CoastGuardApp :An Online Service Portal for Philippine Coast Guard Auxiliary 505th Unit

A Research/Capstone Project

Presented to the Faculty of the

College of Computer Studies

MINDORO STATE UNIVERSITY

Calapan City Campus

Masipit, Calapan City, Oriental Mindoro

In Partial Fulfillment

Of the Requirements of Degree

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

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April 2024

CHAPTER I

INTRODUCTION

Project Context

This research project aims to develop an efficient online application system integrated with appointment interview functionality for the 505th squadron of the Philippine coast guard auxiliary. In the contemporary landscape, leveraging digital solutions is imperative for enhancing organizational processes. The proposed system will streamline the application process, allowing potential members to submit their information electronically. Moreover, the inclusion of appointment interview features will facilitate seamless communication between applicants and squadron representatives. The innovation not only aligns with modern technological trends but also contributes to the optimization of the recruitment process, ensuring a more organized and responsive approach for the 505th squadron.

In today's rapidly evolving landscape, the integration of digital solutions stands as a crucial pillar for refining and fortifying organizational processes. The focal point of this research initiative revolves around the development of an advanced online application system seamlessly woven with appointment interview capabilities, tailored explicitly for the

505th squadron of the Philippine Coast Guard Auxiliary. By embracing this innovative system, the aim is to revolutionize the traditional application process, empowering prospective members to efficiently submit their credentials and pertinent information through electronic channels. This shift towards a digitized platform not only transcends the constraints of paperwork and manual data entry but also signifies a pivotal step towards a more agile, responsive, and technologically aligned approach. The inclusion of appointment interview functionalities further amplifies this transformative endeavor, fostering seamless and direct communication channels between applicants and squadron representatives. Such integrative features promise a holistic and streamlined recruitment experience, wherein applicants can effortlessly schedule, manage, and partake in interviews, reducing logistical complexities and expediting the evaluation process. This innovation aligns harmoniously with contemporary technological trends, reflecting a proactive stance in harnessing digital advancements for the betterment of organizational efficacy. Furthermore, by optimizing the recruitment process, this initiative ensures heightened organizational efficiency and responsiveness, promising the 505th squadron a more structured, organized, and proficient approach to candidate assessment and selection.

Objectives of the Study

General Objective:

The General Objectives of this Study is to assess and enhance the efficiency and effectiveness of public services within the 505th Squadron of the Philippine Coast Guard Auxiliary through the implementation of web-based technological innovations and the development of an online application system.

Specific Objectives:

1. Develop and integrate a user-friendly online application system within the web application to streamline processes for membership, training, and event participation.
2. 2. Create a complete system on a website to oversee squadron tasks, training plans, and community engagement efforts. Gather input from 505th Squadron members through surveys or interviews to grasp their needs, hopes, and worries about using web tools for these purposes.
3. Enhance communication and engagement by implementing push notification features and feedback mechanisms within the web application.

Scope and Limitation of the Study

This research project aims to develop and evaluate the efficiency of the Online Application System designed exclusively for the 505th Squadron of the Philippine Coast Guard Auxiliary. The study encompasses a multifaceted analysis, including the system's functionality, user interface, user experience, technical performance, and its impact on organizational workflow, resource utilization, and decision-making processes within the squadron. Furthermore, it explores the Online Application System's capacity to streamline application processes, enhance data accuracy, and facilitate seamless communication between applicants and the squadron. User perspectives from both administrators and applicants will be considered, providing valuable insights for potential system enhancements. Importantly, this evaluation is delimited to the specified Online Application System of the 505th Squadron, excluding broader Coast Guard Auxiliary systems or other squadrons. Internal administrative processes beyond those directly associated with the online application system will not be addressed, ensuring a focused analysis of the system's role within the organizational structure. External factors influencing the squadron's overall functionality are also beyond the scope of this study.

Significance of the Study

The implementation of web-based technological innovations in public services for the 505th Squadron Philippine Coast Guard Auxiliary holds significance as it enhances accessibility, efficiency, and transparency. Online application systems streamline processes, reduce paperwork, and facilitate quicker responses, ultimately contributing to improved service delivery and operational effectiveness.

This Study holds significant implications for various stakeholders within the 505th squadron of the Philippine coast guard auxiliary:

1. **Applicants**

   Applicants stand to benefit from a streamlined and user-friendly application process. The online system enhances accessibility, allowing individuals to submit their applications conveniently. The appointment scheduling feature ensures a more organized and efficient interview process, contributing to an overall positive experience for applicants.

2. **Administrators and Recruiters**

   The study directly benefits administrators and recruiters by automating manual tasks associated with application processing and interview scheduling. This efficiency enables them to focus on higher-value aspects of the recruitment process, such as candidate evaluation and selection.

3. **505th Squadron Leadership**

   The leadership of the 505th Squadron gains improved oversight and control over the recruitment process. The

online system provides real-time data and analytics, facilitating informed decision-making. This contributes to a more strategic and effective approach to manpower planning and resource allocation.

4. Efficiency Gains

The study brings about efficiency gains for the entire recruitment process. By reducing paperwork, minimizing errors, and optimizing resource utilization, the squadron benefits from cost savings and improved operational efficiency.

5. Enhanced Professionalism

The adoption of a modern online application system enhances the squadron's professionalism and image. It showcases a commitment to embracing technological advancements, making a positive impression on both applicants and external stakeholders.

6. Identifying these specific individuals and groups underscores the multifaceted impact of the study, demonstrating how the proposed system positively influences various aspects of the recruitment process within the 505th Squadron of the Philippine Coast Guard Auxiliary.

Conceptual Framework

Figure 1 shows the concept of the study. It displays the input, output and process of Online Application System with Appointment Interview for 505th Squadron Philippine Coastguard Auxiliary (PCGA). The input includes the features offered of the system, next is the process that need to be done such as requirements analysis, system design, implementation, testing and deployment. As a result, the system will perform its design and purpose.

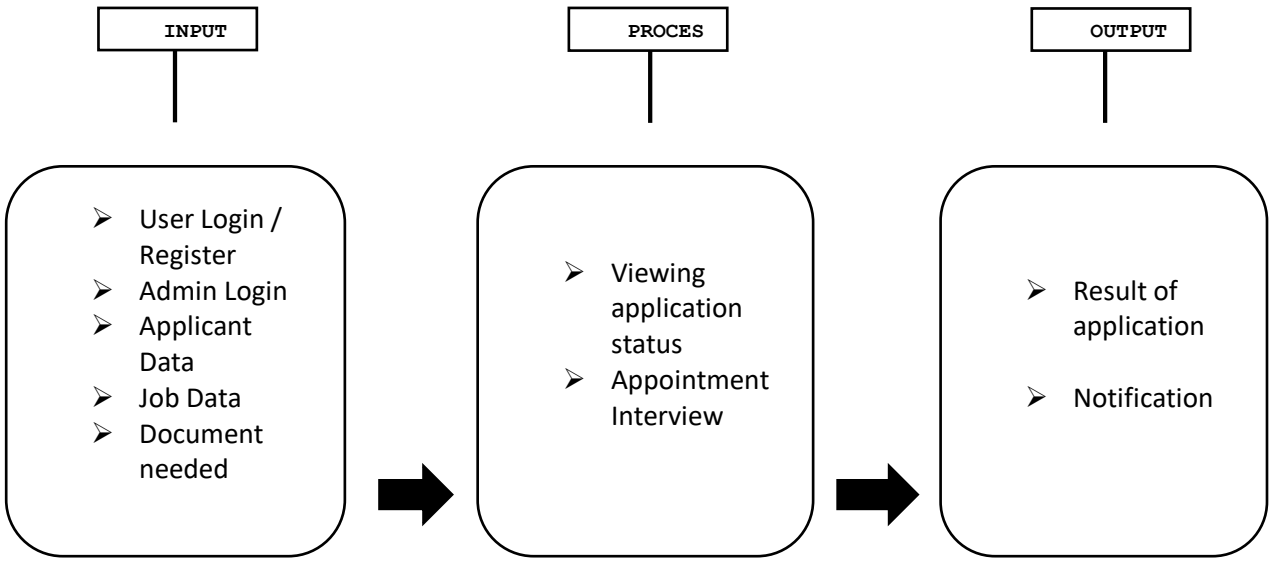

Figure 1. Conceptual Framework

Definition of Terms

For clarification, the important terms used in this study have been conceptually and operationally defined. The following terms are:

Web Application Development. Refers to the process of creating a software application that can be accessed through a web browser over the internet. In the context of the Squadron this involves building a specialized platform that handles various tasks related to processing applications.

Online Application Processing. Is the mechanism through which individuals submit their applications using web based forms and interfaces. For the Squadron this entails developing a system that enables submission, review and management of applications pertaining to Coast Guard Auxiliary activities.

505th Squadron of the Philippine Coast Guard Auxiliary. Is an unit, within the Philippine Coast Guard Auxiliary tasked with carrying out designated missions and activities. It is crucial to understand the requirements and operational context of this squadron in order to tailor the web application to its needs.

User Interface (UI). Encompasses all visual elements and interactive components of a web application with which users directly interact. UI design focuses on creating an user friendly

experience, for individuals using the application to submit or review applications.

User Experience (UX). Refers to the experience a person has when interacting with a web application. It involves factors such, as usability, accessibility and satisfaction. A positive UX is crucial for promoting user engagement and ensuring application processing.

Integration with Existing Systems. The seamless connection of the new web application with any existing databases, information systems, or processes within the 505th Squadron. Integration ensures a cohesive and efficient workflow without duplicating efforts or data.

Flexibility: The ability of the web application to handle an increasing volume of users, data, and transactions without compromising performance. Scalability is crucial for accommodating potential growth in the number of applications and users over time.

Feedback Mechanisms: Systems and features in place to collect feedback from users and stakeholders regarding he web application's functionality and performance. This feedback loop is essential for continuous improvement and user satisfaction.

Chapter II

REVIEW OF RELATED LITERATURE

The Philippine Coast Guard Personnel played a vital role on both the land and water, with its main responsibilities being the protectors of marine resources, the environment, and the lives and property at sea, as well as aiding in the enforcement of maritime laws under Philippine Jurisdiction. Their experiences in carrying out their duties include a variety of activities and problems. Each time they face harsh weather and tough situations in order to save lives and respond to distress calls, they risk their personal safety, witness difficult circumstances, and reap the benefits of supporting others in need throughout their lives. Their training, expertise, and commitment enable them to overcome challenges and carry out their responsibilities as Philippine coast guardians. The study explored lived experiences of the Philippine Coast Guard Personnel in performing their functions. The study included ten (10) personnel of Philippines Coast Guards participants of the study. This study was conducted during face to face interviewed. Results showed that the four (4) main themes based on the responses of the respondents such as: Family Centeredness, Sense of Service, Performing Challenging Duties and Responsibilities and Dealing with the Challenges. The personnel of Philippine

Coast guard were continuously performing their duties and responsibilities for the safety of community travelers and living species in sea. Thus, safeguarding the sea and keeping citizens safe in voyage is evident that the personnel of Philippine coast guard were diligent in doing their duties and responsibilities.(May S. Abad et al., 2023). A webGIS application is proposed that is able to assess the intensity of conflicts among marine activities; the area of the Cyclades in the Aegean Sea was used as a case study. The webGIS application allows the visualization of existing activities, the delineation of conflicting activities, the detection of areas where multiple conflicts co-exist, and the delineation of areas of conflicts based on specific criteria. The webGIS application is available via a user-friendly interface as well as allowing interaction with users by providing them the opportunity to comment on the results and/or exchange ideas with other users of various groups; therefore, the participatory process, a creative stage in MSP, is further supported. The usefulness of such tools in coastal and marine planning and the decision-making process are further discussed.(Patera & Pataki, 2022). An online interview platform is an Internet-based tool offering a virtual environment for remote interviews among geographically dispersed participants. Remote conferencing minimizes travel expenses and the time taken to set up face-to-face meetings, and can be put to good use

during a COVID-19-like pandemic with its strict protocols. These factors have driven the worldwide shift to web-based interviewing tools. The virtual video conferencing platforms that exist, though ideal for video conferencing, are not adequate enough to handle interviews. This is because they are unable to test the competency of a candidate to the fullest and, further, have no means to check malpractice. (Kathiravan et al., 2023). The author has found a variety of results concerning the relationships between the use of social media platforms and the success factors of online recruitment. It should be noted that individuals who are more likely to intensively use social media platforms tend to have different views about websites offering online recruitment services. Hence, the study participants are likely to share similar perceptions concerning the efficiency inherent in the online recruitment process as well as in their intentions to use such platforms and tools. It should be noted here that while the majority of the participants held a positive attitude towards online recruitment, they preferred to not use professional social media platforms, such as LinkedIn. (Alainati, 2022)

In this paper, we focused on the problem of missing database constraints in web applications with resulting data integrity issues and the feasibility of extracting the missing database

constraints from the application code. Specifically, we first conducted an empirical study on missing constraints in five popular web applications. Then we designed and implemented a tool that identified 210 previously unknown missing constraints with reasonable accuracy from eight widely-deployed web applications, including one commercial company with millions of users. We have reported 92 of them to the developers of these applications, so far 75 of them are confirmed. (Shen & Zhou, 2023). Social networking sites are web-based services that allow users to create profiles, view a list of available users, and invite or accept friends to join the site. The basic appearance of this social networking site displays the user's profile page, which consists of the user's identity and photo. The emergence of this social networking site was initiated by an initiative to connect people from all parts of the world. Many social networking sites have sprung up lately, such as Friendster, My Space, Twitter, Facebook, and so on. But at this time, the most popular social networking site is Facebook; according to the alexa.com site, Facebook is in the top three most frequently accessed sites and is the number one site most frequently accessed among other social networking sites. (Sutabri, 2023). The article begins with overview of two Web applications classifications (generalized and with emphasis on business services). As result, capabilities of these applications are

defined and examples are given. The main benefits of using Web applications are also listed. Thus, this article discusses stages of development of Webapplications, formulates main tasks that arise during development and describes ways to solve them. During review of problems in development of Webapplications, we note that initially it is necessary to analyze goals of project and functions that will be offered to user. (Sotnik et al., 2023)

In this paper we elaborated in Web Content Management System based Web Engineering with a strong focus on the reusability of components in software product lines. From structuring goal elicitation with the problem frames approach it can be concluded that eliciting WCMS requirements in e-Business starts from identifying the e-Business model of the web initiative and goals are set for the required user operations in the WCMS. Having the knowledge of both the available software solutions in the product platform of the WCMS and the objectives from a e-Business strategy, the requirement engineer could use this as the starting point to prioritize requirements by applying reusable software for best-practice strategy. A remark should be made that many organizations do not explicitly apply their eBusiness model in requirements engineering. We do believe that we have found a useful solution to improve WCMS-based Web Engineering, but further validation and real-life cases should provide more data.

Further research includes applying these models in other vertical markets to identify software commonalities. Also it might be interesting to investigate how the atomic e-Business models can help understand the reuse of product software components in other software domains. (Of, n.d.). The manual approach to tool management has several issues, including inaccurate reporting, unmonitored tool conditions, and errors in calculating the number of units or tools. These issues can have a significant impact on inventory management and overall agency operations. Therefore, a computerized tracking tool inventory system via a mobile software application can significantly improve inventory management and enhance the performance and provision of institutional services.(Castilla, 2023). Based on the performance model, we explore ways that it can assist various system management functions for online services. First, we examine component placement and replication strategies that can achieve high performance with given hardware resources. Additionally, our model can be used to estimate resource needs to sup- port projected future workload or to analyze the cost-effectiveness of hypothetical hardware platforms.(Stewart & Shen, n.d.). Database-backed web applications persist a large amount of production data and have high requirements for integrity. To protect data integrity against application code bugs and operator mistakes, most RDBMSes allow application

developers to specify various types of integrity constraints. Unfortunately, applications (e.g., e-commerce web apps) often do not take full advantage of this capability and miss specifying many database constraints, resulting in many se- vere consequences, such as crashing the order placement page and corrupting the store inventory data(Shen & Zhou, 2023). The Internet has penetrated into all spheres of life and is rapidly gaining momentum. The Internet allows person to access information anytime and anywhere. In this case, various methods and approaches that are used in various areas of research can be used. Web-applications are modern information systems that provide some information services on Internet, Web- applications are interactive and usually allow users to interact with different elements. So, Web-applications allow businesses to streamline their operations, increase efficiency, and reduce costs. Since impact of global computer network Internet on modern world has no analogues, and Web-applications have wide scope and are easily accessible from any place, features topic of their development is relevant.(Sotnik et al., 2023)

Our Online Interview Platform, a web application built using Node.js and Express.js, offers indispensable features that are prerequisites for an interview. These include a real- time collaborative code editor that uses an operational

transformation algorithm which allows users to collaborate in real time, test and run code; a video/audio conferencing feature using Peer JS; a chat box for communication, and a real-time collaborative whiteboard that lets users design or draw diagrams. The features are included in the same tab, thus ensuring that the candidate does not switch tabs. Using this application, candidates will be screened based on their technical knowledge, appropriately assessed, and performance-based hiring decisions made. The proposed approach proved that the mal- practices strictly restricted while comparing with existing approaches.(Kathiravan et al., 2021). Online appointment management system is one of the support tools that can help organization to manage and improve customer services. As a result, appointment systems have become useful tools for managing their clients' appointments and schedules. Thus, in this study, a web-based appointment management system is proposed. The system took into account environmental factors, sequencing rules, and appointment rules (priority rule). The goal of this system is to assist organizations or service providers in maintaining greater operational and staff productivity, by assisting them in maintaining control over the arrival flow and customer traffic on the premises. The functional specifications for the system were acquired through a search of relevant literature and already-existing web-based applications. The prototype was

developed based on the specifications. The prototype was then put through a usability evaluation. The results demonstrate that the functionalities for managing appointments supplied by the web-based appointment system were satisfactory to the respondents.(Norazra et al., 2022). The new generation of security threats has been promoted by real-time applications, where several users develop new ways to communicate on the internet via web applications. Structured Query Language injection Attacks (SQLiAs) is one of the major threats to web application security. Here, unauthorized users usually gain access to the database via web applications. Despite the giant strides made in the detection and prevention of SQLiAs by several researchers, an ideal approach is still far from over as most existing techniques still require improvement, especially in the area of addressing the weak characterization of input vectors which often leads to low prediction accuracy. To deal with this concern, this paper put forward a hybrid optimized Logistic Regression (LR) model with Improved Term Frequency Inverse Document-Frequency (ITFIDF-LR). To show the effectiveness of the proposed approach, attack datasets is used and evaluated using selected performance metrics, i.e., accuracy, recall, specificity and False Positive Rate. The experimental results via simulation when compared with the benchmarked techniques, achieved performance record of 0.99781 for accuracy, recall and

F1-score as well as 0.99782, 0.99409 and 0.00591 for precision, specificity and False Positive Rate (FPR) respectively. This is an indication that the proposed approach is efficient and when deployed is capable of detecting SQLiA on web applications.(Magawata et al., 2022). Web platforms, both mobile and desktop, have become an increasingly popular and essential tool for performing these tasks. Embracing advances in web browser technology provides the means for creating scalable molecular graphics and analysis tools with near-instant access to any available data. Web-based tools are platform-independent and require little or no local software installation, making them available to virtually everyone in both the scientific and non-scientific community, reaching an audience larger than ever before. Moreover, these technologies (most notably JavaScript, HTML and WebGL and their surrounding ecosystem (including Node.js, TypeScript, GitHub offer good support for the development of modular libraries and components. In summary, the web provides a unique opportunity to develop a common library and a set of tools for accessing, analyzing, and visualizing macromolecular data.(Sehnal et al., 2021). As the world became more digitally advanced, and therefore intertwined, the complexities of our systems increased. The complexities of our systems rapidly growing suggests that the risk and vulnerabilities of our systems increase as well. Therefore, as

ships became and continue to become more technologically advanced by adopting automation through computers and storing data on ship's server networks, this has introduced more complexity.(Montvydas & Engineering, 2023). As web technologies become more ubiquitous web development subfields such as full-stack, frontend and backend engineering, product and user-experience design, and web accessibility continue to emerge and expand. These roles require general web development knowledge and skills as part of day-to-day job functions. According to the Bureau of Labor Statistics, general knowledge and skills are centered around graphic design and web development programming languages Projections by the U.S. bureau of labor statistics predict significant growth for Web Development and Web Development–adjacent jobs in the next decade. However, persons with disabilities are still significantly underrepresented.(Kearney-volpe et al., 2021). Notification tools can be useful in improving adherence to follow-up imaging test completion,10,11 highlighting the importance of exploring alternative methods of notifying providers of the need for follow-up. In particular, a centralized system which maintains a database of outstanding incidental findings and allows for multiuser management over time would solve many of these issues, as it would not rely on variable individual workflows. When integrated into an existing EMR, these systems can relay follow-

up recommendations to physicians, either directly or with the assistance of a quality improvement team monitoring the database. Systems which effectively extract information from unstructured free-text documents using natural language processing (NLP), rather than requiring clinicians to over-structure data at the time of input, can augment existing workflows and provide the back- bone for these centralized results management tools.(Bala et al., 2020). Considering the Philippine Coast Guard's various mandates and the challenges brought by the dynamic changes in the maritime environment, there is a need to enhance and equip its personnel with vital knowledge, skills, and competencies. However, these cannot be achieved successfully without the faculty members performing their roles in the educational context. It is vital to train and develop them, and professional instructors or educators must handle them. Moreover, establishing the Philippine Coast Guard Academy is one of the reasons why this research is imperative. At the inception of the said academy, there should be a faculty development program in place as part of the education and training system and career development growth, which contributes to the quality of personnel serving the maritime environment. The faculty development program will enable instructors or educators to become more professional in adapting to changing environments such as technological advancements and help the Philippine coast guard

achieve its vision of becoming a world-class coast guard by 2028.(Faycho-Bangayan, 2022).

This research provides suggestion to the hospital to construct the appointment system, take attention of patient flow and set scheduling of the capacity to increase the effective and efficiency outpatient department performance. The most suitable appointment system for outpatient is using no-show. The condition that affect patient waiting times are the physician come on call, go show patient, no proper calculation of the room capacity, the number of physicians and the number of sub-specialists. This research is a preliminary study that analyzed each variable separately. Analysis was performed to confirm that the waiting time targets not met the minimum service standard of hospital.(Mardiah & Basri, 2020). Online appointment scheduling systems have been designed in response to the problems of the traditional ones. In Iran, most outpatient clinics and our study population suffer from high patient' no-show rate and long waiting times because of not using online appointment scheduling system. In this study, the effect of an online appointment scheduling system was investigated by comparing the evaluation metrics of appointment scheduling before and after the intervention. This before-after pilot study was conducted on ten outpatient clinics with different specializations. Five clinics

were selected as the intervention group and five clinics as the control group. A checklist was designed to evaluate appointment scheduling metrics. These checklists were completed from April to July 2017 in the pre-implementation phase and from September to December 2017 in the post- implementation phase. Online appointment scheduling systems have been designed and implemented in response to the barriers and problems associated with the traditional ones.(Reza et al., 2019). Despite a major increase in the range and number of software offerings now available to help researchers produce evidence syntheses, there is currently no generic tool for producing figures to display and explore the risk-of-bias assessments that routinely take place as part of systematic review. However, tools such as the R programming environment and Shiny (an R package for building interactive web apps) have made it straightforward to produce new tools to help in producing evidence syntheses. We present a new tool, robvis (Risk- Of-Bias VISualization), available as an R package and web app, which facilitates rapid production of publication-quality risk-of-bias assessment figures. We present a timeline of the tool's development and its key functionality.(Mcguinness, 2020).

Chapter III

METHODOLOGY

This chapter presents the methods and strategies used in this study in order to develop an approach that matches its objectives. It was obtained using different processes, specifications, analysis, data gathering instruments and evaluation that guide the researchers to manage and control the research.

Development Method

This study utilized quantitative as a research design, this design produces logical, statistical and unbiased findings. Data was collected in an organized manner and on larger samples that were representative of the total population. Quantitative research collects information from existing and potential customers using sampling methods and sending out online surveys or questionnaires, the results of which can be depicted in the form of numerical. After careful understanding of these numbers to predict the future of a product or service and make changes accordingly.

Figure 2. Iterative Model

Planning. In this phase, researchers conduct interviews and observations according to the problem that needed to be resolved. Researchers developed the objectives and plans of the project that serves as the foundation to produce the desired output of the system at the end of the study.

Requirements Gathering. In this phase, researchers will gather more information and data requirements needed for the development of the system. Also, determine the functional and non-functional requirements of the project.

Design. During this phase, researchers will begin to design the hardware and software of the system according to the requirements of the users. The developer will thoroughly plan and implement trial and error to be able to meet the desired output of the user interface.

Development. During this phase, researchers will start the coding process for the functionality of the system through Visual Studio Text Editor Application and PhpMyAdmin as administrator tool for the

database, wherein database will serve as data storage of the system and CodeIgniter 4 as the framework of the proposed system.

Testing. In this phase, researchers will execute the pre-deployment of the system for trial and error just to see if the device is properly functioning.

Implementation. In this phase, researchers will create the iteration of the project after the testing process in order to analyze and improve the design and functionality which needs more improvements to meet the project objectives.

Maintenance. In this phase, researchers must maintain the functionality of the system during deployment to maintain its performance. Also, researchers will determine and fix the errors that may occur over a period of time.

Gantt Chart

The table below represents the schedule and plan of the development of the system. The Requirements Phase was scheduled for the month of November 2023 with the task will to be completed. The design of the system was completed in the month of December 2023. The Implementation Phase was scheduled for the whole month of _____ with the tasks to be completed. The development of our project was from November - _____, the remaining months is for testing phase and deployment.

Table 1. General Gantt Chart

Task Name	Task Date																			
	Oct				Nov				Dec				Jan				Feb			
	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2		Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4
1.Planning																				
1.1 Conduct an interview																				
1.2 Define project objectives																				
1.3 Define project plan																				
1.4 Approval of project plan																				
2.Requirements Gathering																				
2.1 Data Collection																				
2.2 Functional																				
2.3 Non-Functional																				
3.Design																				
3.1 Frontend software design																				
4.Development																				

4.1 Back-end coding																			
5.Testing																			
5.1 Functionality testing																			
5.2 User interface testing																			
6.Implementation																			
7.Maintenance																			
7.1 Project monitoring																			
7.2 Resolve system errors																			

Requirements Specifications

The user must meet the required functions of the system in order to fully use the system. This includes the functional requirements, user interface, software interface, hardware interface and security interface. Users must familiarize themselves with the processes and procedures of the system.

Functional Requirements

Functional requirements define how the system works and how it should be worked to function properly to avoid unnecessary events happening. This part will discuss the presentation of the system, this can be reviewing the process and how the data are operated to produce or create a functional output. It is important to discuss the functional specification of the proposed system for the benefit of the future researchers.

Table 2 . Functional Requirements

Features	Description
1. **Activities**	Allows User to access the navigation button for activities to look for some information about the tasks, duties, and responsibilities that individuals working in the public sector are involved in as part of their job.
2. **Services/Program**	Allows user to access the website to see the services or program that Philippine coast guard has.
3. **Statistical Data**	This Features here you can see the quantity of those who have been hired per year and monthly.
4. **Push Notification**	This Feature will provide a reminder through a text that contains important information.
5. **Online Application**	Allows User to Access the website for applying purposes.

Table 2 shows that the Online Application System with Appointment Interview For 505th Squadron Philippine Coastguard Auxiliary (PCGA) with features consists of Activities, Services/Program, Statistical Data, Push Notification, Online Application.

User Interface

The user interface is also a significant part of the project because it facilitates interaction between the user and the program. The user interface for the created system is depicted in the tables below. Each discusses the description given and assisted the reader in visualizing the project as a whole.

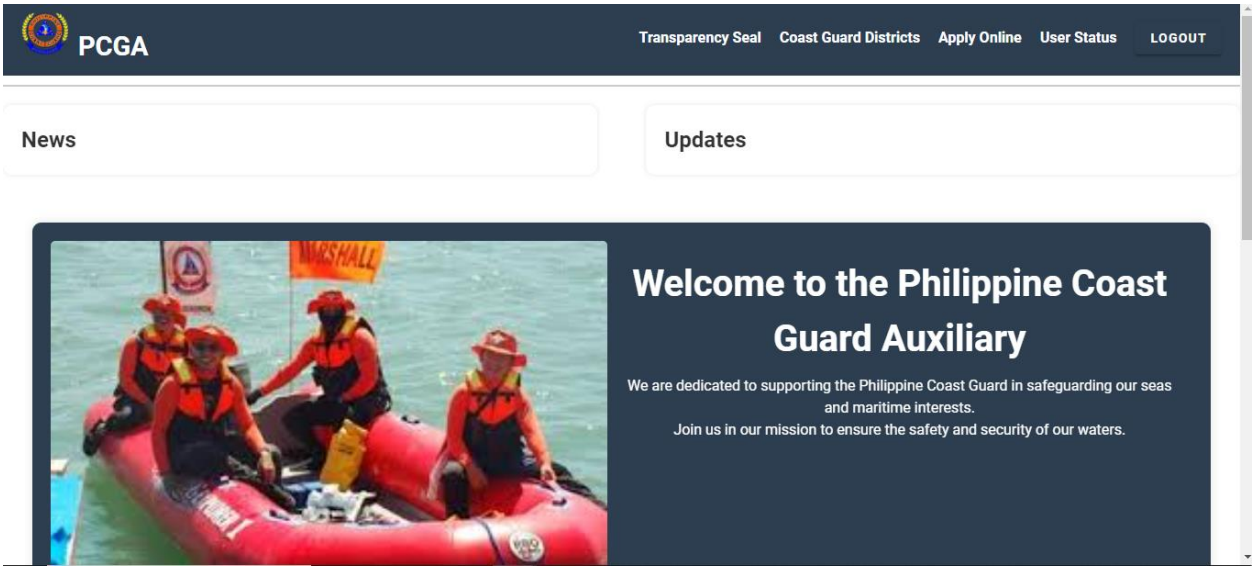

Figure 4. User Interface

Hardware Interface

The hardware used in this project follows the required specifications in developing this system. The hardware interface included in this method defines the logical and physical characteristic of each interface between the software product and the hardware component of the system. The proponents used an Intel (R)core (TM)i3 Random Access Memory and a hardware of 512 GB storage that would be sufficient for the storage of the OS, databases, files, and other important things to be used.

Software Interface

The software interface is the one of the most important interfaces because it describes the difference between the system and other software components (name and version) including database, operating system, tools, libraries, and integrated commercial components. The proponents used different applications such as Php, MySql server for database management for the web application we PHP scripting language, CSS, Bootstrap, Ajax, HTML language.

Security Requirements

Before determining if the program is secured, the researchers first determined exactly what a security requirement is all about. The researchers ensured that the system is accessed only by authorized persons. Through username and password, the admin and users can have access to the system.

Technical Background

The technical background gives important information regarding technical aspects of the project which makes it easier to define what is required in easy-to-understand words for

developers. The next sections go over hardware and software specifications.

Hardware Specifications

Hardware Specifications refers to the technical descriptions of the hardware items, its components and capabilities. Table 3 below presents the different hardware components to be used for the completeness of this project.

Hardware	**Functions**	**Specification**		**Unit**
		Minimum	**Recommended**	
Computer/Processors	Computers and Servers, it is Use for hosting the software applications. Adequate processing power, memory, and storage capacity.	**Intel (R)core (TM)i3 -7020U CPU**	**I3 and above of versions**	**1**
RAM	It serves as a type of volatile computer memory that is used to store and provide quick access to data that is actively being used and	**2gb**	**4gb**	**2**

	processed by a computer's CPU (Central Processing Unit).			

Software Specifications

Software Specification refers to the representation of the software used by the system. The researchers recommend installed Excel File, medium to fast internet connection and any form of search engine to search for the website. Table 4 below also presents the other software specifications to be used by the project.

Table 4. Software Specification

Software Used	**Minimum Specification**	**Recommended Specification**
Operating System	Windows 7 or macOS 10.12	Windows 10 or latest
Visual Studio Code	Visual Studio Code 1.50.0	Latest stable version of Visual Studio Code
CodeIgniter	CodeIgniter 3.1.11	CodeIgniter 4.4.3
Axios	Axios 1.2.1	Axios 1.6.2
Vue	Vue 2.0.0	Vue 3.0.0
Vue-router	Vue-router 3.0.0	Vue-router 4.0.0
PhpMyadmin	PhpMyAdmin 4.9.0	PhpMyAdmin 5.2.1
Laragon	Laragon 4.0.16	Laragon 5.2
Brave	Brave Browser 1.15.72	Brave Browser v1.61.100
GitHub	Access to GitHub	Git client installed

	through a web browser	(e.g., Git Bash) for advanced version control features
WebSpy	WebSpy 2.0.0	WebSpy 3.0

As shown on the Table 4, the proponents used a variety of applications, including PHP for a programming language and CodeIgniter for the framework used by the researchers, Wamp Server for the database, and google chrome for browser. The researchers also employed a 64-bit operating system that could handle the researcher's system project.

System Analysis and Design

System analysis and design are concerned with the planning and development of information systems by understanding and specifying in detail what a system should perform as well as how the system's components should be implemented and work together

System Overview

Online Application System with Appointment Interview For 505th Squadron Philippine Coastguard Auxiliary (PCGA) is an online website that provides services for coastguard operations for a service needed. It provides a function that allows the user to apply online, where they can fill out the form that will contain their important information such as name, age, gender, address and all the needed information from the users. It is a

website where you can see the PCGA coastguard auxiliary details including their mission, activities and events. The system helps the admin to see all the users who access or use the system, also can sort the users and admin can decide whether they will accept or reject the application. Only the admin can access the dashboard side where you can see everything that the user input. In general, the system can help the office staff to manually check and sort the users who are applying to them. This system is available to all users who want to browse or know more about PCGA Coastguard Auxiliary and also who will apply online. This online website is available through Windows platform.

System Architecture

A system architecture shows the representation and structure of the system.

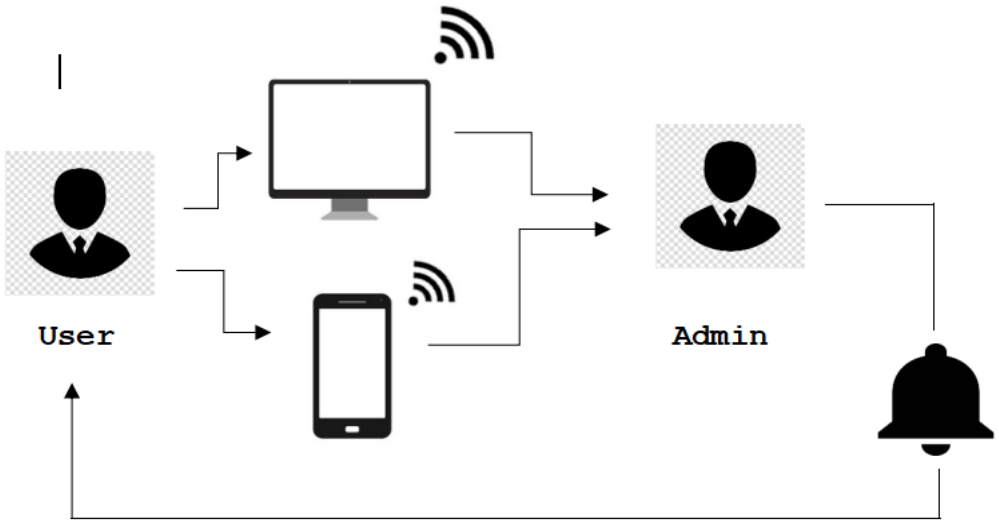

Figure 4. System Architecture

This figure shows the process on the website the user can access the website through online, they can also apply here if they want to become a member of the PCGA they can set a date when they are available if they have been hired and need to be interviewed. This component manages the appointment interview process. It includes features such as appointment ,calendar, push notification and chat system, applying through online will help make our application easier by setting the appointment interview users have the freedom to choose when they are not busy and when they are available for the interview push notification gives us the alert for important information via SMS.

Use Case Diagram

A representation of a user interaction with the system and depicting the specifications of a use case. A use case diagram can portray the different types of users of a system and the various ways that they interact with the system.

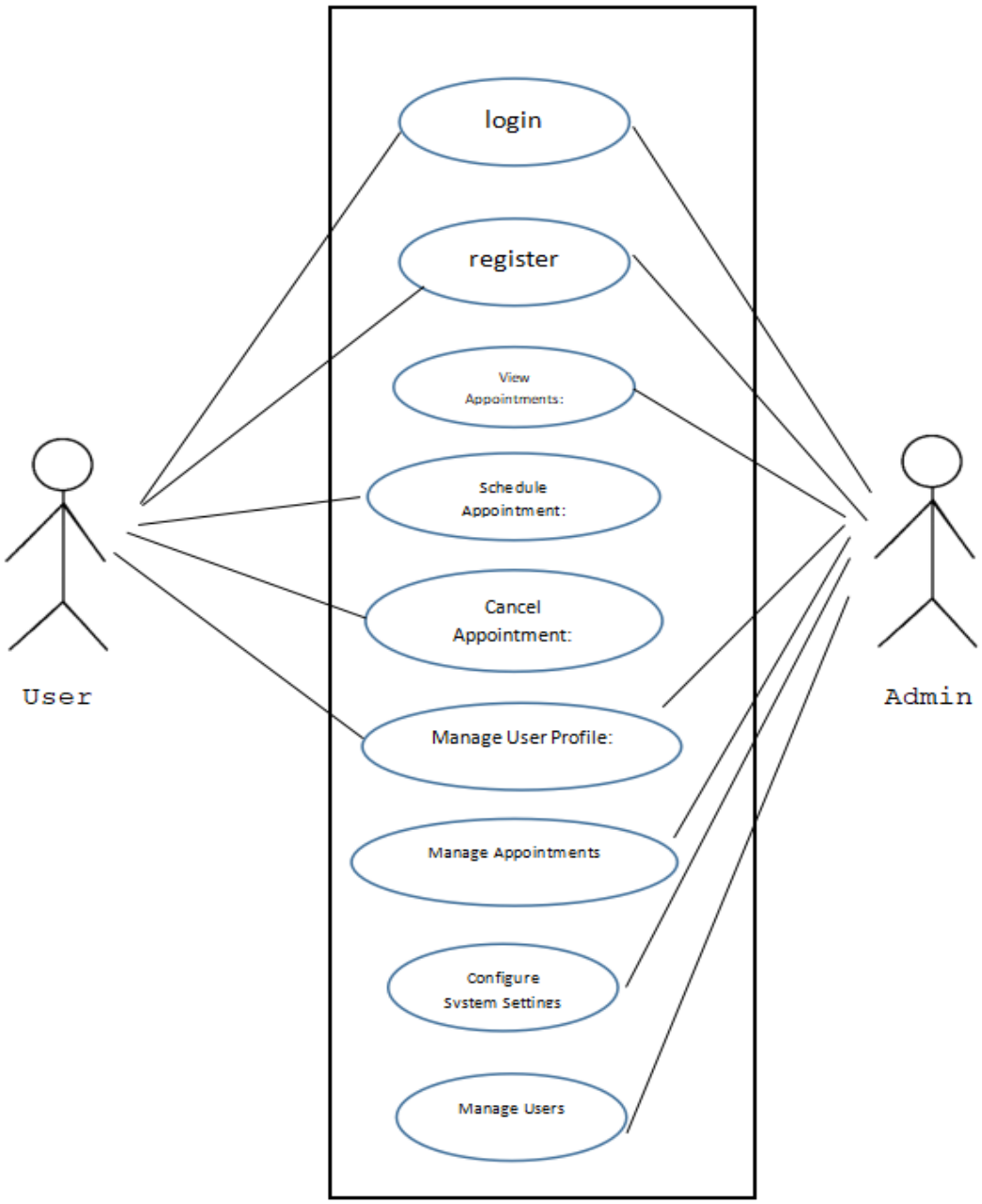

Figure 5. Use Case Diagram

The Figure 5 shows the use case diagram for the proposed appointment management system, the Admin has the authority to Manage Users, allowing them to perform various tasks related to user management. Additionally, the Admin can Accept/Reject Appointments, providing the capability to approve or reject

appointment requests initiated by users. Furthermore, the Admin is equipped with the functionality to Manage Profiles, enabling them to handle user profile-related actions. On the user side, individuals can interact with the Appointment Management System by Applying on the PCGA Application, signifying the process of applying for an appointment through the designated application. Users also have the ability to Manage their Account, allowing for the customization and maintenance of their account details. The user-initiated actions include Scheduling Appointments for new meetings and Cancelling Appointments for previously scheduled sessions.

Activity Diagram

This part of the document presents the flow of the project using an object-oriented flowchart. Its purpose is to capture the dynamic behavior of the system. It focuses on the execution and flow of the behavior of a system instead of implementation.

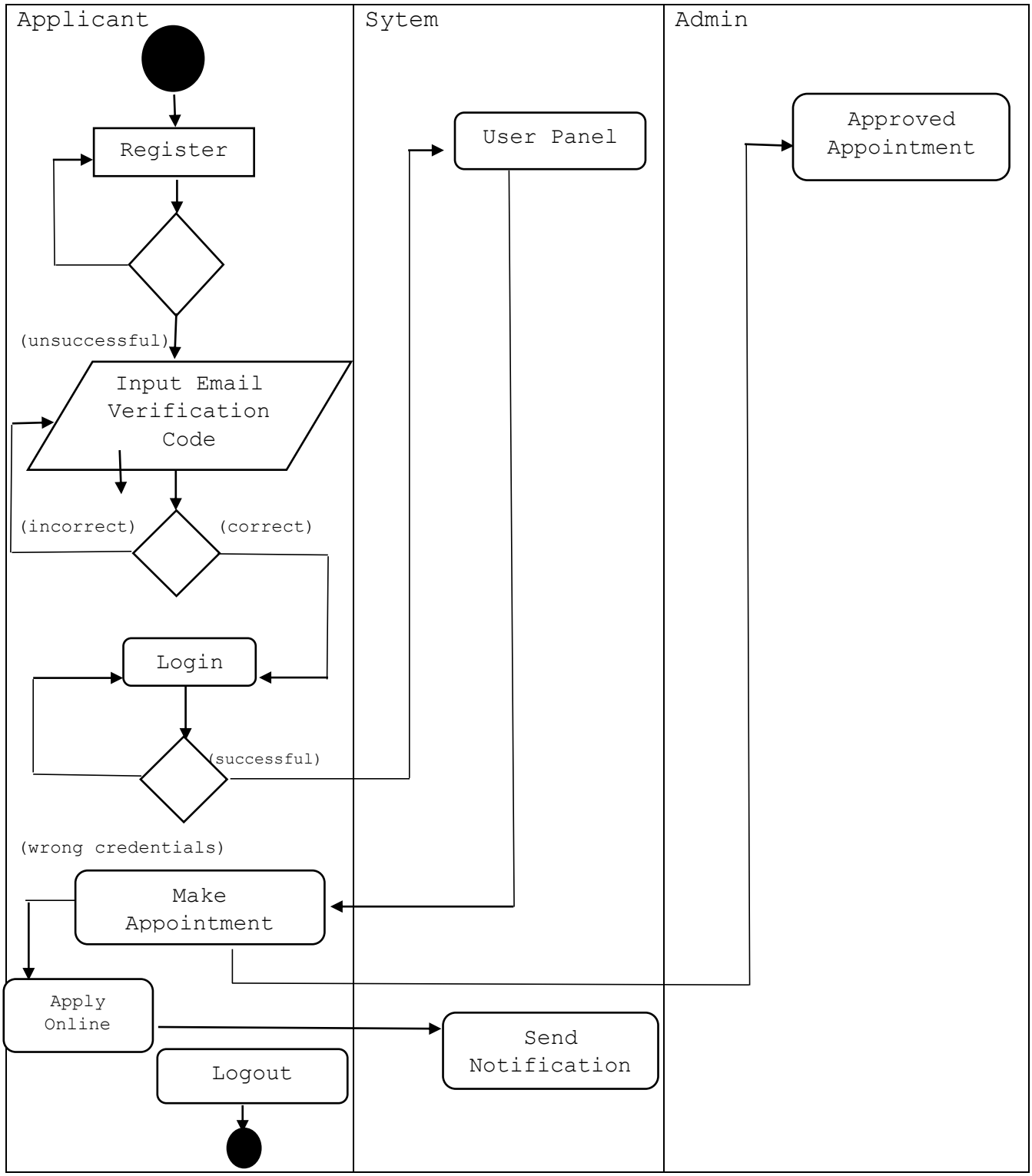

Figure 6. Activity Diagram

Figure 6 shows, the activity diagram of the system wherein the users will sign up/create an account on the system, verify

their email address through email verification and access their created account by logging in on the system using their registered credentials. The user can make an appointment, apply online, track the status of their application.

Data Flow Diagram (DFD)

The data flow diagram is like a map that shows the flow of information for any processes of the system. From here, the context diagram and diagram 0 are discussed.

Context Diagram

This presents the basic overview of the whole system or process being analyzed.

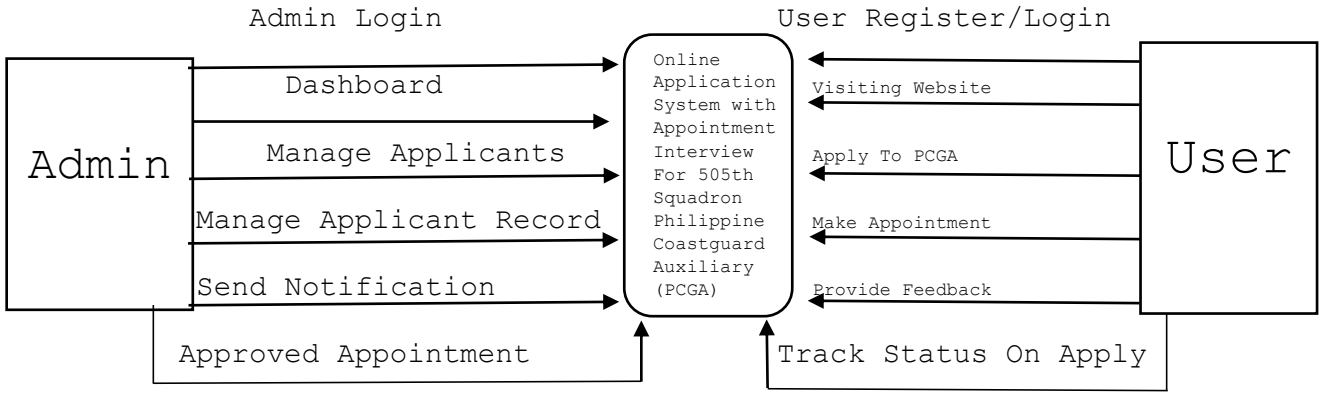

Figure 7. Context Diagram

Figure 7 shows the development on how the proposed system will work and function in respective areas that they are designed to work on.

Diagram 0

The Diagram 0 of Online Application System with Appointment Interview shows the flow of information to visualize the processes of the project.

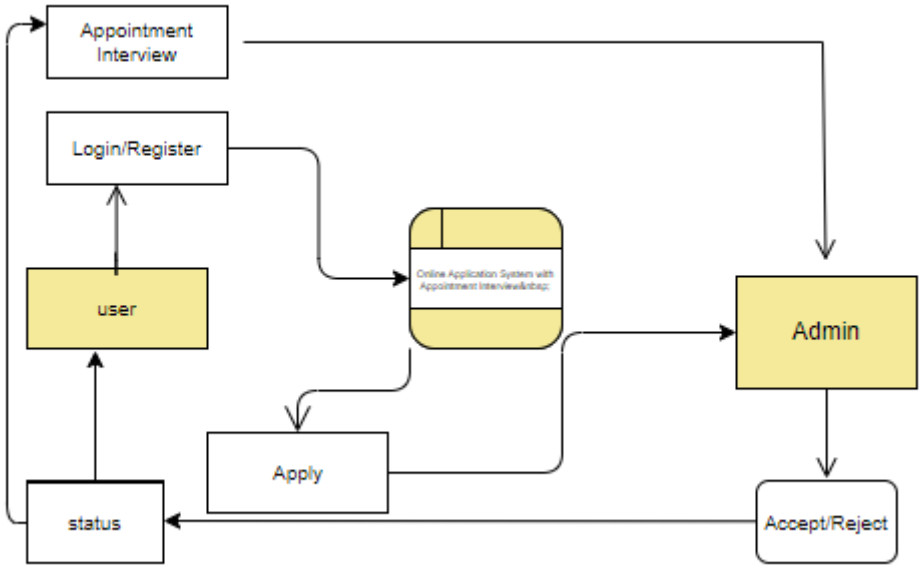

Figure 8. Diagram 0

This figure is diagram 0 of the system and it shows the whole data system of the project and emphasizes the way it interacts with the external entities.

Database Schema

System design was an important stage in the study's development. This phase displayed the properties of the entities in the system. This allows the user to view the attributes of existing entities. It describes the data from the study.

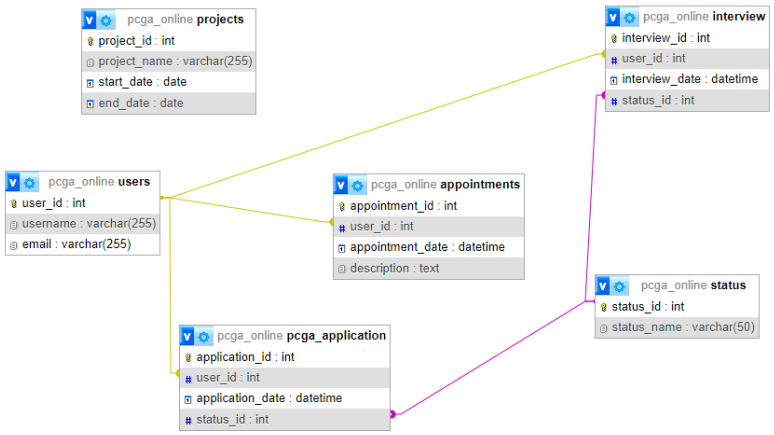

Figure 9. Database schema

The diagram illustrates the overall structure and interrelationships of various tables within the database. It depicts how the tables are interconnected using primary keys and foreign keys, which creates a relationship between them. The primary key serves as a unique identifier for each record in the table, while the foreign key creates a link between tables by referencing the primary key of another table. The diagram provides a visual representation of the database schema and the relationships between tables, which allows for efficient data manipulation and maintenance while ensuring data consistency and accuracy.

Testing and Evaluation

This section is referring to the testing and evaluation phase of the software development process. During this phase, developers are required to conduct tests on their system to 49 determine its capabilities and limitations. This will allow them to identify any issues or potential problems prior to the production and deployment stages. The tests should include all the requirements outlined in the Requirements Phase, such as design, performance, supportability, etc. The results of these tests will be evaluated to assess the progress of the system and ensure it meets the requirements of the project. The developers considered the following:

1. Unit Testing- a type of software testing where individual units or components of a software system are tested. This type of testing is usually done by the developers, as it requires detailed knowledge of the internal structure of the system. Unit Testing is designed to test individual functions, modules, and features of the system, to ensure that they all behave as expected

2. Component Testing- involves testing the individual components of the system (modules, classes, objects, and programs) in isolation, without integrating them with other components. This helps to identify any defects or bugs in the

individual components before they are integrated into the system. It also helps to identify any unexpected interactions or dependencies between components that could cause problems or errors in the system. 50

3. System Testing- a type of software testing that evaluates the entire system or application and its components to verify that all individual modules are working properly and that data is transferred accurately between modules and the entire system. System testing is meant to ensure that the system meets its requirements, performs as expected, and functions correctly in its intended environment. It is an overall test of the system and its components, and it is typically done after unit and integration testing.

Participants of the Study

The respondents to the study were composed of the manager of PCGA, staff, customer, and IT Experts.

Table 5. Respondents of the Study

Respondents	Number of Respondents
Manager	1
IT Experts	2
Applicants	20
TOTAL	**23**

Table 5 shows the respondents of the study, including the number of each category of respondents.

Data Gathering Instrument

For the purpose of the study, the researchers provided questionnaires which were answered by the respondents of the study. The acquired data of the respondent would validate to formulate the needed information for the website. The researchers used the rating scale questionnaire as instrument where it used Likert scale to get information from the respondents.

Table 6. Likert Scale-type

Scale	Range	Verbal Interpretation
5	4.51-5.00	Strongly Agree
4	3.51-4.50	Agree
3	2.51-3.50	Moderately Agree
2	1.51-2.50	Disagree
1	1.00 -1.50	Strongly Disagree

Implementation Plan

If the proposed system is adopted by certain people, the researchers have devised an implementation strategy. If this is the case, the system as well as its documentation will1 be turned over. It will be used as a guide for the client who will oversee system updates and maintenance. There should be a letter of agreement stating that the system is freely given to the user and that the researchers will not be responsible for the project's updating and maintenance. If the initiative is approved, the researchers are planning to conduct several strategies

Table 7. Implementation Plan

Activities	Date	Progress Notes
Meeting with the client	November, 2023	Agreed in the project proposal
Deployment Approval		
System development and monitoring		
Period System Evaluation		

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