# GuideURSelf: A MOBILE-BASED SERVICE DESK SOLUTION FOR UNIVERSITY OF RIZAL SYSTEM

A

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## APPROVAL SHEET

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- The Project Team

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# Chapter 1
# THE BACKGROUND OF THE PROJECT

## Introduction

Information is the foundation of understanding and knowledge. It provides facts and insights on many fields, as it plays a significant role in comprehension of many different topics. However, effective information dissemination is still important to ensure that it reaches the intended audience.

Digital platforms extend beyond traditional hardbound books, offer a broader scale of topics, and exchange insights through online discussions and help forums. Individuals ask professionals and experts regarding various topics they are curious about or requiring assistance with.

Various sites, digital forums, and organizations utilize this system to improve information exchange and avoid misinformation. From enterprises to educational institutions, service desks helped provide information customers searched for. With the increasing demands of service desks and centers, industries applied modern technology to improve their performance.

Chatbots offer the ease, speed, and convenience that improve the quality of customer service with automation, trust, and productivity (Zhou, 2023). Virtual tours, on the other hand, are helpful for navigational ease, providing an immersive experience for users with directional instructions, and interactive maps (Garcia et al., 2023).

Chatbots and virtual tours have been implemented in many universities worldwide, improving the university's promotions, information distribution, and

customer service by increasing the students, guests, and employee's satisfaction in service and internal processes.

The University of Rizal System is a university located in Rizal, established by Republic Act 9157 on August 11, 2001. It comprises satellite universities located in the division of Rizal: Angono, Antipolo, Binangonan, Cainta, Cardona, Morong, Pililla, Rodriguez, Tanay, and Taytay. The massive number of employees, students, and stakeholders that inquire on a daily basis takes a lot of effort, time, and resources to respond to each. Responding to all inquiries and questions would cost time, effort, and resources, and with the various activities within the university, availability of service desks would be at risk. Disrupting the flow of information between the university and the students will risk the processes and activities related to the information.

In response to these challenges, the project team was encouraged to design and develop the GuideURSelf: A Mobile-Based Service Desk Solution for the University of Rizal System, which will implement an autonomous chatbot that provides self-sufficient responses that require minimal human intervention and immersive virtual tours that offer navigational assistance to lessen the need for inquiring questions about the place featuring all of the 10 campuses of University of Rizal System. The project also aims to conserve resources for customer service while securing the continuous flow of information within the university to improve the quality of service and to help users address their concerns and provide service satisfaction.

## Objectives of the Project

The general objective of the project is to design and develop GuideURSelf: A Mobile-Based Service Desk Solution for University of Rizal System.

Specifically, the study aims to:

1. Assess the proposed system using the developed quality assurance test plan with at least 97% passing rate.

2. Evaluate the user acceptance level of the proposed system using the ISO/IEC 25010 model in terms of Functional Suitability, Performance Efficiency, Compatibility, Reliability, Usability, Security, Maintainability, and Portability.

## Scope and Limitation of the Project

The project focuses on the design and development of GuideURSelf: A Mobile-Based Service Desk Solution for the University of Rizal System, located in the Province of Rizal, during the academic year 2024-2025.

The project will be developed using Android Studio, and Flutter for mobile application development. Visual Studio Code, ReactJS, Node.js, and MongoDB for web application development. Cohere, Quadrant, Langchain, and fast API for developing the chatbot. Marzipano JS Library will be utilized for developing the virtual tour. Figma for designing the user interface. The system has three (3) levels of user types with different access and restriction levels on the system, which are the Super Administrator, Administrator and the User.

The Super Administrator, managed by the University Head of the Management Information System Unit has the privilege to access all system features and functions.

The Administrator, managed by the Head of the Management Information System Unit of each of the ten (10) campuses of the University of Rizal System, has the same privileges as the Super Administrator but with limited access, focusing only on their assigned campus.

The Users, which are the students, faculty, visitors, and anyone interested in the University of Rizal System, can use the chatbot to ask campus-related queries, and take a virtual tour of the campus.

The system will have a web application for Super Administrator and Administrator, and a mobile application for Users developed only for Android devices. The system will also require internet connectivity for using the chatbot for queries and the virtual tour. The system will also include a geo-mapping feature integrated into the virtual tour, allowing users to pinpoint and locate specific locations such as buildings, offices, and other key areas.

The project team will also employ the Rapid Application Development Model (RAD) as the project development framework. There will be a total of fifty-eight (58) respondents of the project, which consists of three (3) students, one (1) faculty member, and one (1) Management Information System Unit on each of the campuses of the University of Rizal System, one (1) University MIS, five (5) IT expert, and two (2) visitors or guests of the campus. The respondents will perform the User Acceptance Testing of the system using the adapted questionnaire based

on the ISO/IEC 25010 software quality standards. The Simple Random Sampling technique will be used to randomly select respondents across the ten (10) campuses of the University of Rizal System, ensuring unbiased selection and contributing to reliable and valid results.

**Significance of the Project**

This project and the proposed GuideURSelf: A Mobile-Based Service Desk Solution for University of Rizal System will be beneficial to the following:

University of Rizal System. This project can help the school to streamline administrative processes and facilitate better information dissemination across all of the campuses, ensuring that all inquiries are addressed accurately and effectively. Additionally, the implementation of this project will provide valuable insights, allowing continuous improvement which could enhance the university's reputation drawing positive feedback and attention to prospective students and potential partners.

New Students. With this system, new students will be more confident in facing their college journey as the system will be their best-buddy that will provide them answers or essential resources that will guide them to be familiarized with the administrative processes such as enrollment procedures, payment processes and even the use of university services like the library.

Current Students. The proposed system will offer current students an easy way to access administrative processes instead of wasting their effort searching for answers on the university websites, saving their time and reducing hassle. As

current students often experience stress from academic pressures, having a system like this that offers instant support for simple queries can reduce some of their frustration.

Prospective Students. The mobile application will enable prospective students to explore the university and get a sense of the environment to see what the campus has to offer. Also, many prospective students may not be able to personally inquire and ask questions directly to staff during administrative processes like enrollment transactions. Furthermore, the system can guide them for queries about admissions processes, program or course offerings of each campus, application for scholarship and many more. These quick streamlining of the university processes can enhance and potentially influence their decision on considering the university as their new home.

Staff. The proposed project can help university staff and employees to streamline information which they can easily access through the app. Furthermore, this ensures they can address the students' needs faster and with more accuracy.

Alumni. This system will help alumni students to still have knowledge on the administrative processes of the university even after graduation. Moreover, graduate students frequently request official transcripts, documents and other certifications for their job application and having a guide can save their time and effort. Also, reducing the need to contact the university manually.

Project Team. Through this hands-on project development, the project team can learn and have a great experience that they can apply in the industry after graduating.

Future Project Team. This project will aid future project teams and may use this project as a basis or reference in conducting studies related to this.

## Definition of Terms

To provide a common understanding of this project, the following terminologies are conceptually and operationally defined:

Automation. A use of technology that performs a task with less intervention by humans, it is often used in machinery or software which increases the accuracy and speed by automating repetitive tasks.

Chatbot. A software application that is designed to act like a human through text and voice interactions. It can have a normal conversation with a real human and provide information according to their questions.

Cohere. A platform that provides some tools that help developers in creating AI-driven applications like chatbot.

Compatibility. The ability of the software to function correctly in a specific environment, interacting with other systems or components without conflicts.

Functional Suitability. The ability of the software to perform its intended tasks accurately and completely under specified conditions.

Geographical Mapping. A process of building visual geographic data on a map. It combines geographic information of latitude and longitude to elaborate complex information.

GuideURSelf. A mobile application designed for the University of Rizal System for streamlining information with integrated chatbot and virtual tours for the users.

LLM. A large language model is a type of artificial intelligence algorithm that uses deep learning techniques and massively large data sets to understand, summarize, generate and predict new content.

Maintainability. The ability of the software to be modified effectively without introducing new errors.

Marzipano. An open-source JavaScript (JS) library used to build 360 degrees panoramic images and virtual tours that are hosted on the web.

Mobile-based. A type of system that refers to services, applications, or systems designed to function on mobile devices such as smartphones or tablets.

NLP. Natural Language Processing is a subfield of Artificial Intelligence (AI) that allows machines to interpret and understand human language, letting them generate meaningful information.

Performance Efficiency. The ability of the software to process data and generate results within acceptable time frames without excessive resource consumption.

Portability. The ability of the software to function correctly in different hardware, software, or operational environments.

QAT. Quality Assurance Testing is an important practice that focuses on analyzing the quality of software applications. It includes some testing techniques such as unit testing, system testing, and user acceptance testing.

RAG. Retrieval Augmented Generation is a method of enhancing the quality of responses by retrieving relevant information from external resources.

RAGAS. A framework used for evaluation of Retrieval Augmented Generation (RAG), which is built to focus on assessing the performance of the language models.

Reliability. The ability of the software to operate without failure for a specified period of time, under specified conditions.

Security. The ability of the software to prevent unauthorized access and maintain data integrity.

Service Desk. An integrated point of contact within the organization that provides assistance for human inquiries, requests, and issues related to their services.

UAT. User Acceptance Testing is the final phase of testing software systems where it will be evaluated whether it meets the requirements before the deployment.

Usability. The ability of the software to be used by its intended users with minimal effort and training and with a high degree of satisfaction.

Virtual Tour. A digital stimulation that allows users to experience places like museums, parks, and campuses from the screen of their devices, often created using a series of 360 or panoramic images.

# Chapter 2

# REVIEW OF RELATED LITERATURE AND STUDY

This section outlines relevant literature and studies that the project team deemed essential to further enhance the importance and feasibility of this project.

## Web Applications

A web-based application is a system that runs and can be accessed by any device with a web browser and has a client-server structure that allows the app to run over a network connection (Keary, 2024). Unlike traditional applications, web applications require a sophisticated infrastructure to handle network-specific challenges, as they operate across distributed resources rather than on a single computer (Kozlovics, 2019).

Several local studies highlight how web-based applications streamline administrative and academic tasks. Galvez et al. (2023) developed a web-based learning application that makes Philippine history more accessible, reducing the need for manual intervention. Tiboron et al. (2022) also explored the role of web applications in education, emphasizing how centralized platforms facilitate both learning and communication, thereby supporting academic goals. Similarly, Mallo-Eustaquio (2019) also highlighted how web applications simplify content management with real-time updates and a centralized approach. Overall, these studies collectively show that web-based applications improve workflows and collaboration, resulting in a more efficient and user-friendly environment.

Therefore, the project team believes that implementing web applications for GuideURSelf will significantly enhance operational management at the University of Rizal System, ultimately improving the overall campus experience. This will also foster a more collaborative and responsive educational environment, which is vital for both student success and institutional excellence.

**Mobile Applications**

Mobile applications are software that runs on mobile devices like smartphones and tablets. According to a 2019 Pew Research Center study, 81% of Americans own a smartphone, highlighting the importance of mobile apps in everyday life (Greenwood & Greenwood, 2024). While in a 2021 Statista report, mobile app downloads reached over 200 billion which only shows how much people rely on these apps across industries (Ceci, 2024).

In education, mobile technology integration has changed the interaction among students, faculty and administrative staff and the campus environment. Mobile apps in education are used in learning management systems (LMS) where students can access course materials and submit assignments. A 2021 EDUCAUSE Center for Analysis and Research (ECAR) study found out that 95% of students own a smartphone and a large portion of them use mobile devices as their main tool to access course content. Thus, universities started to develop their own mobile apps to improve the campus experience and share university processes. This way, policies, procedures and academic resources are communicated more effectively and students and staff can access important information more easily (“The Evolving Landscape of Students' Mobile Learning

Practices in Higher Education", n.d.). For example, research on mobile apps developed for Open University of Sri Lanka (OUSL) showed that these apps enabled communication between students and administrative departments. The app allowed students to access university services, track administrative requests and manage their academic records which reduced the need for in-person consultations (Jayatilleke & Kulasekera, 2020).

Tagana et al. (2022) also created a mobile application for the Letran school system to make tasks like checking grades, paying tuition, and getting school announcements easier. Their research found that these applications helped students and administrative staff communicate better, making school operations run more smoothly.

Given the impact mobile applications have had across sectors especially in education, the project team was inspired to develop a mobile application. The growing reliance on smartphones, as shown above, highlights the potential of mobile technology to streamline university processes and make them more accessible. With that, GuideURSelf will ensure that essential information and services are always at the fingertips of the students and anyone interested in the University of Rizal System.

**Virtual Tour**

According to the article by Khan (2023), stated that in recent years, virtual tours have become a more popular tool for colleges and universities to promote and showcase their campuses and facilities to aspiring students who are unable

to visit the location physically due to distance, cost, or other factors. To solve that problem, virtual tours offer an immersive and interactive experience that enables students to explore the inside of the campus in the comfort of their home.

Furthermore, in the study by Rivera et al. (2021), they developed a mobile application that has mapping directories that are related to virtual tours. The study also highlights how the developed application reduces navigation difficulties for students, new employees, and visitors by having an objective feature such as to inform, locate, and navigate. The inform feature provides detailed descriptions of rooms, faculty offices, and campus facilities. The locate feature also helps users find paths to their chosen destinations. The navigate feature uses artificial intelligence (AI) characters to easily guide users to their exact location. The study concluded that these features significantly improve the user experience by enabling effective navigation across different colleges and areas within the campus. Additionally, Asani et al. (2019) developed their virtual tour of LF-ViT by physically mapping the area in which panoramic and sky view photos were taken, and to ensure that structures are placed accurately in the virtual environment, Google Maps were also used.

Ultimately, the inclusion of a virtual tour in the GuideURSelf is especially beneficial. It allows new and prospective students to explore the university's ten (10) campuses remotely, offering them the chance to familiarize themselves with the campus environment at their own pace. For students who may feel overwhelmed by in-person tours or social interactions, the virtual tour feature provides a comfortable and stress-free way to navigate key areas of the campus

such as facilities, faculty room and offices, without needing to physically be there. This can reduce feelings of isolation or anxiety and help them feel more prepared and confident when attending in person.

**Service Desk Chatbot Integration**

The service desk is a core component of IT Service Management (ITSM) and is defined as the central point of contact for an organization and its users or customers. This service desk is specially designed to help enable the receipt and handling of support services, requests for service, or incidents via an automated system. Service desks ensure that organizations process the requests effectively, providing a superior service to their clients by offering support teams to handle diverse topics such as service requests, incident reports, or feature requests (Bosu et al., 2019).

Moreover, technological developments give opportunities for the easier distribution of information in all types of human activities, including the educational or academic process. Academic Information Systems (AIS) can help academic activities to be more integrated between their elements, such as students, lecturers, and other academic communities in a college. AIS has become a mandatory application for universities nowadays. It was built to provide convenience to users in campus's academic administration activities online (Dewi et al., 2020).

In the era of information technology, universities like Andalas University utilize information technology by developing it into a campus Academic Information

System (AIS). The benefits of the Academic Information System are to improve the quality of academic administration services (Yindrizal et al., 2019). The study examines how the implementation of the AIS affects service efficiency and student satisfaction. The study concluded that, although the system has the potential to improve service quality and institutional competitiveness, student satisfaction was negatively affected by unreliable information and insufficient user training, emphasizing the need for improvements in both areas.

On the other hand, the use of Large Language Models (LLMs) is significantly transforming information dissemination in education by offering powerful tools to enhance personalized learning, create educational content, and improve assessments. LLMs can handle complex tasks, such as explaining difficult topics, giving instant feedback, and adjusting lessons to fit each student's needs. This makes learning easier to understand and more engaging. LLMs can help teachers design curriculum materials by creating content that fits each student's learning style and progress. They can also answer tough questions and provide detailed feedback, helping students grasp difficult ideas. In this way, LLMs not only distribute information effectively but also improve engagement and comprehension by adapting to the needs of learners (Abd-alrazaq et al., 2023).

In line with this, the study by Bubas (2024) shows how GPT-4o can be used to improve self-assessment tools in education, especially in areas like communication skills. It helps design more accurate and personalized assessments, which can make evaluating student performance easier and more reliable. This involves automating the generation and evaluation of assessment

scales, thus improving the validity and relevance of educational assessments. GPT-4o's role in streamlining these processes highlights its potential in disseminating information in an educational context through interactive, adaptive assessments. Moreover, research by Shahri et al. (2024) demonstrates how GPT-4's personalized learning features are applied across various sectors in education. It focuses on individualized learning plans and the role of AI in transforming traditional classroom interactions, making education more adaptable by providing students with immediate feedback and personalized learning paths.

Technological advancements in education, such as Academic Information Systems (AIS) and AI-driven tools, particularly Large Language Models (LLMs) and OpenAI's GPT-4 and GPT-4o, can greatly enhance service quality, simplify processes, and improve information dissemination. Using these technologies, schools can provide more responsive and personalized services, ultimately leading to better educational outcomes and increased student satisfaction.

The study by Heo and Lee (2019) introduces CiSA, an inclusive chatbot designed to enhance the accessibility of campus-related information for international students and academics at Kookmin University. The findings highlighted the effectiveness of CiSA in overcoming the language barriers and improving user satisfaction. However, it only focuses on services related to the campus.

In multi-varsity and large campuses, students may need a variety of particulars, support, counseling, and special assistance. At present, the campuses manage that through exhaustive information on websites, email notifications,

messaging, and help desks to cater to the student's needs. However, the students who need quick and personalized services find difficulty receiving information. One of the solutions is engaging Artificial Intelligence as a Service (AIaaS) using chatbots to offer intelligent personalized services to address the queries of the students (Srimathi & Krishnamoorthy, 2019). The study investigated the integration of artificial intelligence, particularly chatbots, to enhance student support in higher education. It highlights the limitations of traditional support methods such as websites and help desks in providing quick, personalized services, proposing AI as a solution for real-time, tailored assistance. The study centers on creating a chatbot that works alongside ERP and CRM systems, using natural language processing (NLP) to help answer student questions.

The study of Heo and Lee (2019) and Srimathi and Krishnamoorthy (2019) highlights the importance of integration of chatbots in universities to improve student support and accessibility of campus-related information. The studies concluded that the use of chatbots offers an important step toward creating a more inclusive, accessible, and effective support system for all students.

In fact, there is a law about the implementation of technology that can be used in organizations or institutions like schools or universities, hereby stated in Section 10. Article XIV of the Constitution of the Republic of the Philippines:

> *"Science and technology are essential for national development and progress. The State shall give priority to research and development, invention, innovation, and their utilization; and to science and technology education, training, and services. It shall support indigenous, appropriate, and self-reliant scientific and technological capabilities, and their application to the country's productive systems and national life."*

The legal basis highlights the importance of offering accessible opportunities for quality education while pursuing innovation. According to the law, incorporating technologies such as chatbots in university service desks aligns with the government's objective to promote educational and technological advancements. By integrating chatbots, universities can boost administrative processes, improve communication, and provide real-time support to students and other people. This technological integration aligns with the Constitution's goal of improving educational services, ensuring equitable access to essential resources, and encouraging innovation in the academic setting.

Furthermore, as stated in Republic Act No. 10173, also known as the "Data Privacy Act of 2012":

> *"It is the policy of the State to protect the fundamental human right of privacy, of communication while ensuring free flow of information to promote innovation and growth. The State recognizes the vital role of information and communications technology in nation-building and its inherent obligation to ensure that personal information in information and communications systems in the government and in the private sector are secured and protected."*

The legal basis highlights the importance of protecting people's privacy by preventing unauthorized access to and misuse of personal information. It aims to find a balance between privacy protection and the free flow of information, which is vital for growth and innovation. Chatbots can be integrated into service desks to improve the streamline of information while following the Data Privacy Act of 2012. Chatbots securely manage personal data that allow users to access or update their information, which enhances communication and builds trust.

These two laws above highlight the importance of making education accessible while also protecting people's privacy. It encourages using technology and improving communication. This means making sure personal information is handled safely and responsibly. It allows for the use of chatbots at service desks while still protecting people's rights.

Service desks with chatbots not only offer better service but also protect individual privacy, creating a more secure and reliable digital environment for everyone.

According to the literature, legal basis, and studies mentioned above, the project team believes that having a service desk with a chatbot powered by a Large Language Model (LLM), specifically OpenAI's GPT-4o, would be beneficial for the university. This solution would serve not only students but also staff and anyone who is interested in the university. A LLM-based chatbot could make customer service faster and better, save the university money, and make communication easier. Students could get quick answers to their questions, which would help them solve problems faster and feel happier about the service provided.

**Software Quality**

It is crucial to ensure the quality and ability of the software to provide accurate information, effective system flow, and user satisfaction to the system. In order to develop and deploy a successful system, it must first undergo a quality assurance test. According to Bhanushali (2023), the aim of a quality assurance test is to determine and eradicate errors of a system while it is being developed,

ensuring the improvement of the final product. It focuses on ensuring high-quality software. It also includes quality control that examines the quality of the application program after it was developed. Testing is under quality control, ensuring the functional and non-functional requirements of the system are met.

This will greatly affect the software's acceptance percentage to users. Inaccurate responses will equate to program errors or bugs, and might cause users to doubt the software's reliability. If not addressed before deployment, the success rate of the software will be greatly affected.

Quality assurance is essential for the software to meet the customer expectation. Proper execution of the test makes a significant difference in succeeding or failing being able to meet the system requirements (Rapp, 2023). To be able to deploy a system that meets its purpose and function effectively, it should be free of errors, all modules should be working as intended, and convenient to use. Being able to test these properly raises the chance of a high-quality rate in terms of user satisfaction and software quality. In order to test a system's quality, tests should be done with consideration of the software's requirements, purpose, and function.

Using quality testing is crucial to ensure the quality of the system before deployment, minimizing issues and eliminating errors. Effective testing will benefit the project team in building a reliable and accurate chatbot and an error-free virtual tour. By applying appropriate testing and standards on the project, the percentage of a successful project output rises, and serves as a guide for the project team to monitor their software system during and after development. This will be important

to ensure the project will be developed with consideration of the requirements and purposes defined by the project team.

**Software Testing**

Software testing is crucial in assessing software quality and ensuring it meets user requirements. It is an integral part of the software development life cycle to enhance performance and reliability (Kusum et al., 2024).

According to Schmid (2023), software testing is an important, yet often overlooked, part of the software development lifecycle. Traditionally, software testing was conducted by dedicated quality assurance teams with formally trained testers. Although these quality assurance teams are reliable, the high cost and delayed responses made them hard to scale and non-flexible for rapid update needs in today's software industry.

Software errors can have significant repercussions on organizations, affecting performance, safety, and financial outcomes.

In testing LLM models of RAG or Retrieval Augment Generation, Es et al. (2023) stated that while the usefulness of retrieval-augmented strategies is clear, their implementation requires a significant amount of tuning, as the overall performance will be affected by the retrieval model, the considered corpus, the LM, or the prompt formulation, among others. Automated evaluation of retrieval-augmented systems is thus paramount. In practice, RAG systems are often evaluated in terms of the language modeling task itself, i.e. by measuring

perplexity on some reference corpus. However, such evaluations are not always predictive of downstream performance.

The above case states that LLM models can also be tested based on the accuracy of information they give as the result of the end user query. Therefore, the project team will use the RAGAs for testing the chatbot's accuracy which will test its Faithfulness, Context Precision, Answer Relevance and Context Recall.

In 2023, Liu discussed that Faithfulness refers to the idea that the answer should be grounded in the given context. This is important to avoid hallucinations, and to ensure that the retrieved context can act as a justification for the generated answer. Indeed, RAG systems are often used in applications where the factual consistency of the generated text with respect to the grounded sources is highly important, e.g. in domains such as law, where information is constantly evolving. Liu also added that Answer Relevance refers to the idea that the generated answer should address the actual question that was provided. Finally, he defined that, Context Relevance refers to the idea that the retrieved context should be focused, containing as little irrelevant information as possible. This is important given the cost associated with feeding long context passages to LLMs.

To support Liu's conceptual definition of RAGAs. In 2024, Vishaalani said that this metric measures how well the generated answer recalls entities from the context. It calculates the fraction of entities recalled from the context relative to the entities present in the ground truth. Higher recall indicates better performance in capturing relevant entities from the context.

However, testing involves much more than just performing a series of test cases, and with the above-mentioned studies, the project team is confident that the proposed system will be reliable and functional for the end users. Now, how will the project team determine whether the proposed system meets the standard quality and meets end users' expectations? This is where User Acceptance Testing will come into play.

With this, users will perform these series of tests outlined with the software quality standard. User Acceptance Testing (UAT), also known as beta or end-user testing, is defined as testing the software by the user or client to determine whether or not it can be accepted (Vijay, 2024). While the software may pass earlier stages like unit testing, quality assurance, system testing, and integration testing, UAT serves as final checking to ensure that the product is fit for its intended purpose.

In conclusion, software testing is crucial for ensuring the quality, security, and stability of applications. With that being said, precise testing will be essential for the proposed project, GuideURSelf: A Mobile-Based Service Desk Solution for the University of Rizal System, to provide a reliable, secure, and user-friendly experience. By prioritizing detailed and objective UAT to the users, we can reduce risks, ensure information reliability and to easily meet the needs and requirements of users at the university.

**ISO/IEC 25010**

The quality model is fundamental to a product quality assessment system. ISO 25010 is a software quality standard. It describes the models, consisting of

characteristics and sub-characteristics, for both software product quality, and software quality in use together with practical guidance on the use of the quality models (Britton, 2021).

Hence, the demands of stakeholders are accurately reflected in the quality model, which classifies product quality into characteristics and sub-characteristics. The quality model for products outlined in ISO/IEC 25010 includes eight (8) quality attributes and 31 sub-characteristics.

With that, by utilizing the ISO/IEC 25010 based software quality model, the project team will test the quality of the developed system GuideURSelf in terms of; Functional Suitability, Performance Efficiency, Compatibility, Reliability, Usability, Security, Maintainability, and Portability.

To begin with, according to Sarwosri et al. (2023), Functional Suitability is the ability of software to provide functionality that meets stated and implied needs when used under certain conditions. Observing from the SOA perspective, services must cover all the specified tasks and user objectives for which they were designed (França & Soares, 2019).

Next is, Performance Efficiency, refers to the performance related to the amount of resources used (Britton, 2021). According to Panduwiyasa et al. (2023), it is necessary to conduct a performance assessment such as stress testing which includes the qualification of the system's ability to process information based on the sub-characteristics of a reliable capacity system, such as the number of requests and data concurrency. While the time behavior sub-characteristic assess the successful connection time and the average time.

Another attribute is, Compatibility, it refers to how well a product, system, or component can exchange information as well as perform its required functions while sharing the same hardware or software environment (Britton, 2021). In 2024, Moumane addressed that to ensure compatibility, developers can adhere to standard coding practices and utilize programming languages compatible with multiple platforms, such as JavaScript, Dart, Xamarin, and Kotlin. Thorough testing on various devices and operating systems is essential to ensure proper functionality across all platforms.

Furthermore, employing responsive design techniques ensures that the app's user interface and features adapt seamlessly to different screen sizes and resolutions.

Proceeding to the next attribute, Reliability, refers to how well a system, product, or component performs specific functions under specified conditions. Reliability refers to the ability of an app to function correctly and consistently under various conditions, such as network changes, device compatibility, user interactions, and security threats. To ensure that your mobile app meets the reliability standards and expectations of your users and clients, you need to perform various types of tests throughout the development and deployment process ("What Are Some Common Mobile Application Reliability Tests?," 2023).

Usability testing is evaluated based on quality components such as effectiveness, efficiency, satisfaction, learnability, errors, memorability, understandability, attractiveness, and accessibility (Chipa and Mwanza, 2021). Mobile application usability has attracted the attention of application users,

software developers, and academics and is a crucial area of research in human-computer interaction (HCI) because it determines the application's success and reduces irritation during usage (Lynn et al., 2020). The usability of mobile applications also determines the successful technology adoption depending on how users feel about the use of the application in terms of improving work performance (Byun et al., 2020).

Security is often defined as a system property that allows the system to perform its mission or critical functions despite risks posed by threats (Lisova et al., n.d.). It is important to highlight the importance of mobile user authentication which acts as the first line of defense, establishing confidence in the claimed identity of a mobile user, which it typically does as a precondition to allowing access to resources in a mobile device (Papaioannou et al., 2020)

Mangca (2023) stated that, the maintainability of a system is evaluated based on its ability to be updated and maintained easily. Her system was found to be highly maintainable, with regular updates and bug fixes being rolled out for the mobile-based application. The organization also reported that the system was easy to maintain, with minimal downtime during updates.

Last but not the least, Portability refers to how well a system, product, or component can be transferred from one environment to another (Kafazov, 2023). Moreover, Semeraro (2024) pointed that to aim for portability, software engineers must adopt a design that abstracts and separates platform-specific elements from the core logic of the software, and very often, utilizing standard programming languages and adhering to open standards and protocols can facilitate this

process. It is worth mentioning that avoiding or abstracting dependencies on system-specific features and third-party libraries can significantly enhance portability.

The project team ensures that the product will meet quality standards to deliver an effective and accurate solution that aligns with the user requirement and expectations. The ISO/IEC 25010 software quality model will also help identify and address any potential issues early on the design and development, ensuring that the system performs effectively across platforms such as web and mobile application, and environments, while also being adaptable for future improvements or changes. This evaluation will contribute to the system's long-term sustainability, usability, and overall success as well.

# Chapter 3

# METHODOLOGY

## Project Development Framework

The project team employs the Rapid Application Development (RAD) from the Software Development Life Cycle (SDLC) models in executing the project.

The software development life cycle (SDLC) is a framework for planning, analyzing, designing, developing, testing, and deploying software (Hossain, 2023).

Rapid Application development is the software development methodology that uses minimal planning in favor of rapid prototyping a prototyping is the working model of the software in the rad functionalities of the system is developed in parallel as a prototype and integrated at the end for the complete product for faster product delivery (Khan, 2023).

The Rapid Application Development model consists of four (4) phases: requirements planning, user design, rapid construction, and implementation.

In the initial phase, which is the requirements planning, this includes the collection and gathering data requirements from the university stakeholders and essential documents. The project team also defines what is feasible within the time frame, the tools to be used and the resources available.

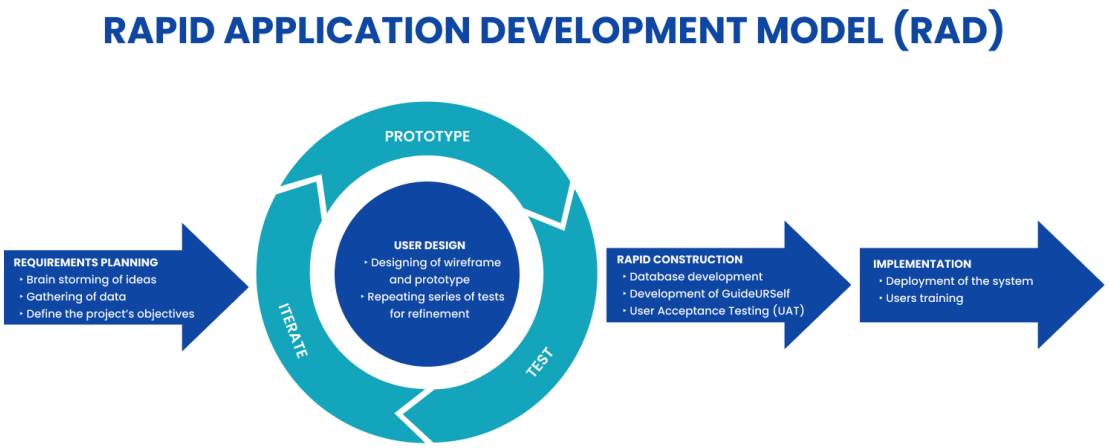


**Figure 1**

Project Development Framework of GuideURSelf: A Mobile-Based Service Desk Solution for University of Rizal System

The next phase involves user design, this involves the creation of preliminary mockups and wireframes using Figma for the mobile and web application. This will help visualize user interactions, data flows and the overall design structure. The project team also develops the working prototype focusing only on the core functionalities, such as the chatbot answering basic queries and a mockup of the virtual tour. This will allow users to interact with core components, providing early feedback on usability.

In the rapid construction phase, the project team begins the actual coding and integrates each planned features of GuideURSelf. Android Studio and Flutter will be used to develop the mobile application. For the development of the web application, Visual Studio Code, ReactJS, Node.js are utilized. The chatbot development process is also facilitated by a fast API, Langchain, Cohere, and Quadrant. While the Marzipano JS Library is utilized to create the virtual tour. Here, the project team continuously develops each module and tests them immediately for bugs and improvements. The accuracy of the chatbot will be tested with RAGAs and various query types to verify response accuracy, and the virtual tour is checked for smooth navigation and information accuracy. The developer and tester work together during this phase to make sure everything works smoothly.

The final stage is implementation, this rolls out the final stages of comprehensive testing of the developed application. Here, the application is almost ready to be deployed, but it still requires some testing for device compatibility as well as user training. The project team conducts final testing to ensure

GuideURSelf is free of major bugs, secure and performs well under user anticipated usage conditions.

This methodology is suited for the current project since it will prioritize immediate feedback on the testing ensuring that key features such as the chatbot and virtual tour aligns with needs of the end users. In addition, RAD's flexibility allows the team to quickly adapt and refine the app, especially when integrating complex technologies like machine learning and natural language processing given the limited amount of time given to the project team. This method guarantees a smooth experience for students and faculty, facilitating prompt delivery and flexibility for future enhancements.

**Locale of the Project**

The project will take place in Rizal, a province located in Region IV-A CALABARZON. It has 13 municipalities and 1 city under the leadership of Hon. Nina Ricci A. Ynares. Acknowledging its relative growth, the importance of education became evident. Among all universities situated in Rizal, the University of Rizal System ensured they are easily accessible to the province’s population.

The University of Rizal System is a merger of two state colleges and a university extension campus established by Republic Act 9157 on August 11, 2001 that authorizes the integration of Rizal Polytechnic College, Rizal State College, and the Rizal Technological University extension campus into a state university in the province of Rizal. The university has expanded to a total of ten campuses

throughout the province of Rizal namely Angono, Antipolo, Binangonan, Cainta, Cardona, Morong, Pililla, Rodriguez, Tanay and Taytay.

The university ensures to offer the best quality of education to their students by continuously improving their services and facilities representing the university's committed aim to deliver excellent products and services to their students, staff, and stakeholders to ensure their satisfaction in instruction, research, extension, production and administrative support services of the university.

**Subject of the Project**

The project will have a total of fifty-eight (58) respondents of the project, which consists of three (3) students, one (1) faculty member, and one (1) Head of Management Information System Unit on each of the ten (10) campuses of the University of Rizal System, one (1) University MIS, five (5) IT expert, and two (2) visitors or guests of the campus. The respondents will perform the user acceptance testing of the system using the adapted questionnaire based on the ISO/IEC 25010 software quality standards.

The respondents were chosen as they are the primary beneficiaries and end users of the system. The project team believes that they are all capable and well-suited for assessing and performing the user acceptance testing of the system. Simple random sampling will be used to randomly select respondents from this group to ensure unbiased selection and achieve the desired number of respondents across the ten (10) campuses of the University of Rizal System.

**Procedure of the Project**

One of the most important characteristics of a well-executed capstone project is that it is logical and organized; thus, the project team followed a step-by-step procedure for developing this project.

The project's design and development kicked off when the team, guided by their Capstone Project Instructor, formulated their proposed titles. From there, each member began researching ideas online, using those as inspiration to formulate their own concepts. Once everyone had thought of their ideas, the project manager organized a meeting where the team discussed and selected the best possible titles they have come up with. Then, the project team identified the end user for interviews to gather insights about the problems and challenges within the organization's process. The project team has submitted all necessary letters for the conducting of the interview; hence, they were permitted in gathering the requirements. Using the data collected, the team finalized their main title along with a few alternatives. During the title defense, the panelists were intrigued with the first title proposed. With that, along with revisions and further discussions, the panelists chose "GuideURSelf: A Mobile-Based Service Desk Solution for University of Rizal System" as the project team's capstone title.

After the main title was created, the project team proceeded to search and gather the data and requirements that will be important for the system development. The project team then started creating Chapter 1 of the manuscript along with the designing of the prototype based on the user requirements. With the guidance of their capstone adviser during meetings, the project team ensured the

logical or step-by-step process in the designing of the prototype of the system and the finalization of Chapters 1-3. Once the capstone adviser has fully checked on the manuscript, it’s time for the project team to prepare for their pre-oral defense.

During the pre-oral defense, the system’s prototype was presented in front of the esteemed panelists where they gave their evaluation, insights and criticism in the project overview. Also, the manuscript containing the Chapters 1-3 including the preliminaries and end matters were showed and carefully reviewed by the panelists. After careful deliberation, the project team will revise the manuscript following the various comments and recommendations of the panelists and then submit the soft bind copy to their capstone project instructor.

# BIBLIOGRAPHY

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## A. BOOKS

Heo, J., & Lee, J. (2019). CiSA: An Inclusive Chatbot Service for International Students and Academics. In Lecture notes in computer science (pp. 153–167). https://doi.org/10.1007/978-3-030-30033-3_12

Rapp, D. (2023). Testing and Quality Assurance. In Apress eBooks (pp. 235–273). https://doi.org/10.1007/978-1-4842-9385-0_6

## B. JOURNAL ARTICLES

Abd-Alrazaq, A., AlSaad, R., Alhuwail, D., Ahmed, A., Healy, P. M., Latifi, S., Aziz, S., Damseh, R., Alrazak, S. A., & Sheikh, J. (2023). Large language models in medical education: Opportunities, challenges, and future directions. JMIR Medical Education, 9, e48291. https://doi.org/10.2196/48291

Asani, E. O., Chijioke, M. Z., Shoyombo, A. J., Kayode, A. A., Ezenwoke, A., & Okocha, F. (2019). LF-VIT: Development of a virtual reality guided tour mobile app of landmark University Teaching and Research Farm. International Journal of Interactive Mobile Technologies (iJIM), 13(05), 110. https://doi.org/10.3991/ijim.v13i05.9119

Bhanushali, A. (2023). Ensuring software quality through effective quality assurance testing: Best practices and case studies. International Journal of Advances in Scientific Research and Engineering, 26. http://www.ijaer.com

Bubas, G. (2024). The use of GPT-4o and other large language models for the improvement and design of self-assessment scales for measurement of interpersonal communication skills. ResearchGate. https://doi.org/10.13140/RG.2.2.32610.95686

Byun, D., Yang, H., & Chung, D. (2020). Evaluation of mobile applications usability of logistics in life startups. Sustainability, 12(21), 9023. https://doi.org/10.3390/su12219023

Chipa, N., Mwanza, B., 2021. Factors impeding mobile money expansion in zambia. International Journal of Engineering and Management Research 11, 178–186. https://doi.org/10.31033/ijemr.11.1.24

Es, S., James, J., Espinosa-Anke, L., & Schockaert, S. (2023). RAGAS: Automated Evaluation of Retrieval Augmented Generation. arXiv.org. https://arxiv.org/abs/2309.15217

França, J. M. S., & Soares, M. S. (2019). SOAQM: Quality model for SOA applications based on ISO 25010. https://doi.org/10.5220/0005369100600070

Galvez, N. J. M. B., Arevalo, N. J. P. N., Yanson, N. M. M., Padua, N. R. M. G., Centeno, N. C. J., & Tanael, N. D. V. (2023). Development of web-based learning application to enhance understanding in Philippine history. World Journal of Advanced Research and Reviews, 20(3), 129–136. https://doi.org/10.30574/wjarr.2023.20.3.2458

Hossain, M. (2023). Software development life cycle (SDLC) methodologies for information systems project management. https://doi.org/10.36948/ijfmr.2023.v05i05.6223

Jayatilleke, B. G., & Kulasekera, G. U. (2020). Forty years of distance education: challenges and implications at the open university of sri lanka. Open Praxis, 12(3), 311. https://doi.org/10.5944/openpraxis.12.3.1122

Khan, S. M. (2023). RAD model used in software development reference: Software requirements engineering. What is RAD (Rapid Application Development). https://www.researchgate.net/publication/371903100_RAD_Model_Used_in_Software_Development_Reference_Software_Requirements_Engineering_What_is_RAD_Rapid_Application_Development

Kusum., Pritika, Talwar., Amit, Puri., Guneet, Kumar. (2024). 1. Overview of software testing. Global Journal of Engineering and Technology Advances. https://doi.org/10.30574/gjeta.2024.19.1.0060

Lisova, E., Sljivo, I., & Causevic, A. (n.d.). Safety and security co-analyses: a systematic literature review. IEEE Systems Journal, 13(3), 2189–2200. https://doi.org/10.1109/jsyst.2018.2881017

Lynn, N. D., Islam, A., & Budiyanto, D. (2020). Increasing user satisfaction of mobile commerce using usability. International Journal of Advanced Computer Science and Applications, 11(8). https://doi.org/10.14569/ijacsa.2020.0110839

Mallo-Eustaquio, G. G. (2019). Design and implementation of EMRC web-based portal. PAARL Research Journal, 6(1). https://ejournals.ph/article.php?id=18471

Mangca, D. C. (2023). Development and assessment of a mobile-based information system for charity foundations. International Journal of Advanced Engineering and Management Research, 08(03), 157–166. https://doi.org/10.51505/ijaemr.2023.8311

Moumane, K., Idri, A., Aouni, F. E., Laghnimi, J., Benabdellah, N. C., & Hamal, O. (2024). ISO/IEC 25010-based Quality Evaluation of Three Mobile Applications for Reproductive Health Services in Morocco. Clinical and Experimental Obstetrics & Gynecology, 51(4), 88. https://doi.org/10.31083/j.ceog5104088

Sarwosri, S., Rochimah, S., Yuhana, U. L., & Hidayat, S. B. (2023). Software quality measurement for functional suitability, performance efficiency, and reliability characteristics using analytical hierarchy process. JOIV International Journal on Informatics Visualization, 7(4), 2421. https://doi.org/10.62527/joiv.7.4.2441

Shahri, H., Emad, M., Ibrahim, N., Rais, R. N. B., & Al-Fayoumi, Y. (2024). Elevating education through AI tutor: utilizing GPT-4 for personalized learning. 2024 15th Annual Undergraduate Research Conference on Applied Computing (URC), Dubai, United Arab Emirates, 1–5. https://doi.org/10.1109/URC62276.2024.10604578

Srimathi, H., & Krishnamoorthy, A. (2019). Personalization of student support services using chatbot. International Journal of Scientific and Technology Research, 8(9), 1744–1747.

https://www.mendeley.com/catalogue/c942eb20-4b8b-3daf-a147-68008012366b/

Tagana, J. P., Gonzales, A. C. & Macapagal, E. E. (2022). Development of mobile application based letran school system. Ani: Letran Calamba Research Report, 18(1), 90. https://ejournals.ph/article.php?id=18992

Tiboron, G. M. B., Gamao, A., & Van M Buladaco, M. (2022). Utilization of web application for education and academic interests among senior high school students. International Journal of Research and Innovation in Social Science, 06(02), 711–714. https://doi.org/10.47772/ijriss.2022.6234

Yindrizal, Y., Suwitri, S., Wira Sakti, N., & Purnawenil, H. (2019). Impact of the use academic information systems to improve student satisfaction of academic administration services in universitas andalas padang. International Journal of Scientific & Engineering Research, 10(5), 1319–1331. http://repo.unand.ac.id/id/eprint/40523

Zhou, X. (2023). Chatbot improves the customer service in four important industries. Highlights in Science Engineering and Technology, 39, 339–346. https://doi.org/10.54097/hset.v39i.6551

## C. CONFERENCE PROCEEDINGS

Bosu, M.F., Abuaiadah, D., Khanna, P., Nepia, S., & Palmer, D. (2019). Evaluation of IT service desk: A case study. https://researcharchive.wintec.ac.nz/id/eprint/6993/

Dewi, M. R., Ngaliah, N., & Rochimah, S. (2020). Maintainability measurement and evaluation of myITS mobile application using ISO 25010 quality standard. 2020 International Seminar on Application for Technology of Information and Communication (iSemantic). https://doi.org/10.1109/isemantic50169.2020.9234283

Garcia, M., Mansul, D., Pempina, E., Perez, M., & Adao, R. (2023). A playable 3d virtual tour for an interactive campus visit experience: Showcasing school facilities to attract potential enrollees. Proceedings of 2023 International Conference on Virtual Reality (pp. 461–466). https://doi.org/10.1109/ICVR57957.2023.10169768

Kozlovics, S. (2019). The web computer and its operating system: A new approach for creating web applications. https://doi.org/10.5220/0008053800460057

Liu, P., Fu, J., Ng, S., & Jiang, Z. (2023). GPTScore: Evaluate as you desire. arXiv.org. https://arxiv.org/abs/2302.04166

Panduwiyasa, H., Febrian, Y. Y., Saputra, M., & Azzahra, Z. F. (2023). Performance evaluation of ERP based to ISO/IEC 25010:2011 quality model (a case study). AIP Conference Proceedings. https://doi.org/10.1063/5.0174711

Papaioannou, M., Ribeiro, J. C., Monteiro, V., Sucasas, V., Mantas, G., & Rodriguez, J. (2021). A privacy-preserving user authentication mechanism for smart city mobile apps. 2021 IEEE 26th International Workshop on Computer Aided Modeling and Design of Communication Links and Networks (CAMAD). https://doi.org/10.1109/camad52502.2021.9617809

## D. INTERNET

Britton, J. (2021, May 6). What is ISO 25010? Perforce Software. https://www.perforce.com/blog/qac/what-is-iso-25010

Ceci, L. (2024, May 16). Mobile app usage - Statistics & Facts. Statista. https://www.statista.com/topics/1002/mobile-app-usage/

Greenwood, S., & Greenwood, S. (2024, April 14). Mobile technology and home broadband 2021. Pew Research Center. https://www.pewresearch.org/internet/2021/06/03/mobile-technology-and-home-broadband-2021/

Kafazov, A. (2023, July 31). Why is application portability difficult and how to prepare for it. CST. https://www.cst-bg.net/post/application-portability

Keary, T. (2024, August 7). Web-based application. Techopedia. https://www.techopedia.com/definition/26002/web-based-application

Khan, F. (2023, March 9). The benefits of using virtual tours in higher education marketing. LinkedIn. https://www.linkedin.com/pulse/benefits-using-virtual-tours-higher-education-marketing-firdosh-khan/

National Privacy Commission. (2024, July 22). Republic Act 10173 - Data Privacy Act of 2012. https://privacy.gov.ph/data-privacy-act/

Province of Rizal | Philippine Statistics Authority | Republic of the Philippines. (2024, July 12). https://psa.gov.ph/classification/psgc/citimuni/0405800000

Schmid, D. (2023, January 1). The importance of software testing. IEEE Computer Society. https://www.computer.org/resources/importance-of-software-testing

Semeraro, A. (2024, May 2). Principles of software quality: reusability, portability, and understandability. Medium. https://medium.com/@antonellosemeraro/principles-of-software-quality-reusability-portability-and-understandability-c570fb4063ba

THE 1987 CONSTITUTION OF THE REPUBLIC OF THE PHILIPPINES – ARTICLE XIV | GOVPH. (n.d.). Official Gazette of the Republic of the Philippines. https://www.officialgazette.gov.ph/constitutions/the-1987-constitution-of-the-republic-of-the-philippines/the-1987-constitution-of-the-republic-of-the-philippines-article-xiv/

The evolving landscape of students' mobile learning practices in higher education. (n.d.). EDUCAUSE Review. https://er.educause.edu/articles/2023/1/the-evolving-landscape-of-students-mobile-learning-practices-in-higher-education

University of Rizal System. (n.d.). History |. http://www.urs.edu.ph/about-us/history-2/

Vijay. (2024, June 14). What Is User Acceptance Testing (UAT): A Complete Guide. Software Testing Help. https://www.softwaretestinghelp.com/what-is-user-acceptance-testing-uat/

What are some common mobile application reliability tests? (2023, November 2). LinkedIn. https://www.linkedin.com/advice/0/what-some-common-mobile-application-reliability-kx2ge

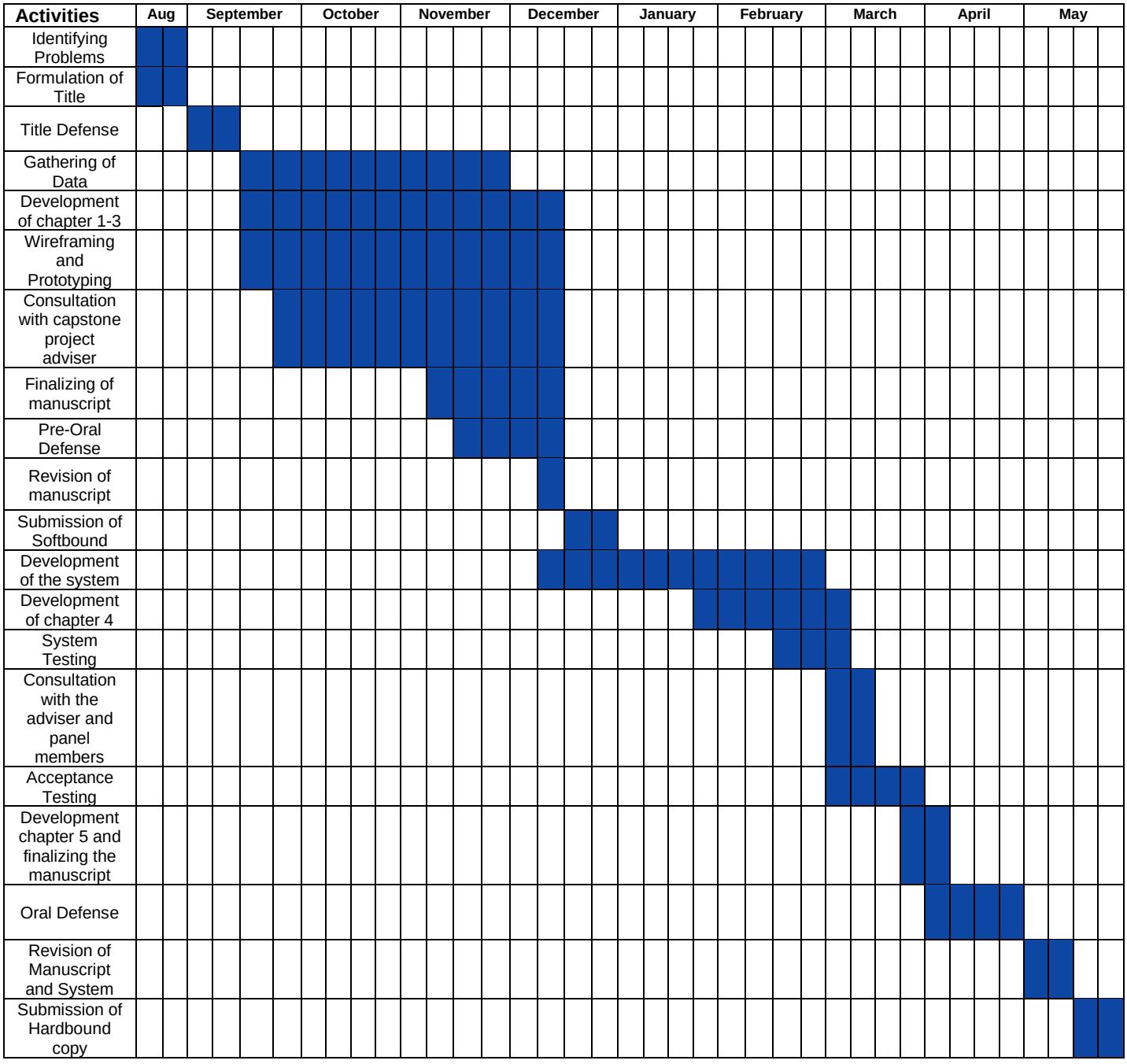
## E. UNPUBLISHED THESIS

Rivera, Cheska Jane L. et al. (2021). “URSB IMAPP”, Undergraduate Thesis, University of Rizal System.

# APPENDICES

# Appendix A

## Gantt Chart of Activities



## Appendix B

Project Team Assignment Form

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Province of Rizal
www.urs.edu.ph

Management System ISO 9001:2015
TÜVRheinland CERTIFIED

Email Address: ursmain@urs.edu.ph /urs.opmorong@gmail.com
Main Campus: URS Tanay Tel. (02) 8401-4900; 8401-4910; 8401-4911; 8539-9957 to 58

*College of Computer Studies - URS Binangonan*

**PROJECT TEAM ASSIGNMENT FORM**

| **Team Alias** | The Nomads |
|---|---|

| **Name and Signature** | **Role** | **Email address** | **Mobile Number** |
|---|---|---|---|
| Corrales, John Irish E. | Project Manager | zjohnirish.1205 @gmail.com | 09763578423 |
| Alva, Eryn Breanne B. | Technical Writer | erynbreannealva @gmail.com | 09484309263 |
| Banta, Jio T. | Programmer | bantajio22 @gmail.com | 09063753815 |
| San Pedro, Kenneth J. | Systems Analyst | kennethsanpedro1108 @gmail.com | 09267353866 |
| Vitor, Paulen V. | Tester | paulenvitor09 @gmail.com | 09517676428 |

Approved by:

**MARTHEA ANDREA O. DALUYON**
Subject Instructor

# Appendix C

Approved Project Title Form

Republic of the Philippines
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Province of Rizal
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Management System ISO 9001:2015
TÜVRheinland CERTIFIED
www.tuv.com ID 9108653929

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Main Campus: URS Tanay Tel. (02) 8401-4900; 8401-4910; 8401-4911; 8539-9957 to 58

*College of Computer Studies - URS Binangonan*

**APPROVED PROJECT TITLE FORM**

**Project Proponents:**

1. CORRALES, JOHN IRISH E.
2. ALVA, ERYN BREANNE B.
3. BANTA, JIO T.
4. SAN PEDRO, KENNETH J.
5. VITOR, PAULEN V.

**Approved Project Title:**

GuideURSelf: A Mobile-Based Service Desk Solution for University of Rizal System

**Recommending Approval:**

**MARTHEA ANDREA O. DALUYON, DIT(CAR)**
Capstone Project Instructor

Date:

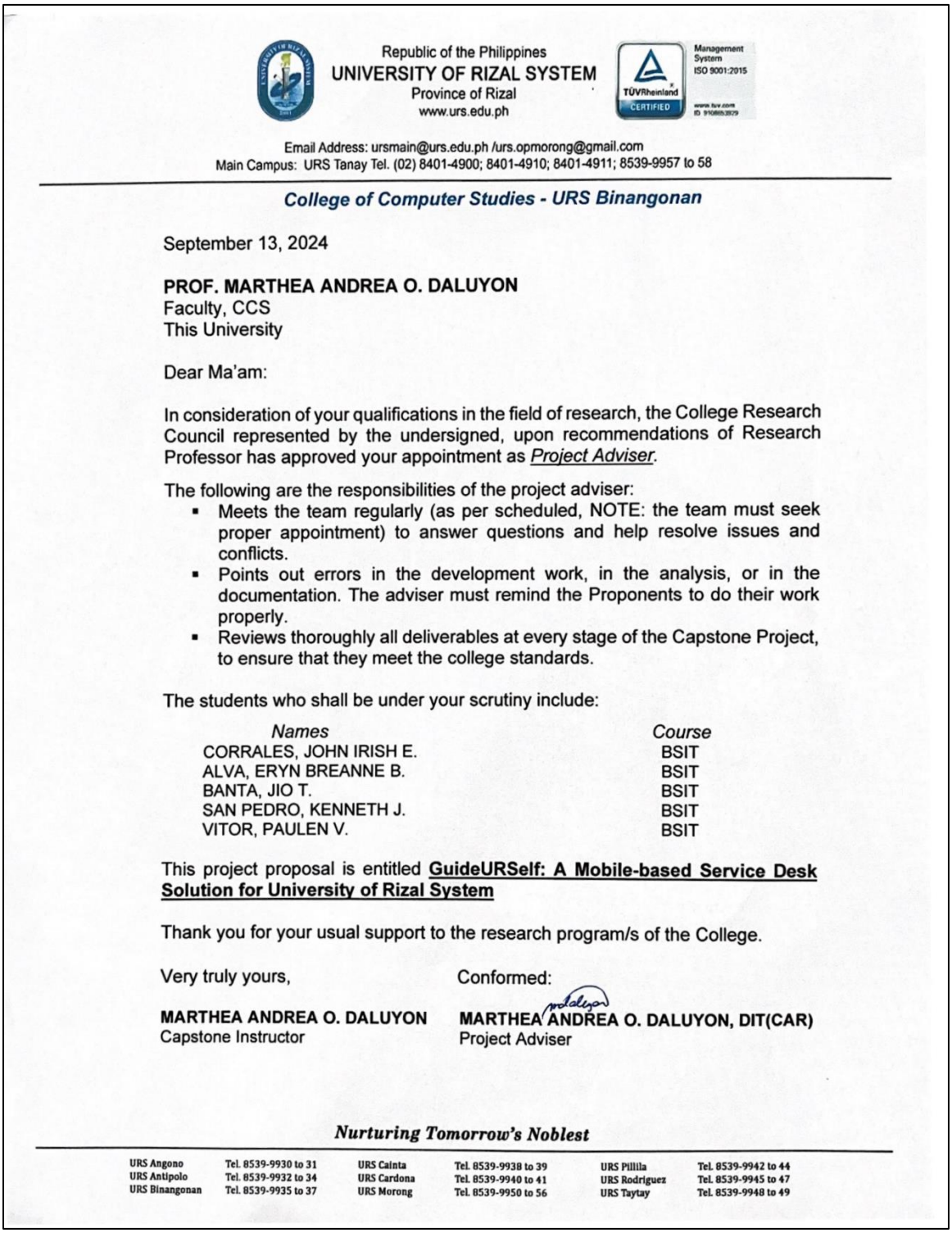
**Approved:**

**JOY SG CRUZ, PhD**
Dean, CCS

Date:

## Appendix D

Letter of Acceptance of the Adviser



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Management System ISO 9001:2015
TÜVRheinland CERTIFIED

Email Address: ursmain@urs.edu.ph /urs.opmorong@gmail.com
Main Campus: URS Tanay Tel. (02) 8401-4900; 8401-4910; 8401-4911; 8539-9957 to 58

***College of Computer Studies - URS Binangonan***

September 13, 2024

**PROF. MARTHEA ANDREA O. DALUYON**
Faculty, CCS
This University

Dear Ma'am:

In consideration of your qualifications in the field of research, the College Research Council represented by the undersigned, upon recommendations of Research Professor has approved your appointment as *Project Adviser*.

The following are the responsibilities of the project adviser:

- Meets the team regularly (as per scheduled, NOTE: the team must seek proper appointment) to answer questions and help resolve issues and conflicts.
- Points out errors in the development work, in the analysis, or in the documentation. The adviser must remind the Proponents to do their work properly.
- Reviews thoroughly all deliverables at every stage of the Capstone Project, to ensure that they meet the college standards.

The students who shall be under your scrutiny include:

| *Names* | *Course* |
|---|---|
| CORRALES, JOHN IRISH E. | BSIT |
| ALVA, ERYN BREANNE B. | BSIT |
| BANTA, JIO T. | BSIT |
| SAN PEDRO, KENNETH J. | BSIT |
| VITOR, PAULEN V. | BSIT |

This project proposal is entitled **GuideURSelf: A Mobile-based Service Desk Solution for University of Rizal System**

Thank you for your usual support to the research program/s of the College.

Very truly yours,

**MARTHEA ANDREA O. DALUYON**
Capstone Instructor

Conformed:

**MARTHEA ANDREA O. DALUYON, DIT(CAR)**
Project Adviser

***Nurturing Tomorrow's Noblest***

| | | | | | |
|---|---|---|---|---|---|
| URS Angono | Tel. 8539-9930 to 31 | URS Cainta | Tel. 8539-9938 to 39 | URS Pililla | Tel. 8539-9942 to 44 |
| URS Antipolo | Tel. 8539-9932 to 34 | URS Cardona | Tel. 8539-9940 to 41 | URS Rodriguez | Tel. 8539-9945 to 47 |
| URS Binangonan | Tel. 8539-9935 to 37 | URS Morong | Tel. 8539-9950 to 56 | URS Taytay | Tel. 8539-9948 to 49 |

## Appendix E

Letter of Acceptance of the Panel

Republic of the Philippines
UNIVERSITY OF RIZAL SYSTEM
Province of Rizal
www.urs.edu.ph

Management System ISO 9001:2015
TÜVRheinland CERTIFIED

Email Address: ursmain@urs.edu.ph /urs.opmorong@gmail.com
Main Campus: URS Tanay Tel. (02) 8401-4900; 8401-4910; 8401-4911; 8539-9957 to 58

*College of Computer Studies - URS Binangonan*

October 7, 2024

**PROF. NEIL RICHARD S. COLADA**
CCS Faculty
University of Rizal System Binangonan Campus

Dear Sir:

In consideration of your qualifications in the field of research, the College Research Council represented by the undersigned, upon recommendations of Research Professor has approved your appointment as Panel *Chairman*.

The following are the responsibilities of the Chairman:

- Brief the Proponents about the Project Proposal and Oral Defense program during the actual Project Proposal and Oral Defense.
- Issue the verdict. The verdict is a unanimous decision among the three members of the Capstone Project Proposal and Oral Defense panel. Once issued, it is final and irrevocable.

The students who shall be under your scrutiny include:

| *Names* | *Course* |
|---|---|
| CORRALES, JOHN IRISH E. | BSIT |
| ALVA, ERYN BREANNE B. | BSIT |
| BANTA, JIO T. | BSIT |
| SAN PEDRO, KENNETH J. | BSIT |
| VITOR, PAULEN V. | BSIT |

This project proposal is entitled **GuideURSelf: A Mobile-Based Service Desk Solution for University of Rizal System**

Thank you for your usual support to the research program/s of the College.

Very truly yours,

**MARTHEA ANDREA O. DALUYON, DIT(CAR)**
Capstone Instructor

Conformed:

**NEIL RICHARD S. COLADA, DIT(CAR)**
Panel Chairman

## Appendix F

User Acceptance Testing Instrument

Republic of the Philippines
UNIVERSITY OF RIZAL SYSTEM
Province of Rizal
www.urs.edu.ph

Email Address: ursmain@urs.edu.ph /urs.opmorong@gmail.com
Main Campus: URS Tanay Tel. (02) 8401-4900; 8401-4910; 8401-4911; 8539-9957 to 58

*College of Computer Studies - URS Binangonan*

Dear Sir/Ma'am;

Greetings of Peace!

The undersigned are currently conducting a study entitled "GuideURSelf: A Mobile-Based Service Desk Solution for University of Rizal System" as part of their requirements to earn the Bachelor of Science in Information Technology at University of Rizal System Binangonan Campus

In line with this, may we request you to be one of the respondents to assess the user acceptance level of the developed system.

Your consideration and favorable action on the matter will be highly appreciated.

Very truly yours,

CORRALES, JOHN IRISH E.

ALVA, ERYN BREANNE B.

BANTA, JIO T.

SAN PEDRO, KENNETH J.

VITOR, PAULEN V.
**Project Team**

Noted:

**MARTHEA ANDREA O. DALUYON, DIT (CAR)**
Capstone Project Adviser

**User Acceptance Evaluation Questionnaire**
GuideURSelf: A Mobile-Based Service Desk Solution for
University of Rizal System

**Part I. RESPONDENT'S PROFILE**

Name (optional): _____ Campus: _____
Respondent: ☐ Student ☐ Faculty ☐ MIS ☐ IT Practitioners

**Part II. EVALUATION OF THE LEVEL OF ACCEPTABILITY**

**Instructions:** Using scale below, please put a check (✓) to indicate your answer on the following. Only one check is allowed per item.

**Legend;**
4 – Highly Acceptable
3 – Acceptable
2 – Moderately Acceptable
1 – Not Acceptable

| | | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| **1. Functional Suitability** | | | | | |
| **1.1** | **Functional Completeness.** The developed system covers all the specified tasks and objectives of the end users | | | | |
| **1.2** | **Functional Correctness.** The developed system provides the correct results with the needed degree of precision. | | | | |
| **1.3** | **Functional Appropriateness.** The developed system facilitates the accomplishment of specified tasks more precisely and objectives of the end users | | | | |
| | | | | | |
| **2. Performance Efficiency** | | | | | |
| **2.1** | **Time Behavior.** The develop system meets the requirements on its response and processing times and throughout rates when performing its functions | | | | |
| **2.2** | **Resource Utilization.** The developed system efficiently used the required amounts and types of resources when performing its functions. | | | | |
| **2.3** | **Capacity.** The develop system's maximum limits meet requirements of the end user | | | | |
| | | | | | |
| **3. Compatibility** | | | | | |
| **3.1** | **Co-existence.** The develop system can perform its required functions efficiently while sharing a common environment and resources with other system, without negative impact. | | | | |
| **3.2** | **Interoperability.** The develop system can exchange and use the information of other system. | | | | |
| | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **4. Usability** | | | | | |
| **4.1** | **Appropriateness Recognizability.** The developed system is appropriate for their needs of the end-user. | | | | |
| **4.2** | **Learnability.** The developed system enables specified users to achieve specified goals of learning to use the system with effectiveness, efficiency, freedom from risk satisfaction in a specified context of use. | | | | |
| **4.3** | **Operability.** The developed system is easy to operate, control and appropriate to use. | | | | |
| **4.4** | **User Error Protection.** The developed system protects users against making errors. | | | | |
| **4.5** | **User Interface Aesthetics.** The developed system's user interface enables pleasing and satisfying interaction for the user. | | | | |
| **4.6** | **Accessibility.** The developed system can be used by people with the widest range of characteristics and capabilities to achieve a specified goal in a specified context of use. | | | | |
| | | | | | |
| **5. Reliability** | | | | | |
| **5.1** | **Maturity.** The developed system meets needs for reliability under normal operation. | | | | |
| **5.2** | **Availability.** The developed system operational and accessible when required for use. | | | | |
| **5.3** | **Fault Tolerance.** The developed system operates as intended despite the presence of hardware or software faults. | | | | |
| **5.4** | **Recoverability.** The developed system can recover the data directly affected and re-establish the desired state of the system in the event of an interruption or a failure. | | | | |
| | | | | | |
| **6. Security** | | | | | |
| **6.1** | **Confidentiality.** The developed system ensures that data are accessible only to those authorized to have access. | | | | |
| **6.2** | **Integrity.** The developed system prevents unauthorized access to, or modification of, computer programs or data. | | | | |
| **6.3** | **Non-repudiation.** The developed system's actions or events can be proven to have taken place, so that the events or actions cannot be repudiated later. | | | | |
| **6.4** | **Accountability.** The developed system allows to traced the actions of an entity uniquely. | | | | |
| **6.5** | **Authenticity.** The developed system allows the identity of a subject or resource can be proved to be the one claimed. | | | | |
| | | | | | |
| **7. Maintainability** | | | | | |
| **7.1** | **Modularity.** The developed system is composed of discrete components such that a change to one component has minimal impact on other components. | | | | |
| **7.2** | **Reusability.** The developed system asset can be used in more than one system, or inbuilding other assets. | | | | |
| **7.3** | **Analyzability.** The developed system is effective and efficient in which, it is possible to assess the impact on a product or system of an intended change to one or more of its parts, or to diagnose a | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | product for deficiencies or causes of failures, or to identify parts to be modified. | | | | |
| **7.4** | **Modifiability.** The developed system can be effectively and efficiently modified without introducing defects or degrading existing system quality. | | | | |
| **7.5** | **Testability.** The developed system can establish criteria for the system to perform tests to determine whether those criteria have been met. | | | | |
| | | | | | |
| **8. Portability** | | | | | |
| **8.1** | **Adaptability.** The developed system can effectively and efficiently be adapted for different or evolving software or other operational or usage environments. | | | | |
| **8.2** | **Installability.** The developed system can be successfully installed and/or uninstalled in a specified environment. | | | | |
| **8.3** | **Replaceability.** The developed system can replace another specified software product for the same purpose in the same environment. | | | | |

# CURRICULUM VITAE

## JOHN IRISH E. CORRALES

155 J. Antiporda St. Lunsad, Binangonan, Rizal
zjohnirish.1205@gmail.com


## Educational Background

| | | |
|---|---|---|
| **College:** | University of Rizal System – Binangonan<br>**BS Information Technology** | 2022 - Present |
| **Senior High School:** | Binangonan Catholic College<br>**Science, Technology, Engineering, and Mathematics** | 2020 - 2022 |
| **High School:** | Binangonan Catholic College | 2016 - 2020 |
| **Elementary:** | Lunsad Elementary School | 2010 - 2016 |

## Organizations Affiliated

| | |
|---|---|
| **University Supreme Student Government (USSG)** | Inclusive date of Membership: 2022 – 2025 |
| **College of Computer Studies Student Body (CCSSB)** | Inclusive date of Membership: 2022 – 2025<br>Auditor, 2023 - 2024 |
| **i-Connect Student Society (ICSS)** | Inclusive date of Membership: 2022 – 2025<br>Project Manager, 2022 - 2023 |
| **Information Technology Students' League (ITSL)** | Deputy, 2022 - 2024 |

## Seminars and Trainings Attended

**Webinar on Introduction to UI/UX Designing using Figma** — October 14, 2022
Via Zoom

**iDesign: Multimedia 101** — February 10, 2023
University of Rizal System – Binangonan

**Cyberzone101: Networking's Square One** — February 10, 2023
University of Rizal System – Binangonan

**Embracing Catalyst Leadership: CCS Ignite the Future!** — November 10, 2023
University of Rizal System – Binangonan

## ERYN BREANNE B. ALVA

Kaytome, Binangonan, Rizal
erynbreannealva@gmail.com


## Educational Background

| | | |
|---|---|---|
| **College:** | University of Rizal System – Binangonan<br>**BS Information Technology** | 2022 - Present |
| **Senior High School:** | Janosa National High School<br>**Humanities and Social Sciences** | 2020 - 2022 |
| **High School:** | Janosa National High School | 2016 - 2020 |
| **Elementary:** | Kaytome-Gulod Elementary School | 2010 - 2016 |

## Organizations Affiliated

| | |
|---|---|
| **University Supreme Student Government (USSG)** | Inclusive date of Membership: 2022 – 2025 |
| **College of Computer Studies Student Body (CCSSB)** | Inclusive date of Membership: 2022 – 2025 |
| **i-Connect Student Society (ICSS)** | Inclusive date of Membership: 2022 – 2025<br>Graphic Artist, 2023 - 2024 |

## Seminars and Trainings Attended

| | |
|---|---|
| **From Concept to Prototype: Elevating UI Designing Using Figma**<br>Audio – Visual Room, University of Rizal System – Binangonan | November 8, 2023 |
| **Embracing Catalyst Leadership: CCS Ignite the Future!**<br>Function Hall, University of Rizal System – Binangonan | November 10, 2023 |
| **SAAS Simplified: Understanding the Basics of SAAS and Contrast from CSS**<br>via Google Meet | January 27, 2024 |
| **RICT Conference 2024: Navigating the Digital Frontier "Innovate, Integrate, Inspire"**<br>University of Rizal System – Morong | April 25, 2024 |
| **TechTrack: Empower Your Tech Journey Through Discovering Your Tech Stack**<br>via Google Meet | April 26, 2024 |

## JIO T. BANTA

Brgy. Pag-Asa, Binangonan, Rizal
bantajio22@gmail.com


## Educational Background

| | | |
|---|---|---|
| **College:** | University of Rizal System – Binangonan<br>**BS Information Technology** | 2022 - Present |
| **Senior High School:** | Angono National High School<br>**Science, Technology, Engineering, and Mathematics** | 2020 - 2022 |
| **High School:** | Angono National High School | 2016 - 2020 |
| **Elementary:** | Doña Justa Guido Memorial School | 2010 - 2016 |

## Organizations Affiliated

| | |
|---|---|
| **University Supreme Student Government (USSG)** | Inclusive date of Membership: 2022 – 2025 |
| **College of Computer Studies Student Body (CCSSB)** | Inclusive date of Membership: 2022 – 2025 |
| **i-Connect Student Society (ICSS)** | Inclusive date of Membership: 2022 – 2025 |

## Seminars and Trainings Attended

**Scrimba: Intro to Web Development with HTML, CSS, and JS** — October 2022
via Scrimba's platform

**Conquering Responsive Layouts** — May 20-22, 2023
via Kevin Powell's platform

**Scrimba: Intro to React Js** — May 20-22, 2023
via Scrimba's platform

**From Concept to Prototype: Elevating UI Designing Using Figma** — November 8, 2023
Audio – Visual Room, University of Rizal System – Binangonan

**Datacamp: Python for Beginners** — September 10, 2024
via Datacamp's platform

## KENNETH J. SAN PEDRO

Tatala, Binangonan, Rizal

kennethsanpedro1108@gmail.com


## Educational Background

| | | |
|---|---|---|
| **College:** | University of Rizal System – Binangonan<br>**BS Information Technology** | 2022 - Present |
| **Senior High School:** | Asian Institute of Computer Studies<br>**Information and Communication Technology** | 2017 - 2019 |
| **High School:** | Pag-Asa National High School | 2013 – 2017 |
| **Elementary:** | Joaquin Guido Elementary School | 2007 - 2013 |

## Organizations Affiliated

| | |
|---|---|
| **University Supreme Student Government (USSG)** | Inclusive date of Membership: 2022 – 2025 |
| **College of Computer Studies Student Body (CCSSB)** | Inclusive date of Membership: 2022 – 2025 |
| **i-Connect Student Society (ICSS)** | Inclusive date of Membership: 2022 – 2025 |

## Seminars and Trainings Attended

**Webinar on Introduction to UI/UX Designing using Figma** — October 14, 2022
via Zoom

**iBegin: Introduction to NodeJS** — November 16, 2022
via Zoom

**TeachTech Project: IT's Basic** — November 25, 2022
via Zoom

**iBegin pt. 2 : Explore with ReactJS** — November 8, 2023
University of Rizal System – Binangonan

**PAULEN V. VITOR**
Poblacion Ibaba, Angono, Rizal
paulenvitor@gmail.com

## Educational Background

| | | |
|---|---|---|
| **College:** | University of Rizal System – Binangonan<br>**BS Information Technology** | 2022 - Present |
| **Senior High School:** | Angono National High School<br>**Science, Technology, Engineering, and Mathematics** | 2020 - 2022 |
| **High School:** | Angono National High School | 2016 – 2020 |
| **Elementary:** | San Vicente Elementary School | 2010 – 2016 |

## Organizations Affiliated

| | |
|---|---|
| **University Supreme Student Government (USSG)** | Inclusive date of Membership: 2022 – 2025 |
| **College of Computer Studies Student Body (CCSSB)** | Inclusive date of Membership: 2022 – 2025 |
| **i-Connect Student Society (ICSS)** | Inclusive date of Membership: 2022 – 2025 |

## Seminars and Trainings Attended

**Introduction to GIT and GITHUB** — March 28, 2023
ROOM 217, University of Rizal System

**From Concept to Prototype: Elevating UI Designing Using Figma** — November 8, 2023
Audio – Visual Room, University of Rizal System - Binangonan