DEVELOPMENT OF A WEB-BASED DOCUMENT MANAGEMENT SYSTEM FOR CAVITE STATE UNIVERSITY-BACOOR CITY CAMPUS EXTENSION SERVICES

Undergraduate Capstone Project
Submitted to the Faculty
Cavite State University-Bacoor City Campus
Bacoor Cavite

In partial fulfillment
of the requirements for the degree of
Bachelor of Science in Information Technology

DENNIEL M. ESTIRA
ROSE ANNE PAPA
LOUISE GABRIELLE D. QUIOYO
JADE P. TAGUBA

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An undergraduate capstone project proposal submitted to the faculty of the Department of Information Technology, Cavite State University, Cavite in partial fulfillment of the requirements for the degree of Bachelor of Science in Information Technology with Contribution No._____ Prepared under the supervision of Mrs. Donnalyn B. Montallana, MIT.

INTRODUCTION

Document is an important part in planning and organizing school events, as it helps ensure clear communication, tracks progress, manages resources, and serves as a reference for future events to improve overall efficiency and effectiveness. however, relying on the manual passing of documents can lead to delays in information flow, miscommunication between departments, difficulty in tracking important files, and documents can be misplaced, lost or torn which led to delay of the event or meeting.

Cavite State University-Bacoor City Campus Extension Services is a growing program, which started as a proposal in 2017, was approved in 2019, and officially launched in 2020. The program, located at the Bacoor City campus, Led by Professor Janice A. Nealega, MBA, the head of Extension Services. Cavite State University Bacoor City Campus has five departments, those are Criminology, DCS, etc. Those departments send paper works to the staff of the extension; the staff of the extension faces difficulties in manually checking the papers individually for possible corrections or revisions this cause to delays and time consuming.

A Document Management System (DMS) is a software solution designed to store, manage, and track documents, enabling individuals to share, pass, and organize their papers online. In recent years, universities have increasingly adopted DMS to improve document storage, paperless environment. Cavite State University-Bacoor City Campus is one of the universities that needed to adopt a Document Management System (DMS) to improve the efficiency and organization of work. The implementation of DMS is part of a larger effort to manage documents better, reduce paper clutter, and make important information easier to access across different departments.

Project Context

Initially, Cavite State University-Bacoor City Campus Extension Services has five departments, each department had a document that need to be passed to the Staff at a given time. Ms. Diana Mae M. Belarmino, MMPA faces challenges in managing all the paperwork given by the departments. The process of manually checking all documents for possible corrections and returning them for correction leads to a lot of waste on time, paper and printing these days are quite expensive.

In addition to the main problem, Department Extension Coordinators encounters difficulties in manual checking of attendance, which is time consuming and prone to errors and delays.

Furthermore, Department Extension Coordinators and Extensionist fail to remember the meeting that is happening in that particular day. This will lead to late attendees or absences.

In conclusion, the system is designed to help solve these problems by allowing documents to be submitted and reviewed online. It will reduce the need for paper, making the process faster and more accurate. The system also provides an attendance that record the time-in and time-out of each Extensionist. This will also provide a

notification of the event/meeting two days ahead of the meeting/event. Overall, the system will help Cavite State University-Bacoor City Campus Extension Services become more efficient, save resources, and improve the overall management of their activities.

Objectives of the Study

The general objective of the study is to design and develop a Web-Based Document Management System for Cavite State University – Bacoor Campus Extension Services, promoting and it is easier to submit documents and other papers.

Specifically, aims to:

1. design a website that:
    a. provides intuitive navigation and easy access to the key features and functionalities, such as the login form;
    b. Improve the interface that allows the coordinator and the facilitator to easily access for submitting documents;
    c. Implement features that allow for immediate updating of documents being forwarded;
    d. Implement features that record the time in and time out to each department and extension coordinator of the event;
2. develop the system using the following:
    a. HTML5 and CSS 4.15 for the front end of the system;
    b. Python 3.13 for the back end of the system;
    c. PyCharm 2024.3 for a programming language; and
3. test the system in terms of system testing;
4. evaluate the system using the adapted ISO 25010 evaluation instrument; and
5. prepare an implementation plan.

Purpose and Description

The proposed web-based document management system is expected to bring significant benefits to various stakeholders within Cavite State University Bacoor City Campus, particularly in its Extension Services Unit. The study's significance is outlined as follows:

University and Extension Services Unit.

The system enhances efficiency in managing documents related to extension programs, reports, and partnerships by providing a centralized and secure digital repository, which reduces reliance on paper-based records. This improves accessibility, allowing faculty and staff to retrieve and submit documents remotely. Additionally, it streamlines workflows, minimizing delays in approvals, submissions, and archiving, ensuring a more efficient and organized process overall.

Faculty and Staff

The system simplifies document filing and retrieval processes, reducing the time spent on administrative tasks. It ensures document integrity and security through proper access controls and backup mechanisms. Additionally, it provides an automated attendance system and sends Gmail notifications for upcoming meetings, enhancing efficiency and communication

Students and Beneficiaries

The system enhances transparency in extension service projects by enabling them to track engagements effectively. It also encourages greater participation in university-led outreach programs by providing easy access to reports, fostering a more informed activity.

Future Researchers

The system serves as a reference for future studies related to digital document management in educational institutions. It provides a framework for further improvements and technological advancements in university records management, supporting the continuous evolution of efficient and secure processes.

TIME AND PLACE OF THE STUDY

The study was conducted at Cavite State University Bacoor City Campus. In November 2024, the study focused on Developing a web-based management system. In January 2024, the researchers interviewed the Staff Ms. Diana Mae M. Belarmino, Coordinator Campus Research and extension services in Cavite State University Bacoor City Campus SHIV, Molino VI, City of Bacoor. The study used Python as the programming language for Creating the System. The web-based design started in January, In the Analysis and Design Phase where the system's functionality and structure are planned and visualized including creating prototyping, and planning for it demonstrate how system will work and flow. The development process lasted in February 2025. During this time, the researchers focused on coding, debugging, optimizing the web-based management system, and revising their research paper. The goal of this research was to collect data from extensions coordinator, focusing on their interaction with and opinions about the web based management system.

Scope and Limitation

The proposed web-based document management system for Cavite State University-Bacoor City Campus Extension Services will include several key features aimed at enhancing efficiency and communication. First, the system will provide notifications that will be sent 2 days before an event, reminding users about upcoming events or meetings to ensure timely participation. Additionally, it will track extensionist attendance during events or meetings, simplifying administrative tasks. The system will also allow teacher reviews after each event, enabling extensionist to provide feedback on the session's effectiveness. Furthermore, a document approval workflow will be implemented, allowing facilitators to pass documents to other facilitators, with the final

approval resting with the head facilitator. The head facilitator will also be able to add comments for necessary corrections before final approval. Finally, the system will maintain a history of all past events and meetings, providing easy access to previous records for reference and improving record-keeping for future use.

However, the system has certain limitations that users should consider. It does not include features for salary computation or determining the compensation of extensionists. Additionally, it lacks financial tracking capabilities, meaning it cannot handle budgeting, reimbursements, or financial reports related to events. Lastly is the absence of real-time communication tools such as live chat or instant messaging, which may affect immediate discussions.

CONCEPTUAL FRAMEWORK

The Conceptual Framework of The Study Used the Input-Process-Output Model for Developing the Development of a Web-Based Document Management System for Cavite State University-Bacoor City Campus Extension Services

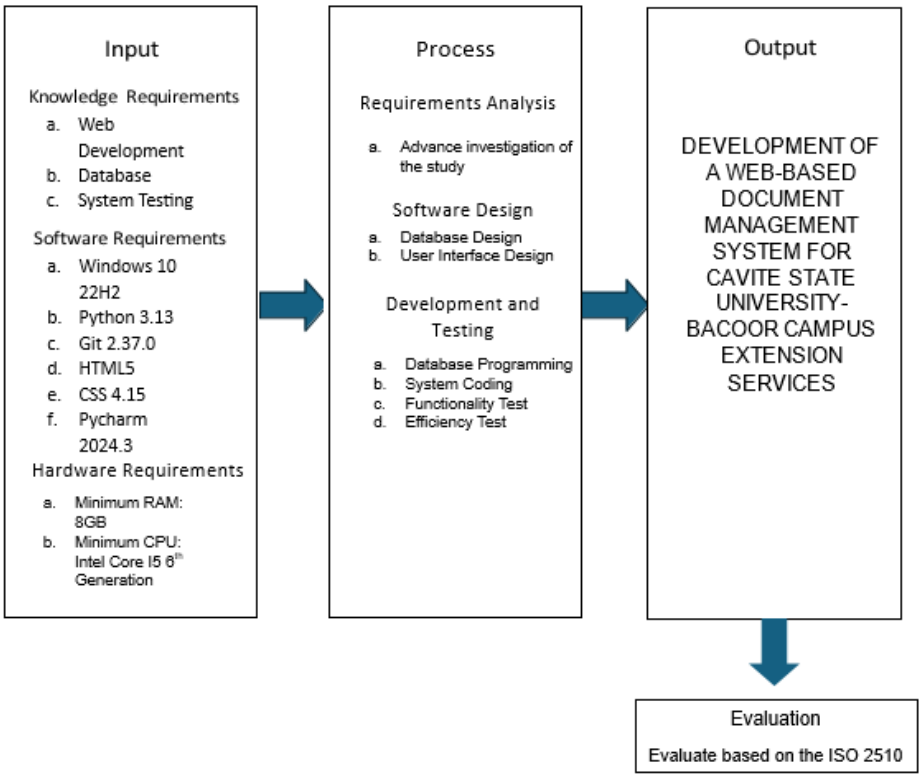


Figure 1. Conceptual framework of the study

The above figure shows the Conceptual Framework and how the system was developed. The Input Stage consists of the Hardware Requirements, Software Requirements, Knowledge Requirements. The system's Hardware Requirements must have a minimum of 8GB RAM with Intel core i5 6th Generation. For the software requirements of the system, Windows 10 must be used to support essential development tools such as MySQL, Python, and PyCharm to create the Web-Based Document System for Extension Services. The knowledge requirement for the system must have a good understanding of web development, database design, and system testing.

The front end of the system is developed using html and CSS. This development tool makes creating a user-friendly interface possible. On the other hand, the back end of the system will be developed using python and My SQLite. Python and db sqlite3 is an open-source web application framework that aims to create conventions for common tasks, such as authentication, routing, and database Interactions.

The system's database was developed using MySQL, an open-source relational database management system widely used for web applications and other database-driven software.

Hardware and Software requirements are also considered, as they can organize the System's UI components and codes using the above software services. For the Process Stage, the process has requirements where the researchers need to investigate in advance so they can study the problem and collect all the data. Design is the one that will show the layout design of the system, process the flow, and document ho

Review Related Literature

This chapter researchers gathered local and foreign related literature a study to provide a background for the present research. It gives the researchers a brief knowledge of the concept of the study.

Foreign Literature

Learning Management System (LMS)

Learning Management Systems (LMS) reinforce the learning process through online classroom environments. A standard LMS supports an inclusive learning environment for academic progress with interceding structures that promote online collaborative-groupings, professional training, discussions, and communication among other LMS users. Instructors should balance active learning with the use of LMS technological resources and the use of guidelines from the qualified curriculum. An LMS allows instructors to facilitate and model discussions, plan online activities, set learning expectations, provide learners with options, and assist in problem-solving with processes for decision making. An instructor's presence within an LMS creates an engaging learning environment. Students can retain their autonomy, enthusiasm, and motivation with LMS use. Stakeholders of the educational community must find scientific studies to support their contributions in LMS platforms to assist scholars in learning.International Journal of Technology in Education 4 (1), 68-92, 2021

The role of digital innovation in knowledge management systems: A systematic literature review

This article investigates the literary corpus on digital innovation in knowledge management systems (KMS) to understand its role in business governance. The

study introduces a broad survey of the scientific literature on this topic to understand how digital innovation promotes new business models through the optimization of new knowledge.We carried out a bibliometric analysis on a database, including 46 articles published in the last three decades (1990–2020). All the articles were written in English. The results show that research published on the topic reveals interesting implications for business models and business performance. These findings especially highlight the links between innovation and sustainability, revealing that digital transformation tools contribute over the long-term to the value creation process. This research contributes to the existing literature analyzing the KMS topic by considering it from the digital innovation processes perspective, pointing out the need to implement new knowledge creation and to share measures which support global and inclusive growth.Journal of business research 123, 220-231, 2021

Artificial intelligence in tactical human resource management: A systematic literature review

Digitization within Human Resource Management (HRM) has resulted in Artificial Intelligence (AI) becoming increasingly prevalent in Human Resource Management Systems (HRMS) and HR Information Systems (HRIS). The tactical procedures of recruitment, employee performance evaluation and satisfaction, compensation and benefit analysis, best practice analysis, discipline management, and employee training and development systems have seen a growth in the incorporation of AI. To better understand this evolution, we seek to explore publication sources and literature that feature the application of AI within HRM. By utilizing a systematic literature review methodology, this paper identifies which tactical HRIS (T-HRIS) components are featured in literature and how each T-HRIS component is represented. This paper gives insight to which component of tactical HRM/HRIS receives attention and identifies gaps in research to give direction to future research

agendas. Alexis Megan Votto, Rohit Valecha, Peyman Najafirad, H Raghav Rao, International Journal of Information Management Data Insights 1 (2), 100047, 2021

ICT officials' opinion on deploying open-source learning management system for teaching and learning in universities in a developing society.

Information and Communication Technology specialists, working within universities play important roles in the deployment of educational technologies for teaching and learning. Given the centrality of these specialists and the woeful dearth of empirics on this subject-matter in Sub-Saharan Africa, this paper interrogates the perspectives of ICT specialists working within universities in Ghana, on the deployment of Moodle®/Sakai® Learning Management System (LMS) by universities in the country for teaching and learning and the challenges involved. Data collection entailed semi-structured interviews with twenty informants. Thematic analysis was used for data analysis. It emerged that there has been impressive formulation of e-learning policy, construction of computer laboratories, Staff Resource Centre, Electronic Support Unit in the Balm Library, installation of Internet facility, Learning Management System, Enterprise Solution Software, Library Solution Software to promote ICT-mediated teaching and learning in the face of barriers. The paper adds knowledge to the extant literature in the field, impacts practice and policy along the pathway for ensuring sustainable deployment of LMS in universities in Sub-Saharan Africa. Moses Kumi Asamoah, E-learning and Digital Media 18 (1), 18-38, 2021

Health Block: A secure blockchain-based healthcare data management system.

The security and privacy of electronic healthcare records (EHRs) remain a critical issue for both healthcare services consumers and providers. Breaching a healthcare system causes the disclosure of sensitive health data. This data is usually saved into centralized databases, which creates vulnerabilities and gives rise to cyber-attacks. This research focuses on enhancing the security and privacy of EHRs by using blockchain technology. This paper proposes a new architecture that takes advantage of decentralized databases to avoid centralized storage issues. The decentralized used database for storing patient electronic health records is the Orbit DB with Interplanetary File System (IPFS). Besides, we have deployed a blockchain network built on Hyperledger fabric by using Hyperledger composer to save hashes of stored data and control access when retrieving it. The proposed Blockchain-based architecture is designed to contribute to the healthcare management systems' robustness and to avoid recorded security limitations in commonly used systems for smart healthcare. Performance evaluation results issued from Hyperledger Caliper and comparative analysis have proved the robustness and superiority of the proposed system in terms of security and privacy requirements, key features of blockchain-based healthcare systems, and performance metrics including various throughput and latency. Bessem Zaabar, Omar Cheikhrouhou, Faisal Jamil, Meryem Ammi, Mohamed Abid, Computer Networks 200, 108500,

Local Literature

Design and Implementation of a Web-based Document Management System

Addresses the challenges of document management in organizations, particularly in educational institutions in Nigeria, where traditional paper-based systems are still prevalent. The authors propose a web-based document management system (WBEDMS) designed to be user-friendly, secure, and efficient, offering features such as document capture, storage, retrieval, version control, and workflow management. The system was developed using Object-Oriented Hypermedia Design Methodology (OOHDM) and implemented using NetBeans, HTML, CSS, JavaScript, PHP, and MySQL. The evaluation results indicate that the WBEDMS achieved a high level of success, with a 95% accuracy rating, a 99.20% usability rating, and a 97% overall quality rating. The paper concludes that the developed WBEDMS is a valuable tool for organizations in Nigeria, particularly in the education sector (Samuel L. Alade 2023).

Web Service for Document Management of University Degree Projects

Addresses the challenges of managing and exchanging documents related to university degree projects. They propose a web service solution that facilitates the storage, exchange, classification, and search of files generated during the graduation process. The service is built using a REST API architecture with Django (Python) for the backend and Vuejs (Javascript) for the frontend. The paper details the development process using the XP (Extreme Programming) methodology, outlining the planning, design, coding, testing, and release phases. The authors present the results, including functional and non-functional requirements, modules, use cases, entity relationship model, and performance tests. They conclude that the web service effectively addresses the challenges of managing degree project documents and highlights its potential for both administrative and didactic use. The

paper suggests future work to enhance the service's functionality, such as implementing file previews, notification alerts, and a shared files module (Sarmiento et. al, 2022).

Development and Implementation of Document Management System for Ilocos Sur Polytechnic State College, Tagudin Campus

Addresses the challenges faced by ISPSC in managing paper-based documents as it prepares to become a university with additional campuses and a larger student and staff population. The researchers developed and implemented a web-based DMS at ISPSC, Tagudin Campus, designed to capture, store, organize, retrieve, and manage documents and files in a centralized digital environment. They conducted a user-satisfaction survey using the Website Analysis and Measurement Inventory (WAMMI) questionnaire, finding that respondents were generally very satisfied with the DMS's ability to arrange, store, track, and manage paper files within the campus. The study highlights the successful implementation of a digital solution to address the challenges of managing paper-based documents in educational institutions, demonstrating the potential for similar systems to improve efficiency and effectiveness (Angala et. al, 2023).

Comprehensive Full Stack Document Management System

Addresses the challenges faced of document system, the system aims to provide organizations with a user-friendly platform for efficient document creation, storage, retrieval, and collaboration. The front-end is built using HTML, CSS, and JavaScript for a responsive and intuitive interface, while the back-end utilizes PHP for server-side scripting and seamless communication with the MySQL database. The system prioritizes security by implementing secure coding practices and a robust database schema for efficient document storage and organization. The paper outlines an Agile methodology for development, including project initiation, planning, design, development, testing, deployment, and maintenance phases. The

architecture of the system is based on a three-tier client/server model, separating the user interface, business logic, and database management for scalability and security (Kumar et. al, 2024).

Web-based Document Management and Tracking System

Web-based document management system developed to tackle the difficulties organizations face with the increasing volume of documents, highlighting Anna Joy D Vitto's contributions on Academia.edu, which detail the system's design aimed at enhancing traditional document handling practices, motivated by the challenges of organizing, storing, retrieving, sharing, and tracking information effectively, especially in the context of inter-departmental communication; the study identified specific organizational challenges through surveys to guide the system's development, which offers features for document storage, retrieval, updating, sharing, and tracking, ultimately intending to simplify document management for employees and suggesting avenues for future research on its effectiveness and integration with other organizational systems, applicable across various sectors like government, education, business, and non-profits, while also referencing existing literature on web-based document management solutions for further improvements (Vitto's et. al, 2022).

Local Studies

Document Management and Repository System of Capstone Projects and Theses

The development of a Web-Based Document Management System (WDMS) for the Extension and Community Relations Division (ECRD) at the University of Science and Technology of Southern Philippines (USTP) aligns with a growing trend in the integration of Information Technology (IT) solutions in organizational operations. Document management, particularly in government, educational, and

non-governmental sectors, is increasingly digitalized to streamline workflows, improve accessibility, enhance collaboration, and reduce the risks associated with physical document handling. The development of a web-based document management system for the USTP Extension and Community Relations Division offers numerous benefits, including streamlined workflows, enhanced document organization, and improved report generation. Through the integration of automation, tagging, and decision support features, the system will address current challenges faced by the office, such as delayed processes and difficulties in managing documents across multiple campuses. Drawing from successful implementations of EDMS in similar organizational contexts, the proposed system holds significant potential to improve the efficiency and effectiveness of the Extension Office's operations (Estrera, et. Al, 2022)

Design and Implementation of a Web-based Document Management System

The document titled "Design and Implementation of a Web-based Document Management System" by Samuel M. Alade provides a comprehensive analysis of the shift from traditional paper-based document management systems to modern electronic solutions, illustrating their vital importance in enhancing efficiency and productivity in diverse sectors, while emphasizing the need for organizations to adopt these systems to maintain competitiveness in a digital world, particularly highlighting a 96.60% user satisfaction rate and addressing the challenges faced by organizations in developing countries, such as Nigeria, in transitioning to effective document management practices (Alada, 2023).

Web-based Document Management System - Project Proposal

Web-based document management systems (WDMS) have transformed the way educational institutions handle student records, providing numerous advantages like improved administrative efficiency and enhanced data security, but their adoption can be challenging due to technical hurdles, the need for user training, potential internet access issues, and high initial costs, which must be navigated to realize their benefits within modern learning environments fully (Gonzales, et. al, 2023).

Web-based Document Management System

The increasing reliance on digital technologies within organizations has spurred significant research into efficient document management systems (DMS). Traditional paper-based systems, while still prevalent, especially in developing countries (Nagrama et al., 2024), present challenges in terms of storage, retrieval, and overall efficiency. Identify technological, organizational, and user factors as key influences on successful implementation. These factors underscore the importance of considering both the technical infrastructure and the human element in the design and deployment of effective systems.

Several studies explore specific approaches to developing and implementing effective DMS. Guo et al. (2021) provide a framework for selecting and implementing DMS within transportation agencies, highlighting the importance of data sharing and interoperability. Sambetbayeva et al. (2022) propose an intelligent DMS model using machine learning techniques to optimize performance. Han et al. (2020) focus on cloud-based architectures, leveraging the scalability and security benefits of cloud computing. Radzi et al. (2018) emphasize the importance of proper document

preparation before digitization, highlighting the need for standardized procedures to ensure data quality and long-term archival integrity.

The research by Nagrama et al. (2024) contributes to this body of knowledge by presenting a case study of a web-based DMS implemented in a Philippine government office. Their study utilizes a waterfall model for system development, adhering to IEEE software engineering recommendations. The resulting system demonstrates improvements in efficiency, security, and accessibility, addressing the specific challenges faced by the organization. The evaluation of the system, incorporating both technical and user perspectives, provides valuable insights into the factors contributing to successful DMS implementation. Future research could focus on comparative studies of different DMS architectures, further investigation of the human factors influencing adoption and usage, and exploring the long-term sustainability and scalability of such systems in diverse organizational contexts.

Digital Archiving and Management System for Academic Institutions

As academic institutions continue to embrace digital transformation, the need for an efficient digital archiving and management system has become paramount. A study conducted at a Philippine state university highlights the development and implementation of a digital archiving system designed to store, retrieve, and manage academic documents, including theses, research papers, and administrative records. The system was developed to improve accessibility, enhance security, and ensure the long-term preservation of institutional knowledge. Findings indicate that the system significantly reduces document retrieval time by 60%, enhances document security through encryption, and streamlines academic workflows. The study underscores the importance of integrating a user-friendly

interface and role-based access control to optimize document management within educational institutions (Del Rosario & Santos, 2023).

Foreign Studies

Design and Implementation of a Web-based Document Management System

One area that has seen rapid growth and differing perspectives from many developers in recent years is document management. This idea has advanced beyond some of the steps where developers have made it simple for anyone to access papers in a matter of seconds. It is impossible to overstate the importance of document management systems as a necessity in the workplace environment of an organization. Interviews, scenario creation using participants' and stakeholders' first-hand accounts, and examination of current procedures and structures were all used to collect data. The development approach followed a software development methodology called Object-Oriented Hypermedia Design Methodology. With the help of Unified Modeling Language (UML) tools, a web-based electronic document management system (WBEDMS) was created. Its database was created using MySQL, and the system was constructed using web technologies including XAMPP, HTML, and PHP Programming language. The results of the system evaluation showed a successful outcome. After using the system that was created, respondents' satisfaction with it was 96.60%. This shows that the document system was regarded as adequate and excellent enough to achieve or meet the specified requirement when users (secretaries and departmental personnel) used it. Result showed that the system developed yielded an accuracy of 95% and usability of 99.20%. The report came to the conclusion that a suggested electronic document management system would improve user happiness, boost productivity, and guarantee time and data efficiency. It follows that well-known document management systems undoubtedly assist in holding and managing a substantial

portion of the knowledge assets, which include documents and other associated items, of Organizations. (Aládé, Samuel, 2023).

A WEB-BASED DOCUMENT MANAGEMENT SYSTEM FOR THE EXTENSION OFFICE

The extension and community relations unit of the university serves as the link between the academe and the communities. It is the unit that ensures that quality extension programs and projects are delivered in a timely manner to community stakeholders who are underserved and underprivileged. As the pandemic had shifted various operations and processes online, the study aims to design and develop an online management system to cater project proposal submission, approval, report generation, and document storage. The online management system is expected to streamline transactions while reducing unnecessary exposure to COVID and cater to the need to keep important extension-related documents accessible and convenient. The design elements include ease of use, accessibility, and the ability to produce downloadable and printable documents for ease of submission to external agencies among others. (Teresa et al., 2022).

Optimizing Educational Institutions: Web-Based Document Management

Documents, which consist of written or printed materials, play a crucial role in educational activities. Private schools in Tangerang still face challenges in efficiently storing, accessing, and managing educational documents. Manual document storage consumes a significant amount of time and physical space. Therefore, a technology-based solution is required to address this issue. This research aims to develop a web-based Document Management System (DMS) that allows teachers and school staff to easily manage, store, and access educational documents digitally. The software development method employed is the Waterfall

model, involving a series of stages ranging from needs analysis to testing and implementation. The outcome is a web based DMS application accessible to teachers in the school. This application enables teachers to view, upload, edit, and download teaching materials effortlessly. Additionally, teachers can manage their teaching schedules and user access rights. The usability of DMS has been tested through User Acceptance Testing (UAT), and users have provided positive feedback on the application.

This web based DMS effectively addresses the issues related to document storage in schools, enhancing the efficient management of educational documents, reducing dependence on physical documents, and increasing productivity in the learning process. Consequently, this DMS holds great potential as a valuable tool in the educational context of the school. (Triyana, Muhammad & Fianty, Melissa 2023).

Implementation of Cloud-Based Document Management Systems in Healthcare

The healthcare industry has embraced cloud-based document management systems (CDMS) to streamline patient records, improve data security, and enhance interoperability among medical institutions. A study conducted by Zhang et al. (2023) examines the adoption of CDMS in major hospitals across Europe and Asia, highlighting improvements in document retrieval efficiency, data redundancy prevention, and compliance with healthcare regulations. The research finds that cloud-based DMS reduces document retrieval time by 75% and improves overall patient data security. The study emphasizes the importance of secure authentication, compliance with HIPAA and GDPR, and the role of artificial intelligence in categorizing and managing medical records efficiently (Zhang et al., 2023).

Artificial Intelligence in Document Management Systems:

A New Paradigm Recent advancement in artificial intelligence (AI) have significantly impacted document management systems, enabling automated categorization, intelligent search capabilities, and predictive analytics. A study by Kumar & Patel (2024) explores the integration of AI-powered DMS in multinational corporations, showcasing how machine learning algorithms enhance document classification, metadata extraction, and decision-making processes. Findings indicate that AI-driven document management reduces manual document processing time by 80%, improves accuracy in document retrieval, and increases overall organizational efficiency. The research suggests that the future of DMS lies in further integration with AI, blockchain for enhanced security, and edge computing for real-time document processing (Kumar & Patel, 2024).

Synthesis

The reviewed literature collectively underscores the increasing adoption of Web-Based Document Management Systems (WDMS) across various sectors, including education, healthcare, and government institutions, to enhance efficiency, accessibility, security, and collaboration. Several studies highlight the shift from traditional paper-based document management to digital solutions as a response to challenges in document storage, retrieval, and security (Estrera et al., 2022; Del Rosario & Santos, 2023; Nagrama et al., 2024). Within academic institutions, WDMS has significantly improved administrative efficiency by reducing retrieval time, securing sensitive information, and streamlining workflows (Gonzales et al., 2023; Triyana & Fianty, 2023). In government and community relations offices, the automation of document approval, storage, and retrieval has mitigated delays and enhanced transparency in decision-making processes (Teresa et al., 2022; Alade,

2023). The implementation of modern methodologies such as the Waterfall model and Object-Oriented Hypermedia Design Methodology (OOHDM) in WDMS development ensures system usability and reliability (Nagrama et al., 2024; Aládé, 2023). Moreover, cloud-based architectures have been integrated into healthcare and multinational organizations, significantly improving data security, compliance, and real-time access to records (Zhang et al., 2023; Kumar & Patel, 2024). The growing role of Artificial Intelligence (AI) and Machine Learning (ML) in WDMS enables automated document categorization, metadata extraction, and predictive analytics, further enhancing productivity and decision-making (Kumar & Patel, 2024; Sambetbayeva et al., 2022). However, challenges such as technical barriers, user training, internet accessibility, and initial implementation costs remain prevalent, requiring strategic planning and support for successful adoption (Radzi et al., 2018; Nagrama et al., 2024). Overall, the literature confirms that well-implemented WDMS can significantly transform organizational operations, fostering efficiency, security, and streamlined document processing in diverse environments.

SYSTEM TECHNICAL BACKGROUND

The researchers have used a Web-Based Document Management System for Cavite State University – Bacoor Campus Extension Services wherein the Campus extension coordinator, Department extension coordinator, and Extension facilitator can access it through their both computer and cellular phone. The Web-Based Document Management System for Cavite State University – Bacoor Campus is a system for extension services for easy and convenient access by the Campus extension coordinator, Department extension coordinator, and Extension facilitator without using the traditional process. These are some of the technical terms that are being used in our system Pycharm, Python, and HTML is the technology being used in our system.

Some extension services in universities are still using the traditional process of manually handing over documents and it can cause problems like slow to pass documents and it's tiring that's why The Web-Based Document Management System is a solution for this kind of situation.

Some articles are related to Web-Based Document Management System. The chosen articles regarding the Web-Based Document Management System have few similarities but have their unique features. The backgrounds of the articles that the researchers choose provide insights and knowledge about the system of both foreign literature and local literature.

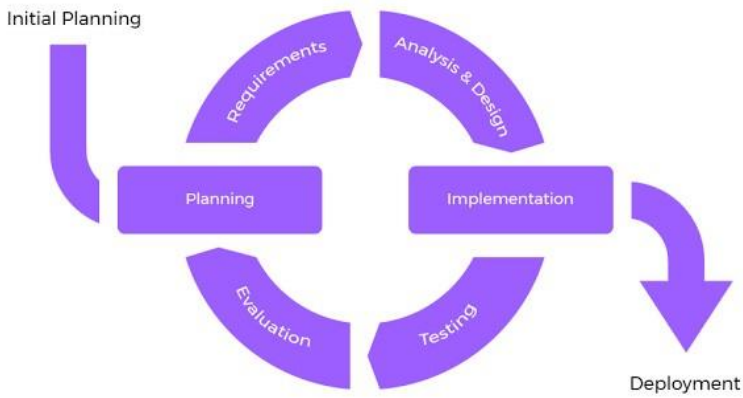


Figure 2 Iterative Methodology

Initial Planning

Initial Planning is the phase where the main goals, challenges, and necessary features of the project are identified through an interview.

In this phase, the researchers conducted an interview with Ms. Diana Mae M. Belarmino, MMPA, to discuss the challenges faced in managing papers and the solutions desired for these issues. The conversation also covered the system's workflow, including the addition of a feature that allows staff to privately comment on papers that need revisions. Additionally, a function for tracking attendance of departments and extensionists in meetings.

Planning

Planning Phase is the stage where the tasks and resources for the project are organized and structured to guide the development process.

In this phase, the researchers break down the overall project into smaller tasks to ensure a smoother development process for the system. They have decided to use Python as the programming language for creating the system.

Requirements

Requirements Phase is the stage where the specific needs and problems of the client are gathered and defined

In this phase, the researchers focus on addressing the client's main issues, such as managing papers, tracking attendance, and providing notifications for upcoming meetings. After discussing these primary concerns, the researchers move on to adding additional features based on the interview with the client

Analysis and Design

Analysis and Design is the phase where the system's functionality and structure are planned and visualized. This involves creating a prototype to demonstrate how the system will work and flow, while also discussing and ensuring the design aligns with the client's work theme and requirements.

In this phase, the researchers create a prototype to demonstrate how the system will work and flow. This is also the phase where the researchers discuss the system's design, ensuring it aligns with the theme of the client's work.

Implementation

Implementation is the phase where the system is developed by converting the design and prototype into a fully functional product.

In this phase, the researchers begin coding the key features, design, and flow of the system based on the prototype they created, transforming it into a fully functional system.

Testing

Testing Phase is the stage where the system is evaluated for functionality, usability, and performance to ensure it meets the requirements and works as intended.

In this phase, the researchers plan to test the system with the departments and the campus coordinator to assess its ease of use and ensure no errors occur during its operation. Additionally, they will evaluate whether the system effectively addresses the problems it was designed to solve.

Evaluation

Evaluation Phase is the stage where the system is assessed to determine if it meets the project's goals and client expectations, and feedback is gathered for possible improvements.

In this phase, the researchers plan to evaluate the system after testing to determine if it meets the client's expectations and to gather feedback for further improvements.

Deployment

Deployment Phase is the stage where the system is officially launched and made available to users after final revisions and testing.

In this phase, the researchers plan to deploy the system after completing the revisions from the evaluation phase, officially launching it and making it available to the client.

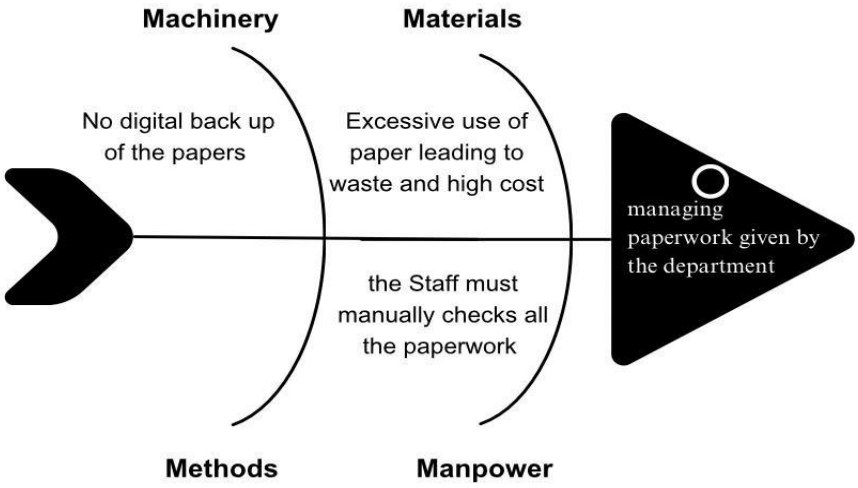


Figure 3 Fishbone diagram of the system for problem 1

Figure shows the problem about the manually checking and corrections of possible mistakes of paperwork of each Departments. This issue leads to delays, errors and time consuming.

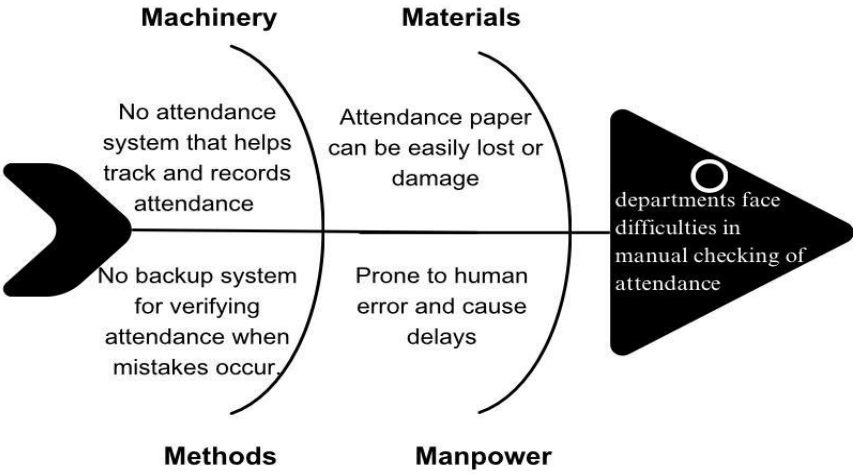


Figure 4 Fishbone diagram of the system for problem 2

Figure illustrates the issue faced by the departments and Extensionists in manually checking attendance, which leads to delays and consumes an amount of time. This problem highlights the need for an attendance system that can efficiently track and record the attendance of individuals involved in the meetings.

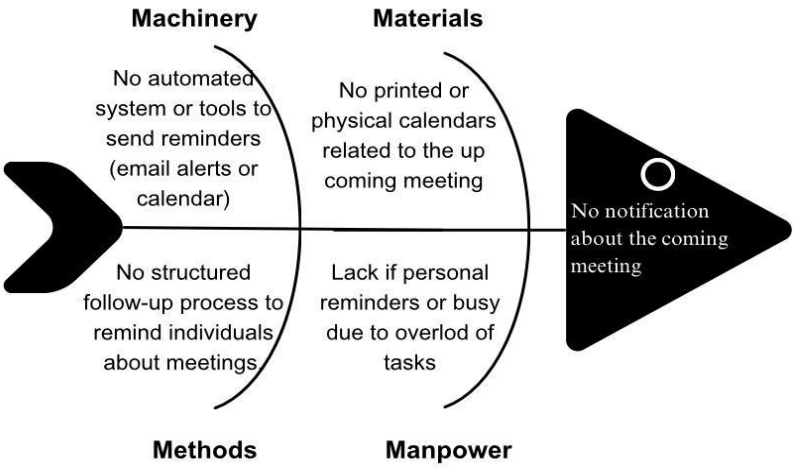


Figure 5 Fishbone diagram of the system for problem 3

Figure shows the issue of the lack of notifications for individuals involved in the meetings. They do not receive reminders or alerts about upcoming meetings. This problem emphasizes the need for an automated system or tool that can send Gmail notifications to ensure individuals are reminded of the upcoming meetings.

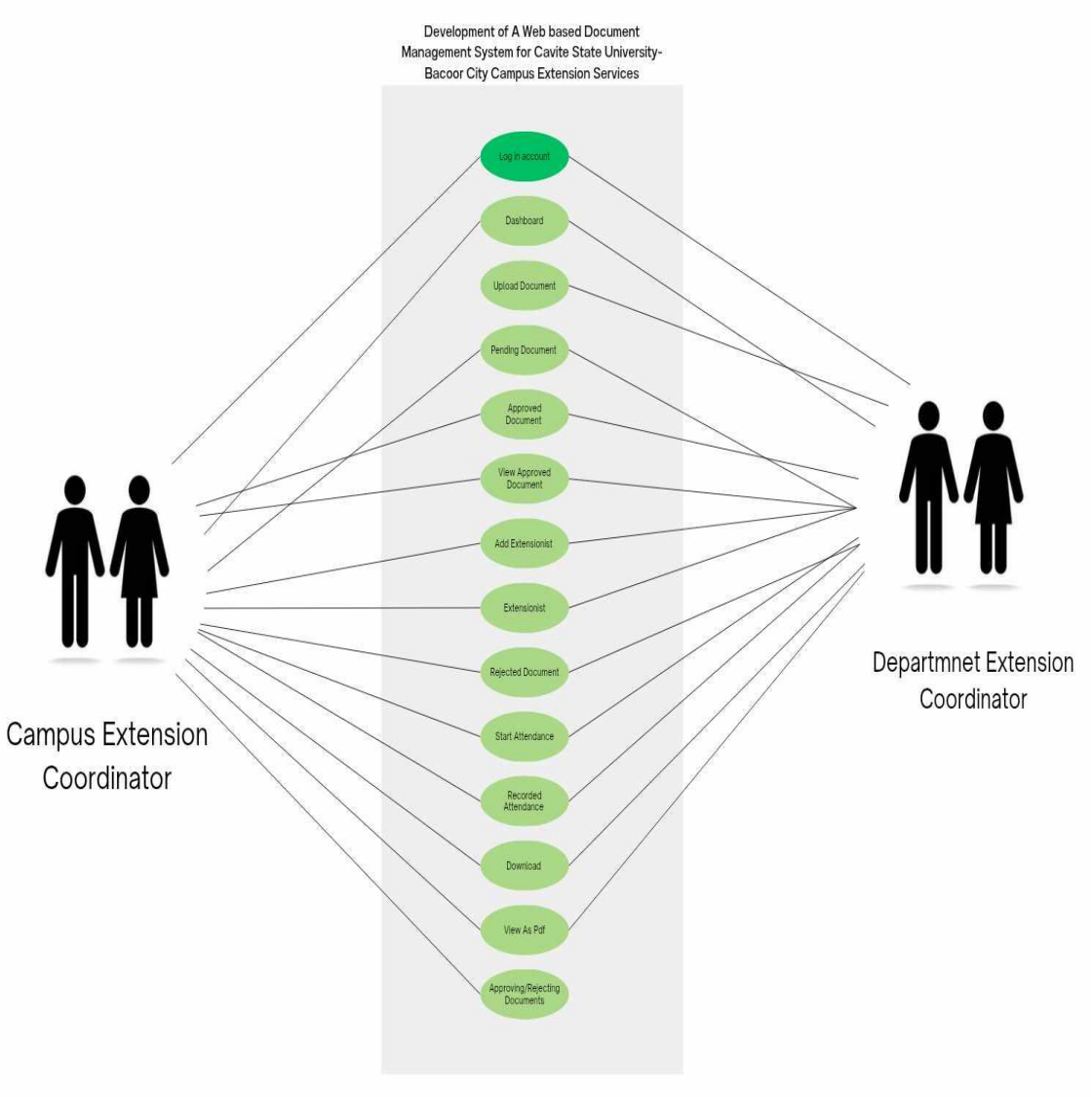
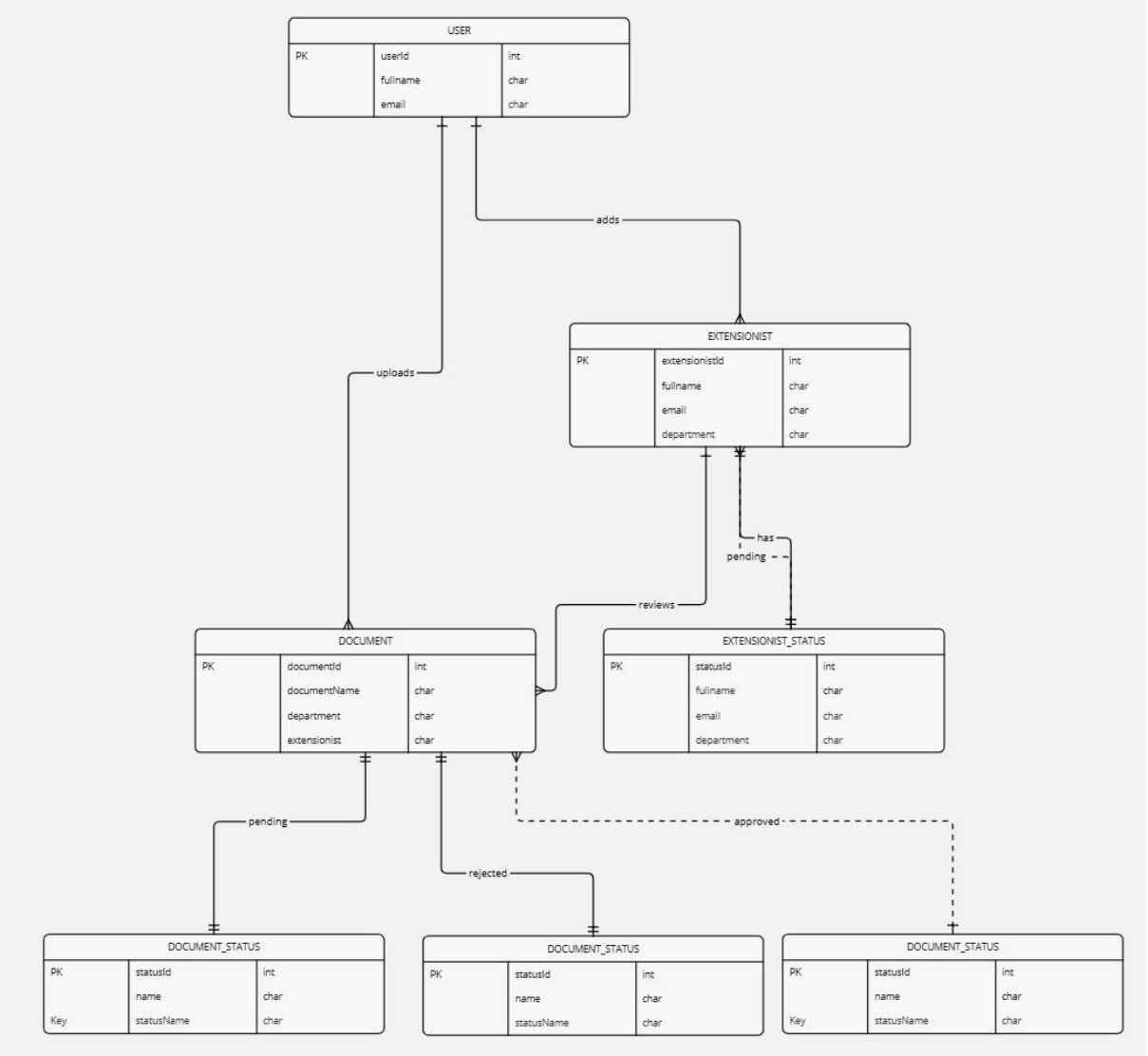


Figure 6 Use Case Diagram of the Development of a Web-based Document Management System for Cavite State University-Bacoor City Campus Extension Services

Figure 6 shows the Use Case Diagram for the Web-Based Document Management System developed for Cavite State University - Bacoor City Campus Extension Services. It shows two main users: the Campus Extension Coordinator and the Department Extension Coordinator. Both can manage documents, track attendance, and approve / reject submissions. The Campus Extension Coordinator has extra privileges to add and manage extensionists. The system streamlines document handling, approval processes, and attendance management for approved efficiency.



Appendix figure 7. Entity Relationship (ER) Diagram

The entity relationship diagram has six entities which are user, extensionist, extensionist status, upload documents, pending documents, approved document, and rejected document. The user can have multiple upload documents and then it will go to the pending section where the head extensionist will check if it is approved or rejected.

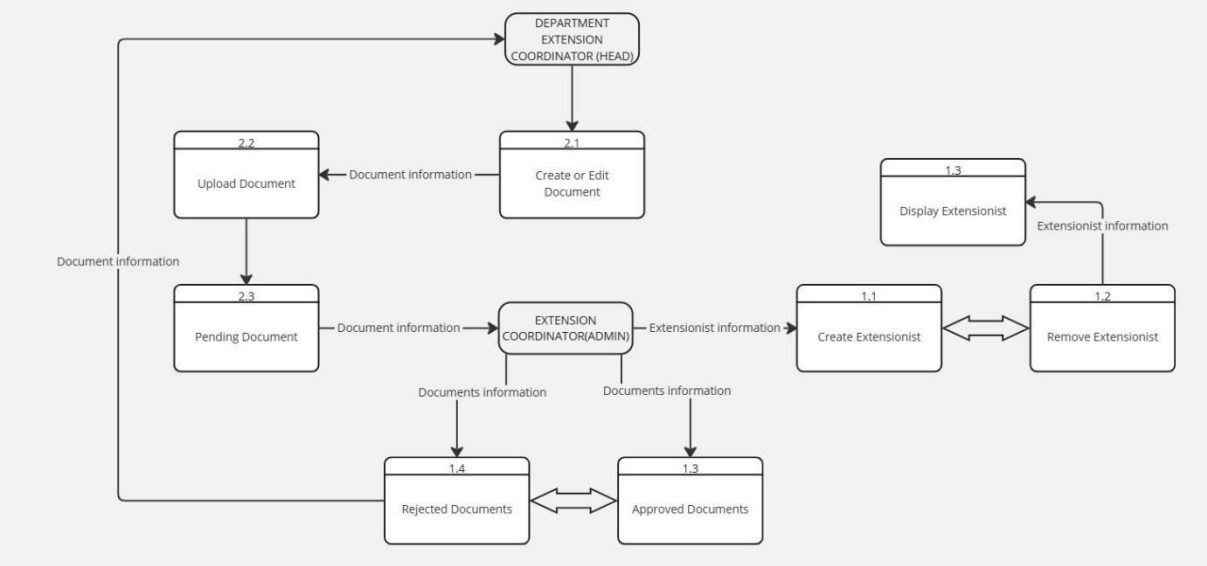
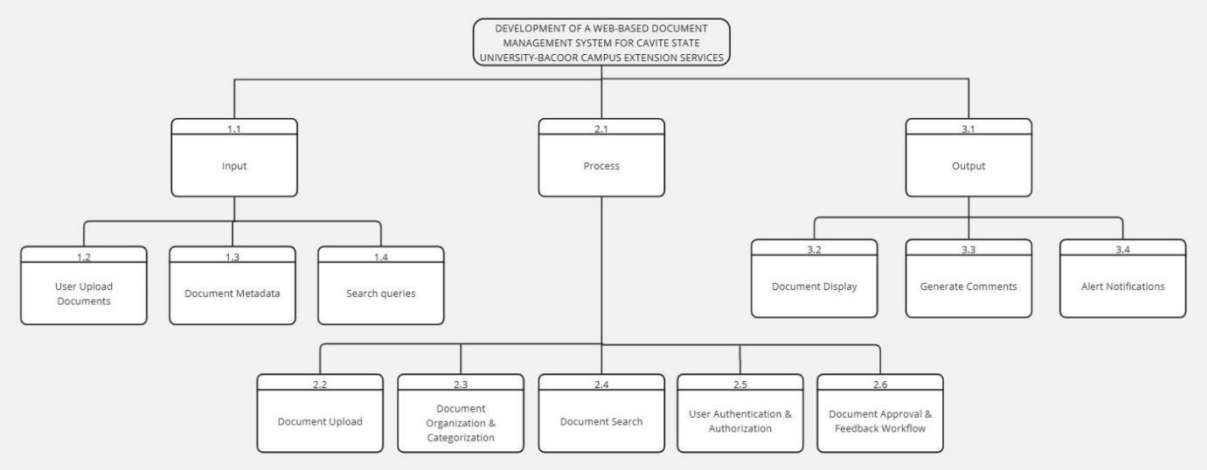


Figure 8 Level 1 data flow diagram of the document management system for CVSU – Bacoor Campus extension services

Figure 8 presents the Data Flow diagram of the uploading documents. As shown in the figure, it illustrates the data flow within an Extension Department system, focusing on document and extensionist management, and it revolves around two primary roles: the Department Extension Coordinator (Head) and the Extension Coordinator (Admin). The Department Head initiates document creation or editing, with "Document information" flowing throughout the system. Uploaded documents enter the system via the "Upload Document" process and are held in "Pending Document" awaiting approval. The Extension Coordinator (Admin) acts as the central figure, managing extensionists through "Create Extensionist" and "Remove Extensionist" processes, with "Extensionist information" being maintained and displayed. Documents are categorized into "Approved Documents" and "Rejected Documents" following the review process, with the potential for movement between these categories. Overall, the DFD depicts a system where documents are created, uploaded, reviewed, and stored, while extensionists are also managed and their information maintained.



Appendix figure 9. Hierarchical Input Process Output

Figure 9 the HIPO Diagram is divided into three main modules: Input, Process, and Output. The Input module handles user uploads and metadata entry, while the Process module manages document organization, search, authentication, and approval workflows. Finally, the Output module displays document, facilitates commenting, and generates alert notifications. Each module is further broken down into sub-modules detailing specific functionalities.