DESIGN AND IMPLEMENTATION OF AN ONLINE SCHOOL FILING SYSTEM WITH AUTOMATED FINANCIAL REPORTS AND AI CATEGORIZATION FOR TEACHERS

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INTRODUCTION

Efficient management of critical administrative tasks such as attendance tracking, filing service credits, and processing leave forms is essential for the smooth operation of educational institutions. These tasks ensure compliance with policies and enhance operational efficiency (Smith, 2023). However, many public schools in the Philippines face significant financial constraints that limit their ability to adopt advanced online systems. According to a study by the Philippine Institute for Development Studies (PIDS), low education funding underpins many challenges faced by the Philippine education system, contributing to inefficiencies and limiting the adoption of innovative solutions (PIDS, 2023). This financial strain often results in reliance on manual processes, leading to delays, misplaced documents, and the need for teachers to refill forms when original documents are lost (Jones & Brown, 2022).

To address these challenges effectively, the development of an online filing and management system presents a practical and cost-effective solution. Unlike costly alternatives, this system allows teachers to conveniently log in, file service credits, submit leave forms, and manage locator slips using shared online access. Furthermore, it incorporates advanced features such as automated document categorization and tagging using machine learning, as well as an Automated Financial Statement Generator based on salary computations for teachers. These features streamline operations, minimize the risk of document misplacement, and enhance financial management, making it particularly suitable for schools facing financial constraints (Johnson, 2021).

Statement of the Problem

The rise of manual administrative processes in schools has posed significant challenges for teachers and administrators. This study aims to answer: How can an online filing and management system mitigate inefficiencies associated with teacher attendance, service credits, leave forms, and locator slips while integrating intelligent document categorization and financial statement generation? Specifically, this study attempts to address the following problems:

Delays and Errors in Manual Filing: Teachers often encounter delays and errors in processing their documents due to manual filing practices, sometimes resulting in the need to refile misplaced forms. *"How can the system minimize delays and lessen the likelihood of document misplacement to ensure accurate record management?"*

Limited Financial Management Tools: Teachers and administrators lack access to automated tools for financial statement generation, relying instead on manual salary computation processes. *"How can the system provide an Automated Financial Statement Generator to simplify salary-based financial reporting for teachers?"*

Inefficient Approval and Record-Keeping Processes: School administrators face difficulty in approving requests and maintaining records due to outdated manual processes. *"How can the system simplify administrative workflows and reduce inefficiencies in record-keeping?"*

Objectives of the Study

The primary objective of this study is to design and implement an online system to manage teacher attendance, service credits, leave forms, locator slips, and automated financial statement generation efficiently.

Specifically, this study aims to:

1. Reduce processing time and minimize errors associated with manual record-keeping practices.
2. Create a module for school heads to review, approve, and track requests seamlessly.
3. Develop an Automated Financial Statement Generator based on the computation of teachers' salaries to simplify financial reporting processes.

Time and Place of the Study

The thesis titled "Design and Implementation of an Online School Filing System with Automated Financial Reports and AI Categorization" received approval in January 2025, and the development of the paper commenced in the month of January 2025. The thesis title defense is scheduled for January 2025.

Scope and Limitation of the Study

The purpose of this study is to develop and implement an online filing and management system to address the inefficiencies in teacher administrative tasks. The system will employ features such as automated categorization, tagging, intelligent search, and automated financial statement generation to enhance functionality and usability. The system is designed for school administrators and teachers, enabling them to manage, secure, and monitor their records efficiently while ensuring timely access to necessary data.

This study focuses on the following modules:

Attendance Management. This module allows teachers to log their daily attendance, providing real-time updates for administrators.

Service Credit Filing. This module enables teachers to submit service credit requests with justifications, ensuring organized and accessible records.

Leave and Locator Slip Management. This functionality facilitates the submission, tracking, and approval of leave forms and locator slips, reducing administrative delays.

Automated Financial Statement Generator. This module computes and generates financial statements based on teacher salary data.

Intelligent Search and Categorization. This functionality implements machine learning-based tagging and categorization for efficient document organization and retrieval.

Report Generation. This module provides administrators with tools to generate detailed and accurate reports on attendance, service credits, and leave records.

The system operates exclusively online, requiring a stable internet connection and excluding third-party integrations due to budget constraints. Initially, it is limited to a single school or a small cluster for focused testing and evaluation. Financial computations are simplified to basic salary structures, without handling complex deductions or allowances.

Definition of Terms

Service Credit. Additional leave granted to teachers for extra services beyond regular duties.

Leave Form. A document submitted by employees to request absence from work.

Locator Slip. A form used to notify the administration of a teacher's location during official duties outside school.

Automated Financial Statement Generator. A system feature that calculates and generates financial reports based on salary data.

Intelligent Document Categorization. The use of machine learning algorithms to classify and organize documents.

Administrative Reports. Documents summarizing and analyzing attendance, leave, and service credit data for decision-making purposes.

Theoretical and Conceptual Framework of the Study

The Design and Implementation of an Online School Filing System with Automated Financial Reports and AI Categorization is grounded in several foundational theories to ensure its design meets user needs and maximizes efficiency.

Systems Theory underscores the importance of creating a cohesive environment where users, processes, and technologies interact seamlessly. By applying this theory, the study emphasizes integrating financial reporting, document categorization, and filing into a single, streamlined platform. This reduces redundancies, enhances collaboration, and ensures that all stakeholders—administrators, teachers, and staff—benefit from a centralized and efficient system.

Diffusion of Innovations Theory (Rogers, 2003) explains the adoption process of new technologies within organizations. For schools to embrace the proposed system, the design must prioritize ease of use, compatibility with existing workflows, and clear advantages over traditional methods. Providing training and support to end-users further facilitates adoption, ensuring the system becomes an integral part of school operations.

Task-Technology Fit Theory (Goodhue & Thompson, 1995) highlights the effectiveness of technology when its functionalities align closely with the specific tasks it supports. In this context, the system is designed with features like automated financial reporting, AI-driven document categorization, and customizable filing mechanisms. These functionalities address the unique needs of schools by improving accuracy, saving time, and reducing the manual workload associated with administrative tasks.

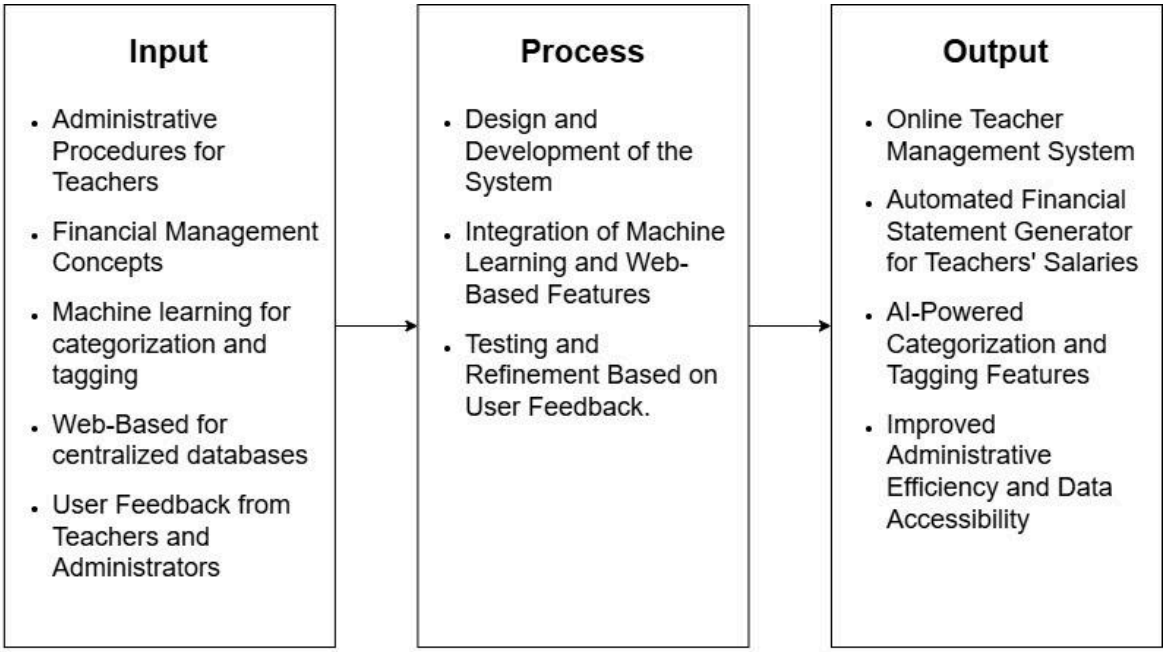

Figure 1. Conceptual Framework in a Input-Process-Output Format

REVIEW OF RELATED LITERATURE

This review of related literature explores the design and implementation of an Online School Filing System (OSFS) that integrates automated financial reports and artificial intelligence (AI) for categorization purposes. The use of such systems in educational institutions aims to enhance data management, improve decision-making, and optimize financial tracking.

Related Literature (International)

Designing Electronic Filing Systems for Educational Institutions

The study by Smith, R., & Anderson, K. (2020) explores the principles and best practices in developing electronic filing systems for schools and universities. The authors emphasize that effective electronic filing systems should be designed with the following goals such as: User-Friendliness, Data Security, Scalability, and Policy Compliance.

The authors also pointed out that manual filing systems are prone to data loss, delayed processing times, and errors, which can affect administrative efficiency. By transitioning to electronic filing systems, educational institutions can improve their document management processes, enhance record accessibility, and reduce processing times for approvals.

Smith and Anderson's (2020) paper is highly relevant to the proposed study, as it provides core principles for building efficient, accessible, and secure electronic filing systems. However, the proposed system expands upon the work by incorporating financial automation, AI-driven categorization, and advanced system integration. These innovations address gaps in their research, such as the absence of AI categorization, deeper financial automation, and the integration of predictive financial tools. Your study builds on their foundational work but adds critical

advancements to improve the overall functionality and impact of online school filing systems in educational institutions.

The Role of Automated Systems in School Administration

In their study, Barrett, G., & Brown, S. (2017) explored the role of automated systems in improving school administration, specifically focusing on leave management and service credit applications. The authors emphasized that traditional manual processes in schools are often inefficient, prone to errors, and cause delays in the approval of administrative requests.

This literature is highly relevant to the proposed study because it supports the idea of using automation to improve the filing and approval process for teachers' service credits, leaves, and locator slips. The proposed system aligns with the core principles discussed by Barrett and Brown.

A Study of Electronic Leave Management Systems in Schools

In their study, Tian, L., & Zhang, L. (2018) examined the digitalization of leave management systems in educational institutions. The study focused on how electronic leave management systems can streamline the leave application process, improve record-keeping, and reduce administrative workload in schools. The authors identified several key benefits of transitioning from manual to digital systems for leave tracking: Time Efficiency, Accurate Leave Tracking, Transparency in Leave Approvals, Data Security, and Policy Adherence.

A Study on the Integration of AI in School Administration Systems

This study by Johnson & Williams (2021) focuses on the integration of Artificial Intelligence (AI) in school administration systems to streamline processes like document management, financial reporting, and student performance analysis.

The authors explore how AI can be used to categorize and sort vast amounts of school-related documents, such as student records, financial statements, and administrative paperwork. The paper demonstrates the use of AI algorithms to automate the categorization of documents based on predefined tags, which improves efficiency and reduces human errors.

The study also examines the automation of financial reporting, with AI helping schools generate accurate and up-to-date financial records, manage budgets, and provide real-time reports on income and expenses. This integration of AI into school administration systems provides a more efficient way to manage and process data, ensuring better decision-making and accountability.

This study aligns with the proposed title by focusing on AI categorization and automated financial reporting. While Johnson and Williams' study is broader in scope, it emphasizes the use of AI to improve the organization of documents and financial data, which is central to your study's goals.

Design and Development of an Automated School Management System

This paper by Patel & Singh (2019) discusses the design and development of an automated school management system that includes functionalities such as online filing systems, student data management, and financial accounting automation. The study specifically highlights the development of an integrated platform that allows for automated generation of financial reports like tuition fee records, salary distribution, and expense tracking.

The authors also explore how AI and machine learning can be applied to categorize and manage vast amounts of student and administrative records. The system allows for automated classification of documents (e.g., student transcripts,

financial receipts, academic performance records), with AI learning to recognize patterns and categorize documents based on their content.

This study focuses on automating financial reporting and document management, but it doesn't delve into how AI categorization can be applied across both academic records and financial reports within the system in an integrated fashion. The proposed study aims to automatically categorize both financial and academic data, creating a unified system where these aspects are closely linked and serve multiple purposes.

Related Literature (Local)

A Case Study on the Integration of Financial Automation in Philippine School Systems

In this study, Dela Cruz and Tan (2019) examine the integration of financial automation within educational institutions in the Philippines. The paper focuses on how automated financial systems help streamline various financial processes, such as tuition fee collection, expense tracking, and budget management. The authors explore the benefits of automating these financial functions, such as reducing human errors, improving reporting accuracy, and providing real-time access to financial data. By automating financial systems, the study shows how schools can achieve greater efficiency in their financial operations, allowing administrators to make informed decisions based on up-to-date financial information.

The study also emphasizes the adoption of financial automation tools that can generate reports on financial statements, track revenue and expenditures, and ensure that financial data is more accessible and transparent to relevant stakeholders. However, while the paper provides valuable insights into the role of

financial automation in school systems, it does not delve into aspects such as document filing systems or the use of Artificial Intelligence (AI) for data categorization.

Artificial Intelligence for Document Categorization in Philippine School Management Systems

In this study, Pangilinan and Santos (2021) explore the application of Artificial Intelligence (AI) in categorizing documents within school management systems in the Philippines. The paper investigates how AI algorithms can be employed to automate the categorization of a wide range of documents, including student records, administrative files, academic performance reports, and other school-related materials. Their research focuses on the benefits of AI in terms of improving data organization, ensuring quick access to relevant information, and reducing the reliance on manual processes.

The authors highlight how AI can analyze large volumes of data, classify documents based on predefined criteria, and help administrators access specific information more quickly and accurately. The study underscores the potential for AI to optimize school management processes by automating the organization of documents, allowing for a more efficient workflow and better decision-making within school administration.

Challenges in Leave Filing and Approval Processes in Philippine Public Schools

The challenges in leave filing and approval processes in Philippine public schools have been widely discussed in various studies, emphasizing the inefficiencies of manual systems and the difficulties faced by both teachers and administrators. Key challenges identified include: (1) Manual Paperwork; (2) Lack of Transparency; Teachers often face challenges in tracking the status of their leave

applications. Without a digital system, it is difficult for both the teacher and the administrator to know where the request stands in the approval process, causing frustration and uncertainty. (3) High Risk of Errors; and (4) Administrative Bottlenecks. In many public schools, the approval process for leaves can be slow and burdened by bureaucratic procedures. Multiple layers of approval, combined with the absence of automated systems, create significant delays in processing leave requests, which can result in teachers being unable to make timely plans for personal or professional commitments.

The Role of Information Systems in Modernizing School Administration (2021)

The article discusses the growing significance of information systems in enhancing the efficiency of school administration. It highlights how information technology (IT) has transformed administrative functions, with particular focus on service credits, leave management, and locator slips, which are central to your proposed system. Here's how the findings apply to the proposed research: Automation of Administrative Tasks, Improved Accuracy and Efficiency, Real-time Data Access and Tracking, Enhanced Decision-Making, and Cost and Time Savings.

The main gap between "The Role of Information Systems in Modernizing School Administration" and the proposed study is that while the article highlights the general benefits of information systems in schools, it does not specifically address the challenges and solutions related to managing teachers' leave applications, service credits, and locator slips. The proposed study aims to bridge this gap by providing a customized solution that integrates leave management, service credit tracking, and locator slip approvals, ensuring efficiency, accuracy, and cost-effectiveness—aligning with the broader benefits of information systems outlined in the article while offering a ai-categorization and automated financial reports.

Implementation of an Online School Filing and Financial System in a University in the Philippines:

In this study, Rodriguez and Villanueva (2022) examine the implementation of an online school filing and financial system at a university in the Philippines. Their research focuses on how the university adopted a digital system to manage both academic records and financial transactions, aiming to streamline administrative processes and improve operational efficiency. The paper outlines the key features of the system, which include the storage and retrieval of student records, automated generation of financial reports, and tracking of tuition fees, payments, and other financial activities.

The study emphasizes the system's role in reducing paperwork, minimizing human error, and providing real-time access to important academic and financial data. Rodriguez and Villanueva also highlight the ease of access to these records for administrators, students, and faculty members, improving transparency and communication within the university. The paper suggests that the implementation of the system led to more accurate and timely financial reporting, greater accountability in financial transactions, and easier access to student records, all contributing to a more efficient administrative workflow.

Rodriguez and Villanueva's study offers a valuable case study of the implementation of an online school filing and financial system in a university in the Philippines. Their work demonstrates the benefits of automating school records and financial reporting, improving administrative efficiency and transparency. However, their study does not address the integration of AI for categorization, deeper financial automation, comprehensive system design, user experience, or scalability. Your research builds upon their work by incorporating AI-driven categorization and expanding the scope of automation to include more advanced financial features and

a more integrated system design, addressing gaps in their study and offering a more holistic approach to school management automation.

Table 1. Table of Comparison

STUDY	FOCUS AREA	KEY FINDINGS	RELEVANCE TO PROPOSED SYSTEM
Design and Development of an Automated School Management System	Automation simplifies leave management, financial reporting, and academic record organization.	Highlighted how automation can streamline key administrative functions.	Supports the integration of financial reporting and academic record management
Design of Electronic School Filing Systems for Institutions	User-friendliness, data security, scalability, and policy compliance improve administrative efficiency.	Showed the importance of secure, scalable, and user-friendly systems in educational settings.	Validates the need for user-friendly interfaces and secure document handling
Artificial Intelligence for Document Categorization in Philippine School Management Systems	AI-driven categorization for educational documents to reduce manual processing.	Showed the efficiency of AI in document categorization for educational institutions.	Validates the use of AI for advanced document categorization
Implementation of an Online School Filing and Financial System in a University in the Philippines	Improves administrative workflow through automated financial reporting and academic record management.	Demonstrated benefits of integrating financial reporting with academic processes in a single platform.	Aligns with the proposed system's financial automation and academic record integration goals.

The Role of Information Systems in Modernizing School Administration	Enhances school administration efficiency through integrated information systems.	Demonstrated the efficiency of integrated information systems in school settings.	Aligns with the proposed system's goal to combine AI-driven categorization, financial reporting, and real-time notifications.

METHODOLOGY

Materials

To implement the proposed system, specific hardware and software resources are required. For hardware, the setup includes a server, which can be either a physical machine or a cloud-based option such as AWS or Azure, to host the system. Development machines, such as laptops or PCs with adequate processing power, will be utilized for development and testing. Networking equipment, including routers and modems, will ensure stable connectivity for system access and operations, especially for on-premise setups, while a reliable internet connection will suffice for web-based systems.

The software stack comprises programming languages and tools tailored to the system's requirements. Backend development will leverage Python for AI/ML and data handling, or PHP for server-side logic, while frontend development will use HTML, CSS, and JavaScript with frameworks like React.js or Vue.js for dynamic user interfaces. MySQL or PostgreSQL will manage structured data storage. Frameworks such as Django or Flask (for Python) or Laravel (for PHP) will streamline backend development. Development tools include Git/GitHub for version control, AI libraries like TensorFlow, scikit-learn, or PyTorch for document categorization and predictive analytics, and Python libraries like Pandas for financial data analysis. Testing will involve tools such as Selenium or Cypress for frontend testing and Postman for API testing. Development environments like Visual Studio Code or PyCharm will enhance the coding experience. Data sources for testing will consist of sample teacher records, financial transactions, and administrative files.

Experimental units to be used

The experimental units for this study consist of various components involved in the development, testing, and evaluation of the proposed system. These components include individual teacher profiles, which are securely stored and managed within the system's database, along with administrative data such as class schedules, evaluation results, and financial reports. The system comprises several key modules designed to streamline processes: a registration module for creating and managing teacher profiles, an evaluation module for collecting and analyzing teacher evaluation data based on established criteria, a document management module for organizing and categorizing administrative records, and a notification module for delivering real-time updates, and announcements.

The primary users of the system are teachers, who will utilize it to access their profiles, evaluations, and notifications, and administrative staff, who will manage the data and oversee the system’s operation. To ensure the system's functionality, accuracy, and responsiveness, testing scenarios such as the submission and categorization of evaluation reports will be conducted. These experimental units are integral to assessing the efficiency and effectiveness of the proposed system in addressing the needs of teachers and administrative staff.

Planned experimental design

The system development follows the System Development Life Cycle (SDLC) methodology. Phase 1 involves requirements analysis, gathering input from stakeholders such as school administrators, teachers, and IT staff to identify challenges in the current filing system. Phase 2 focuses on system design, employing UML diagrams like class, sequence, and use-case diagrams to define the

architecture, ensuring modularity for scalability. In Phase 3, the implementation phase, the system will be developed using the chosen tools and programming languages, prioritizing AI-driven categorization and real-time financial tracking. Phase 4 entails testing, including unit testing, integration testing, and user acceptance testing to validate functionality and usability. Finally, Phase 5 involves deployment and training, where the system is introduced in a controlled environment and users are trained.

The evaluation criteria include accuracy, measuring AI categorization performance through metrics like precision, recall, and F1-score; efficiency, assessing time savings in administrative tasks compared to manual processes; usability, collecting user feedback on navigation and performance; and reliability, testing system performance under varying load conditions. Based on the user's prior knowledge and experience with similar projects, Python is recommended for its simplicity and extensive library support for AI/ML tasks. PHP is a viable alternative if the team prefers server-side scripting, while JavaScript remains indispensable for modern frontend development due to its ease of learning and demand in the industry.

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