need for a sophisticated system to streamline university-related queries becomes increasingly apparent. Recognizing these challenges, the developers embark on a transformative journey to develop *TUPSeek*, an intelligent and specialized chatbot tailored to address queries specific to the TUP-M.

In the contemporary educational ecosystem, the integration of technology is not merely a luxury but a necessity. Students often find themselves navigating a complex web of university-related information, ranging from course details and academic resources to administrative procedures. Traditional methods of accessing information, such as static websites or manual inquiries, fall short of meeting the instantaneous and dynamic expectations of today's tech-savvy students and faculty. In response to this demand, TUPSeek emerges as a cutting-edge solution

designed to harness the power of artificial intelligence and natural language processing, revolutionizing the way information is accessed and processed within the university community.

Artificial intelligence (AI) has changed how we go about our daily lives by creating and testing sophisticated tools and apps, also known as intelligent agents, that can carry out a range of tasks. A computer software known as a *chatbot* makes use of artificial intelligence and the Human-Computer Interaction (HCI) concept (Bansal & Khan, 2018). (Chatbot | Definition of chatbot in English by Lexico Dictionaries, 2019) According to the dictionary, a chatbot is "a computer software that replicates human-to-human conversation, notably via the Internet." It uses sentiment analysis and Natural Language Processing (NLP) to communicate in human language with humans and other chatbots via text or voice (Khanna et al., 2015). Artificial conversation beings, interactive agents, clever bots, and digital assistants are other names for chatbots.

This research project is born out of a commitment to address the evolving needs of the academic community and contribute to the ongoing discourse on the integration of technological advancements in educational institutions. Drawing inspiration from the growing significance of chatbots in various domains, particularly in providing professional development for school librarians, the development of TUPSeek aims to redefine the accessibility and responsiveness of university-related information. Through a meticulous and phased approach, TUPSeek seeks to navigate the intricacies of university queries with finesse, ensuring that students and faculty experience a seamless and efficient interaction with the information ecosystem of the TUP-M.

Background of the Study

In the ever-changing landscape of education, incorporating technology has become crucial to meet the dynamic needs of students and faculty. At the TUP-M, students frequently face hurdles in efficiently accessing university-related information and services. The growing complexity of

queries and the demand for instant responses underscore the urgency for an advanced system. In addressing these challenges, the developers advocate for the creation of *TUPSeek*, a specialized chatbot meticulously designed to navigate queries unique to the TUP-M. This initiative seeks to enhance the overall accessibility and responsiveness of university-related information, ensuring a more seamless and effective interaction between students, faculty, and the technological resources available.

The proposed chatbot, *TUPSeek*, is positioned as a tailored solution to bridge the gap in information retrieval, catering specifically to the intricate needs of the TUP-M. By providing targeted responses and streamlining access to pertinent resources, TUPSeek aims to empower users to navigate the academic environment with greater ease and efficiency. This research initiative aligns with the institution's commitment to leveraging technology for an enhanced educational experience, acknowledging the imperative role of innovative solutions in addressing the unique challenges faced by its academic community.

Objective of the Study

General Objective:

- To design and implement TUPSeek, a specialized chatbot for handling queries related to the Technological University of the Philippines, Manila.

Specific Objectives:

- To identify the key information and services frequently sought by students and stakeholders.

- To design an intuitive and user-friendly interface for TUPSeek.

- To implement a robust Natural Language Processing (NLP) system for accurate and context-aware query responses.

- To integrate TUPSeek into existing university communication channels.

- To evaluate the effectiveness and user satisfaction of TUPSeek in addressing queries.

Significance of the Study

This research project holds substantial significance for various stakeholders within the university community and beyond. It addresses the pressing need for a streamlined and efficient information retrieval system for students and faculty. The study contributes to the body of knowledge by exploring the application of chatbot technology in the context of a university environment. The potential beneficiaries include students, faculty, administrative staff, and prospective students, who stand to gain from quicker and more accessible information.

For Students:

The implementation of TUPSeek, holds immense significance for current students. It promises a more efficient and user-friendly experience when seeking information related to courses, schedules, campus resources, and various academic queries. With quicker access to accurate information, students can enhance their academic productivity, streamline their administrative tasks, and focus more on their studies. TUPSeek aims to empower students by providing a seamless platform for information retrieval, contributing to a more positive and effective learning environment.

For Prospective Students:

Prospective students are poised to benefit greatly from TUPSeek, as it offers them a glimpse into the university's commitment to leveraging innovative technologies. The chatbot-driven information system can assist prospective students in navigating the admission process, understanding program details, and obtaining relevant information about campus life. This enhanced accessibility can contribute to a more informed decision-making process for potential new entrants, ensuring that they have a clear understanding of the university's offerings and support systems.

For Teachers:

Faculty members stand to gain from the implementation of TUPSeek as it can streamline communication channels, making it easier for them to disseminate important course-related information, updates, and announcements. The system's efficiency can aid teachers in managing administrative tasks more effectively, allowing them to focus on delivering quality education. Improved accessibility to resources and information may also contribute to a more engaging and interactive classroom experience, benefiting both educators and students alike.

For Administrative Staff:

Administrative staff play a crucial role in the university ecosystem, and TUPSeek can significantly ease their workload. By automating routine inquiries and providing a centralized information hub, the system enables administrative staff to allocate their time and resources more efficiently. This not only enhances their productivity but also contributes to a more responsive and service-oriented administrative environment, ultimately improving the overall efficiency of university operations.

For Future Researchers:

The research outcomes of this project are poised to provide valuable insights and potential solutions for future researchers in the field of educational technology. TUPSeek's implementation and its impact on the university community can serve as a benchmark for evaluating the effectiveness of chatbot technology in similar educational settings. Researchers can build upon these findings to explore further applications, improvements, and innovations in information retrieval systems for academic environments, fostering continuous advancements in the integration of technology in education.

Scope and Delimitations

The research project aims to address the need for an efficient information retrieval system within the Technological University of the Philippines, Manila (TUP-M), by developing and implementing TUPSeek—a specialized chatbot. TUPSeek's major purpose is to provide students and applicants with timely and accurate solutions to questions related to various aspects of university life, including academic programs, schedules, and campus resources. The study includes the development of an intuitive and user-friendly interface to ensure a smooth interaction experience. The implementation phase involves the integration of a robust Natural Language Processing (NLP) system to improve the chatbot's capacity to understand and reply contextually to user inquiries. Furthermore, TUPSeek's integration into existing university communication channels, such as websites and social media platforms, is a crucial component, ensuring widespread accessibility.

CHAPTER 2

CONCEPTUAL FRAMEWORK

This chapter includes a more detailed description of the review of related literature, similar research, the study's conceptual model, and the operational definition of key terminology by providing more information that will assist developers in better understanding the study.

Review of Related Literature

In the realm of educational technology, the integration of Artificial Intelligence (AI) has witnessed significant advancements, especially with the widespread adoption of chatbot systems. These systems, capable of interactive and conversational responses, are proving to be instrumental in reshaping the landscape of student engagement and administrative support within academic institutions.

The surge in AI technology's educational applications is evident in the study conducted by Roos (2018), highlighting the expansive use of AI, particularly chatbots, in supporting teaching and learning activities. Okonkwo and Ade-Ibijola (2020) emphasize the transformative role of chatbots in fostering personalized learning experiences. This aligns with the vision of TUPSeek, a proposed chatbot for the Technological University of the Philippines, Manila (TUP-M), designed to address various student inquiries.

According to Cunningham-Nelson et al. (2019), the pivotal role of Ccatbots in providing standardized information and facilitating personalized learning experiences. TUPSeek, by leveraging chatbot technology, aims to cater to the diverse needs of students, offering instant responses to queries about course contents, practice materials, and evaluation criteria. As noted by

Sinha et al. (2020), the deployment of chatbots as mobile web applications enhances accessibility for students, making learning resources readily available.

Studies by Alhussien and Alshamrani (2022) underscore the impact of chatbots on student engagement and retention. TUPSeek, by providing real-time access to academic information, aims to increase student engagement and support retention efforts. The findings align with the broader literature on chatbots enhancing the overall educational experience.

The adoption of a comprehensive Information Systems Success Model (D&M) serves as a theoretical framework for assessing the efficiency of TUPSeek. Drawing insights from previous studies (Andoh-Baidoo et al., 2010; Petter, DeLone, and McLean, 2008; Seddon and Kiew 1996), the model incorporates dimensions such as Framework Quality, Data Quality, Administration Quality, Use, Client Satisfaction, and Net Benefits. This framework ensures a holistic evaluation of TUPSeek's effectiveness in meeting the diverse needs of the TUP-M community.

The literature suggests that TUPSeek, as a chatbot tailored for the TUP-M community, can significantly enhance student interactions. Insights from Palasundram et al. (2018) emphasize the immediate access to standardized information, making TUPSeek an invaluable resource for addressing a spectrum of inquiries, including enrollment requirements, academic calendars, and graduation prerequisites. TUPSeek, by leveraging the principles of social learning, has the potential to foster engagement among students, enabling them to collaboratively address various campus-related matters.

Moreover, the extensive review of related literature establishes a strong foundation for the development and implementation of TUPSeek. In alignment with the broader trends in AI and chatbot technology in education, TUPSeek is poised to revolutionize student interactions, enhance learning experiences, and streamline administrative processes at the TUP-M.

Conceptual Model of the Study

INPUT	PROCESS	OUTPUT
• Admission process and policies • Campuses • academic Programs • Office and Department location • Names of the people in position (e.g. dean, coor, vpaa, pres, registrar per college, etc.) • Names of professor per college/department • Support Services (Office of admission, registrar, clinic, library, osa) • Student conduct and discipline • Student privileges • Announcements and Advisories • Organizations, Administrations, Centers	• Data gathering of the school's information. • Development of the chatbot for TUP inquiries / queries. • Organizing and double checking if the data is accurate.	• TUPseek: INTERACTIVE TECHNOLOGICAL UNIVERSITY OF THE PHILIPPINES, MANILA QUERY ASSISTANT

Table 1: Conceptual Framework

In table 1, it shows the Conceptual Framework that the developers followed and served as a study guide. Wherein it consists of Input, Process, and Output or also known as the IPO diagram; the first rectangle from the left includes the input of the study consisting of independent variables and controlled variables which the developers have obtained in testing the chatbot. The independent variables and controlled variables are from the Student's Handbook and University's website to obtain the answer to the research questions.

The second rectangle contained all the passages that the independent variables had undergone to ensure that the results of the research were successful. The test process consists of

gathering information related to Technological University of the Philippines, Manila (TUP-M) and its employees, development and testing the accuracy of the chatbot. The third rectangle showed the output of the study, which is the chatbot or the project itself.

System Architecture of the Study

The figure below shows how the system is set up, including its basic structure, logic part, and data part. This image helps make sense of how all the different pieces and functions in the system work together. It gives a clear view of how things are laid out and what the system can do.
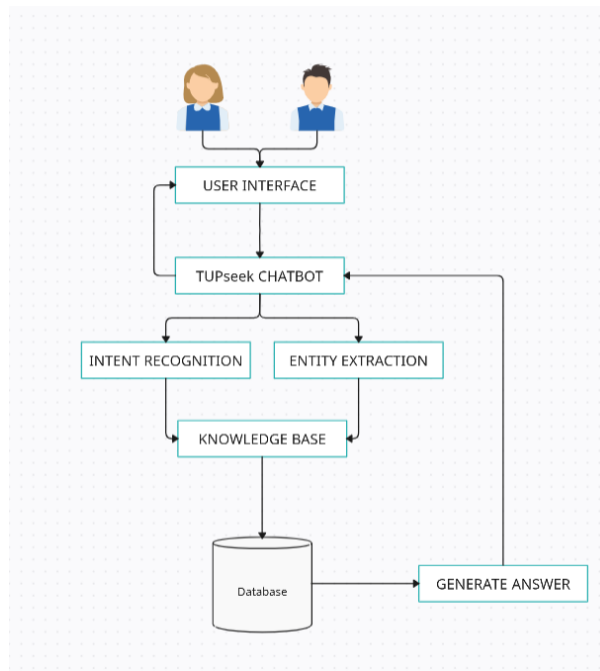
Fig. 1: System Architecture

- **User Interface:** Where users talk to the chatbot, asking questions and getting answers. It can be a website or a phone app.

- **Chatbot Server:** The chatbot's main part. It takes what users say, understands it using things like recognizing what they want (Intent Recognition) and picking out specific details (Entity Extraction). Then, it gives the right responses.

  - *Intent Recognition:* Figures out what users want, like asking about admissions or courses.

- o ***Entity Extraction:*** Picks out important details from what users say, such as course names or department names.

- **Knowledge Base:** Stores info the chatbot needs. This can be common questions, university rules, course info, and other important details.

- **Answer Generation:** After knowing what users want and finding details from the knowledge base, the chatbot puts together a good answer to the user's question.

- **Database:** Sometimes the chatbot talks to other systems or databases outside (external) to get more info or real-time data. For example, it might connect to the university's database.

Definition of Terms

Natural Language Processing (NLP). is a branch of artificial intelligence (AI) that enables computers to comprehend, generate, and manipulate human language. Natural language processing could interrogate the data with natural language text or voice.

Chatbot. A chatbot is a computer program that simulates human conversation with an end user.

TUPSeek. An interactive chatbot designed and implemented for the Technological University of the Philippines, Manila, aimed at providing immediate answers to queries related to the university, including courses, building locations, staff information, rules, and regulations.

Query Assistant. A tool or system, in this context represented by TUPSeek, that assists users (guests and students) in obtaining information by responding to their queries about Technological University of the Philippines, Manila (TUP-M).

Guest/Student Interface. The user interface is specifically designed for guests and students, allowing them to log in, chat with the chatbot, and access TUPSeek as a browser extension.

*Admin Interface***.** The user interface is designed for administrative staff, providing access to the dashboard where they can view information about users, guests, and questions asked, and manage the chatbot extension.

Wireframe. It is a way to design a website service at the structural level. A wireframe is commonly used to layout content and functionality on a page which takes into account user needs and user journeys. Wireframes are used early in the development process to establish the basic structure of a page before visual design and content is added.

Keras. Keras is a high-level, deep learning API developed by Google for implementing neural networks. It is written in Python and is used to make the implementation of neural networks easy. It also supports multiple backend neural network computation.

Natural Language Toolkit. NLTK is a leading platform for building Python programs to work with human language data. It provides easy-to-use interfaces to over 50 corpora and lexical resources such as WordNet, along with a suite of text processing libraries for classification, tokenization, stemming, tagging, parsing, and semantic reasoning, wrappers for industrial-strength NLP libraries, and an active discussion forum.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter includes a detailed discussion of the project design, development, operating and testing, and evaluation process of the system methods, as well as the procedures that will be carried out by the developers, as well as the proposed flow of the steps to be completed in order to collect information necessary for the study.

Project Design

The main objective of this project is to implement a specialized chatbot named *TUPSeek*, finely tuned to cater to the unique information needs of incoming freshmen and current students at the Technological University of the Philippines, Manila (TUP-M). The primary focus is on providing an intuitive and responsive platform that efficiently addresses queries related to the university's information, enhancing the overall accessibility and user experience for the TUP-M community.
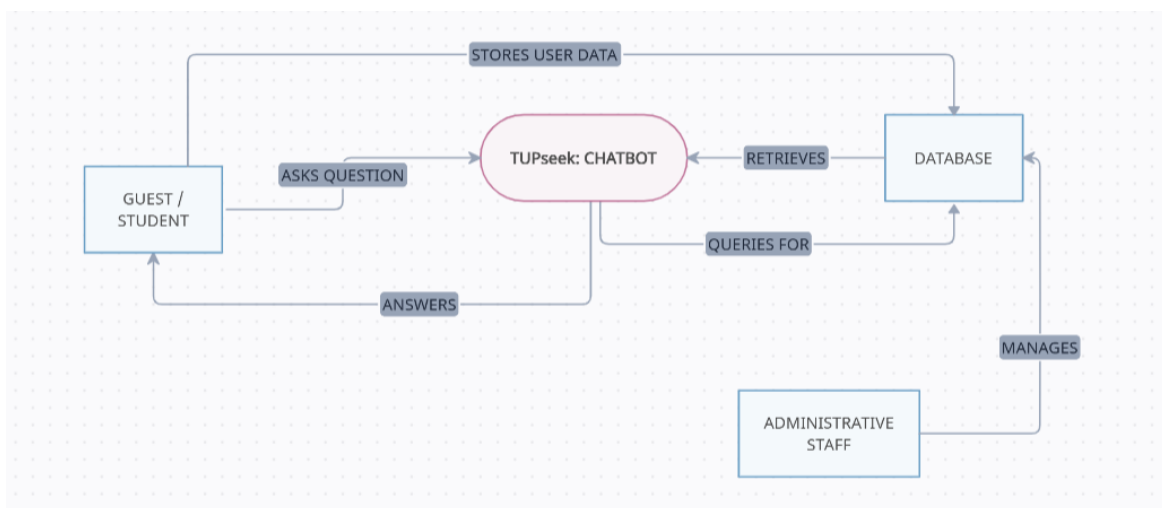
Fig. 2: Context Diagram

A context diagram serves as a comprehensive visual snapshot, capturing the interplay between a system and its external entities. Within this framework, the *GUEST* entity assumes a pivotal role, requiring authentication to access the system, thereby enabling interaction with the website. Subsequently, the pertinent information generated by the *GUEST* is systematically stored in the *DATABASE*. This lays the foundation for the *GUEST* to seamlessly engage the *CHATBOT*, querying the university's information. The *CHATBOT*, in turn, facilitates this interaction by retrieving requisite data from the *DATABASE* and furnishing responses to the *GUEST*'s inquiries. Additionally, *ADMINISTRATIVE STAFF* members, tasked with the responsibility of maintaining the *DATABASE*, play a crucial role in ensuring the currency and accuracy of information within the system.

Project Development

Phase 1: Project Planning and Scope Definition

The initial phase of the TUPSeek project was characterized by meticulous planning and scope definition. This involved a thorough analysis of the project's objectives, constraints, and milestones. The scope definition was a nuanced process that required careful consideration of the project's overarching goals. By specifying the target users and establishing milestones for model development, the developers laid the groundwork for a systematic and goal-oriented approach to the entire project. In this phase, the developers also conducted a thorough review of the existing literature on chatbots and Natural Language Processing (NLP) to identify the most effective techniques and methodologies for building a chatbot that could effectively handle university-related queries. The developers also consulted with university stakeholders to gain a deeper understanding of the specific needs and requirements of the project.

Phase 2: Research and Requirement Analysis

The second phase of the project involved a comprehensive research and requirement analysis. This phase was crucial in identifying key university-related queries and gathering data crucial for training the model. The research phase was not limited to query identification alone; it extended to the gathering of data crucial for training the model. The developers explored relevant university documents and FAQs, aiming to create a robust knowledge base that would empower TUPSeek to effectively handle a wide range of queries.

In this phase, the developers also conducted a thorough analysis of the existing data sources and identified the most relevant and useful data for training the model. The developers also developed a detailed plan for data preprocessing and cleaning, including tokenization, stemming, and stop-word removal. This ensured that the data was in a suitable format for training the model and that the model would be able to effectively handle the complexities of natural language.

Phase 3: Designing the User Interface

The third phase of the project was dedicated to designing an intuitive user interface. This involved the creation of wireframes, considering seamless integration with the NLP system. The user interface was designed with a user-centric approach, ensuring that users could input queries effortlessly and receive responses in a prompt and user-friendly manner. The design phase was not only about visual aesthetics but also about creating an interface that harmoniously interacted with the underlying NLP system. The goal was to provide a seamless and engaging user experience that aligns with the project's overarching objectives.

In this phase, The developers also conducted usability testing to ensure that the user interface was intuitive and easy to use. The developers also gathered feedback from users to identify areas for improvement and to refine the design. This ensured that the user interface was not only visually appealing but also functional and effective.

Phase 4: Natural Language Processing (NLP) System with NLTK

The fourth phase of the project was dedicated to the development of the NLP system. This involved preprocessing the training data, incorporating tokenization, stemming, and stop-word removal to enhance the quality of the data. The NLP system's training was a crucial aspect of this phase, ensuring that TUPSeek could comprehend and respond contextually to user queries.

In this phase, the developers also developed a detailed plan for model training, including the selection of the most effective algorithms and the tuning of hyperparameters. This ensured that the model was trained effectively and that it would be able to accurately classify user queries. The developers also conducted thorough testing and evaluation of the model to ensure that it was performing as expected.

Phase 5: Development of TUPSeek with Keras

Building upon the robust NLP system, the fifth and final phase of the project marked the actual development of the TUPSeek chatbot application. The user interface, designed in the previous phase, was seamlessly implemented, ensuring a cohesive integration that underwent rigorous testing to validate functionality. The development phase was characterized by coding the chatbot application, with an emphasis on harnessing the capabilities of the NLP system for natural language processing. Rigorous testing procedures were employed to validate the functionality and

performance of TUPSeek, ensuring it could effectively handle the queries for which it was designed.

In this phase, the developers also conducted thorough testing and evaluation of the chatbot, including usability testing and performance testing. This ensured that the chatbot was not only functional but also effective and user-friendly. The developers also gathered feedback from users to identify areas for improvement and to refine the chatbot.

Testing and Operating Procedure

System Function	Procedure	Expected Output
Log in as Guest/Student	1. Input email address 2. Input password 3. Input the verification code. 4. Click the log in button.	1. The application should handle both scenarios without crashing. 2. Incorrect credentials should generate an error message and prompt the user to input the correct details. 3. Upon successful login the user must be redirected to the home screen.
Chatting with the chatbot	Click the text input	1. The Guest/Student will be able to get an answer/s corresponding to their questions.
Add extension to website	1. Click the Extension Icon 2. Click Manage Extension 3. Add TUPSeek as an Extension	1. The logo of TUPSeek will be shown at the upper right corner of the Guest's or Student's chosen browser.

Table 2: Guest/Student Interface

System Function	Procedure	Expected Output
Log in as Admin	1. Input email address 2. Input password 3. Input the verification code 4. Click the log in button	1. The application should handle both of these scenarios without crashing. 2. Incorrect credentials should generate an error message and prompt the user to input the correct details. 3. Upon successful login the user must be redirected to the home screen.
Dashboard	1. Homepage of the Admin/s	1. The admin can see the total user/guest, the user's or guest's information and question asked.
Add extension to website	1. Click the Extension Icon 2. Click Manage Extension 3. Add TUPSeek as an Extension	1. The logo of TUPSeek will be shown at the upper right corner of the Guest's or Student's chosen browser.

Table 3: Admin Interface

CHAPTER 4

RESULTS AND DISCUSSION

This chapter discusses the project description, project structure, project capabilities and limitations, and project evaluation.

Project Description

The project created TUPSeek, a web-based system that leverages modern technology to effectively respond to students seeking information about the Technological University of the Philippines, Manila (TUP-M). For administrators and teachers, the system helps alleviate the burden of handling numerous student queries on a wide range of topics. For students, once verified, the system grants access to the chatbot (named Drea), enabling them to ask questions and learn more about the university. Upon completion, TUPSeek will provide the Technological University of the Philippines with an advanced tool for managing student data and evaluating student performance and progress. This system will not only enhance operational efficiency but also support the university's mission to foster academic excellence and student success.

Project Structure

The project structure contains screenshots and forms used in the program with its description and function in the system.
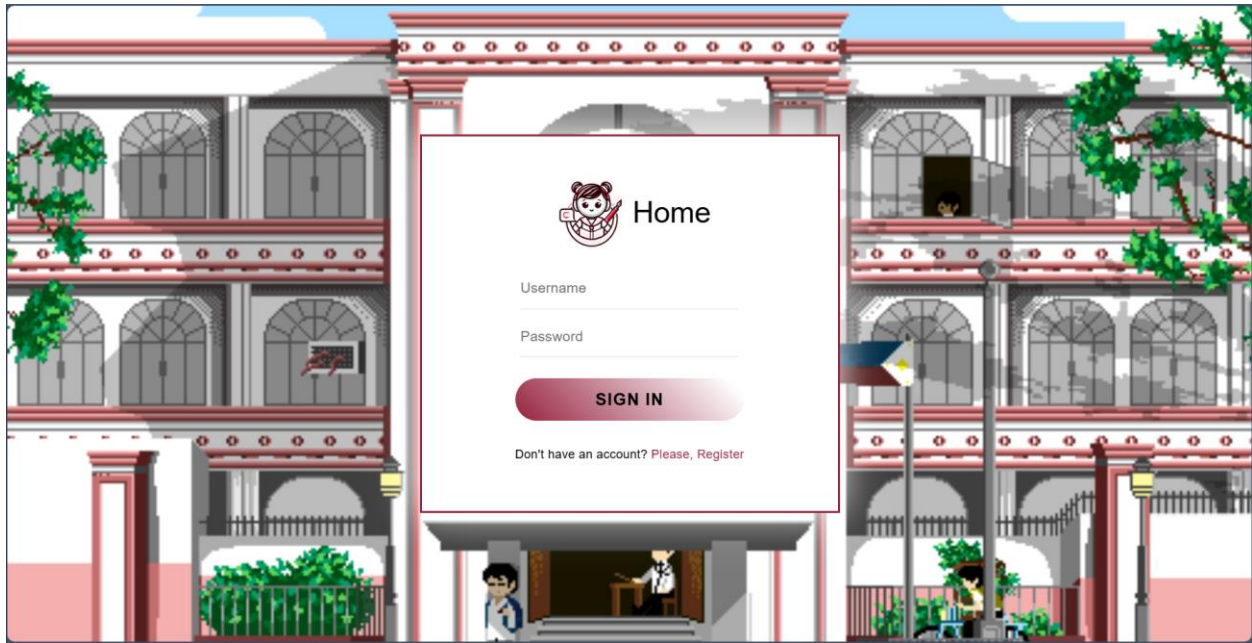
Fig. 3: Log in Page

In figure 3, it illustrates the log-in page for TUPSeek, providing users access to information about the Technological University of the Philippines, Manila. This interface allows users to securely authenticate and access a wide range of resources and services offered by the university.
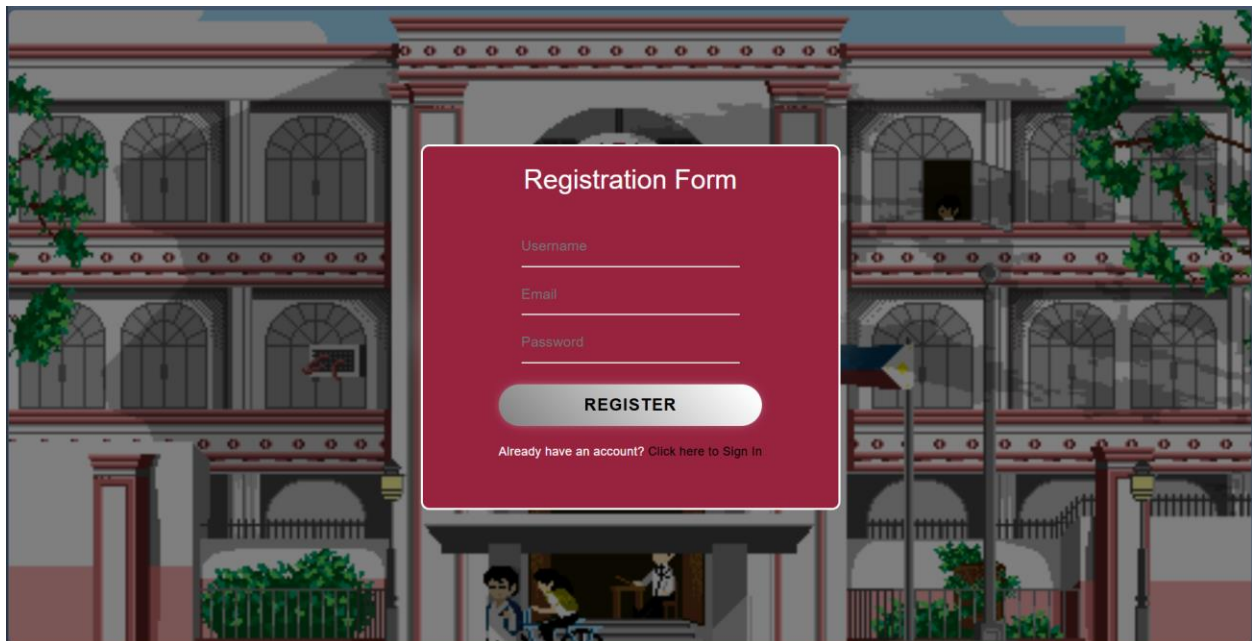
Fig. 4: TUPSeek Registration Page

In figure 4, it displays the registration page for new users on TUPSeek. This page allows individuals to create a new account to access information and services related to the Technological University of the Philippines, Manila. The registration process is designed to be straightforward and user-friendly, guiding users through the necessary steps to set up their account.
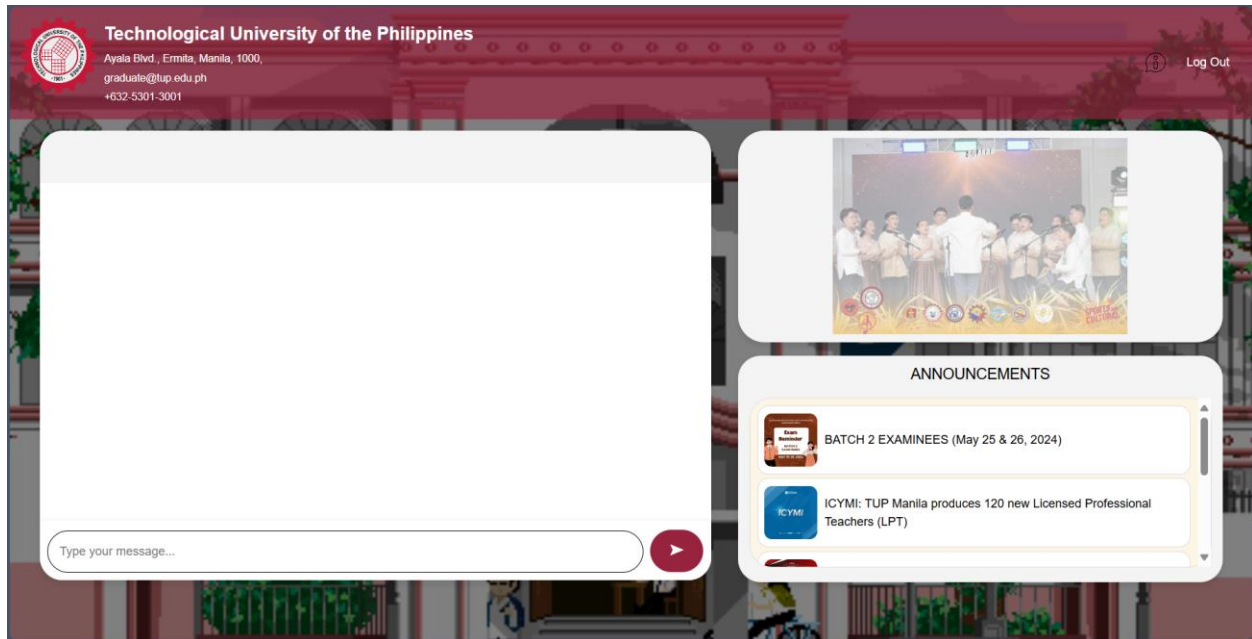
Fig. 5: TUPSeek Main Page

In figure 5, it presents the main page of TUPSeek, featuring a chatbot interface, an announcement list, and a calendar of events at the Technological University of the Philippines, Manila.

Project Capabilities and Limitations

The following are the capabilities of the developed system:

- TUPSeek may offer general information regarding the university's history, mission, vision, essential values, and policies.

- It provides academic information regarding programs, courses, enrollment, registration, tuition fees, scholarships, and financial aid.

- TUPSeek provides students with information about campus resources, such as libraries, laboratories, and sports facilities.

- It additionally shares essential announcements and updates from the university administration, as well as upcoming events, seminars, and workshops.

- It conveys information on student life, such as housing options, campus dining, transportation, extracurricular activities, clubs, and organizations.

And like any other systems, the system has the following limitations:

- TUPSeek's analysis of context is limited, so it may have difficulty with complex or unclear queries.

- The information it provides may not always be up to date so regular updates are necessary. TUPSeek is unable to deliver personalized advice or support based on student particular circumstances, and it does not have access to or manage personal student records due to privacy and security concerns.

- It offers general information but may not give out detailed coverage of specific or niche topics. In such cases, it will direct students to the appropriate departments or offices for more in-depth inquiries.

- There are certain technical limitations that may arise, such as possible issues or downtime that might influence the availability and responsiveness. Additionally, there may be limitations in handling multimedia queries or providing visual aids beyond text-based responses.

- TUPSeek's mainly allows communication in English, but it may have limited support for other languages and may not fully understand slang, idiomatic expressions, or regional dialects.

Project Evaluation

The developed system, TUPSeek, incorporates a wide variety of capabilities to enhance the university experience. It functions as a centralized platform that provides a comprehensive understanding of the different aspects of university life. TUPSeek guarantees that students have access to essential resources by offering a comprehensive overview of the institution's background, including its history, mission, vision, core values, and institutional policies, as well as by facilitating access to academic information, including program details, course offerings, enrollment procedures, registration guidelines, tuition fees, scholarships, and financial assistance. Furthermore, the system functions as a repository for campus amenities, providing information on libraries, laboratories, sports facilities, and other resources. Also, TUPSeek ensures timely communication by disseminating critical announcements, updates, upcoming events, seminars, and workshops from the university administration and student government. Moreover, the system provides information on the diverse array of organizations on TUP-M, as well as the accommodation options, campus dining facilities, transportation services, and extracurricular activities, thereby improving the overall university experience for students.

TUPSeek's limited capacity to analyze context can pose challenges when handling complex or unclear inquiries. Furthermore, the information it offers may not always be up to date, necessitating consistent updates to guarantee its accuracy. TUPSeek does not provide personalized advice or support that is specific to individual students' needs, and it strictly adheres to privacy and security protocols by refraining from accessing or managing personal student records. TUPSeek provides general information, but its lack of coverage on specific or niche topics may require students to direct their inquiries to relevant departments or offices. Technical limitations, such as potential issues or downtime, may impact its availability and responsiveness, making it

challenging to handle multimedia inquiries or provide visual aids beyond text-based responses. TUPSeek primarily operates in English and provides limited support for other languages. As a result, it may encounter difficulty comprehending vernacular, idiomatic expressions, or regional dialects.

The TUPSeek was evaluated with a significant emphasis on user experience. The layout was both intuitive and tidy, and the overall design was visually appealing. The system was convenient for users to navigate and locate the desired functionalities. The evaluation yielded several recommendations for improving TUPSeek. Initially, incorporate additional topics or information to address a diverse range of inquiries about the Technological University of the Philippines, Manila. Secondly, include more keywords and acronyms to help TUPSeek identify different query formats and generate precise responses and instructions.

To conclude the statements above, TUPSeek's evaluation emphasized the strong performance, functionality, and user experience, as well as the areas that require refinement. Using the recommended improvements, the TUPSeek web page can more effectively manage the university's information and meet user expectations.

Respondents

Type of Respondents	No. of Respondents	Percentage
Professional	15	50%
Non-professional	15	50%
Total	**30**	**100%**

Table 4: Total Number of Respondents

In table 4, shows the number of respondents and their respective percentage together with the

type of respondents.

Summary of Results

A. Functionality Suitability

Criteria	Professional	Non-Professional	Rating
The system includes features that are completely functioning.	3.55	3.6	3.58
The system functions cover all the specified tasks and user objectives.	3.81	3.73	3.77
The system produces accurate results with the required level of accuracy.	3.73	3.87	3.8
Mean Rating			**3.71**

Table 5: Functionality Suitability

B. Reliability

Criteria	Professional	Non-Professional	Rating
The system satisfies reliability requirements to which it can avoid failures due to defects in the system.	3. 67	3. 67	3.67

The system was able to maintain functionality in the event of faults or errors.	3.71	3.67	3.69
The system is functional and accessible when required for use.	3.73	3.8	3.77
The system is capable of resuming its functionalities and recover data after an event of failure.	3.73	3.87	3.8
Mean Rating			**3.72**
OVERALL MEAN			**3.755**

Table 6: Reliability

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

Summary of Findings

This project aims to create an interactive query assistant for the Technological University of the Philippines, Manila (TUP-M) to assists the students, faculty, and incoming college students that is interested in the university.

The developed system, TUPSeek, has effectively accomplished the following: (1) enhancing accessibility to university-related information for students and faculty through a user-friendly chat interface; (2) integrating a search function enabling swift and accurate retrieval of information based on keywords, topics, or specific criteria; (3) systematically organizing and categorizing university-related information for seamless navigation within different areas or departments; and (4) implementing a secure user authentication system with varying permissions for tasks such as accessing, updating, or deleting information.

To evaluate the system, the developers divided 30 respondents into two groups: IT experts and non-IT experts. The participants in this study were enrolled students, alumni of the Technological University of the Philippines, Manila, and personnel members of the University Information Technology Center.

The following are the findings of the conducted evaluation:

1. A significant proportion, specifically 93.55% of the participants, expressed their favorable perception regarding the system's functional suitability. This indicates that

the system's functionalities were comprehensive, accurate, operational, and well-suited to cater to the requirements of the end-users.

2. A notable majority, specifically 93% of the respondents, expressed their astonishment at the system's performance, usability, and efficiency.

CONCLUSION

The development and testing of TUPSeek, a specialized chatbot tailored for TUP-M-specific inquiries, have yielded positive results. Our research aimed to introduce an innovative solution to enhance the user experience and streamline university information retrieval processes. As educational technology advances and artificial intelligence gains prominence in academia, TUPSeek stands as a pivotal advancement in modernizing TUP-M's information dissemination framework.

TUPSeek's implementation holds significance for various university stakeholders. It simplifies access to course information, academic resources, administrative procedures, and campus amenities for students, thereby enhancing academic productivity and administrative efficiency. Moreover, prospective students benefit from TUPSeek by gaining insights into the university's support systems and programs, aiding in informed decision-making regarding admissions and campus life.

Furthermore, TUPSeek facilitates improved communication and administrative management for academics and staff, enabling efficient allocation of time and resources. This contributes to a more responsive and service-oriented administrative environment within the university.

Lastly, the findings of this study provide valuable insights for educational technology developers. The deployment and impact evaluation of TUPSeek serve as a benchmark for assessing chatbot technology in similar educational contexts, fostering the integration of technology into education.

RECOMMENDATIONS

Based on the evaluation results and feedback obtained from users, several recommendations have been identified to further enhance the functionality and user experience of TUPSeek:

1. **Expand Coverage**: Incorporate additional topics or information to address a diverse range of questions about TUP-M, ensuring comprehensive coverage of university-related queries.

2. **Improve Language Processing**: Include more keywords and acronyms to help TUPSeek identify different query formats and generate precise responses and instructions, thereby enhancing its ability to understand and respond contextually to user inquiries.

3. **Enhance Reliability**: Implement measures to ensure TUPSeek's reliability and accessibility, including proactive monitoring for potential issues or downtime and robust mechanisms for resuming functionalities and recovering data after a failure.

4. To enhance TUPSeek's capabilities and responsiveness over time, establish a framework for continuous improvement and iteration, incorporating user feedback and emerging technologies.

By implementing these recommendations, TUPSeek can further solidify its position as a valuable resource within the TUP-M community, effectively managing university-related information and meeting the evolving needs of its users.

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APPENDICES

APPENDIX A: CERTIFICATE OF ORIGINALITY

We hereby certify that this Research Paper is our own work and that, to the best of our knowledge and belief, it contains no material previously written or published by another person or organization nor any material which has been accepted for award of any other degree or diploma from a university or institution of higher learning, except where due acknowledgement is made thereof.

Furthermore, we declare that the intellectual content of this research paper is the product of our work although we have received assistance from others on the manner of organization, presentation, style and language.

Sincerely yours,

Alexandria Lee G. Brillo
Developer

Raine Francesca Maximo
Developer

Deazelle M. Capistrano
Developer

Erika F. Velasquez
Developer

Attested By:

Prof. Dolores Montesines
Subject Adviser

APPENDIX B: SURVEY FORM

Name (Optional): __Kenneth Balare__   **Sex:** __M__   **Type of Respondent:** __IT Expert__

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.		/		
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.		/		
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): _____Vicente Estember_____ **Sex:** _M_ **Type of Respondent:**___IT Expert___

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.		/		
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: ___Put more information, ask the offices._____

Name (Optional): _____ **Sex:** _F___ **Type of Respondent:** ___IT Expert___

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		4	3	2	1
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		4	3	2	1
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): ___Val Patrick Fabregas___ **Sex:** _M_ **Type of Respondent:**___IT Expert___

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		4	3	2	1
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.		/		

PART 2: RELIABILITY					
INDICATOR		4	3	2	1
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*		/		
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.		/		
Availability	*The system is functional and accessible when required for use.*		/		
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*		/		

Comments/Suggestions: Add more keywords/acronym, more information, and try to add more design or aesthetic to the home page. _____

Name (Optional): _____ **Sex:** __F__ **Type of Respondent:** ___IT Expert___

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		4	3	2	1
Functional Appropriateness	The system includes features that are completely functioning.		/		
Functional Completeness	The system functions cover all the specified tasks and user objectives.		/		
Functional Correctness	The system produces accurate results with the required level of accuracy.		/		

PART 2: RELIABILITY					
INDICATOR		4	3	2	1
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*		/		
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.		/		
Availability	*The system is functional and accessible when required for use.*		/		
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*		/		

Comments/Suggestions: _____

Name (Optional): ___Edward Cruz___ **Sex:** _M_ **Type of Respondent:** ___IT Expert___

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.			/	
Functional Completeness	The system functions cover all the specified tasks and user objectives.		/		
Functional Correctness	The system produces accurate results with the required level of accuracy.		/		

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*		/		
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.			/	
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: ___Use more keywords into one question for more accurate answers.___

Name (Optional): _____ **Sex:** __M__ **Type of Respondent:** ___IT Expert___

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): _____ **Sex:** _M_ **Type of Respondent:** __IT Expert___

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*		/		
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.		/		
Availability	*The system is functional and accessible when required for use.*		/		
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*		/		

Comments/Suggestions: Intergrade more information about the TUP-M. _____

Name (Optional): _____Rexy_____ **Sex:** _M_ **Type of Respondent:**___IT Expert___

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.		/		
Functional Completeness	The system functions cover all the specified tasks and user objectives.		/		
Functional Correctness	The system produces accurate results with the required level of accuracy.		/		

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*		/		
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.		/		
Availability	*The system is functional and accessible when required for use.*		/		
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*		/		

Comments/Suggestions: ____Do something about its (more) security (log-in)._____

Name (Optional): _____ **Sex:** __F__ **Type of Respondent:**___IT Expert____

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		4	3	2	1
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		4	3	2	1
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): _____ **Sex:** _M_ **Type of Respondent:** ___IT Expert___

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.		/		

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*		/		
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*		/		

Comments/Suggestions: _____

Name (Optional): _____ **Sex:** _M_ **Type of Respondent:** __IT Expert__

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		4	3	2	1
Functional Appropriateness	The system includes features that are completely functioning.		/		
Functional Completeness	The system functions cover all the specified tasks and user objectives.			/	
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		4	3	2	1
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.			/	
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): _____ **Sex:** __M__ **Type of Respondent:**___IT Expert___

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.		/		
Functional Completeness	The system functions cover all the specified tasks and user objectives.		/		
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*		/		
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): _____ **Sex:** _M_ **Type of Respondent:**___IT Expert___

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		4	3	2	1
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.		/		
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		4	3	2	1
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*		/		

Comments/Suggestions: _____

Name (Optional): _____ **Sex:** __F__ **Type of Respondent:**___IT Expert____

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.		/		
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*		/		
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.		/		
Availability	*The system is functional and accessible when required for use.*		/		
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): ___Lourdes___ **Sex:** _F_ **Type of Respondent:** _Non-IT Expert_

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*		/		
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: ___Improve the chatbot and gathered more information.___

Name (Optional): Carl   **Sex:** M   **Type of Respondent:** Non-IT Expert

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: Change or add shadow in the design in home page.

Name (Optional): ___David___ **Sex:** _M_ **Type of Respondent:** _Non-IT Expert_

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: ___Medyo ayusin lang ang design_____

Name (Optional): ___Yul_____ **Sex:** _M_ **Type of Respondent:** _Non-IT Expert_

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.		/		
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*		/		
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: ___Ayusin pa yung pag generate ng answers_____

Name (Optional): _Ernest_ **Sex:** _M_ **Type of Respondent:** _Non-IT Expert_

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): _Grace_ **Sex:** _F_ **Type of Respondent:** _Non-IT Expert_

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): _____ **Sex:** __F__ **Type of Respondent:** Non-IT Expert

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		4	3	2	1
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.		/		
Functional Correctness	The system produces accurate results with the required level of accuracy.		/		

PART 2: RELIABILITY					
INDICATOR		4	3	2	1
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*		/		
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.		/		
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): _____ **Sex:** __F__ **Type of Respondent:** __Non-IT Expert__

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): Mark   **Sex:** M   **Type of Respondent:** Non-IT Expert

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.		/		
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.			/	
Availability	*The system is functional and accessible when required for use.*			/	
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*		/		

Comments/Suggestions: _____

Name (Optional): _____ **Sex:** __M__ **Type of Respondent:** Non-IT Expert

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
4	Highly Acceptable
3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.		/		
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.		/		
Availability	*The system is functional and accessible when required for use.*		/		
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): _____ **Sex:** __M__ **Type of Respondent:** Non-IT Expert

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
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3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		4	3	2	1
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.		/		

PART 2: RELIABILITY					
INDICATOR		4	3	2	1
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*		/		
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.		/		
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*		/		

Comments/Suggestions: _____

Name (Optional): _____ **Sex:** _M_ **Type of Respondent:** Non-IT Expert

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
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3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		4	3	2	1
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		4	3	2	1
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
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Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): _____ **Sex:** _M_ **Type of Respondent:** Non-IT Expert

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
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3	Very Acceptable
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INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): _____ **Sex:** _M_ **Type of Respondent:** Non-IT Expert

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
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3	Very Acceptable
2	Fairly Acceptable
1	Not Acceptable

PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		4	3	2	1
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		4	3	2	1
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*	/			
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

Name (Optional): _____ **Sex:** __M__ **Type of Respondent:** <u>Non-IT Expert</u>

Instruction: Using the scale below, evaluate the Creating an Information Retrieval System (IRS) for Research Papers at the Technological University of the Philippines – Manila Campus by putting a check (✓) on the appropriate column.

Numerical Rating	Equivalent
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3	Very Acceptable
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PART 1: FUNCTIONAL SUITABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Functional Appropriateness	The system includes features that are completely functioning.	/			
Functional Completeness	The system functions cover all the specified tasks and user objectives.	/			
Functional Correctness	The system produces accurate results with the required level of accuracy.	/			

PART 2: RELIABILITY					
INDICATOR		**4**	**3**	**2**	**1**
Maturity	*The system satisfies reliability requirements to which it can avoid failures due to defects in the system.*		/		
Fault Tolerance	The system was able to maintain functionality in the event of faults or errors.	/			
Availability	*The system is functional and accessible when required for use.*	/			
Recoverability	*The system is capable to resume its functionalities and recover data after an event of failure.*	/			

Comments/Suggestions: _____

APPENDIX C: CURRICULUM VITAE

Alexandria Lee G. Brillo

Blk 3 Lot 135 Phase 1A Sub Urban

San Jose Rod. Rizal

09562503189

alexandrialee.brillo@tup.edu.ph

EDUCATIONAL BACKGROUND

Primary: Amityville Elementary School

9002 Ana Maria Drive St., Rodriguez, 1860 Rizal

(2009-2015)

Secondary: Kasiglahan Village National High School

Kasiglahan Village Street, San Jose, Montalban, 1860, Rizal, Philippines

(2015-2019)

ABE International Business College

Carms Bldg, V.V. Soliven Cor Felix Ave, Cainta Rizal, 1900 Rizal

(2019-2021)

College: Technological University of the Philippines, Manila

San Marcelino St, Ayala Blvd, Ermita, Manila, 1000

(2021-Present)

PERSONAL DATA

Birthdate: June 19, 2002	Age: 21
Birthplace: Quezon, City	Religion: Roman Catholic
Gender: Female	Status: Single
Father's Name: Jose D. Brillo Jr.	Occupation: Messenger
Mother's Name: Shailini G. Brillo	Occupation: Elevator Attendant

Deazelle M. Capistrano

Blk 6 Lot 13 Bristol St. Chesapeake Village Buhay na Tubig,

Imus City, Cavite

09763655099

deazelle.capistrano@tup.edu.ph

EDUCATIONAL BACKGROUND

Primary: Imus Pilot Elementary School

CWGQ+PMR, Nueno Ave, Imus, Cavite

(2009-2015)

Secondary: General Emilio Aguinaldo National High School

Imus, 4103 Cavite

(2015-2019)

General Juan Casteñeda Senior High School

9WJP+WP9, Imus, Cavite

(2019-2021)

College: Technological University of the Philippines, Manila

San Marcelino St, Ayala Blvd, Ermita, Manila, 1000

(2021-Present)

PERSONAL DATA

Birthdate: September 7, 2003   Age: 20

Birthplace: Olongapo, Zambales   Religion: Iglesia Ni Cristo

Gender: Female   Status: Single

Father's Name: Dionisio R. Capistrano   Occupation: Retired

Mother's Name: Mary Ann M. Capistrano   Occupation: Hairdresser

Raine Francesca Maximo

#82 Pag-asa 3 Street, Malhacan,

Meycauayan City, Bulacan

09358105038

raine.maximo@tup.edu.ph

EDUCATIONAL BACKGROUND

Primary: Calvario Elementary School

Calvario Cemetery, Dazo Street, Meycauayan, Bulacan

(2009-2015)

Secondary: Jesus Is Lord Colleges Foundation, Inc.

101 MacArthur Hwy, Bunlo, Bocaue, 3018 Bulacan

(2015-2019)

University of the East, Caloocan

105 Samson Rd, Caloocan, Metro Manila

(2019-2021)

College: Technological University of the Philippines, Manila

San Marcelino St, Ayala Blvd, Ermita, Manila, 1000

(2021-Present)

PERSONAL DATA

Birthdate: February 10, 2003   Age: 21

Birthplace: Meycauayan, Bulacan   Religion: Roman Catholic

Gender: Female   Status: Single

Father's Name: Roberto I. Nicholas   Occupation: Driver

Mother's Name: Zorayda B. Maximo   Occupation: Housewife

Erika F. Velasquez

163 Libis Orkana St. Brgy 20 Caloocan City

Caloocan City

09477455428

erika.velasquez@tup.edu.ph

EDUCATIONAL BACKGROUND

Primary: Kaunlaran Elementary School

Tamban St, Kaunlaran Village, Caloocan, Metro Manila

(2009-2015)

Secondary: Lukan Dula High School

2252 Juan Luna St, Tondo, Manila, Metro Manila

(2015-2019)

Polytechnic University of the Philippines, Manila

1016 Anonas, Sta. Mesa, Maynila, Kalakhang Maynila

(2019-2021)

College: Technological University of the Philippines, Manila

San Marcelino St, Ayala Blvd, Ermita, Manila, 1000

(2021-Present)

PERSONAL DATA

Birthdate: September 4, 2003	Age: 21
Birthplace: Manila	Religion: Roman Catholic
Gender: Female	Status: Single
Father's Name: Edwin Velasquez	Occupation: Driver
Mother's Name: Dovie Lyn F. Velasquez	Occupation: Teacher