**CAPSTONE CORNER: A SECURE AND USER-FRIENDLY ARCHIVING SYSTEM**

A Capstone Project

Presented To the Faculty Of

Information Technology Pangasinan State University

In Partial fulfilment

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## Chapter 1

### INTRODUCTION

#### 1.1 Context of the Project

The Bachelor of Science in Information Communication Technology (BSICT) program of PSU-San Carlos City Campus was offered in the year 2005. The Campus Dean during that time was Dr. Dominador N. Simon. He sent some faculty members to avail of the PSU faculty scholarship program and enrolled in BSICT program offered in PSU-Urdaneta City Campus. After two years of schooling, Dr. Simon asked Mrs. Evelyn B. Lomboy if the campus has the capability to offer the BSICT program in the campus. Mrs. Lomboy replied positively with enthusiasm and courage. Mrs. Lomboy then took the lead in the offering of the program despite the worries and doubts of some. She was the first ICT instructor with 23 enrollees on its first year, then 48 on its 2nd year until BSICT program became the most preferred program in the campus that needed to be limited. Additional instructor was hired in 2006 in the person of Mr. Lin V. Tadeja, Mr. Christopher A. Rodriguez in 2007, Dr. Gilbert M. Talaue in 2008 and Mr. Jose Carlo N. Gamboa in 2009, and Dr. Fernando S. Viray, Jr. in 2010. Now, there are 11 competent BSIT faculty members in the campus. The nomenclature of the program was changed to BSIT in the year 2008 to conform with the CHED MEMORANDUM ORDER (CMO) NO. 53 series of 2006. (COLLEGE OF HOSPITAILITY MANAGEMENT, BUSINESS ADMINISTRATION and COMPUTING, para. 1).

A Thesis Archiving System is designed to provide a platform for managing and archiving thesis documents. It is comprised of three main pages: one for the admin, one for the faculty, and one for the students/users. Admin to update existing records. This includes modifying information about a particular thesis, such as adding or editing the title, author, abstract, keywords, and any other relevant data. The admin can also add new records to the system when new theses are submitted or archived. Admin page handles the transactional aspect of the system. It facilitates the borrowing and returning of thesis books. Students or users who need to access a particular thesis can request to borrow it, and the admin can manage the lending process by keeping track of the borrowed items and their due dates. Once a student returns a thesis, the admin updates the status accordingly to make it available for other users. Thesis Archiving System includes a database component that ensures the security and integrity of the records. The database allows for backing up and restoring all the thesis documents and related data. This feature ensures that even in the event of system failures or data loss, the information can be retrieved and restored. On the user side, the students or users page provides a convenient interface for them to view and search for their thesis documents. They can easily access their own theses and retrieve the necessary information whenever required. They manage the thesis document inventory, update and add new records, handle the borrowing and returning of thesis books, and ensure the database's backup and restore functionality. Meanwhile, the students can benefit from the system by accessing and searching their own thesis documents as needed.

Laravel is a web application framework that has expressive and elegant syntax. A web framework gives a structure and a starting point for developing your application, allowing you to concentrate on building something wonderful while we sweat the minutiae.

Laravel attempts to give an exceptional developer experience while also delivering powerful features like as comprehensive dependency injection, an expressive database abstraction layer, queues and scheduled operations, unit and integration testing, and more.

Laravel is a framework that can grow with you, whether you are new to PHP web frameworks or have years of experience. We'll assist you in your first steps as a web developer or give you a boost as you advance your skills. We can't wait to see what you come up with.

Based on an article entitled “What is a capstone project? And why is it important?” by Stephanie L., 2023 the capstone project has evolved into a crucial component of academic programs at universities. Although it might take many different shapes, its goal never changes. The capstone project offers a singular chance to do independent group study and provide a creative answer to a pressing practical issue. A project of this size and scope might be difficult, but it can also be extremely gratifying. The capstone project, which is typically the last assignment, is extremely important for preparing students for the workforce because it has real-world implications and can help students refine their professional knowledge and skills.

The proposed system is a web-based application that provides a Secure for storing the capstone projects and capstone checker. The main purpose of this project is to give the students of BSIT, to store their final year capstone, allow lower year students to find some references and ideas for their future or upcoming final year capstone and allow the third-year groups to check if the system that they will propose was acceptable or not. The system will be written using a Laravel Framework and has multiple features and functionalities that are related to this kind of system. This has user-friendly functionalities and a pleasant user interface using CSS and bootstrap. The proposed web application aims to store existing softcopy capstone system and documentation, from 2021-present. Check the user’s input title if it has a duplicate in the database. And check user’s problems and features along with the title. Check the user’s features to see if it fits the capstone criteria of Pangasinan State University.

#### 1.2 Objectives of the Project

The Capstone Corner project aims to develop a secure and user-friendly archiving system and proposal checker for (BSIT) Bachelor of Science in Information Technology specifically, it aims to:

1. Identify the existing manual process of Pangasinan State University San Carlos CHMBAC regarding the monitoring of the CHMBAC thesis and Information Technology Capstone Project.
2. To determine the features of the system that aligns to the functional and non-functional requirements.
3. To test the usability of the system.

#### 1.3 Significance of the Project

This project will be valuable and significant to students, teachers, school, and future researchers. The result of this project may help the following individuals and group:

**Administrator**. The administrator will able to store securely finalized capstone projects and modify all types of accounts.

**Students**. Using this system, lower-year students can find some references and ideas for their future or upcoming final-year project, allowing the third-year groups to check if the system that they will propose is acceptable or not. The student can view archives, search archives and use the compatibility checker.

**Faculty.** A faculty can view and search capstone projects. They can also manage an archive they uploaded and manage student accounts.

**College.** This system is beneficial for CHMBAC because it provides a dependable and efficient way for CHMBAC to manage and store significant data and documents while guaranteeing the security and privacy of sensitive information. They can also use the system in proposal session for them to check if the presenter’s title is existing or not.

**Future Researchers.** This project could also serve as the basis or as a reference and guide for future researchers who wish to conduct the same study, or any study related to the topic.

#### 1.4 Purpose and Description

The system is made to be user-friendly, with an intuitive interface that enables CHMBAC staff to quickly upload, organize, and access documents. Its goal is to provide a dependable and efficient way to manage and store significant data and documents while guaranteeing the security and privacy of sensitive information. Additionally, it has sophisticated search and filtering features that make it simple to locate particular files or information quickly. Capstone Corner was created with security in mind using the middleware restrictions and tokens feature of the Laravel framework in addition to a user-friendly UI. It has access restrictions and advanced encryption to make sure that only authorized individuals can access sensitive data. The compatibility checker provides the end user a platform where they can check if the system project that they will propose is acceptable or not. The platform first checks the user’s input title and checks if it has similarity to other systems. Secondly, the problem will be checked if it fits the PSU capstone criteria. Overall, Capstone Corner offers CHMBAC a dependable and secure archiving system that is simple to use and maintain. With a compatibility checker for the students for them to check the feasibility of their system that will be proposed.

#### 1.5 Scope and Limitations

The proposed project entitled “Capstone Corner: A Secure and User-Friendly Archiving System” is intended for Pangasinan State University San Carlos Campus BSIT. The system would be uploaded and hosted online for convenient access for student users. The system has three levels of access such as Administrator, Faculty and Students. The CHMBAC DEAN would be the administrator which can manage the system such as reviewing the capstone projects, accounts of students as well as the faculty, they can see the capstone project that was uploaded in the system. The faculty would be the one to upload the final capstone project of the student. They can also view and search capstone projects. The student can view files, search files and use the compatibility checker. The system lets the admin insert or update new data information to the database such as new capstone projects and new account registration.

This system also allows the administrator to manage all tasks, including adding, updating, monitoring, and archiving data of Pangasinan State University San Carlos City Campus BSIT capstone in the database. With this, all of the data are easier to handle and managed o by the BSIT administration. All of the search parts are done efficiently using the titles of the capstone projects. Students are allowed to search for capstone projects anytime and anywhere as long as there is an internet connection. The students can search and see the titles of the capstone. The system does not cover the following features such as creating a file, private message, chat, and video and audio. The system only accepts files in PDF format.

For the compatibility feature of the system, the system can only check the title if it has a similarity to the capstone projects in the database. While in the proposed capstone project feature and problem will be sent to the faculty members and admin if it fits the criteria or not and feedback will be returned to the student.

## Chapter 2

### REVIEW OF RELATED LITERATURES AND STUDIES

**2.1 Related Literature**

This chapter present of the review of literature and filed up after an in-depth search done by the researcher.

# 2.2.1 Archiving and document management at taibah university: a case study (taibah university 2019)

Shared network drives are accessible by different groups of specialists, and files, including organizational documents, accounting data, and information for meetings, can be accessed only by authorized users. The use of the automated system based on the secured network guarantees the quick access to data, its effective storage and management, an easy flow of information in an organization, and the use of electronic archiving. All documents collected and stored by specialists at Taibah University are secured and have backups, but archiving for long periods of time is not guaranteed for all types of documents (Taibah University 2019). Archiving is associated with additional costs spent on storing and managing large amounts of data; therefore, the University does not provide this service for all types of documents they collect and store.

**2.4.1digital humanities and the use of web archives (vlassenroot et al., 2019).**

Their study is a continuation of their description of the state-of-the-art of national web archiving (published in the first issue of international journal of digital humanities), which is now extended to social media archiving (vlassenroot et al., 2019). They describe the current legal, technical, and operational aspects of preserving social media content, like the selection and preservation policy. Their analysis is complemented with results from an online survey to which 15 heritage institutions (national libraries and national archives) responded

# 2.5.1based digital archiving efforts boosted by the pandemic (Lacsamana, 2021)

Which is an article published on June 16, 2021, By Brontë H. Lacsamana, they discuss the impact the COVID-19 pandemic's effects on archiving procedures in different Philippine institutions. It begins by bringing up the University of the Philippines (UP) archives, whose plans to move their holdings had to be put on hold because of the uncertainties and constraints brought on by the pandemic. They were forced to change their emphasis to digital work as a result, enhance their digital assets, and train their workers through webinars. On a national scale, digitization initiatives were under way, with the Senate's Legislative Records and Archives Services (LRAS) and the House of Representatives' (HRep) archives progressing in digitizing legislative records and enhancing access through online tools and systems. The paper also emphasizes the significance of guaranteeing public access to archives following their digitization. While ABS-CBN's film restoration initiative concentrated on making films accessible through internet platforms, the Mindanao Film Archive experienced workflow delays and limited public access as a result of temporary closures. The National Archives of the Philippines (NAP) was established in 2007 and has since made efforts to release circulars, implement electronic records management policies, and foster collaboration among regional and national government agencies. This article mentions the NAP in relation to policies and partnerships.

# 2.6.1 Entitled records for life: digital archiving to transform business productivity (Epson, 2022)

Based on an article entitled Records for Life: Digital Archiving to Transform Business Productivity On Jun 27, 2022 from the official blog website of EPSON the advantages of switching from conventional physical archiving to digital archiving are covered in the article. It highlights the fact that digital archiving involves more than just turning paper documents into digital format. It emphasizes the benefits of reducing workflow, converting to smart archives, and boosting productivity and efficiency with scanners. Physical records are kept in vast storage rooms using the traditional archiving approach, which can take up a lot of space and is prone to mislabeling or misplacement. As a result, time may be lost looking for particular papers rather than being spent on things that are more beneficial. These barriers are removed by digital archiving, which enables better worker organization and productivity. The essay highlights the effects of digital archiving across a range of businesses, but especially in the healthcare sector. It describes how digitalization has transformed telehealth services, hospital information sharing, and patient care. Healthcare digital archiving enhances patient experience and guarantees current records, resulting in tangible benefits. Traditional archiving in normal office environments entails specialized storage areas and time-consuming sorting procedures. Organizations may save space and work more effectively thanks to the development of cutting-edge scanners like Epson scanners. Traditional archives can be converted into consolidated, easily searchable digital files, which relieves load on both the back-end and front-end operations. Customers benefit from digital archiving by being able to use cloud storage, sign documents digitally, and handle administrative difficulties while on the go. The article also mentions how scanning has a positive impact on sustainability. The risk of losing private information is reduced and the organization's carbon footprint is reduced when confidential documents are shared digitally rather being sent via mail or courier.

# 2.7.1 Web archives as a data resource for digital scholars (vlassenroot et al., 2022)

Based on an article entitled Web archives as a data resource for digital scholars published on 08 March 2019 by Eveline Vlassenroot, Sally Chambers, Sven Lieber, Alejandra Michel, Friedel Geeraert, Jessica Pranger, Julie Birkholz and Peter Mechant, where they dicuss the exploratory analysis of web archiving and social media. Their study is a continuation of their description of the state-of-the-art of national web archiving (published in the first issue of International Journal of Digital Humanities), which is now extended to social media archiving. They describe the current legal, technical, and operational aspects of preserving social media content, like the selection and preservation policy. Their analysis is complemented with results from an online survey to which 15 heritage institutions (national libraries and national archives) responded. The authors discuss and reflect on important challenges in and flaws of social media archiving which are very relevant for future researchers of this data.

**2.8.1 Online document management system.** **(joseph christian g. noel, 2019)**

With storage prices falling and capacity ever increasing, the problem of how or where to store files and documents have pretty much. Been solved or normal users. Indeed, with the increasing number of files a user stores, the main problem now is the efficient and effective management of files the user has. By” management”, this refers to a system which enables easy access, organization and retrieval of files the user keeps, and the ability to perform certain functionalities automatically. The authors aim to build a prototype of such a document management system ThesisFS. ThesisFS will present all the basic functionalities of a web-based file system, and will have additional document management features such as intelligent document searching called Search Folders, automated indexing and tagging called Smart Indexing, and automated user-defined actions called Action Folders.

**2.9.**1 **Online thesis archiving system for university of Makati**. ( Aljane gilles, 2019).

The study aimed to develop Online Thesis Archiving System for UMAK that would help the students, faculty or whoever are in need to easily access theses. Users can access the system even if they are off of the school since it is an online system. Users will register by filling up the registration form. Upon registering the system will send email verification to the user for security purposes. The system has the features of searching, previewing of full theses and abstract, users can also download thesis. The searching has filter by title, author, subject matter, year submitted, and program title. Users will be able to know what the most viewed thesis is. They can also save a particular thesis offline by adding it on their profile. The system will be managed by the admin which is the librarian. Admin can update, delete, and upload thesis. The system has the dashboard which displays the numbers of users registered, number of thesis per college, number of views per thesis and number of abstract viewed. The project requires Sublime Text 3 for the front-end tool using PHP, HTML, CSS, JavaScript while for the back-end tool are the XAMPP and MySQL. XAMPP is use only as a development tool, to allow website designers and programmers to test their work on their own computers without any access to the Internet. MS Office 2016 is required in Software for documentation purposes. Adobe Photoshop is use for editing pictures that will be used for the system. Domain is will be used for maintaining the website since it is an Online System. The researcher used CamScanner for scanning the documents. Aer capturing sample hardcopy of thesis the researcher import the picture in CamScanner and edit, aer editing the pictures it will be saved as PDF form. This will be saved in the database of the system. CamScanner helps the researchers to be digitalized the theses that are in the library. The System need a browser since it is an online system. Google Chrome is the browser that the researcher used.( Aljane Gilles, 2019).

**3.1.0 Archives in an Academic Library: The Case of a Private: The Case of a Private University in the Philippines. (Barut, Sheryll D. and Cabonero, 2021)**

The study used the qualitative method of research to determine the status of the UA in terms of the ten (10) domains. A researcher-rated checklist was made based on the RA 9470 standards on archives and was put into the context of the archives of SMU. It was subjected to the examination of four (4) panel of experts in librarianship, and research in December 2019. The primary documentary evidences used were the annual reports, newsletters, handbooks, and manuals of the ULRC; and the circulars, memos, and manual of SMU. Document scanning and photo-documentations were also used to provide proof of evidences on the status of the SMU Archives. The interview was used to cross-check the data culled from documents.

**3.2.0 Two Reports on Web Archiving: Literature Review and Tools Analysis (Jackie Dooley, March 28, 2018 )**

The tools we reviewed are Archive-It, Heritrix, HTTrack, Memento, Netarchive Suite, SiteStory, Social Feed Manager, Wayback Machine, Web Archive Discovery, Web Curator Tool, and Webrecorder. Most tools built for web archives focus on capturing and storing technical metadata for accurate transmission and re-creation but capture minimal descriptive metadata, in part because so little exists in the captured files. Descriptive metadata therefore must be created manually, either within the tool or externally. The title of a site (as recorded in its metadata) and the date of harvesting are routinely captured, but it may not be possible to extract them automatically. Titles are sometimes unhelpful, such as “home page” or “title.” Not all tools define descriptive metadata in the same way. The hope for auto-generation of descriptive metadata may be fruitless unless or until creators of textual web pages routinely embed more metadata that can be available for capture. Development of new tools and enhancement of existing ones are actively underway.

#### 3.3.0 The Use of Personal Digital Personal Digital Archiving For Effective Learning During Pandemic Covid-19 (Naufal Ahmad Rijalul Alam,2022)

#### Personal digital archiving may include the following steps: Emails, Photographic materials (including those saved on mobile devices, desktop computers, or in social media), Tweets, Instagram posts, and Facebook pages are examples of social media, Receipts in Digital Form, Email or Correspondence via Email, Family Photographs Scanned, and Online Portfolio or Personal Website. Personal digital archives are how individuals manage and store their digital archives so that they can be used now and in the future. A well-managed personal archive can help individuals make more informed decisions about how their files will be used in daily life (Wicaksono, 2021).

#### 2.2 Summary of Related Literature

|  |  |  |  |
| --- | --- | --- | --- |
| **Author/Year Published** | **Title** | **Advantage** | **Disadvantage** |
| (TAIBAH UNIVERSITY 2019) | Archiving and Document Management at Taibah University: A Case Study | Quick access to data, effective storage and management, easy flow of information in an organization, and use of electronic archiving. | Limited archiving for long periods of time and additional costs associated with storing and managing large amounts of data. |
| (VLASSENROOT ET AL., [2019](https://link.springer.com/article/10.1007/s42803-021-00040-5#ref-CR1)). | digital humanities and the use of web archives. | Description of legal, technical, and operational aspects of preserving social media content. | The study's dependence on answers from only 15 heritage institutions may restrict the study's generalizability. |
| **(LACSAMANA,2021)** | **Based Digital archiving efforts boosted by the pandemic.** | Enhancement of digital assets, emphasis on digital work, and training through webinars. | Workflow delays and limited public access due to temporary closures. |
| (EPSON,2022) | entitled Records For Life: Digital Archiving to Transform Business Productivity. | Reduction of workflow, smart archiving, increased productivity and efficiency. | Potential risk of data breaches and cybersecurity threats. |
| (EPSON,2022) | entitled Records For Life: Digital Archiving to Transform Business Productivity. | Enables a comprehensive overhaul of the workflow. Save storage space and get rid of labeling and positioning problems by transforming paper archives into searchable digital files. | It also involves a sizable upfront investment in cybersecurity measures, employee training, and technology.  Firms are more susceptible to data loss due to technical failures. |
| **JOSEPH CHRISTIAN G. NOEL, 2019)** | **Online Document Management System.** . | Students, faculty, and other users can utilize the system to access theses even while they are not on campus. This improves the convenience and flexibility of research. | Users must rely on a stable internet connection to access the theses because the system is online. Users' ability to use the system properly may be hampered by limited or intermittent internet connectivity. |
| **Barut, Sheryll D. and Cabonero, 2021** | **Archives in an Academic Library: The Case of a Private: The Case of a Private University in the Philippines.** | This degree of rigor improves the study's findings' dependability and trustworthiness, offering a thorough picture of the UA's current situation. | he exclusion of diverse perspectives and other archival resources may restrict the study's depth and range of results. |
| **Jackie Dooley, March 28, 2018** | **Two Reports on Web Archiving: Literature Review and Tools Analysis** | This raises the chances of locating a suitable technology that meets specific online archiving criteria. | Lack of automatic extraction of descriptive metadata from web pages impedes productivity and may result in inconsistent or incomplete metadata entries, reducing the general accessibility and discoverability of preserved material. |
| **Naufal Ahmad Rijalul Alam,2022** | **The Use of Personal Digital Personal Digital Archiving for Effective Learning During Pandemic Covid-19** | Guaranteed that their personal digital archives include varied elements of their lives and activities by including a wide variety of digital assets, allowing a holistic preservation of digital footprint. | Issues in identifying the appropriate preservation tactics, metadata standards, and technologies to utilize, which may necessitate continual efforts to stay educated. |

#### -2.3 Synthesis

#### The existing systems, both foreign and local, were examined as a reference for developing the information system. The study identified features that are present in these systems but not in the proposed system, Capstone Corner: A Secure and User-Friendly Archiving System. The researchers thoroughly analyzed and evaluated the related systems, considering their modules and functions.

The related studies mostly the local show that those employees that currently transferred top digital archiving from the traditional paper archiving are struggling to adjust their environment in working in a digital archiving.

#### Furthermore, the related studies introduced important concepts that helped the researchers gain a deeper understanding of the approaches involved in creating a system that will be beneficial to librarians and future researchers. These concepts aid in enhancing the system's usability and determining its usage.

**2.4 Gap**

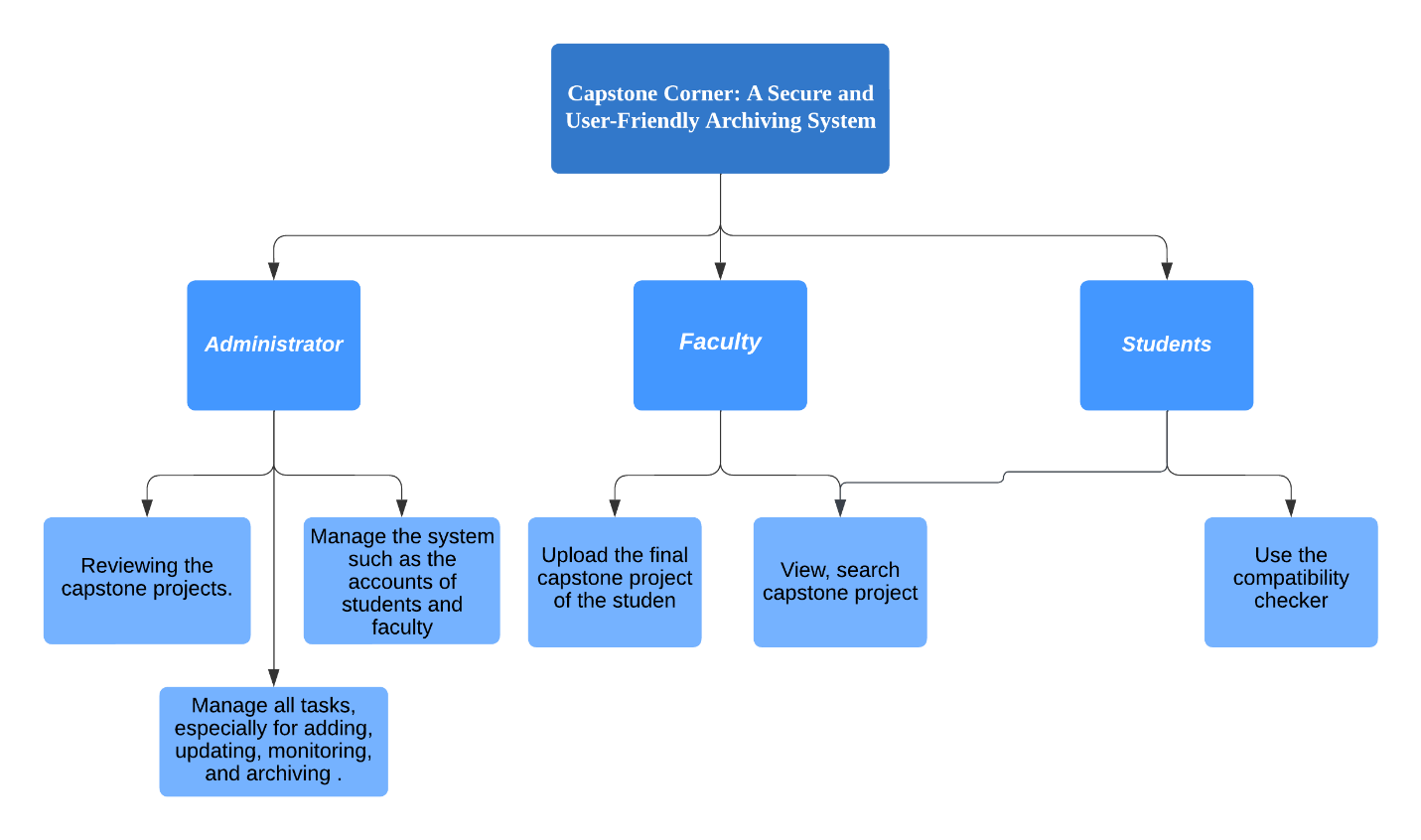
#### Despite Pangasinan State University (PSU)'s emphasis on offering education and research opportunities in this field, there is a glaring absence of a comprehensive application created to meet the specific needs and challenges of managing a secure and user-friendly archiving system. As a result, the proponents have identified a significant gap in not having an archiving system in CHMBAC. The lack of a specialized software for this purpose has a number of drawbacks, including the inability to enhance data security, promote efficient document management, and storages soft copies of Capstone Project. Due to these restrictions, PSU is unable to allocate resources efficiently, make well-informed decisions. By filling this gap and creating the Capstone Corner: A Secure and User-Friendly Archiving System, The proponents hope to completely alter how the CHMBAC handles its archiving procedures. The CHMBAC students' final year projects will be stored and lower year students will be able to find resources and ideas for their upcoming or future final year projects, and third-year groups will be able to assess whether the system they will propose is appropriate or not. By giving CHMBAC a strong tool that incorporates a dependable, secure, and user-friendly archiving system that is easy to use and maintain the proposed Capstone Corner: A Secure and User-Friendly Archiving System seeks to close this gap. It aims to maximize CHMBAC's revenue generation and decision-making through the application of our technology.

#### 

#### 2.5 Conceptual Framework

Concept maps are an effective tool for discovering connections between concepts of the project. Knowledge of these connections and visualizing them can aid in knowledge discoveries of the course material.

The Capstone Corner: A Secure and User-Friendly Archiving System's conceptual operation is shown in figure 2.1



**Figure 2.1 Concept Map of a Secure and User-Friendly Archiving System**

How the system will operate, and flow is shown in Figure 2.1. There are three tiers’ users starting with the administrator, who manages all tasks like evaluating capstone projects, student accounts, and faculty accounts. Next is the faculty. They submit the students' final capstone projects and have access to see and search for them. The students come last. Students have access to files and read, search, and use the compatibility tester.

#### 2.6 Definition of Terms

The following terms defined as operationally and logically for better understanding of this project.

**Archive.** A database or storage system designed for managing and safe storage of data for Capstone projects. For project materials like documents, reports, and code repositories, it would be a central repository.

**Capstone Corner.** The name of the web-based application that provides a Secure for storing the capstone projects and a title and criteria compatibility checker.

**Capstone project.** It serves as a concrete illustration of their comprehension of the principles and use of secure and user-friendly archiving systems.

**CHMBAC.** The beneficiaries of this system.

**Compatibility.** The system's ability to efficiently integrate and cooperate with different software components.

**Criteria.** The set of requirements or standards used to assess the effectiveness and quality of the system.

**Secure.** In the context of an archiving system refers to the use of controls and procedures to guarantee the privacy, accuracy, and accessibility of archived data.

**Title.** The data needed from the user that the system will check if it has a similar in the database.

**User-friendly.** An archiving system's user-friendliness is defined as its simplicity and intuitiveness from the users' point of view.

**Users.** Users include admin, faculty and students.

## Chapter 3

### 

### METHODOLOGY

The quality of the material, as well as clear, specific explanation of how they will be study is done, is critical for the study to be an organized and effective effort. This is what it implies and is a component of the research methodology, which includes the requirement analysis, system framework, data analysis, technical background, implementation plan, statistical tools, and network diagram, which are used to establish its validity and reliability, data gathering procedures, and the appropriate statistical treatment of data.

#### 3.1 Requirement Analysis

The analysis of requirements is crucial to the success or failure of a system or software project. The requirements must be written, actionable, quantifiable, tested, traceable, relevant to identified business needs or opportunities, and detailed enough for system design. The process of defining user expectations for a new or improved application is known as requirements analysis (ReQtest, 2018). It encompasses all tasks performed in order to determine the expectations of diverse stakeholders. As a result, "requirements analysis" refers to the process of analyzing, documenting, validating, and maintaining the requirements of software or systems. High-quality requirements are written, actionable, quantifiable, testable, and traceable, and they help identify business opportunities. The primary source of data in the identification of requirements is the first step in the gathering of information, the state, and the current process of Pangasinan State University. After gathering the necessary information, the developers investigated the system's problem. Developers create the user's requirements. The developers thoroughly analyzed all of the requirements essential to meet the desired idea for the system to be constructed.

### 3.1.1 Hardware and Software Requirements

The developers meticulously detailed the hardware and software requirements that would meet the created system’s expectations. In software deployment, the disclosure of hardware and software requirements allows the system to perform as intended. The set of documents or documentation that described the behavior of a system includes the variety of elements that attempt to define the intended functionality required by the stakeholder to satisfy their different users.

### 3.1.2 Hardware Requirements for System Development

Hardware requirements are the statements of requirements that would identify and dictates the performance of the system in order to satisfy both clients and owners of the system. Identifying the hardware requirements enables the system to provide its best performance and handle the processing of data (Siedle, 2015). The hardware requirements for the development Capstone Corner: A Secure and User-Friendly Archiving System are very important aspect of the development.

## . Software Requirements for System Development

This chapter comprises various procedures and methodologies for to achieve the target objection of the project. The method and step presented will guide the developers in completing the input process and output phases for developing the Capstone Corner: A Secure and User-Friendly Archiving System.

**Table 3.1 Software Requirements**

|  |  |
| --- | --- |
| **Computer Hardware Components** | **Specification** |
| Display | 1280x720 |
| Processor | Intel core i3 |
| RAM | 8 GB |
| Hard Disk Drive | 125 GB (SSD) |
| Mouse / Keyboard | USB / Wireless |

## Software requirements is a set of documents that explain a software application's characteristics and behavior. It consists of a few numbers of aspects that seek to define the customer's intended functionality to satisfy their various consumers. To ensure smooth project development, every team member must understand the development process in the same way. This would define the features and behavior of the system or software application for commercial use (Inflecta, 2020).

**Table 3.2 System Development Software Requirements**

|  |  |
| --- | --- |
| **Computer Software Components** | **Specification** |
| Windows Operating System | Windows 10 |
| Database | MySQL |
| Programming Language | PHP /Java Script / CSS / HTML |
| Web Browser | Google Chrome /Microsoft Edge – Latest versions / Brave |
| Framework | Laravel |

#### 3.2 System Framework

Agile-Scrum software development will be the project's methodology. Agile software development is a set of methods that emphasize iterative development and the evolution of requirements and solutions through collaboration among self-organized, cross-functional teams. Agile methods encourage a flexible project management process that encourages regular review and adaptation, a leadership philosophy that promotes teamwork, self-organization, and accountability, a set of engineering best practices that enable the rapid delivery of high-quality software, and a business approach that aligns development with customer needs and company objectives. Scrum can be traced back to Hirotaka Takeuchi and Ikujiro Nonaka's influential Harvard Business Review essay "The New Product Development Game" in 1986. This article examined how companies such as Honda, Canon, and Fuji-Xerox approached product development in a scalable and team-based manner, with an emphasis on the empowerment of self-organized teams.Scrum was founded in 1993 as a software development process by Jeff Sutherland and his colleagues at Easel Corporation, who were inspired by the concepts presented in the article. They combined the article's principles with ideas from object-oriented development, empirical process control, iterative and incremental development, productivity enhancement, and complex and dynamic system management. The term "Scrum" comes from the sport of rugby and refers to how a game is restarted after a foul or when the ball is out of play.

#### 3.3 Tools for Data Analysis - Use Case, ERD, Data Dictionary

This area of the study discussed the different tools used for data analysis. It also includes the used case diagrams and entity relationship diagram models for the representation of the systems’ workflow.

**Data Analysis**

Important data are gathered primarily from the dean of the college of hospitality management business administration and computing in Pangasinan State University, San Carlos City Campus. The main respondents of this project are the Bachelor of Science in Information Technology Department within the PSU SC. The respondents are result in random sampling to find them reliable in conducting usability test. The true identity of the respondents is not revealed for confidential purposes. The developers used different data gathering instruments for acquiring valuable and relevant information needed for the study. They utilized different methods in order to obtain necessary information to complete the study.

**Document Analysis** - The focus of the analysis should be the critical examination, rather than mere description of the documents. It is a social research method and is an important research tool in its own rights. Documentary work involves reading lots of written material.

The document analysis is a social research method and an important research tool in its own right. It is also an essential component of most triangulation schemes, which combine methodologies in the study of the same phenomenon (Bowen, 2009). The developers undergo on a thorough analysis of online appointment system and inventory and management system documents was conducted, determining and identifying the needs and challenges of the current online veterinary management with the appointment system.

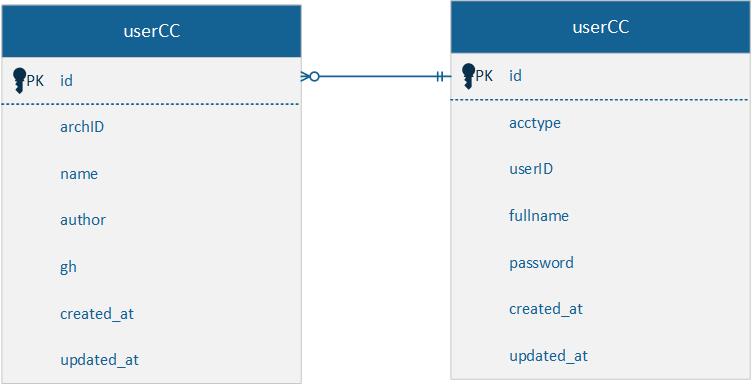
**Interview** – To avoid misinterpretation of the question, the questions should be asked as written for all respondents. For the same reason, clarification of the question should be avoided. However, if there is a misunderstanding, the questions can be repeated. The questions should be asked in the order specified in the questionnaire, as a specific question may not make sense if the questions preceding it are skipped. An interview is a formal encounter in which one or more people are being questioned, discussed with, or evaluated another individual in order to obtain background information (Malicdem, et.al, 2012). The developers interviewed and discussed with the stakeholders and clients involved in the study in order to obtain the necessary data and information to support and strengthen the study. In addition, interview gives the developers a better response rate than mailed questions, and the people who cannot read and write can also answer the questions.

**Internet Sources** – The internet has made researching a topic easier than ever before. People with internet access can simply pull up a search engine, type, and click away instead of going to the library. According to lumencandela (2020), scholarly journals and databases are the most common sources of reliable, credible information on the Internet. These academic, peer reviewed collections offer extensive reports, case studies, articles, and research studies to help you with your research. The developers used internet websites in gathering relevant data and obtaining current information and related articles relevant to online veterinary management with the appointment system. Many related studies are found on the internet which helped the developers to strengthen their points in developing the study.

**Survey** – the developer’s utilized surveys to gathered information and to avoid biased opinion that way affect the outcome of the study. A survey, according to qualtrix (2020), is a method of gathering information from a sample of people by asking relevant questions with the goal of understanding populations as a whole. Surveys are an important source of data and insights for everyone involved in the information economy, from businesses to the media, to government and academia. In relationship to the study, the survey is a research method used for collecting data from a predefined group of respondents to gain information and insights into various topics of interest. The data is obtained through the use of standardized procedures to ensure that each respondent can answer the questions at a level-playing field to avoid biased opinions that could influence the outcome of the research or study.

**Use Case Diagram**

The information and persons engaged in the developed system's process are represented in figure 3.2. It entailed the administrator is in charge of the system's overall transactions. The administrator is able to login in the system. Administrator also managed the to monitor the sales. The inventory also facilitates by the administrator. The control and checking of the products done by inventory management of the system. The records of assets and crops are safely kept in the system. Analytics is also one feature of the developed system which would help the administrator to identify the monthly and latest sales of the agriculture. Furthermore, the administrator is capable of accessing the information in the system which enables them to manipulate the content of the system from inside to outside. The used of case diagram is a one way to summarize the details of a system and users within that system. It is generally shown as a graphical representation of interactions among different elements in the system. Use case diagrams would specify the events in a system and how those events flow, however, use case diagram does not describe how those events are implemented.



**Figure 3.1 ERD**

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**Figure 3.2 Use Case**

#### 3.4 Technical Background

This developed capstone project is a web application to help the agriculture department at PSU SC. According to Robert Gibb (2016), “A web application is a computer program that utilizes web browsers and web technology to perform tasks over the internet. Web applications use a combination of server-side scripts (PHP and ASP) to handle the storage and retrieval of the information, and present information to users”. PHP or Hypertext Pre-processor is the most popular server-side scripting language in the world. It is known to be one of the simplest programming languages and 48 it is the most used server-side scripting languages for web development. PHP is being widely utilized in developing web applications and become one among main languages for developers to make new applications. Leading social networking sites like Facebook and reputed organizations like Harvard University are both supported by PHP which makes PHP popular and increases it credibility. PHP is considered a very effective technology that offers a convenient development process with many additional to aid it. In fact, according to the Popularity of Programming Languages Index (PPLI), PHP is the fifth most popular coding languages in the world. With those supports and claims, the developers would utilize the PHP as the main development language. PHP provides the developers with the following advantages such as: (1) Platform Independent, (2) Open Source and Dynamic Library Support, (3) Organized, (4) Free Availability, (5) Database, (6) Easy to Understand and Code, (7) Easy Integration and Consistency. In addition, PHP is a scripting language that implements complex feature on a webpages should incorporated. JavaScript is an essential part of the web, used on 95% of all websites and the web is an essential part of modern life. The web allows us to do things that used to be possible only in native applications installed on our computers. These modern, complex, interactive websites are often referred to as web applications. JavaScript frameworks power much of the impressive software on the modern web including many of the websites you likely use every day. In today’s technical web development era, websites are nothing without responsive design frameworks. The introduction of these front-end development frameworks has helped developers focus on the development of the user-centric applications.

In the capstone project, the developers would developed a web application called Agri-Farm Assets and Crops Monitoring System, which would utilize Hypertext Pre-processor (PHP) as the programming language and JavaScript (JS) along with Cascading Style sheets (CSS) as the PHP framework. With the introduction of JS Framework and CSS Frameworks, developers are now able to extend the functionality of a number of applications. It provides convenient interface and capability to create a web application. It is embedded with the template engine, which is commonly used for the listing of fantastic web layouts for web applications that would be helpful in developing web applications. The list of these exceptional front-end web development frameworks is much more extensive than the others. We have managed to summarize the ones that are truly innovative in the features. They are easy to use and learn and help developers to scale the functionality of the applications. Technical solutions is used to select, design, and implement solutions to requirements. Solutions, designs, and implementations encompass products, product components, and product related lifecycle processes either singly or in combination as appropriate (Wibas 2021). Typically, these activities interactively support each other. Some level of design, at times fairly detailed, can be needed to select solutions. Prototypes or pilots can be used as a means of gaining sufficient knowledge to develop a technical data package or a complete set of requirements. Quality attribute models, simulations, prototypes or pilots can be used to provide additional information about the properties of the potential design solutions to aid in the selection of solutions. Simulations can be particularly useful for projects developing systems-of-systems. 50 The developers created a web-based application called Agri-Farm Assets and Crops Monitoring System using PHP, HTML, CSS, Bootstrap, JavaScript, jQuery, MySQL, XAMPP. This monitoring system with point of sales, inventory, and analytics was created using version 7 of PHP. The system might not operate well with the old PHP version such as PHP version 5 and below. The PHP version 6 and 7 can run the system without any problems but PHP version 8 might have because it is an up-to-date version of PHP that have a lot of new features, improvements, and developments. And if you are using version 5 below you can upgrade anytime. In addition, for its User Interface Design, developers used a HTML and CSS for a better lightings and design that the user would satisfy within each page. And also Bootstrap for a responsive design, by the use of HTML, CSS, Bootstrap, we can create a user-friendly interface. Finally, developers also used JavaScript and jQuery to add some functions of the system, for the back end, developers used MySQL. Developers used XAMPP allows you to build your website offline by using the local server. And for Integrated Development Environment, programmers used sublime text software for building applications and editing the codes.

**Software Used in the System**

Developers utilized different software application and programs to develop the system. This said application are as follows:

**PHP**. The PHP stands for PHP: Hypertext Pre-processor, is a widely used open-source general-purpose scripting language that is used to build dynamic websites. When a 51-website visitor visits a page, the server executes PHP instructions and provides the results to the visitor's browser.

**HTML**. The Hyper Text Mark-up Language (HTML) is a collection of mark-up symbols or codes that is used to structure a web page and their contents. HTML is made up of element or tags and attributes which work together to identify document parts and tell the browser how to display them.

**CSS**. Cascading Style Sheets, is a language for describing how Web pages are presented, including colors, layout, and fonts. It enables the presentation to be adjusted for different types of devices, such as huge displays, small screens, or printers. The separation of HTML and CSS makes it easier to maintain websites, share style sheets across pages, and customize pages for diverse situations.

**Bootstrap**. The bootstrap is the most popular, free and open-source framework for creating responsive layout in web pages, with much less effort. It contains HTML, CSS, and JS components for creating forms, buttons, navigation, dropdown, modals, layout and many other things, the list is very long indeed.

**JavaScript**. JavaScript is a scripting language that enables you to create dynamically update content, control multimedia, animate images, and pretty much everything else. It enables you to integrate dynamic features into web pages that you would not be able to do with only HTML and CSS.

**MySQL**. MySQL is a relational database management system based on SQL – Structured Query Language. The application is used for a wide range of purposes, including data warehousing, e-commerce, and logging applications. The most common use for MySQL, however, is for the purpose of a web database.

**XAMPP**. The XAMPP is a cross-platform web server that is free and opensource. It is a short form for Cross-Platform, Apache, MySQL, PHP, and Perl. XAMPP is a popular cross-platform web server that allows programmers to write and test their code on a local webserver before converting to a live server.

#### 3.5 Implementation Plan

The implementation plan describes how the information system will be deployed, installed and transitioned into an operational system. The plan contains an overview of the system, a brief description of the major tasks involved in implementation, the overall resources needed to support the implementation efforts. The plan is developed during the design phase and is updated during the development phase.

The implementation of Capstone Corner: A Secure and User-Friendly Archiving System in the Pangasinan State University, San Carlos Campus to help the department of Information Technology goal of the study. The content of this system should adapt to the users’ requirements. The developers are responsible for creating and developing an implementation plan for the developed system. These developers would provide with a description of how the information system would be deployed, installed, and turned into a functional system. Once completed, the table below reflects the suggested implementation strategy for the Capstone Corner: A Secure and User-Friendly Archiving System. It outlines the approach required, the activities carried out, the people engaged, and the time span of each activity.

|  |  |  |  |
| --- | --- | --- | --- |
| **STRATEGY** | **ACTIVITIES** | **PERSONS INVOLVED** | **DURATION** |
| Approval from the PSU SC Bachelor of Science in Information Technology Dean | Letter of Approval from the Researchers | Researchers, IT Faculties and CHMBAC Dean | 3 Weeks |
| System’s Implementation | Installation of the system and required software and hardware | Researchers, Faculties | 5 Hours |
| Information Distribution | System Manuals | Researchers, Information Technology Department Dean, | 1 Day |
| 1 Day Training | Training and Lectures of System Users | Researchers, Administrator, IT Faculty, CHMBAC Dean, | 1 Day |

#### 3.6 Statistical Tool

Statistics is the study and practice of advancing human knowledge through quantitative analysis of empirical data. It is based on statistical theory, which is ab application of mathematics. In which, Statistical tools are tools which are purposively make or are used for data collection and analysis in research methodology. This also includes the scaling system, which was used by developers as a technique to monitor the respondent’s interpretation of facts. The developers used weighted arithmetic mean to determine the average response for each item of the five (5) options in each item in the questionnaires namely, 5 (Strongly Agree), 4 (Agree), 3 (Neutral), 2 (Disagree), 1 (Strongly Disagree).

The following is the mathematical formula for the weighted arithmetic mean.

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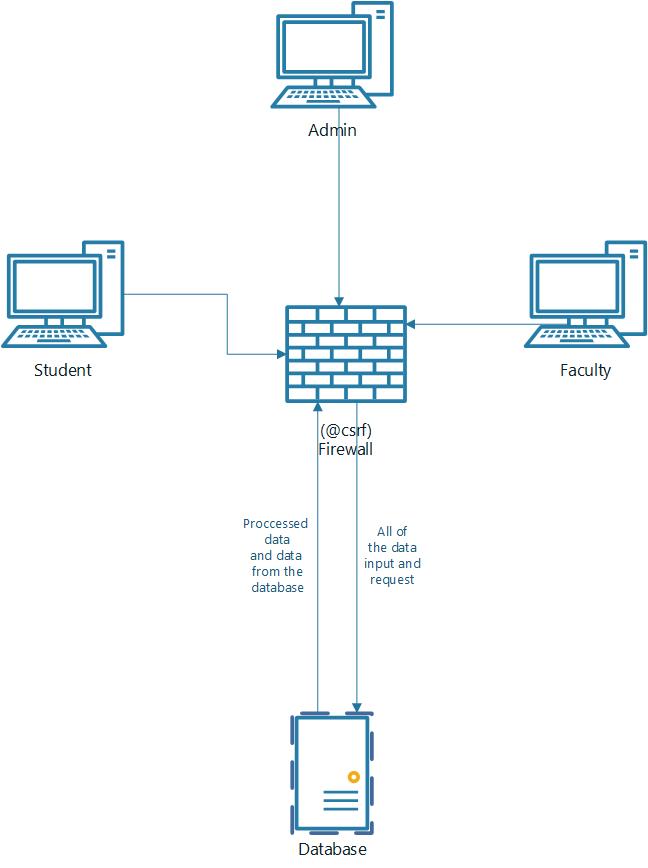
|  |  |
| --- | --- |
| Where: | 𝑊(𝑎𝑣𝑒) = weighted mean |
| 𝑊𝑖 | = weight of frequency of each option |
| 𝑋𝑖 | = value of each option |
| 𝑁𝑖 | = the number of respondents |

|  |  |
| --- | --- |
| **Scale** | **Points** |
| Strongly Agree | 5 |
| Agree | 4 |
| Neutral | 3 |
| Disagree | 2 |
| Strongly Disagree | 1 |

**Table 3.4 Scales and Point in the Instrument**

The table 3.4 shows the scales and points used in the acceptability test conducted on the system. It demonstrated that 5 points is equivalent to strongly agree on the questions being asked, 4 point is equivalent to agree on the questions being asked, 3 points is equal to neutral on the questions being asked, 2 points is equivalent to disagree on the questions being asked, and lastly, 1 point is equivalent to strongly disagree on the question being asked.

#### 3.7 Network Diagram

The system framework of the developed system is based on the functional and non-functional requirements identified by the developers. The identification of those requirements is based on the strict principles of validity. Developers gathered information that would utilize in developing the system framework.

**Figure 3.4 Web Network Diagram**

The Capstone Corner: A Secure and User-Friendly Archiving System for Pangasinan State University, San Carlos City, provides access to the admin. The feature of the system is focused on archiving capstone, account management and title compatibility checker wherein admin can manage all of the accounts including the faculty and students. Also, the additional feature for the system we called compatibility checker was a feature for both admin, students and faculty where the feature ask the user to input a capstone title, feature and problem and this attributes will be processed by the system if it has an existing similar system. The procedure by which the system is consists of defined procedures and features such as development and coding, quality assurance, testing and implementation. The systems’ web network diagram depicts the entire process, but it does not explain the whole process happens in the system but rather shows the flow of operations.

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