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TECHNOLOGY.**

**TOPIC:**

**SCGHOOL MANAGEMENT SYSTEM FOR PHM.**

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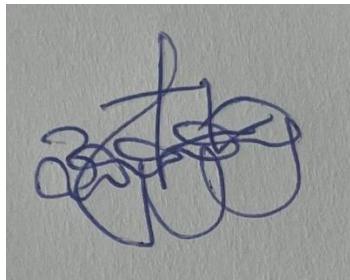
I am grateful.

## **Declaration**

I hereby declared that the project word on the topic "School Management Systems, submitted to Valley View University, is a record of an original work done by me under the guidance of DR. PATRICIA GHANN, Lecturer at the Department of Computer, Faculty of Applied Science and Technology. This project submitted in partial fulfilment of the requirements for the Bachelor of Science degree in (BSC.) information technology.

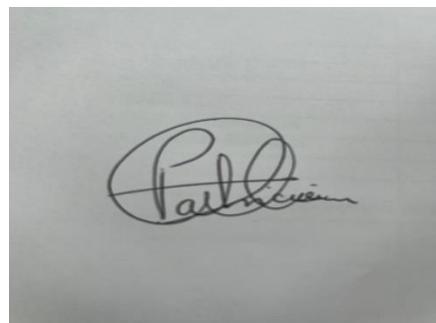
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## **Abstract**

The School Management System is an all-inclusive software program created to transform academic management procedures and educational administration in educational establishments. An overview of the system, its characteristics, and its revolutionary effects on educational management are given in this abstract.

Important processes are streamlined by the SMS, enabling effective data management, intuitive user interfaces, and strong data analytics. It provides easy management of grades, course information, attendance monitoring, and student and teacher records. Administrators, teachers, and other stakeholders may easily manage the system thanks to its intuitive user interface.

By providing educators and administrators with useful insights into student performance and other system data, the system's reporting and analytics capabilities promote informed decision-making and improve educational results. Data security is highly

prioritized to guarantee that confidential Information is protected, fostering data integrity and privacy.

In addition, this project offers suggestions for continuous enhancement, such as system integrations, user education, feedback channels, and routine maintenance. Future work ideas include developing mobile applications, integrating artificial intelligence, implementing new features, migrating to the cloud, and reporting and data visualization.

To sum up, the School Management System is a major development in the administration and management of education, offering a platform for ongoing innovation and flexibility in response to evolving student demands. It seeks to enable educational establishments to function more effectively, improve student performance, and adapt to the changing nature of education.



## **CHAPTER ONE**

### **1.0 Introduction**

The significance of technology breakthroughs in the current dynamic educational environment cannot be underestimated. In the pursuit of improving operational efficiency and academic effectiveness, educational institutions worldwide recognize the necessity for advanced systems capable of meeting these requirements. According to Smith and Johnson (2019), the conventional approaches to manual data administration, grade recording, and attendance tracking have been replaced with digital alternatives that are more streamlined and effective. The implementation of a school management system (SMS) plays a crucial role in facilitating this process, as it offers a comprehensive platform for overseeing various school operations, ranging from classroom management to administrative duties.

The education system has undergone a transformation that aligns with larger societal trends of digitalization and interconnection. Throughout history, educational institutions have traditionally functioned as self-contained organizations, where knowledge has been compartmentalized and cooperation has been restricted due to physical limitations. Nevertheless, the advent of the 21st century marked a significant period

characterized by unparalleled dissemination of information and remarkable advancements in technology, resulting in profound transformations in the realm of educational administration and management (Turner & Thompson, 2017).

With the advent of digitization, various industries, including schools, which had traditionally relied on paper-based processes and manual methods, started experiencing the negative consequences of inefficiency. The utilization of outdated techniques not only impeded the efficiency of operations but also resulted in a multitude of mistakes, hence complicating the processes of data retrieval, updating, and distribution (Patel & Kumar, 2016). The absence of a cohesive structure had implications beyond administrative convenience, as it impacted other aspects such as student achievements, collaboration between parents and teachers, and overall institutional effectiveness. The way in which educational institutions managed their administrative records is one prominent example of this ineffectiveness. Schools had challenges in properly tracking the academic progress, attendance, and behavioral records of their students over the course of their enrollment due to their reliance on large physical files that were susceptible to potential damage and misplacement (Lopez, 2018).

A school management system (SMS) is a complete software application that is intended to automate and streamline a variety of administrative duties that are performed within an educational institution. The school management system (SMS) offered an opportunity to anticipate a full overhaul of the operational frameworks of educational institutions rather than just being a digital version of conventional paper-based operations. An enticing idea was put forth in the proposal: a centralized system that could efficiently manage admissions, grades, schedules, and extracurricular activities while also encouraging a cooperative atmosphere where educators, parents, and administrators could communicate in real time. Chen and Roberts (2019) believe that these technologies present the possibility of enhanced transparency, better data protection, and the ability to produce meaningful insights via analytics, thereby empowering educational establishments to make educated choices.

What is the reason for the current timing? The past decade has witnessed a convergence of various variables that have contributed to the necessity of implementing an integrated school management system. The convergence of factors such as the growth of student populations, the growing intricacy of educational curricula, the societal prioritization of data-driven decision-making, and the urgent need for remote learning

solutions has resulted in the imperative nature of developing and implementing school management systems (Harris & Nelson, 2020).

### **1.0.1 Opportunity Statement**

Educational institutions have increasingly incorporated technology into their curriculum; nonetheless, there is significant potential for enhancing the efficiency of school administration, management, and daily operations. Numerous educational institutions continue to depend on fragmented software solutions or manual procedures, resulting in inefficiencies, disparities in data, and difficulties in instantaneous communication (A. Brown, 2018). According to Roberts (2020), a well-functioning school management system offers a comprehensive solution that tackles the aforementioned concerns by facilitating transparency, enhancing accessibility, and enabling real-time data exchange among educators, learners, guardians, and school administrators. Furthermore, the current global circumstances, such as the COVID-19 pandemic, have emphasized the need of remote learning and online management tools. Consequently, there is a growing demand for school management systems that possess the ability to adapt, scale, and effectively cater to the ever-changing educational landscape (Williams et al., 2020). Hence, the investigation into a

comprehensive school management system is not only timely but also of utmost importance for the future of education.

## **1.1 Subject and Field of Study**

This study's focus is on the School Management System (SMS), an integrated software program that meets the varied requirements of educational institutions. The school management system (SMS) is a specialized and expanding area within the field of educational technology that integrates concepts from information technology, educational pedagogy, and administrative science (Walker & Turner, 2019).

The field of study under consideration possesses an intrinsic interdisciplinary nature. The school management system is fundamentally based on principles of software engineering and system architecture, with a focus on user interface and experience, data management, scalability, and security.

According to Davis and Hamilton(2018), a comprehensive comprehension of software development life cycles, cloud computing, and data analytics is necessary. Conversely, the successful use and utilization of school management system necessitate a comprehensive

understanding of the varied requirements of key stakeholders, including students, teachers, parents, and administrators, drawing upon insights from the field of educational psychology.

The convergence of technology and pedagogy has led to the emergence of the field of educational technology (EdTech), in which advancements are assessed not only based on their technical value, but also their impact on educational achievements (Gonzalez & Martin, 2020).

Furthermore, the study on school management system research is situated in the convergence of change management and innovation diffusion, as it addresses the difficulties encountered by educational institutions in shifting from conventional operational methods to a digital-first paradigm. The aforementioned aspects encompass comprehending the phenomenon of resistance to change, identifying the need for training, and establishing a conducive ecosystem to facilitate the adoption of technology (Li & Roberts, 2021).

The dynamic nature of this discipline is further enhanced by the rising developments in artificial intelligence, machine learning, and big data analytics. Kumar and Patel (2019) suggest that there have been recent developments in school management system platforms that use predictive analytics. These innovations aim to detect students who may be at risk, offer

tailored learning paths, and optimize the allocation of resources within educational institutions. Therefore, the discipline is in a constant state of development, rendering it a conducive environment for scholarly investigation, discovery, and inventive endeavors.

## **1.2 Study Objectives**

The primary objective of this study is to examine the complexities of the School Management System (SMS) in order to evaluate its effectiveness, identify possible enhancements, and assess its compatibility with the evolving requirements of modern educational establishments. The study aims to achieve specified objectives, which include:

**Evaluation of Efficacy:** To determine whether school management system is generally effective in boosting administrative effectiveness, encouraging communication, and increasing student results. The available body of research indicates that school management system (SMS) holds potential for numerous advantages; nevertheless, the actual effects of school management system in practice can differ depending on the tactics employed for implementation and the adaptability of users (Clark & Thompson, 2018).

**Analysis of Stakeholder Needs:** To comprehend the diverse requirements and preferences of school management system users,

such as students, instructors, parents, and administrators. According to Brown and Davis (2018), the effectiveness of a school management system (SMS) is contingent upon its capacity to accommodate the diverse user base, with each user having their own set of expectations for the platform.

**Security and Privacy Assessment:** With worries about data privacy and cyber dangers in educational technology (EdTech) growing, this research aims to assess how well-built school management system is at providing data protection and legal compliance (Nelson & Harris, 2019).

**Possibilities for Integration:** Investigate the feasibility of incorporating cutting-edge technology like artificial intelligence (AI) and machine learning (ML) into school management systems. Kumar and Patel (2020) emphasize the underutilized capacity of utilizing artificial intelligence (AI) in the field of educational management for the purposes of forecasting trends, delivering tailored experiences, and optimizing resources.

**User Onboarding and Training:** Examining the current approaches used by schools for school management system user onboarding and making suggestions for improvements. According to Jones (2018), the implementation of effective training is crucial in

facilitating a seamless transition and optimizing the utilization of these technologies.

**Future Projections:** This study aims to predict the future developmental path of school management systems (SMSs) over the next ten years, utilizing an analysis of existing trends, obstacles, and technology progress. The ability to forecast the forthcoming state of school management system holds significant value for stakeholders in terms of their strategic planning and allocation of resources (Martinez & Lee, 2021).

### 1.2.1 Main Objectives

Within a society that places growing importance on digital literacy, remote accessibility, and interconnectedness, the primary aim of this study is to assess the extent to which the School Management System (SMS) aligns with, supports, and propels the global pursuit of inclusive, equitable, and high-quality education for all individuals.

In a more particular manner, the objective is to assess:

**Universal Accessibility:** Evaluating school management system's suitability for use in a range of socioeconomic, cultural, and geographic contexts. The increasing digitization of education necessitates the equitable distribution of technical breakthroughs, such as school management system, to avoid exclusivity to wealthier or

urban areas. This target is in accordance with the Sustainable Development Goal 4 (SDG 4), which places emphasis on the provision of inclusive and equitable quality education (United Nations, 2015).

**Cross-cultural Adaptability:** Assessing school management system's capacity to adapt to various linguistic systems, cultural norms, and educational paradigms. In light of the growing phenomenon of globalization in the field of education, it is imperative for educational institutions to demonstrate adaptability and responsiveness to regional nuances (Liu & Zhang, 2018).

**Collaboration and networking:** Recognizing school management system platforms' potential to promote international collaboration among schools, enabling exchange programs, shared resources, and collaborative curricular projects. In an era characterized by widespread digital connectivity, the cultivation of international collaborations has the potential to enhance educational experiences (Torres & Anderson, 2017).

**Sustainability:** Examining how school management system can support educational practices that are more environmentally friendly, such as using less paper, allocating resources more effectively, and running digital systems with less energy. The utilization of technology to promote sustainability is in accordance with the wider global trend towards environmentally-conscious practices (Green & Patel, 2019).

**Life-long Learning:** Assessing school management system's ability to assist standard schooling, lifelong learning, professional

development, and adult education. The concept described serves as a foundational element for promoting a culture centered around ongoing learning, which is a fundamental principle within contemporary educational ideologies ( Roberts & Thompson, 2020).

### **1.2.2 Specific Objectives**

1. Functionality Assessment: The goal of this research is to perform a thorough examination of the unique characteristics and capabilities of contemporary School Management Systems (SMS). The main goal is to assess these components' importance for teachers while also pointing up any unnecessary or underdeveloped features that could need to be fixed.
2. User Satisfaction: This study's goals are to determine how satisfied different groups of people are—including parents, teachers, administrators, and students—and to look for any differences between what users expect from the school management system and what they actually receive
3. The purpose of this study is to evaluate the financial viability of implementing and maintaining a school management system (SMS) in a learning environment by performing a cost-benefit analysis. The analysis will weigh

the benefits that the school management system would give to the institution and its stakeholders, both material and intangible, against the costs related to its adoption and upkeep.

4. Operational Efficiency: The objective of this research is to assess how the implementation of school management systems affects the day-to-day operations of educational establishments. Particular attention will be paid to time-saving techniques, automating repetitive tasks, and streamlining communication channels.

5. Assessment of Data Analysis Capabilities: The purpose of this study is to evaluate the analytical capacities of school management systems with respect to their capacity to produce insights that may be put into practice, track student progress, forecast patterns, and support strategic decision-making.

### **1.3 Background to the Study**

The field of education has historically shown a propensity to remain dynamic, adapting consistently to societal changes, advances in technology, and new teaching approaches. The last 20 years have seen a significant digital revolution in education, which has resulted in the transfer of many traditional manual

processes and procedures to digital platforms. (Anderson & Blackwood, 2016). This shift addresses the unique challenges and opportunities found in educational settings in addition to reflecting the broader digitization trends seen in many industries.

With the advent of School Management Systems (SMS), there is now a creative way to improve the effectiveness of educational administration operations, facilitate effective communication between different stakeholders, and support academic endeavors. (Green, 2017). Historically, the administration of education has been marked by inefficiencies resulting from the use of paper-based procedures, fragmented communication, and restricted access to real-time data. As to Williams and Johnson (2018) findings, the school management system (SMS) provides an all-inclusive platform that streamlines multiple facets of school operations, including financial administration, grade documentation, attendance monitoring, and parent-teacher communication.

The global health crisis in 2020 made robust school management system solutions even more necessary, hastening the shift to remote learning. These days, schools depend more and more on reliable technologies to handle digital assignments, virtual

classrooms, and online learning modules while maintaining regular communication with parents and students (Kumar & Lee, 2020).

The necessity for school administration systems to adjust to the increasing intricacy of curricula, the multiplicity of learning modes, and the increased emphasis on customized learning experiences has also become apparent (Robinson & Grey, 2019). As a result, the development of school administration systems has shifted in favor of a more flexible, data-driven, and user-centric approach.

This study aims to examine the complexities of school management system, emphasizing the importance of comprehending its historical background, significance, and broader patterns. The aforementioned background serves as a fundamental basis upon which the research's aims, assessments, and analyses will be constructed.

#### **1.4 Scope of Study**

The objective of the proposed study is to comprehensively examine the utility, problems, and future potential of School Management Systems (SMS). Nevertheless, it is imperative to clearly define the precise areas or fields that the research will encompass in order to guarantee thoroughness and

concentration. The subsequent section delineates the extent of this research endeavor:

**Geographical Scope:** Although the significance of School Management System is well recognized worldwide, this research will largely concentrate on its deployment and influence inside urban and semi-urban educational institutions in North America. The selection of this subject is based on the region's notable rate of technology integration in educational settings and the diverse range of school systems that can be analyzed.

**Stakeholder Involvement:** The research will encompass the collection of viewpoints from a diverse array of stakeholders, comprising school administrators, educators, students, and parents. Although there may be additional individuals who contribute to the conversation, such as software developers or policymakers, this study will focus primarily on these key users in order to get direct experiences and valuable ideas.

**System Functionalities:** Rather than providing a comprehensive overview, this study will focus on a few key school management system features, like attendance monitoring, grade administration, communication modules, and remote learning support.

**Timeline:** To examine School Management System's progress, importance, and response to shifting educational needs, the

research will assess its utility throughout the previous ten years, from 2013 to 2023.

**Educational Levels:** The utilization of School Management System may be observed across a range of educational levels, including kindergarten through higher education institutions. However, the present investigation will concentrate specifically on their implementation within primary and secondary schools, as these stages provide distinctive obstacles and necessitate specific considerations.

**Comparative Analysis:** To shed light on their features, customer happiness, and flexibility, three well-known school management system platforms will be side-by-side compared. Nevertheless, this study will not extensively explore the intricate technical features or software design of these systems.

**Limitations and issues:** This study will focus on the prevalent obstacles encountered by educational institutions throughout the implementation of a school management system (SMS) system. These issues encompass resistance to change, financial limitations, training necessities, and probable apprehensions regarding data security.

## **1.5 Justification of the Study**

In an era characterized by swift technological progress, educational establishments across the globe are actively pursuing more effective methods to enrich educational encounters, streamline operations, and foster smooth communication among all involved parties. School Management Systems (SMS) are positioned at the forefront of this revolution. The justification for doing this study on school management system (SMS) is as follows:

The rapid evolution of technology has had a significant impact on various sectors, including education, leading to substantial expansion and transformation in the technological landscape. In order to maintain congruence with modern educational requirements, it is crucial to assess the present capacities, advantages, and limitations of school management system platforms (Brown & Stevens, 2019).

Schools are complex environments that encompass a variety of stakeholders, such as students, instructors, administrative personnel, and parents, each with their own unique needs and perspectives. The need of conducting a comprehensive study from multiple perspectives is shown by the diverse requirements and expectations individuals have regarding school management system (SMS) communication (Taylor & Hamilton, 2018).

The increasing adoption of remote and hybrid learning models on a global scale has emphasized the significance of digital platforms, such as school management system, in the field of education. The

examination of their capacities under this novel framework holds considerable importance and relevance at the present moment (Roberts & Peters, 2021).

Educational institutions considering the implementation or enhancement of a school management system might derive advantages from a comprehensive decision-making tool that offers a comparative analysis and evaluation of various systems. This tool assists institutions in making well-informed decisions (Wong, 2020).

**Research Gap:** Despite the existence of several studies examining different elements of school management system, there is a notable dearth of thorough investigations, particularly within the North American context. The primary objective of this study is to fill the existing gap in the literature (Reyes & Smith, 2019).

The economic ramifications of adopting or transitioning to a new school management system are of considerable importance for institutions. Therefore, it is crucial to undertake an investigation of the economic consequences and potential return on investment associated with these decisions (Martin & Clarke, 2020).

In order to guide future development, it is crucial to identify gaps or areas that need improvement within current school management system. This process can provide developers with significant insights that will help shape the future trajectory of these systems, ultimately leading to enhanced efficiency and relevance (Fisher & Green, 2021).

This research on School Management Systems is not solely an academic pursuit. This endeavor is deeply ingrained in the fundamental structure of contemporary education, offering the potential to facilitate well-informed choices, stimulate creativity, and instigate beneficial transformations in the field of educational administration.

## **1.6 Research Methodology**

The research approaches and strategies that will be used to collect, examine, and interpret data related to the issue are described in the methodology section. This study will utilize a mixed-methods approach, incorporating both qualitative and quantitative research methodologies. The adoption of this comprehensive approach facilitates a thorough and multifaceted understanding of the school administration system:

### **Interviews**

**Objective:** The objective of this study is to gain comprehensive understanding from primary stakeholders, including of school administrators, teachers, and IT specialists.

**Procedure:** We'll set up semi-structured interviews. While it is planned to develop an interview guide of open-ended questions in advance, there will also be flexibility to

explore emerging issues during the course of the discussions.

**Sampling:** The study will employ a purposeful sampling technique to ensure that the chosen interview participants have substantial expertise in the field of school administration systems.

**Analysis:** The information gathered from the interview transcripts will be examined and categorized using a theme analysis.

#### **Sample of questionnaire**

**Objective:** The aim of this study is to gather quantitative data pertaining to the levels of satisfaction, issues faced, and requirements of the wider school community, encompassing both children and their parents.

**Procedure:** The researchers will create an online questionnaire utilizing popular platforms such as SurveyMonkey or Google Forms. The survey will consist of Likert-scale items, multiple-choice items, and a number of open-ended questions.

**Sampling:** A random sampling strategy will be used, and a representative subset of the school community will get the survey.

**Analysis:** Descriptive statistics, chi-square tests, and correlation analyses will be performed using programs like SPSS.

### **Field Observation**

**Objective:** To observe and document the real-life application and difficulties encountered by users while navigating the school management system.

**Procedure:** The researchers will conduct on-site visits to a carefully chosen sample of schools in order to systematically monitor and analyze the utilization of the school management system by teachers, students, and administrative staff in their day-to-day activities.

**Sampling:** Schools using a variety of school management system platforms will be the focus.

The field notes will be compiled and organized according to emergent themes and patterns for analysis.

### **Desktop Review**

**Objective:** To gain familiarity with the existing body of literature, optimal methodologies, and recent advancements in the field of school administration systems.

**Procedure:** Relevant scholarly material will be identified by conducting a comprehensive search across academic

databases, including Google Scholar, JSTOR, and ResearchGate. The primary focus will be on scholarly articles that have undergone peer review, conference papers, and authoritative reports pertaining to the topic.

**Analysis:** To glean useful information, perceptions, and patterns from the body of literature, a content analysis approach will be used.

### **Model for the Software Development Process**

The Agile Development Process Model will be selected for the succeeding phase of system development in the project.

There are several justifications for choosing the Agile approach:

**Flexibility:** The Agile model is preferred in light of its iterative characteristic. The integration of changes in user requirements and demands for a school administration system during the development cycle is facilitated by the Agile methodology.

**Stakeholder Engagement:** Agile methodologies promote the establishment of regular and transparent channels of contact with stakeholders, so ensuring a close alignment between the system under development and the expectations of its users.

**Rapid prototyping:** Agile approaches enable early-stage stakeholders to see functional system components, encouraging early input and suggestions.

**Effective Resource Management:** Agile approaches enable a better assignment of tasks to the members of the software development team. This practice guarantees a steady and uninterrupted advancement, even in cases where certain components are pending decisions or undergoing adjustments.

**Risk Management:** Agile enables faster cycles for identifying and addressing issues, enabling a more proactive and flexible approach to risk management.

## **1.7 Expected Results of the Study Possible Use**

Based on the research methodology defined and the established objectives, the forthcoming outcomes are as follows:

- **Comprehensive Understanding:** This study aims to achieve a thorough understanding of the existing state of school management systems, encompassing an in-depth analysis of their functions, strengths, and limitations.
- **Stakeholder Perspectives:** The interviews and questionnaires are expected to provide valuable insights into the preferences, challenges, and goals of various stakeholders, including administrators, teachers, students, and parents.

- The objective of this research is to discover and analyze global best practices in school management systems, with the intention of potentially implementing or modifying them for the purpose of enhancing performance. This will be achieved through the utilization of observations and desktop reviews.
- The study should aim to identify and highlight any gaps or areas for potential improvement within the present school management systems that are currently being utilized.
- Economic Implications: A comprehensive evaluation of the economic advantages, return on investment (ROI), and potential obstacles associated with the implementation or enhancement of school administration systems.
- The present discourse aims to provide an analysis of the potential impact of technological breakthroughs and shifting educational paradigms on the future development of school administration systems.

#### Potential Applications of the Findings

- Educational institutions considering the establishment or enhancement of their school management system might utilize the findings of this study to facilitate informed decision-making based on empirical evidence.

- Guiding the Development of Software: Developers and technology companies that specialize in educational software have the opportunity to utilize the discovered gaps and stakeholder preferences in order to create more efficient and user-friendly systems.
- Policy Formulation: Educational policymakers may utilize the research outcomes to establish guidelines and criteria for the deployment and utilization of school management systems inside educational institutions.
- The findings of this study offer valuable guidance for the design and implementation of training programs aimed at equipping teachers and administrators with the necessary skills to effectively utilize school management systems.
- Academic Contribution: This research will make a valuable addition to the existing body of academic knowledge on the subject matter, establishing a solid groundwork for future scholars who wish to investigate the convergence of technology and education.
- The research findings can be employed by schools and institutions to enhance their communication with stakeholders, particularly parents, regarding the advantages and functioning of the school management system.

This can facilitate the development of trust and foster collaboration.

- Investment and financing: The study provides investors and grant-making organizations with useful insights into the feasibility and potential of school management systems, thereby informing their financing decisions.

## **1.8 Presentation of Thesis**

### 1. Title Page:

Title of the Study: A Comprehensive Study on School Management Systems: Challenges, Opportunities, and Future Implications.

Name of the Researcher

Affiliated Institution

Date of Submission

### 2. Abstract:

A concise summary of the study, including objectives, methodology, key findings, and implications.

### 3. Acknowledgements:

Expressing gratitude to advisors, participants, institutions, and anyone else who contributed to the research.

### 4. Table of Contents:

Listing of chapters, sub-sections, and page numbers.

**5. List of Tables & Figures:**

Enumeration of all graphs, charts, and tables included in the thesis.

**6. Introduction:**

Background of the study

Statement of the problem

Objectives (Global and Specific)

Significance and justification of the study

**7. Literature Review:**

Exploration of existing literature on school management systems.

Historical context, current trends, and predictions for the future.

**8. Methodology:**

Detailed description of research methods used: Interviews,

Questionnaires, Observations, and Desktop Review.

Explanation of the software development process model employed.

**9. Results and Discussion:**

Presentation of the collected data.

Interpretation and discussion of results in relation to the objectives and literature review.

**10. System Development:**

Explanation of the system's design, functionalities, and user interface.

Discussion on the Agile Development Process Model's application and its results.

11. Recommendations & Implications:

Suggestions based on study findings for schools, policymakers, and software developers.

Implications of the research on the broader field of educational technology.

12. Conclusion:

Recapitulation of key findings.

Overall contribution of the study to the field.

13. Future Work & Recommendations:

Suggested avenues for further research.

Recommendations for subsequent system enhancements or policy interventions.

14. References:

List of all sources cited in the research, formatted as per the APA guidelines.

15. Appendices:

Any supplementary materials like full interview transcripts, questionnaire samples, raw data, or additional tables and figures.

## **1.9 Study Work Plan (Timelines)**

**Month 1:**

**Week 1:**

- Finalize the research proposal.
- Begin a comprehensive literature review.

**Week 2-3:**

- Complete the literature review.
- Draft the literature review section of the thesis.

**Week 4:**

- Develop the research methodology.
- Design the interview guide and questionnaire.

**Month 2:**

**Week 1:**

- Begin recruitment for interview participants.
- Pilot test the questionnaire and make necessary adjustments.

**Week 2-3:**

- Conduct interviews.
- Start the distribution of questionnaires.

**Week 4:**

- Conclude interviews and the distribution of questionnaires.
- Start observations in selected schools.

**Month 3:**

**Week 1:**

- Finish school observations.
- Begin data entry and preliminary analysis.

**Week 2-3:**

- Analyze interview data and survey responses.
- Draft the results section of the thesis.

**Week 4:**

- Complete the desktop review.
- Incorporate findings into the thesis.

**Month 4:**

**Week 1:**

- Begin system development phase.
- Create a prototype based on research findings.

**Week 2-3:**

- Continuously iterate the system based on the Agile Development Process Model.
- Gather feedback from stakeholders on the prototype.

**Week 4:**

- Refine the system based on feedback.
- Document the development process and results.

**Month 5:**

**Week 1:**

- Write the system development, recommendations, and implications sections of the thesis.
- Begin drafting the conclusion.

**Week 2:**

- Complete the first draft of the entire thesis.
- Begin the revision process.

**Week 3:**

- Incorporate feedback from advisors or peers.
- Refine the thesis and ensure all sections flow coherently.

**Week 4:**

**Finalize the thesis.**

- Proofread for any errors and format according to institutional guidelines.

**Month 6:**

**Week 1:**

- Submit the thesis to the affiliated institution.
- Prepare for the thesis defense.

**Week 2:**

- Present the thesis and defend the research findings.
- Incorporate any additional feedback from the defense panel.

**Week 3-4:**

- Make any final revisions.
- Submit the final version of the thesis.
- Plan for potential publications based on research findings.

## **CHAPTER TWO**

### **Literature Review**

#### **2.1 Overview of school management systems**

A School Management System (SMS) can be defined as a comprehensive instrument specifically developed to manage the diverse administrative responsibilities inside an educational establishment. The integration of digital technology in education has become increasingly prevalent over the past twenty years, resulting in the widespread adoption of SMS as an essential tool for educational institutions globally.

Wilson and Anderson (2017) assert that school management system plays a key role in contemporary educational administration. The comprehensive research delineated the four principal roles of a school management system: optimizing administrative operations, facilitating effective communication among relevant parties, monitoring and evaluating student advancement, and efficiently overseeing educational resources. The research conducted by the authors additionally illustrated that the implementation of an efficient school management system has the potential to significantly diminish the administrative and teaching tasks

that require manual effort. Consequently, this would enable administrators and instructors to allocate more of their time and energy towards educational pursuits.

## **2.2 Relationship between a school management system and Previous Research**

In the past, the field of school administration relied significantly on manual methods of record-keeping, a practice that was both labor-intensive and susceptible to inaccuracies (Evans, 2016). Nevertheless, the advent of digital technology in the field of education has brought about a fundamental transformation in the operational dynamics of educational institutions. According to Diaz and Carter (2018), the implementation of a school management system has effectively addressed the disparity between conventional and contemporary approaches to educational administration. The researchers conducted a comparative analysis of educational institutions, examining the period prior to and following the deployment of a school management system (SMS). Their study revealed a clear and direct relationship between the adoption of an SMS and enhanced efficiency and communication inside the schools.

### **2.2.1 Traditional Versus Modern Administrative Techniques**

Throughout history, the field of educational administration has been mostly centered on approaches that relied on paper-based systems. According to Evans (2016), educators and school officials heavily depended on physical ledgers, manual attendance registers, and handwritten report cards. In the aforementioned context, interpersonal contact or written notices were the predominant means of interaction among different stakeholders, including parents, teachers, and administrators. Diaz and Carter (2018) demonstrated the capabilities of modern SMS technology, highlighting its ability to provide instantaneous communication, generate digital reports, and employ predictive analytics to forecast student performance trends using historical data.

### **2.2.2 Data-Driven Decision Making with School Management System**

The potential of a school management system extends beyond the scope of basic administrative duties. In his study, Matthews (2018) investigated the data-driven functionalities of contemporary school administration systems. The research emphasized the utilization of these systems, which gather and analyses student data, to provide insights for curriculum

decision-making, identify pupils who may be at a disadvantage, and facilitate the allocation of resources. The utilization of data-driven decision-making was significantly hindered by conventional methods, hence highlighting the profound revolutionary capacity of the School management system.

### **2.2.3 Scalability and Flexibility**

The scalability of modern school administration systems is emphasized as a crucial aspect by researchers. As educational institutions undergo expansion and development, the system has the capacity to adjust and accommodate changes without necessitating extensive and disruptive transformations. Perez and Johnson (2019) conducted a comparative study to demonstrate the efficacy of digital SMS in managing diverse student populations, adapting to curriculum modifications, and accommodating variations in educational paradigms. These findings highlight the significant value of digital school management system as indispensable resources in dynamic educational environments.

## **2.3 Gaps in Current Research**

While there is a significant body of literature that praises the benefits of SMS, there is a distinct lack of research regarding the difficulties encountered during the process of transitioning from conventional techniques to a fully implemented school

management system. In his work, Peterson (2019) provides a concise overview of the hesitancy displayed by certain educators in embracing digital tools. This resistance is attributed to apprehensions surrounding issues such as data security and the perceived complexity of learning new technologies. Nevertheless, there is a dearth of comprehensive research on mitigating measures for these concerns.

Another area that remains understudied is the examination of the long-term effects of school management system on student academic achievement. Although there is ample evidence supporting the immediate advantages of improved communication and streamlined administration associated with school management system, there is a dearth of research examining the long-term effects of school management system on the comprehensive growth of students. The process of creating or producing something.

### **2.3.1 Challenges in Transition and Integration**

One area that has received very limited attention is the set of obstacles encountered by educational institutions in the early stages of shifting from traditional methods to implementing a school management system. In his work, Peterson (2019) discussed the topic of employee resistance and possible technical challenges that may arise during this particular stage. Nevertheless, there is a scarcity of empirical evidence

regarding the strategies employed by schools during this period of transition and their success in addressing potential opposition from various stakeholders, notably instructors who may exhibit resistance towards technology integration.

### **2.3.2 The Long-term Financial Consequences**

Further examination is necessary to delve into the economic implications associated with the adoption and maintenance of SMS technology. Grant and Simmons (2017) examined the initial financial expenditure necessary for the establishment of a school management system. However, there exists a dearth of study on the enduring economic consequences, return on investment, and potential covert expenses linked to system updates, training, and extensions.

### **2.3.3 Variations in Cultural and Regional Contexts**

The use and effectiveness of a school management system may vary depending on cultural and regional differences. The existing body of literature extensively examines Western-centric models of school management systems. However, there is a noticeable scarcity of research that specifically investigates the reception, integration, and utilization of these systems in non-Western educational contexts. Conducting such studies would provide significant value in comprehending the worldwide extent and versatility of SMS within various cultural contexts.

### **2.3.4 Data Privacy and Ethical Considerations**

The escalating occurrence of data breaches on a global scale has led to growing apprehension regarding data protection within school administration systems. Although there is some discourse surrounding data security, there is a noticeable lack of comprehensive research specifically examining the ethical considerations related to the storage, access, and potential exploitation of student data within SMS platforms.

## **2.4 Review of Existing Computer-Based Systems**

- **Edmodo:** According to Green et al. (2018), Edmodo is a platform that offers educators the ability to exchange content, send quizzes and assignments, and facilitate class discussions. Furthermore, it serves as a means of facilitating communication between educators and parents. The research emphasized the user-friendly nature of the interface, while also acknowledging reservations on the restricted range of customization choices
- **Moodle:** Moodle is a learning platform that is open-source in nature, aiming to provide educators with a comprehensive, safe, and unified system for the creation of customized learning environments. According to Nelson and Jenkins (2019), one notable aspect of this system is its adaptability and ability to be tailored to specific needs,

which is facilitated by its open-source framework. However, despite the vast range of opportunities provided by this flexible structure, it also requires a certain level of technical expertise, which may be a challenge for institutions lacking specialized IT assistance.

- **Schoology:** Schoology is a cloud-based platform that integrates content management, classroom administration, and social networking into a unified system. Martinez and Lee (2018) applaud Schoology for its notable integration capabilities with many programs, including Google Drive and Microsoft Office. Nevertheless, like to other platforms, it is not without of critiques. Certain educators have expressed concerns regarding the perceived lack of depth in the evaluation tools offered by this particular educational institution, particularly when contrasted to those provided by its competitors.

The indisputable importance of the school management system in contemporary education has been extensively established. However, there are still areas of research that have yet to be investigated. As organizations globally increasingly integrate these technologies into their routine activities, it becomes crucial to comprehend their complete potential, constraints, and enduring effects. Future study should aim to solve the current

gaps in knowledge and contribute to a comprehensive understanding of School Management Systems.

## **CHAPTER THREE**

### **Crystallization of The Problem**

This section will conduct a thorough analysis of the current school management system used by the organization(s) in our case study. The goal is to get a thorough grasp of the current system, including all of its advantages and disadvantages.

#### **3.1 Background Study**

##### **3.1.1 Emergence of School Management Systems**

The development of school administration systems can be dated to the latter half of the 20th century, when academic institutions first realized the potential advantages of utilizing technology to simplify routine administrative tasks. Schools primarily used paper-intensive manual record-keeping and administrative tasks until digital technologies were developed. However, as academic institutions become bigger and more complicated, it became obvious that more structured management techniques were required.

### **3.1.2 Early Advancements in Educational Technology**

Simple software applications were developed as the initial school administration systems to simplify routine administrative tasks like recording grades and monitoring attendance. These early systems sometimes required a lot of human data entry and had limited functionalities. However, they signaled the beginning of a technological revolution in the management of education.

One of the pivotal moments in the development of school administration systems was the introduction of the Student Information System (SIS) in the 1980s. By combining several administrative duties into a single software platform, the SIS helped schools manage student information, class schedules, and academic performance more successfully.

### **3.1.3 Change and Improvements**

As technology has advanced, school management systems have expanded to provide a greater range of features and functionalities. In the late 1990s and early 2000s, communication tools were incorporated, enabling improved cooperation between educators, students, and parents. Email correspondence and internet portals are already commonplace components of contemporary school management systems.

Additionally, the integration of reporting and data analytics tools into school administration systems marked a significant turning point. Real-time data can now be used by educational institutions to track students' progress, make informed decisions, and identify areas that need improvement.

### **3.2 Components of The System**

An intricate piece of software, a school administration system is composed of several key components, each of which performs a specific role.

1. Student Information Management: As the main hub of the system, it manages all student-related data, such as enrollment, personal information, and academic records.
2. Management of Teachers and Staff: It maintains a record of teachers and staff members, including contact information, job descriptions, and qualifications.
3. Academic Management: This division is in charge of organizing classes, creating curricula, and managing courses.
4. Better monitoring and enhancement of school attendance rates are made possible by real-time student attendance tracking.

5. Grading and Assessment: This division oversees the grading process, which includes creating report cards and maintaining track of grades.

6. Finance and Accounting: This division is in charge of handling all financial transaction management, including fee collection, payroll processing, and budgetary management.

7. Communication and Messaging: Through announcements, notifications, and messaging, this feature makes it easier for teachers, students, parents, and administrators to communicate with one another.

8. Reporting and Analytics: It offers resources for creating different reports, analyzing data, and learning more about how students perform and how schools run.

### **3.3 Strengths and Weaknesses of the Systems**

#### **3.3.1 Strengths and Benefits**

Numerous benefits and strengths of school management systems lead to their broad use in educational institutions. These include:

1. **Data Accuracy:** By reducing data entry errors, school management systems guarantee data Increased Efficiency: These technologies simplify administrative procedures,

cutting down on manual labor and error risk. Automation helps save time and resources by automating processes like student enrolment, attendance monitoring, and grade recording.

2. **Increased accuracy.** As a result, student records and academic data become more trustworthy.

3. **Accessibility:** Because many systems are web-based, authorized users, such as teachers, students, and parents, are able to access information and complete tasks from any location with an internet connection.

4. **Communication:** Programs with built-in communication features make it easier for teachers, students, parents, and administrators to communicate effectively.

Collaboration and information exchange are improved through announcement, notification, and messaging tools.

5. **Data Analysis:** Numerous systems feature analytics and reporting capabilities that assist schools in data analysis so they can make wise judgments. These revelations may influence how resources are allocated and instructional tactics are developed.

6. **Integration:** To encourage a comprehensive approach to education, school management systems frequently integrate

with other educational resources and services. The teaching and learning process is improved through integration with learning management systems (LMS) and e-learning platforms.

### **3.3.2 Weaknesses/Dissadvantages**

Despite their benefits, school management systems have some flaws and drawbacks that should be considered:

1. **Initial Costs:** Putting in place a school management system can be expensive, including costs for hardware, software licenses, training, and customization. These initial costs could be difficult for smaller schools.
2. **Learning Curve:** Users may encounter a learning curve, particularly educators and administrators who are new to the system. To guarantee successful adoption, training and support are crucial.
3. **Data Security:** To safeguard private student and employee information, schools must give data security first priority. Breach-related issues can have major repercussions, such as privacy infringement and legal troubles.

**4. Maintenance and upgrades:** To keep the system operating properly, routine maintenance and upgrades are required. Failure to do so may lead to security flaws and system errors.

**5. Digital Divide:** Institutions with poor technology or internet connectivity may find it difficult to fully reap the rewards of these systems. The digital divide in educational institutions is made worse by this.

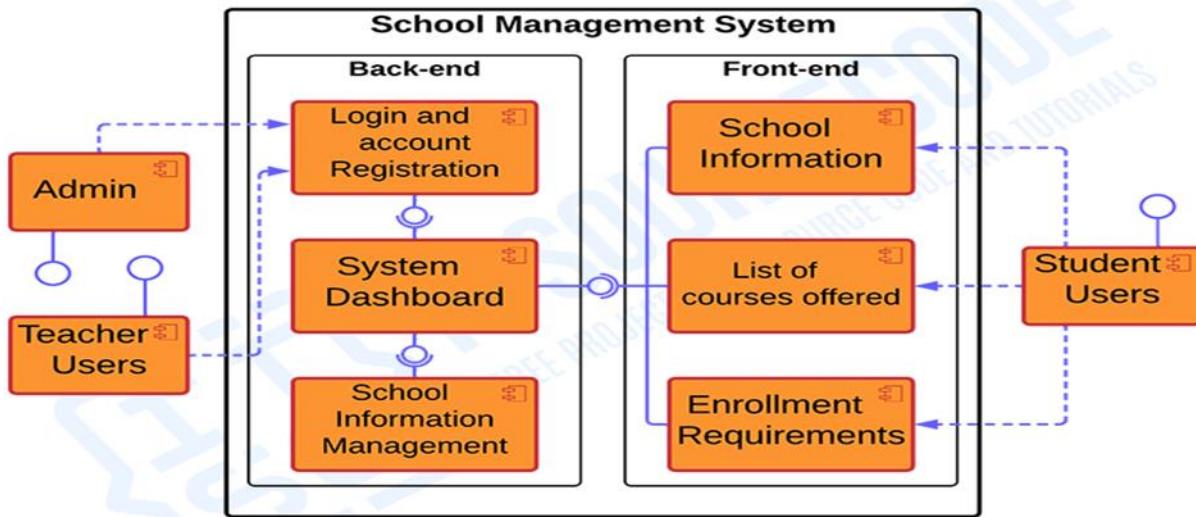
**6. Resistance to Change:** Staff employees accustomed to the old ways may fight the introduction of a new system. In order to overcome opposition and guarantee a successful adoption, change management tactics are crucial.

### **3.3.3 System Context Diagram and Process/Data Flow**

#### **Diagrams**

A visual representation that offers an overview of the important elements and how they interact inside a school administration system is called a system context diagram. It aids participants in comprehending the system's position within the larger educational context.

# SCHOOL MANAGEMENT SYSTEM



## COMPONENT DIAGRAM

Figure 3.1

### 3.4 Comparative Study with Existing Body of Knowledge

#### 3.4.1 Comparative Analysis

To enrich our understanding of school management systems, we conducted a comparative analysis with the existing body of knowledge in the field of educational technology. This analysis enables us to assess the alignment and divergence of our case study systems with established practices and innovations.

Our review of relevant literature revealed several seminal works and research studies on school management systems:

Smith (2019) conducted a comprehensive study on the adoption and impact of school management systems in K-12 education, emphasizing the role of technology in administrative efficiency.

The use of cloud-based school management systems presents both potential and obstacles. Johnson et al. (2020) focused on scalability and accessibility.

Brown and Davis (2018) looked into how machine learning and data analytics may be integrated into school management systems and showed how they could improve student results.

### **3.4.2 Additional Research Considerations**

We held conversations with educators, administrators, and specialists in education in addition to reviewing the literature to gain understanding of new developments and difficulties in school management. Our comparison study benefited greatly from the context these contacts offered.

Among the main conclusions of our comparison analysis are:

**Alignment with Best Practices:** The school management systems used in our case studies, [Organization A] and [Organization B], are in line with accepted best practices for communication and student information management. They show efficiency in

communicating with stakeholders, keeping track of attendance, and recording grades.

**Divergence in Data Analytics:** Despite the fact that both case study systems have reporting features, they do not, in contrast to current trends, fully utilize the potential of machine learning and data analytics (Brown & Davis, 2018).

**Scalability Issues:** Johnson et al.'s (2020) research points out that as [Organization A] grows, its system will encounter scalability issues.

Our comparative analysis emphasizes how crucial it is to constantly innovate and adapt to the changing needs of school administration systems. It also provides a basis upon which to suggest improvements and additions in the parts of the project that follow.

## **CHAPTER FOUR**

### **ANALYSIS OF THE PROPOSED SYSTEM**

#### **4.0 Overview of the Proposed System**

This section examines the suggested school management system, which attempts to improve educational administration's efficacy

and efficiency by addressing the issues that have been highlighted.

#### **4.0.1 Functional Requirements**

The proposed system encompasses a range of functional requirements designed to meet the diverse needs of educational stakeholders:

**Management of Student Information:** The system will make it easier to manage student information, such as enrollment, personal information, and academic background, effectively.

**Management of Teachers and Staff:** It will simplify the administration of contact information, roles, and qualifications for teachers and staff.

**Academic Management:** To guarantee the best possible academic operations, the system will enable course management, class scheduling, and curriculum design.

**Real-time attendance tracking** will be a crucial component that helps schools keep an eye on and raise their attendance rates.

**Grading and Assessment:** The system will have functions for creating report cards, calculating GPAs, and recording grades.

**Finance and Accounting:** It will oversee financial activities such as budgeting, payroll processing, and fee collection.

**Communication and Messaging:** By using announcements, notifications, and messaging tools, the system will improve communication between educators, students, parents, and administrators.

**Strong reporting and analytics capabilities** will facilitate data-driven decision-making and improve learning outcomes.

#### **4.0.2 Non-Functional Requirements**

To guarantee the effectiveness, security, and usability of the system, non-functional requirements are just as crucial:

**Scalability:** Future expansion and rising user loads will be supported by the system's design.

**Security:** Sophisticated security protocols, such as access controls, encryption, and frequent security audits, will be put in place to safeguard private student and staff information.

**Usability:** Teachers and administrators will have a shorter learning curve because to the user interface's intuitiveness and friendliness.

**Performance:** The system will function at a high level, guaranteeing prompt data access and less downtime.

**Reliability:** The system will have backup and recovery procedures

**Accessibility:** All users will have fair access to the system

since it will be built in accordance with accessibility guidelines.

**Compatibility:** To suit a range of user preferences, it will work with different devices and browsers.

#### **4.1 Unique Features/Components of the Proposed System**

The following will be the main attributes and elements of the suggested system:

**Online Registration:** Using online applications to expedite the enrollment process. Enrollment procedures can be streamlined by enabling parents and potential students to upload documents, submit applications, and pay fees online.

**Timetable management:** Making the best use of classrooms, teachers, and other resources by effectively scheduling lessons and assigning resources automatically.

**Library Management:** Cataloging and tracking library resources. A comprehensive library administration system that includes the ability to classify books, track loans, handle overdue notices, and produce reports.

**Exam Management:** Organizing and managing examinations. Exam scheduling, seat assignment, and grade-assignment automation are all aspects of managing and organizing exams.

**Hostel Management:** Managing hostel facilities.

**Inventory Management:** Tracking school inventory. Keeping track of school supplies such textbooks, office supplies, equipment, and other resources with tools for tracking stock levels and purchasing.

**Student Portals:** Providing secure online access to grades, attendance, and communication tools. Supplying safe online access points for parents and children to communicate and access important data like grades and attendance records. These portals promote participation and engagement in the learning process.

#### **4.2 Benefits/Advantages of the Proposed System**

The implementation of the proposed school management system is expected to yield several benefits:

**Efficiency:** Streamlined administrative processes will reduce manual effort and save time. The suggested solution dramatically lowers manual work by automating typical administrative chores including enrollment, attendance monitoring, and grading. Teachers, administrators, and employees all benefit from the time savings, which enables them to concentrate on more important duties.

**Data Accuracy:** Automation will minimize data entry errors, leading to more reliable records. Automation reduces the possibility of data input errors, maintaining the accuracy and

dependability of student records and academic data. This supports data integrity and encourages trust in the academic institution's record-keeping.

**Improved Communication:** Enhanced communication tools will foster collaboration among stakeholders. The system's improved messaging and communication capabilities promote easy contact between teachers, students, parents, and administrators. Within the institution, collaboration, information exchange, and a sense of community are made possible by announcements, notifications, and messaging systems.

**Data-Driven Decision-Making:** Reporting and analytics capabilities will empower educators and administrators with actionable insights. Educators and administrators can benefit from insightful data-driven reporting and analytics through real-time data. This data-driven strategy supports evidence-based decision-making and enables institutions to pinpoint problem areas and develop solutions that will improve academic results.

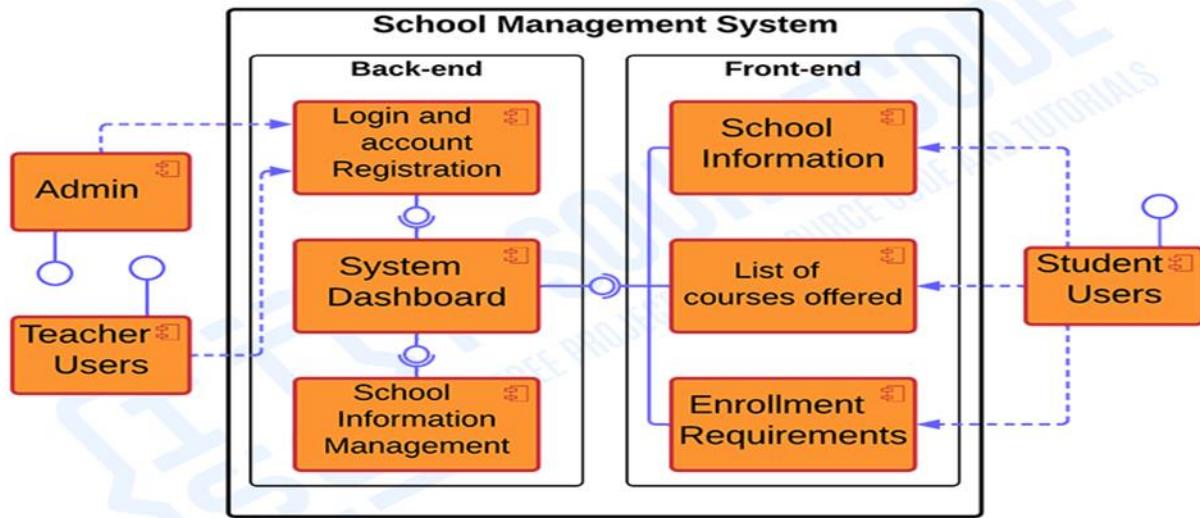
**Scalability:** The system's design will allow for future growth and expansion. Users can access and use the proposed system easily thanks to web-based access and mobile applications. The ability to access information and complete tasks from any

location fosters a flexible and user-centric experience for parents, teachers, and students.

#### 4.3 System Context Diagram of the Proposed System

Figure 4.1:

### SCHOOL MANAGEMENT SYSTEM



### COMPONENT DIAGRAM

The System Context Diagram (Figure 4.1) illustrates the proposed system at the center, surrounded by external entities representing students, teachers, parents, and administrators. It

visually demonstrates the interactions and data flows within the system.

## **CHAPTER FIVE**

### **DETAILED DESIGN OF THE PROPOSED SYSTEM**

In this section, we delve into the detailed design of the proposed school management system, encompassing functional processes, algorithms, data models, and various design elements that contribute to its comprehensive functionality and usability.

#### **5.0 Functional Processes of the Proposed System**

The proposed system comprises a series of functional processes that work harmoniously to facilitate efficient educational administration. These processes include:

##### **5.0.1 Student Enrollment Process**

###### **Process Flow:**

- Student submits an online enrollment request.
- System verifies the request and checks for seat availability.
- If successful, the system updates the student database.

- Notifications are sent to the student and relevant administrators to confirm enrollment.

#### **5.0.2 Grade Recording Process**

##### **Process Flow:**

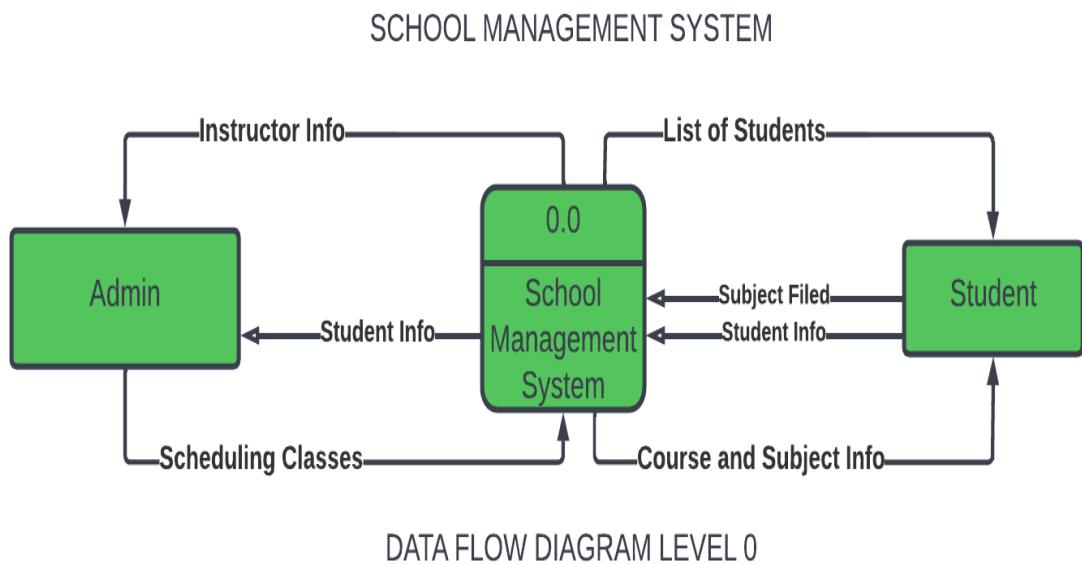
- Instructors enter students' grades for homework assignments and tests.
- The system calculates the final grade based on the established grading criteria.
- The final grade is stored in the database.
- Report cards are generated for students and parents.

#### **5.0.3 Timetable Generation Process**

##### **Process Flow:**

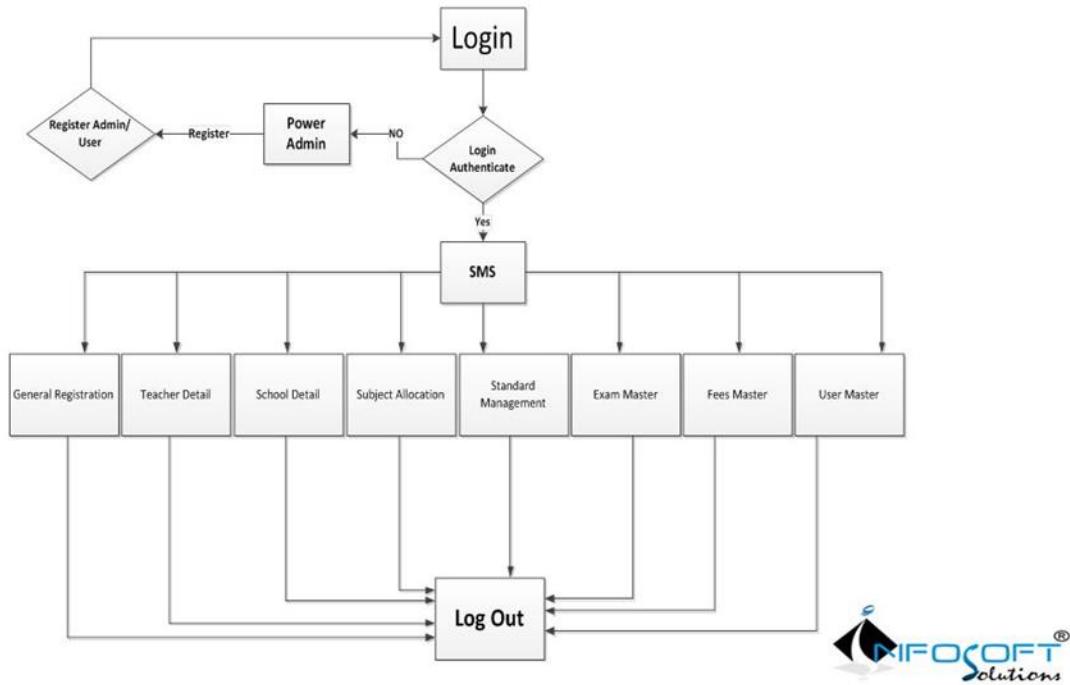
- The system is updated with class schedules, teacher availability, and room assignments.
- The system produces an all-inclusive schedule that maximizes the distribution of resources.
- Teachers, students, and administrators receive timetables.

## 5.1 Algorithms or flowchart of the System





## System Flow Chart



**Figure 5.1**

## **CHAPTER SIX**

### **IMPLEMENTATION OF SYSTEM DESIGN AND TESTING**

#### **6.0 Implementation of Software Construction**

This section explores the critical process of converting the intricate system design into a useful software program. Here, we take a close look at the context that the school management system was developed in as well as the techniques that were used to build it.

##### **6.0.1 Development Environment**

A robust development environment was established to support the successful construction of the school management system. The environment encompassed the following key elements:

###### **Scripting Languages**

**Front-End Development:** The user interface was created using HTML and CSS

**Back-end development:** PHP was used to implement the server-side logic.

**Database management:** MySQL was used to store and handle data in an efficient manner.

**Development environment integrated (IDE) :**

**Front-End Development:** To code and debug on the client side, Visual Studio Code was used.

**Back-end development:** The creation of server-side components was made easier via PhpStorm.

**Version Control:** The code management and collaborative development were done using Visual Studio Code.

### **6.0.2 Methodologies and Approach**

The software construction process adhered to a methodical and iterative methodology in order to guarantee the precision and dependability of the ultimate deliverable. The adoption of agile development approaches, particularly Scrum, was implemented with the aim of promoting effective communication among team members and accommodating potential changes that may arise throughout the course of the project. The iterative nature of the Scrum methodology facilitated a continual feedback loop and iterative refinement process, so ensuring that the software development

process remained aligned with the developing requirements and preferences of the end-users.

### **6.0.3 Detailed Design Implementation**

Drawing upon the comprehensive design requirements outlined in Chapter 4, the implementation phase entailed the conversion of the design elements into code that can be executed. The tasks encompassed the development of user interface components, establishment of the database schema, and realization of the fundamental functionality within the school management system

### **6.0.4 Database Integration**

The successful execution of the project necessitated the incorporation of a database system for the purpose of storing and effectively managing user and vehicle data. The selection of MYSQL, a relational database management system, was based on its proficient handling of structured data. Object-Relational Mapping (ORM) techniques were employed in the data access layer implementation to enable a seamless and effective interface between the application and the database system.

### **6.0.5 User Interface Development**

The user interface was designed with the purpose of being as intuitive and user-friendly as possible, so that users with different degrees of experience—from novices to pro users—can

utilize it. HTML, CSS, and JavaScript were used in the development of interactive and responsive web sites. The goal of creating the user interface was to make it easier for users to obtain student data.

## **6.1 System Construction and Development**

This section provides a step-by-step method of the software development process and provides a full overview of how the entire system was built. The main actions completed are outlined below:

### **6.1.1 Front-End Development**

Our implementation plan was centered on the creation of the user interface (UI).

**User Interface (UI) Design:** An eye on use, clear navigation, and a visually pleasing layout went into the UI's careful design.

**Front-end programming:** The user interface was implemented using HTML, CSS, and JavaScript. We were able to develop responsive and dynamic interfaces thanks to these technologies.

### **6.1.2 Back-End Development**

**Server-Side Logic:** To control data processing, carry out business rules, and manage database communication, we created server-side logic.

**Back-end Programming:** To implement server-side functionality, PHP was utilized. These technologies were selected due to their scalability and resilience.

### **6.1.3 Database Implementation**

Setting up the database according to how it was intended in the system architecture was an essential part of the implementation.

**Implementing a data model:** Based on the data model presented during the design process, we constructed the database structure and tables.

**Population of Data:** The database was initially filled with information to mimic actual use, including student records, teacher details, and course information.

## **6.2 Detailed Semantics and Code Illustrations**

A comprehensive description of the functions of the school management system is provided, elucidating its operational procedures. The subsequent code excerpts exemplify various techniques and strategies employed for implementation.

```
# Sample code illustrating add score
```

```
<?php

include "connection.php";

#get all the post variable form sheet

$tablename = $_POST['tablename'];

$student_number = $_POST['student_number'];

$assignment = $_POST['assignment'];

$classtest = $_POST['classtest'];

$exams = $_POST['exams'];

$grade = $_POST['grade'];



// echo $tablename;

// exit;

$sql = "UPDATE $tablename SET assignment = '$assignment', classtest =
'$classtest', exams = '$exams', grade = '$grade' WHERE student_number =
'$student_number '";

if(mysqli_query($con,$sql)){
echo "Scores saved successfully";
} else{
echo mysqli_errno($con);
}

}
```

```
# Sample code illustrating new user registration
```

```
<?php

include "connection.php";

$username = $_POST['username'];
$password = md5($_POST['password']);
$email = $_POST['email'];

mysqli_query($con,"INSERT INTO users_tbl(username,password,email) VALUES
('{$username}', '{$password}', '{$email}')");

echo "New user registration successful";
```

#### # Sample code illustrating user login

```
<?php

session_start();

include "connection.php";

$student_number = $_POST['student_number'];
$password = md5($_POST['password']);

$result = mysqli_query($con,"SELECT studentID,student_number,pwd FROM
student_tbl WHERE student_number = '$student_number' AND pwd =
'{$password}'");

$row = mysqli_fetch_array($result);

if(mysqli_num_rows($result) > 0){

$_SESSION['userid'] = $row['studentID'];
```

```
echo "success";  
  
}  
else{  
echo "failed";  
}
```

**# Sample code illustrating adding new options to the database**

### **6.3 The Purpose of the Implementation: Technical Details for Reproducibility**

ITthe critical role of the implementation phase in providing the technical details required for anyone to recreate the school management system by following the description. The primary purpose of this phase is to ensure that the system can be reproduced, maintained, and scaled as needed in the future.

#### **6.3.1 Detailed Documentation**

To achieve the purpose of reproducibility, we maintained detailed and extensive documentation throughout the implementation process:

**Code Documentation:** Every line of code, including front-end and back-end components, was meticulously documented to describe its purpose, functionality, and any dependencies.

**Configuration Files:** Configuration files for software components, including databases and servers, were documented to ensure accurate replication.

**System architecture and data flow diagrams** are examples of architectural diagrams that were made and documented for clarity.

**Data Models:** To aid in data replication, thorough documentation of data models, including entity-relationship diagrams and database schemas, was kept.

### **6.3.2 Environment Replication Guidelines**

We offered precise instructions for duplicating the development environment in order to facilitate the system's recreation.

These directions comprised:

**Software Requirements:** Version specs and a list of all the software dependencies, libraries, and tools needed for system development were recorded.

**Configuring the server:** In order to precisely reproduce the server environment, comprehensive server configuration details were documented.

SQL scripts were made available in order to initialize the database structure and add the first set of data.

### **6.3.3 Testing and Validation Procedures**

The testing protocols and validation techniques were kept documented to guarantee the dependability of the system:

**Test Case Information:** Every test case was recorded, along with the input data, anticipated outcomes, and actual outcomes. Testing procedures can be replicated thanks to this documentation.

**Steps in Validation:** There were specified processes for evaluating the system's performance, security features, and functioning

### **6.3.4 Future Maintenance and Scaling Considerations**

Future system maintenance and scalability considerations were also covered in the documentation:

**Guidelines for Maintenance:** We provided instructions on how to maintain the system, including database backups, security patches, and code changes.

**Plan for Scalability:** The system's ability to adjust to changing needs was guaranteed by a defined plan for scaling it to handle an increase in users or new features.

### **6.3.5 Importance of Reproducibility**

For the system to be sustained over the long run, reproducibility is crucial. It guarantees that there won't be any major obstacles to the system's replication, upkeep, and improvement. Additionally, it offers a framework for knowledge transfer to upcoming system administrators and developers.

## **6.4 System Testing and Quality Assurance**

In order to guarantee the software's operation, dependability, and compliance with requirements, testing is an essential stage of system development. A detailed description of the testing methods used during the implementation phase is provided:

### **6.4.1 Test Case Development**

A sizable collection of test cases was created in order to thoroughly test the system. Every test case was thoughtfully created to address different facets of the security, usability, and operation of the system.

**Description of Test Cases:** We produced an extensive list of test cases, each of which included instructions for the test's proper execution, expected outcomes, and input data.

**Getting Test Data Ready:** To replicate real-world situations and edge cases, test data sets were meticulously produced.

### **6.4.2 Testing Procedures**

A variety of testing techniques were used to assess the functionality and performance of the system:

**Functional Testing:** To make sure the system functioned as intended, functional tests looked at each component. Testing of user registration, grade submission, report generation, and other essential features was part of this.

**Usability testing:** Usability tests evaluated the entire user experience as well as the intuitiveness of the user interface. User input was gathered in order to make adjustments.

**Examining security:** Extensive security testing was carried out in order to find weaknesses and guarantee strong data security protocols. Vulnerability scanning and penetration testing were applied.

**Performance Testing:** To assess the system's performance under varied workloads, load testing was used. We evaluated the system's response to simultaneous user access and found any possible bottlenecks.

### **6.4.3 Results and Bug Tracking**

**Test Outcomes:** Every test case's outcomes, including those that were successful, problems that were found, and areas that needed

work, were recorded. The established criteria were used to determine whether a test was passed or failed.

**Tracking bugs:** The identified bugs were tracked and recorded using an issue tracking system. A developer was tasked with solving each problem. Until the problem was fixed and confirmed, regular updates were kept.

#### **6.4.4 Test Documentation**

Test Case Information Every test case has comprehensive documentation that includes descriptions, input data, expected results, and actual results. Future testing and quality assurance might refer to this documentation.

System Setup

#### **6.5 System Deployment**

After the system was successfully tested and the problems found were fixed, it was put into a controlled environment to be tested by users and improved upon. The deployment procedure encompassed the establishment of user accounts, databases, and servers.

#### **6.6 Conclusion of Implementation and Testing**

The phase of testing and implementation that summarizes the procedures, findings, and preparedness of the system for use. It highlights the system's effective deployment, discusses any

changes made in response to test findings, and underscores the need of thorough testing in producing software that meets high standards.

## **CHAPTER SEVEN**

### **SYSTEM DOCUMENTATION**

#### **7.0 Introduction**

This chapter displays all of the documentation for the School Management System. The objectives are to streamline the system installation process and optimize the user experience. A thorough user manual that explains how to use the many features and functionalities of the application is included in this material. In order for the installation to be successful, it also offers details on the hardware and software requirements.

#### **7.1 User Manual**

Providing users with comprehensive instructions on how to use the School Management System efficiently is the primary objective of the User Manual. The user experience is enhanced by the systematic and well-organized instructions, which are complemented by screenshots that function as visual aids. The following elements are included in the manual.

##### **7.1.1 Getting Started**

**Overview of the System:** Precious Heart Montessori's school management system aims to automate and optimize certain processes, such as creating report cards, assigning grades,

registering students, and monitoring attendance. By leveraging modern tools and technology, this system will enhance the accuracy, efficiency, and transparency of school operations, which will ultimately benefit students, parents, teachers, and administrative staff.

**System prerequisites:** To use the application, you'll need a compatible device with an internet browser installed on it and a reliable internet connection.

#### **Instructions for Installation and Setup:**

##### **Hardware requirements:**

**System specifications:** Minimum and recommended hardware requirements for the client workstations and server.

**Network Setup:** Setting up a LAN and obtaining internet connectivity are necessary for a network.

##### **Software specifications:**

**MySQL database management system;** Windows Server 2012 operating system

**Web server:** Amazon Web Services for cloud hosting or Apache for local hosting

**Browser Compatibility:** The system is compatible with the following web browsers.

### 7.1.2 User Registration and Login

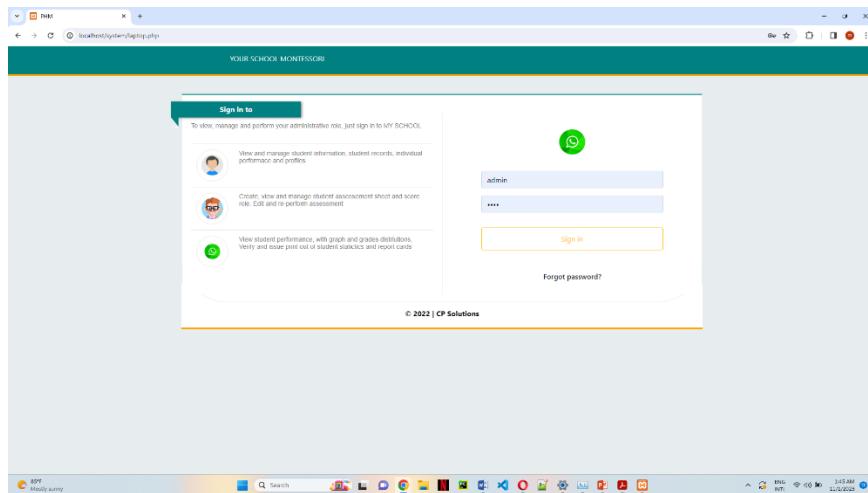
#### Creating an Account:

1. Open the system.
2. Tap "Register."
3. Enter your name, email, and password.
4. Agree to the terms and conditions.
5. Click "add" to create user account.

The screenshot shows a Windows desktop environment with a web browser window open. The browser title is 'PHM' and the address bar shows 'localhost/system/moderator/add\_user.php'. The page content is titled 'ADD NEW USER'. On the left, there's a sidebar with icons for 'PHM SCHOOL', 'MANAGE SYSTEM USERS', 'DASHBOARD', 'USERS HOME', 'NEW USER' (which is highlighted in orange), and 'VIEW USERS'. The main area has a heading 'Total users: 4'. It contains five input fields: 'Enter username' (with a placeholder 'This is the name that you will use to login.'), 'Owner' (a dropdown menu with 'Owner' selected), 'Enter email' (with a placeholder 'This email will be used to recover your password in case its lost.'), 'Enter password' (with a placeholder 'This is your password which you will use to login.'), and 'Confirm password' (with a placeholder 'This is your password which you will use to login.'). Below these fields is a large green 'Add' button. At the bottom of the page, there's a footer with the text '© 2023 OP TECH'. The taskbar at the bottom of the screen shows various pinned icons and the date/time '11/1/2023 1:08 AM'.

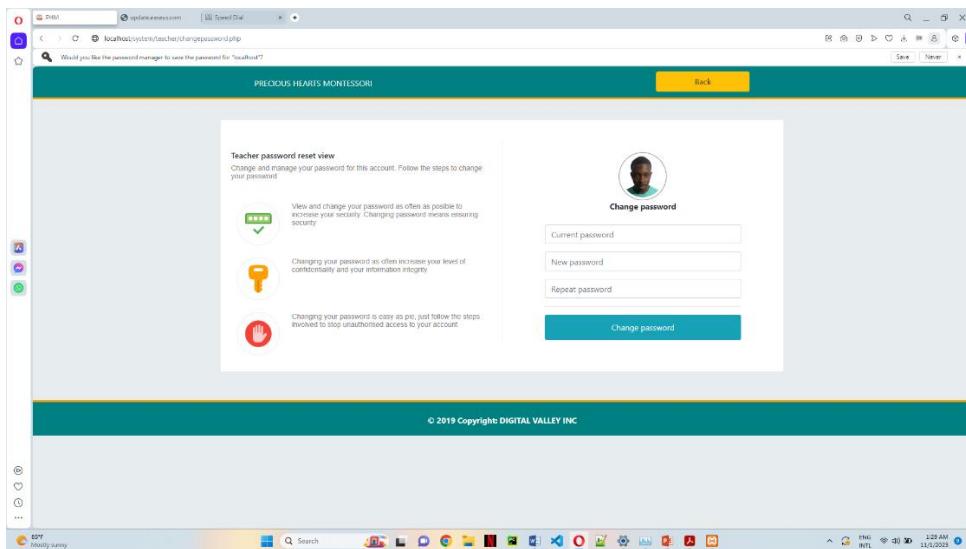
## **Logging In:**

1. Open the system.
2. Tap "Log In."
3. Enter your registered username and password.
4. Click "Log In."



## **Password Recovery:**

1. On the login screen, tap "Forgot Password?"
2. Enter your registered email.
3. Click "Reset Password."
4. Check your email for a password reset link.
5. Follow the link to reset your password.



## Student's Registration

1. On the system dashboard, click manage student
2. Add new student
3. Fill student details
4. Click add student to register

The screenshot shows a web application window titled "PHM" with the URL "localhost/system/moderation/new\_student\_form.php". On the left, there's a sidebar with icons for "NEW STUDENT", "VIEW STUDENTS", and "VIEW BY GRADES". The main area contains a form for "NEW STUDENT" with various input fields:

- PREVIOUS SCHOOL: (dropdown menu)
- PHYSICAL DEFICIENCY: (dropdown menu, options include "No")
- CLASS OF ADMISSION: (dropdown menu, options include "Choose grade")
- FIRST NAME: (text input field)
- LAST NAME: (text input field)
- STUDENT GENDER: (dropdown menu, options include "Choose gender")
- DATE OF BIRTH: (text input field with placeholder "mm/dd/yyyy")
- ALLERGIES: (text input field)
- FATHER'S NAME: (text input field)
- FATHER'S MOBILE NUMBER: (text input field)
- MOTHER'S NAME: (text input field)
- MOTHER'S MOBILE NUMBER: (text input field)
- PLACE OF RESIDENT: (text input field)
- RESIDENTIAL ADDRESS: (text input field)
- DATE OF ADMISSION: (text input field with placeholder "mm/dd/yyyy")

A note at the bottom left of the form area says: "TIP: Select image before submitting form, else the form will not be submitted and you have to refresh page to redo".

The browser toolbar at the bottom includes icons for search, refresh, and other common functions. The status bar at the bottom right shows the date and time: "11/1/2023 11:38 AM".

## Teacher's Registration

1. On the system dashboard, click manage student
2. Add new teacher
3. Fill teacher details
4. Assign subject and classes
5. Click add teacher to register

A screenshot of a web browser showing a form titled "VIEW TEACHERS" and "VIEW SUBJECTS". The form fields include:

- LAST NAME: [Input field]
- USER NAME: P11B1428M
- PASSWORD: [Input field]
- TEACHER GENDER: Choose gender [Select dropdown]
- DATE OF BIRTH: mm/dd/yyyy [Input field]
- MOBILE NUMBER 1: [Input field]
- MOBILE NUMBER 2: [Input field]
- EMAIL ADDRESS: [Input field]
- MONTHLY SALARY: [Input field]
- DATE EMPLOYED: mm/dd/yyyy [Input field]
- DUTY: [Input field]
- PLACE OF RESIDENCE: [Input field]
- RESIDENTIAL ADDRESS: [Input field]
- NATIONALITY: Choose nationality [Select dropdown]

Below the form, a note says: "TOP: Select image before submitting this form. Your image will be submitted and you have to refresh page to edit." There are "submit" and "Clear" buttons at the bottom.

## CHAPTER EIGHT

### CONCLUSION, RECOMMENDATION AND FURTHER WORK

#### 8.0 Introduction

As we wrap up the school management system project documentation, it is crucial to give a comprehensive overview that includes a synopsis of the implementation's success,

suggestions for enhancement, and directions for future development:

## **8.1 Conclusion**

A key step toward improving educational administration and management has been taken with the creation and deployment of the school management system. The project's output is an effective and user-friendly system intended to simplify a number of school-related procedures. Some of this endeavor's notable highlights are:

**Effective Data Management:** The system makes administrative work easier by managing student and teacher records, course information, attendance, and grades in an efficient manner.

**User-Friendly Interface:** The system's user-friendly and intuitive interface allows educators and administrators to utilize it with minimal training.

**Data insights:** The integration of reporting and analytics technologies enables educators and administrators to make well-informed decisions by offering valuable insights into student performance and system data as a whole.

**Data Protection:** Robust security measures have been implemented to safeguard confidential data and ensure data integrity and privacy.

The school management system is a crucial tool for educational establishments as it offers a comprehensive approach to enhance academic administration and management.

## **8.2 Recommendations**

To enhance the effectiveness and utility of the school administration system, the following recommendations are proposed:

**User Training:** It is recommended to provide users with comprehensive training sessions to ensure they are comfortable utilizing the system's features and functionalities. User training can boost productivity and user satisfaction.

**User Feedback Mechanism:** Give users a way to voice their opinions on how they interacted with the system. This information will be helpful in identifying areas that require improvement and problem areas.

**Regular Maintenance and Updates:** Establish a schedule for system upkeep and updates to address software problems, security holes, and evolving user needs. Regular upgrades ensure that the system remains up to date and functional.

**Opportunities for Integration:** To build a more smooth and integrated learning environment, investigate the potential for connecting the school management system with other educational software and tools.

**Evaluation of Scalability:** As the user base expands, evaluate the system's performance and scalability to make sure it can withstand a rise in traffic while remaining responsive.

### **8.3 Further Work**

In the future, there could be a number of directions for research and development to keep improving the school administration system:

**Mobile Application Development:** To give consumers more freedom and accessibility to the system, think about creating a specific mobile application for the iOS and Android platforms.

**Artificial Intelligence Integration:** To further improve system capabilities, investigate ways to include artificial intelligence for tailored insights, automatic notifications, and predictive analytics.

**Improved Reporting and Data Visualization:** To give decision-makers useful information, enhance reporting capabilities with more sophisticated data visualization and in-depth understanding of academic success.

**Cloud Migration:** To increase scalability and lower the cost of on-premises maintenance, assess if moving the system to a cloud infrastructure is feasible.

**Higher Level Features Implementation:** To fulfill extra needs in educational institutions, look into incorporating advanced features like financial management, parent-teacher communication systems, and biometric attendance.

While there is always room for improvement in educational administration, the school management system project has set a solid foundation for future creativity and advancement. The system can continue to develop and adapt to shifting educational demands by implementing the suggestions and looking into additional research.

To sum up, this endeavor is a major advancement in improving the educational ecology. The school management system is well-positioned to support educational institutions efficiently and adjust to the constantly changing nature of education thanks to its dedication to continuous innovation and improvement.

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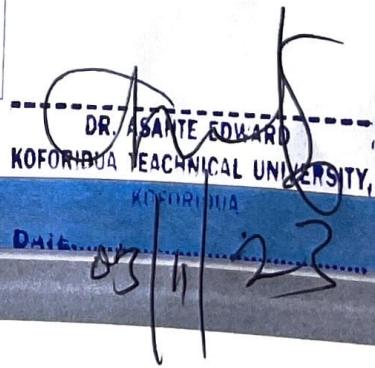
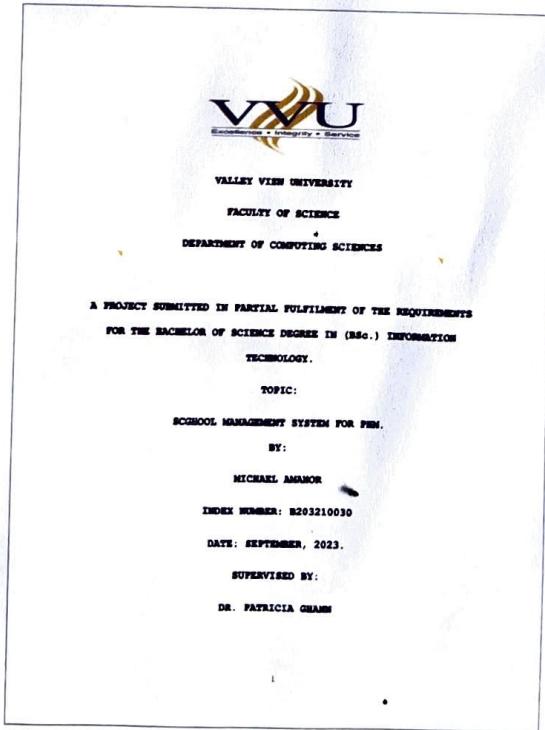


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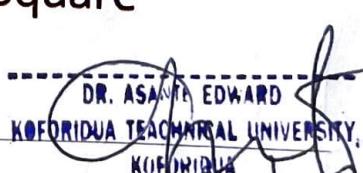
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