QUEZON CITY UNIVERSITY

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LLISynch: A SCHOOL MANAGEMENT SYSTEM FOR LEANDRO LOCSIN INTEGRATED SCHOOL

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CHAPTER I: INTRODUCTION

Technology nowadays has been a crucial part of our lives, and it has been a staple to every institution we are in. Education is also innovating as the time goes by, with the help of technology, every student's learning and growth fosters as well the operations within it. And a School Management System (SMS) is a software solution designed to enhance and expedite the administrative process within the educational institutions.

Public institutions are commonly limited to using paperworks and no existing system can help them expedite their process, hence, more time is consumed in some of their practices. So, the main goal of a School Management System is to cut down the management of different school processes such as faculty and student management, as well as the student enrollment, and facility management. And by integrating those processes into a single architecture, the administration can reduce their paperworks, improve their efficiency, and ensure that some valuable resources are allocated effectively.

Background of the Study

The **Leandro Locsin Integrated School (LLIS)**, located in Brgy. Kaligayahan, Quezon City, is a public education institution that has been serving the community for years. This school promotes a holistic education that combines strong academics with arts and culture, aiming to develop students' academic, creative, and problem-solving skills. The school is dedicated to improving the educational experience for students, faculty, and staff by implementing a School Management System with four (4) interconnected subsystems to enhance various functions:

The **Automated Enrollment System** will sort and place incoming senior high school students to proper sections and courses with due consideration of the administration staff, their earned credits, and the availability of slots to be placed in accordance with their academic needs. Additionally, the system will have a scheduling process for enrolled students. It will also identify any pending requirements and inform students if they are already enrolled in their desired strands. As a result, it will further simplify the process of enrollment and improve the overall handling experience for students and the administrative personnel.

The system will also have a separate process that caters irregular students to those who may have gaps in their academic records due to late enrollment, or transfers. These students often face unique challenges during the enrollment process, including mismatched schedules, incomplete prerequisites, or limited available slots for specific courses. By accommodating irregular students, the system ensures a more inclusive enrollment experience, allowing them to identify and resolve academic deficiencies, fit into appropriate sections, and proceed efficiently in their educational journey.

Faculty management at Leandro Locsin Integrated School presently comprises manual procedures for monitoring personal data, class assignments, leave management, and performance assessments, resulting in inefficiencies and vulnerability to errors. These inefficiencies limit the school's capacity to proficiently handle teacher performance, scheduling, and leave requests. The rising demand for efficient operations necessitates an **Automated Faculty Management System**, which addresses this need by digitizing administrative chores. Implementing this technology will enhance efficiency, decrease administrative burdens, and improve real-time management of teacher data, ultimately leading to superior faculty and educational outcomes.

The **Automated Student Management System** stores and tracks students' workloads, personal information, grades, and records, streamlining the process by consolidating all student data into one system instead of multiple records. The current manual handling of student records consumes too much time and effort when retrieving information. The system aims to provide an easier and more efficient access to information, improve tracking capabilities, and enhance productivity. It will reduce the time and effort spent on manual tasks, lower the risk of errors, and offer a simpler way to manage student data, ultimately improving the services provided to students.

The proposed **Automated Facility Management System** aims to address these issues by integrating key functions such as facility scheduling, resource management, space optimization, and security monitoring into a unified platform. By automating these processes, schools can streamline operations, reduce manual intervention, and gain real-time insights into facility performance. This will enable better decision-making and optimized space utilization, ultimately improving efficiency and reducing costs. Additionally, the Automated Facility Management System will support sustainability efforts by tracking and managing resource consumption more effectively.

Objectives

General Objective

The overall main goal of the proposed system is to develop an efficient and user-friendly School Management System for Leandro Locsin Integrated School that streamlines the administrative processes, and facilitates easy access to student information.

Specific Objectives

1. **The system is developed to develop a system that automates the management** process of different school sectors such as Faculty, Students, Facilities, and Enrollment system.
2. **The system is developed to create a centralized database** of facility information, including facility availability, maintenance history, warranties, and inspection records for easy access and reference.
3. **The system is developed to ensure data accuracy and security** that protect sensitive data from unauthorized access, ensuring compliance with relevant data privacy and security. It aims to minimize errors in manual data entry and protect confidential information by validating data in real time. Implement safe procedures for admins and student authorization and authentication, and ensure encrypted storage of personal and academic records.
4. **The system is developed to design an user-friendly interface** that ensures ease of use for increasing user satisfaction.
5. **The system is developed to integrate different school processes**, aiming to enhance efficiency, streamline operations, and ensure a more organized workflow.

Scope

1. The system will automate the process of scheduling and managing school operations including student enrollment, faculty management, student data handling, and facility management to streamline administrative tasks and improve overall efficiency.
2. The system ensures data confidentiality and security with restricted access. Authorized users, like administrators and faculty, have real-time access to faculty-related data.
3. The system will generate detailed academic progress reports and report cards, reducing the need for manual report creation by school staff.
4. The system will monitor school data such as student records, enrollment process, facilities and faculty records.
5. The system allows administrators to easily view, update, and manage users' complete digital profiles, including faculty details, facility equipment and student records.

Delimitation

1. The system does not include previous records or logs, past student records, facility data, student records and equipment allocation and facilities management.
2. The system is operated through online means. Offline capabilities are invalid; users lacking internet connectivity will not have access to the system.
3. The system will not be completely automated; human involvement is still essential in the process.
4. The system can only be used by authorized personnel to access the records and data.

5. The system operates exclusively within Leandro Locsin Integrated School and does not go beyond other schools. This restriction is established to maintain and focus on school specific policy in student management.

Operational Definition of Terms

1. **Automated School Management System:** Refers to an integrated digital platform designed for Leandro Locsin Integrated School to streamline administrative operations, including Enrollment, Faculty, Student, and Facility management. It serves to improve efficiency, reduce manual tasks, and centralize data for easier access and management.
2. **Automated Enrollment Management System:** Refers to the subsystem that organizes and manages student enrollment. The system monitors enrollment progress and updates records in real time, reducing manual input. Its effectiveness is measured by the time taken to complete the enrollment process and the level of user satisfaction with the system's functionality and ease of use.
3. **Automated Faculty Management System:** Refers to the subsystem within the Automated School Management System that manages faculty profiles, including personal details, qualifications, assignments, and timetables. It automates attendance tracking, leave applications, and class scheduling, including assigning substitute teachers.
4. **Automated Student Management System:** Refers to the subsystem that manages student data, including personal details, schedules, grades, and attendance. It automates attendance tracking, generates academic reports and report cards.
5. **Automated Facility Management System:** Refers to the subsystem that automates the scheduling and management of school facilities and resources, including

classrooms, labs, and equipment. It tracks resource usage, manages allocations for equipment like projectors and computers, and handles scheduling for events and activities. The system is managed by the Administrative Officer and School Property Custodian.

6. **User-Friendly Interface:** Refers to the design of the system's graphical user interface to ensure ease of use, accessibility, and satisfaction for various users, such as administrators, faculty, and students.
7. **Streamlining Operations:** Refers to reduction of manual administrative tasks and paperwork by implementing automation and digital record-keeping systems. This process improves efficiency by replacing traditional paper-based methods with automated workflows, minimizing human error and ensuring quicker, more organized management of administrative functions.
8. **Data Security:** Refers to measures taken to protect sensitive school data from unauthorized access, breaches, and errors. This includes encryption, user authentication, and compliance with relevant data privacy regulations.
9. **System Integration:** Refers to the unification of multiple subsystems such as enrollment, faculty, facility, and student management into a single architecture, facilitating seamless data sharing and operational workflows.
10. **Real-Time Access:** Refers to the ability of authorized users to retrieve and update information instantly via the system, ensuring up-to-date records and faster decision-making.

CHAPTER II: REVIEW OF RELATED LITERATURE

Local Study

The primary aim of this research was to assess the efficacy of the current student record management system utilized by various Higher Education Institutions in the Philippines and suggest a framework that could be implemented in routine interactions with stakeholders. This study employed a quantitative research design to obtain a comprehensive understanding of the issue. Despite lacking a wholly dedicated records management system, some higher education institutions in the Philippines prioritized record preservation, according to the data collected. In addition, the chosen Higher Education Institutions placed a premium on verifying record duplication before record creation, and the ability to analyze and maintain the integrity of record-keeping was foundational to archive science and had a centuries-long theoretical foundation. The chosen higher education institutions (HEIs) in the Philippines utilized an efficient and effective records management system. The outcomes of this research will serve as the foundation for the development of their computerized student record management system.

School management automation through Management Information Systems (MIS) is the application of technology to automate, integrate and optimize administrative and academic processes within the school environment. The research method used in this study was literature research. The results show that cost challenges are often the biggest barrier, with budget restrictions making it difficult for some educational institutions to support the initial investment and ongoing operational costs of SIM. Solutions include finding alternative funding models, partnering with technology companies, and adopting cloud-based solutions to reduce infrastructure costs. Regarding user resistance, it was found that effective training

programmes and awareness campaigns on the benefits of SIM can minimize the discomfort of adapting to new technology. Finally, in the area of data security, the findings emphasize the importance of security audits, user training, and compliance with data protection regulations to maintain the integrity and privacy of institutional data. This research demonstrates that although challenges exist, with the right strategies, SIM implementation can optimize school management functions and enrich the learning process.

This study investigated the use of the School Information System (SIS) in strengthening the management of government secondary schools in Meru District Council. The study adopted the Technology Acceptance Model (TAM). The Diffusion Innovation theory and Technological Acceptance model guided this study. A qualitative research approach alongside a case study research design was adopted. The targeted population of the study was 1203 including 46 heads of schools, 1083 teachers, 46 academic teachers, 26 ward secondary officers, 01 District Education Officer (DSEO) and 01 District Information Communication Technology Officer (DICTO) of which 37 were drawn. Purposive and simple random sampling techniques were used to get respondents. Interview and questionnaire methods were used to collect data. The study's trustworthiness was maintained through the supervisor’s corrections, expert advice, and following all necessary ethical procedures. The study revealed that the School Information System carries user-friendly features that strengthen the management of government secondary schools such as student information management, and teacher and staff management. However, the facilities are not sufficiently available. Furthermore, the study found that the School Information System greatly enhances data management and analysis, streamlining administrative tasks and resource management, promoting teachers’ accountability and improving communication in government secondary

schools. The study recommended that there should be the provision of enough facilities, alternative sources of energy, seminars, and training to promote the implementation and use of the School Information System in government secondary schools.

Based on the study Development of a Computerized Student-Advising and Enrollment System, the use of the traditional "paper and pen" method of student student record in terms of handling a manual enrollment system was inefficient and prone to human errors; causing delays and issues that prompted stakeholders to pushed the school to implement a new system. The main goal of the system was to organize student records effectively—enhancing advising and enrollment processes. The structured method should reduce human errors and save time, benefiting both students and school staff. The system uses modern, cost-effective technologies such as SMS and barcodes. It employs open-source tools such as Apache 2 for web service, PHP for server-side scripting, MySQL for database management, and other technology tools including XML AJAX for barcoding. The implementation of the Computerized System has transformed and improved how student records are managed and collected. It made the process much easier to retrieve student checklists and related reports—which could now be accessed by authorized users from designated departments or workstations. The enrollment process improved significantly, specifically in interaction between advisers and advisees. With the new system, advisers had more time to engage in necessary conversations with their advisees, enchanting the overall advising procedure. Additionally, based on the study—the system is still being tested and is currently used exclusively by the school to ensure the it's stability. Once proven, reliable and usable, other departments will also use it, as it is designed to be scalable and capable of supporting extensive use across the school. In conclusion, the transition from manual to

digital has improved efficiency, accuracy, and the quality of interactions between students and advisers, streamlining the whole process and more effectively.

Student academic performance describes how well a student meets the standards of a course or a whole of the program. Through a learning management system, these student performance data can be analyzed using predictive models integrated into information systems. This study aims to understand the user acceptance of an information system that predicts students' academic performance using the technology acceptance model, through a survey conducted among the users in a higher education institution in the Philippines. Results show that perceived ease of use has a significant influence on perceived usefulness. Moreover, there is no significant relationship between perceived usefulness and attitude towards use of technology. Overall, the technology acceptance model explains the determinants of adoption of predictive analytics on student academic performance. Practical and research implications are discussed.

The study is primarily aimed at describing how to design and develop a teacher evaluation system for a higher learning institution in Nueva Ecija, Philippines. Specifically, it sought to describe the activities undertaken in the software development lifecycle stages, including planning and requirements analysis, design, development, and testing. Maintenance and deployment stages were not covered in this study. Using developmental research, proponents developed the system following the SDLC stages. The results show how the proponents successfully developed the system. Proponents suggested that future studies may be conducted which may focus on the assessment phase covering deployment and maintenance stages, to learn how end-users and information technology (IT) experts view the developed system

Teachers face numerous challenges in managing their classrooms efficiently in the vast education landscape. With the advent of technology, classroom management Systems have emerged as a powerful tool to streamline the teaching process. This blog explores how a classroom management System can significantly aid teachers in maintaining order, fostering engagement, and optimizing the learning experience for students. Classroom management System refers to a set of digital tools designed to assist teachers in organizing and controlling various aspects of their classrooms. These tools simplify administrative tasks, enhance communication, and create a conducive learning environment.

The School-Based Management (SBM) is a system of public education which is systematic and consistent decentralization to the school level of authority and responsibility to make decisions on significant matters related to school operations within a centrally determined framework of goals, policies, curriculum, standards and accountabilities. Thus, this study is primarily aimed to evaluate the implementation of the School Based Management (SBM) as it correlates to the academic performance of selected public high schools. The researcher used a descriptive research of a correlation type in determining the respondents' impression on the existence of the School-Based Management and the results of the National Achievement Test from the School Year 2010-2013. The data gathered were treated through the use of Pearson's r, Standard Deviation, Kruskal Wallis and the Games-Howell Post Hoc Test. Results show that There is significant differences on the dimension of SBM particularly on the aspect of Leadership and Governance and the stakeholders such as the principal and community and the department heads and community. Likewise, there are significant differences between the stakeholders principal and department head, principal and faculty, principal and alumni, principal and community, principal and parent, and community and parent and the SBM dimension on Curriculum and Learning.

Advancements in ICT have caused a transformation of educational organizations, impacting leadership, decision-making, human resource management, responsibility, and planning. This research aims to evaluate the effects of technology intervention at Romblon State University and optimize its effectiveness in delivering academic services and managing the institution. Data were gathered from end-users using surveys and focus group discussions and analyzed with statistical methods. While the system was found highly effective, several implementation issues that affect utilization and service delivery were identified. Improvements are necessary to further optimize the system and enhance the overall experience of its users.

IntelliSchool: A Student Information System (SIS) for Senior High School (SHS) is a software application designed to manage and streamline various aspects of student-related academic information effectively. This study focused on ensuring data accuracy and consistency, creating a paperless and web-based class record system, promoting fairness and transparency in form generation, and improving communication and engagement between parents and the school through a messaging feature. A descriptive-developmental approach was utilized, incorporating interviews and direct observations of transaction processes for data collection. The software development life cycle (SDLC) followed was Rapid Application Development (RAD), which included stages such as requirements planning, user design, development, and system launch. The system was built using technologies like CodeIgniter PHP Framework, MySQL, jQuery, and Code Espresso SMS Gateway. In the descriptive phase, test cases were employed to assess system functionality, alongside the Post Study System Usability Questionnaire (PSSUQ) administered to 5 IT experts and 35 end-users. Data analysis utilized standard mean calculations. The test cases received a "passed" rating, while the PSSUQ yielded an overall mean score of 1.21 across measures of

system usefulness, interface quality, and information quality. The system underwent a pilot implementation on a locally hosted network, successfully meeting its objectives. It is recommended to use a server that can support users without compromising system performance.

This study aimed to assess the cybersecurity challenges faced by state universities and colleges in the Zamboanga Peninsula during the 2021-2022 academic year. The findings showed that the main challenges included lack of support from management, limited budgets, poor infrastructure, and skill gaps. The study concluded that there is a need to improve IT security management practices at these institutions, highlighting the importance of addressing these challenges. Recommendations were made for various groups, including university leaders, deans, office heads, program chairs, faculty, staff, students, and future researchers, to help enhance IT security practices and raise awareness and education in this area.

The Learning Resource Management and Development System (LRMDS), set up by the Department of Education (DepEd) in the Philippines, is an important part of the education system designed to improve teaching and learning. This study looks at how well public-school teachers in a specific district in Western Visayas used LRMDS during the 2019-2020 school year and what factors affected their skills. To collect data, 170 teachers filled out a detailed questionnaire that was carefully checked for accuracy and reliability. The findings show that most teachers have a moderate level of skill in using LRMDS. Additionally, there are noticeable differences in how teachers use LRMDS based on their age. These results highlight the need for focused training and support to help teachers improve their skills with LRMDS. Enhancing teachers' abilities with LRMDS can lead to better use of technology in education and improve student learning.

An inefficient and ineffective university enrolment system may add to the stresses a student could experience in this college life. Hence, for the purpose of providing feedback to the UIC administration, this study was conducted to assess the college enrolment system as to its efficiency and effectiveness. Using a researchers-made questionnaire, the researchers administered the instrument to 365 randomly selected college students in the first semester of the academic year 2014-2015. The results were triangulated through interviews with three personnel – a registrar's staff, a cashier and an academic coordinator. Results revealed that respondents found the enrolment system to be averagely efficient and effective. However, there were some issues that need to be addressed and these include the insufficiency of evaluators, lack of familiarity on the curriculum of the evaluators, and inadequacy of time in evaluating students prior to the enrolment period particularly on the second semester. Moreover, the efficiency of the enrollment system was dependent on the efficiency of its subsystem. Hence, a malfunction of one component could affect the efficiency of the succeeding components. Tukey results showed that the Education department students had the least satisfied clientele while the first year students were the most satisfied.

This study aims to improve a university's queuing system by providing an effective enrollment queueing system. Each variable mentioned in this research and its details were accumulated by thoroughly examining the strengths, pitfalls, and blindsides of the existing system in enrollment, thus aiming at a desired output in improving the waiting lines of the students and guardians. The researcher's primary output is an enrollment Queueing System. The university will have a well-defined and controlled process, specifically in the enrollment queueing system, that will help them achieve customer satisfaction, eliminate overcrowded areas and noise of using microphones and speakers, and eliminate downtime in its process. The study will benefit students, guardians, and the university. They can enroll in the

university with less effort of waiting in the windows, reduce the stress of staying in a crowded area, and wait without too much noise from the speaker while the staff calls the names of the students enrolling. The study will help parents enroll their children. The university will have an integrated system after implementing this Enrollment Management System or the Queue System Software, eliminating the long enrollment process queue. It will reduce employees' workload because it is owing to automation. The university could increase its service time to equal the service that more students or guardians offer. The university provides a more reliable service with the aid of the Queue System Program, which will please every customer.

Local Literature

The researchers created the Automated, Systematized, Enrollment Program (A.S.E.P.), an electronic enrollment system, specifically for Antonio A. Maceda Integrated School (JHS) and Raja Soliman Science and Technology High School. A.S.E.P. collects data automatically. Real-time information gathering regarding the enrollment status is carried out. Addressing issues with pre-data collection, data collection, learner information system (LIS) encoding, and data retrieval is the primary objective of A.S.E.P. The PSDS of SDO-Manila and the SRCs of RSSTHS and AAMIS validated the tool used to evaluate the utility of A.S.E.P. The survey questionnaire's participants were chosen through the technique of purposeful sampling. There were 18 men and 26 women that responded.

Educational data has empowered planners at school, national, and global levels to make data-driven decisions, plan activities, and develop policies that ensure quality learning, even with limited resources. Consequently, an Educational Management Information System

(EMIS) has become a crucial tool for converting data into meaningful information, helping educational planners take appropriate actions. Since the system's usage and features vary across different studies, this paper provides a brief review of EMIS to help future researchers better understand the topic. In summary, EMIS varies depending on the academic level it covers, the level of autonomy, the stakeholders involved, and its capabilities. These capabilities include (i) Data Entry and Repository, (ii) Evaluation and Report Generation, (iii) Decision-making and Planning, and (iv) Learning/Teaching Management. The paper also discusses seven examples of EMIS to provide further insight into its features. Additionally, the review highlights how EMIS, enhanced by artificial intelligence technologies like natural language processing, neural networks, big data, and knowledge-based systems, can help planners make more efficient decisions and plans when handling large datasets, providing insights that traditional data analysis might struggle to uncover.

Local System

Colleges and universities are established to offer educational services, much like any other organization. Schools have processes similar to businesses, such as admissions, data management, and report generation. These processes are facilitated by a centralized system for storing, processing, and retrieving information. Without a computer system, the complexity of college transactions results in personnel being burdened with paperwork to manage student records. This was the motivation behind the design and development of the School Management Information System (SMIS) for a community college in northern Mindanao. This paper outlines the system's major functionalities and modules, using the Agile Model for its implementation. It also examines the system's impact on service delivery

and overall college operations. The project was evaluated using ISO 25010, a quality model for software evaluation, and the results showed that SMIS performed well in terms of functionality, usability, and reliability, with average scores above 4.04 on a Likert scale, indicating a very good performance. The study found that respondents agreed the e-school system enhanced the school's transaction processes and had strong overall quality in functionality, usability, and reliability. Future recommendations include integrating smartphone and tablet-based attendance monitoring and installing a kiosk on campus for grade and schedule viewing, connected to the database server.

The school is one of the fields that are embracing technology to improve education, facilities, and systems on campus. Unfortunately, not all schools today are still equipped with the necessary technology to meet their needs. They are still tallying the results of faculty evaluations manually, which is time-consuming and frustrating for school personnel. Teacher evaluation is widely regarded as the most effective tool for improving the quality of instruction in schools. In almost every stage of the decision-making process, timely and accurate information is useful. The Online Faculty Monitoring and Evaluation System will facilitate the collection and analysis of faculty evaluation data in less time. The Online Faculty Monitoring and Evaluation System is a paperless process in which the evaluator evaluates the teacher using the computer and the system. The results of the software evaluation met the researchers' objectives and are thus worthy of continuation and development. The overall mean of the system evaluation indicated that the developed study was extremely useful and could be of great assistance to the School. The outcomes of the faculty members' evaluations improved their usage.

Foreign Study

The ongoing technological revolution has brought numerous advantages to various sectors, prompting organizations to adapt their business models and embrace more sophisticated systems. Educational institutions, in particular, have felt the effects of this progress, as school management now requires automated processes that ensure the protection of data against both human error and cyber-attacks. This paper discusses the development and integration of a system aimed at managing personal information within schools by implementing an information management architecture. The system's main goal is to generate certified documents that can be securely shared across trusted systems. The study takes a descriptive approach, seeking to identify irregularities in the Personal Information Management Systems (PIMS), explore their relationships, and validate the research hypothesis for future comparison with similar studies.

Learning management systems (LMS) play a crucial role in knowledge acquisition and learning management in the digital age. Since users are key stakeholders who affect the system's sustainability, their attitudes toward these systems are of great importance. This study aims to investigate the factors that influence student satisfaction with LMS, focusing specifically on Blackboard and Edusoft. These systems are mandatory for all students at International University Vietnam National University HCMC. A quantitative survey was conducted among current students to assess the impact of four factors—announcement system, instructional information, interaction, and technology quality—on the perceived usefulness of LMS, as well as how this usefulness affects their overall satisfaction. The findings indicate that all five factors significantly influence learner satisfaction, both directly and indirectly. The study also examines the relationship between the interaction features of LMS and student satisfaction. From the students' perspective, they were able to express

which factors they consider most important when using LMS daily. For the university, this research offers insights into student perceptions, which can guide future improvements in LMS.

Schools have different departments and offices with interrelated functionalities that need one's cooperation in order to function well. Offices are scattered across the campus and transfer of information is affected. The need to build an integrated School Management System using a centralized database will make school services of better quality. The need to integrate technologies like barcodes, use of internet, video cameras, sensors and the use of a better framework are needed to cope up with the changing needs of the society and in providing quality school service. Thus this study aimed to build such a system, implement the system and identify the level of acceptability. Features of the system include enrollment, assessment, report generation and providing decision support modules. The system is based on a standardized school management framework derived from different existing school management systems. This is under qualitative as well as descriptive research. The Agile AWE model is used in project development. This is implemented in an institution that uses the manual process of school management. Manager, staff, teachers, students and guardians will provide the needed system requirements and at the same time they will be the respondents in getting the level of acceptability. Feedbacks are continuously gathered and help identify possible improvements. This system is beneficial to institutions currently using manual processes in their departments. This is a fully functional and configurable system that will suit the needs and surely provide quality service.

This study presents the design and development of a student management system integrated with a programmable device programming system. Aimed at addressing the evolving needs of higher education institutions, the system enhances reliability, flexibility,

and operational efficiency. By utilizing a BP neural network, the system achieved a throughput of 180 times per second with peak CPU utilization of 99% and stability exceeding 95%. The research highlights the significant improvements in system performance compared to traditional student management systems. The results emphasize the system's superior stability and its potential for streamlining university management, especially in handling enrollment, student records, and facility management.

This paper provides a thorough examination of Automated Educational Management Systems (AEMS) based on an extensive literature review. It focuses on key areas such as automated class scheduling, teacher substitution management, and optimizing seating arrangements, while analyzing the development, challenges, and future prospects in educational administration. By reviewing numerous research articles, technical papers, and academic studies, this survey seeks to uncover trends, challenges, and technological innovations in AEMS. The analysis includes various methodologies and technologies and their effects on educational institutions, highlighting the essential role of automation in improving administrative functions. By synthesizing findings from a wide range of sources, the survey offers insights into how automated systems can transform educational operations, reduce administrative burdens, and enhance overall efficiency within educational settings. Additionally, the review discusses the implications for future research and development, aiming to advance the ongoing discussion on enhancing educational management through automation.

Foreign Literature

A forward-looking perspective on the assurance of general education opportunities via non-physical attendance (online attendance), where physical attendance is not the default, is necessary in light of the shortcomings of the Japanese compulsory enrollment system, which is based on attendance at a particular school. Municipal Boards of Education are currently being asked to "promote the guarantee of diverse opportunities for general education" and "form public school networks," while prefectures are required to work with municipalities to set up new councils and comprehensive support centers in order to provide a continuous guarantee throughout the school years across a wide area.

This article examines the factors that influence primary and secondary school teachers' intentions to adopt Learning Management Systems (LMSs). By extending the Unified Theory of Acceptance and Use of Technology (UTAUT) with insights from education and game-based learning research, the study investigates the impact of IT innovations on education. It emphasizes the significance of understanding LMS adoption to improve teaching and learning practices. Utilizing multi-group structural equation modeling (SEM), the study analyzes differences in adoption intentions based on individual and organizational characteristics, comparing users and non-users as well as teachers from various fields. The findings contribute to theoretical developments by creating and testing a comprehensive model that links technology features and individual characteristics to adoption intentions. Furthermore, the study provides practical recommendations for increasing LMS adoption and fostering more effective learning environments.

Online education facilitated the continuation of learning, which had been temporarily and uncertainty halted due to the global onset of the COVID-19 pandemic. Since then,

educational institutions have maintained learning through both synchronous and asynchronous methods, with instruction taking place remotely on digital platforms. During this large-scale shift to online education, driven by the pandemic, Learning Management Systems (LMS) played a crucial role in ensuring continuous learning and student engagement. Drawing from existing research, insights from MOOC platforms, and observations from LMS applications in corporate training, this article synthesizes the literature on how effectively using LMS can create an interactive, student-centered learning process that meets the needs of diverse learners in higher education.

Foreign System

The last few years have seen a consistent decrease in the life-cycles of software developments and the ever more frequent new releases. Indeed, there has been a significant shift in the software development industries toward fully automating testing at all levels of testing to ensure the quality of those deliveries. Testing is performed at the system testing level for the product generated as an entire whole in the test environment designed closely to simulate the production environment. This layer is hard to deploy automated tests due to system-wide breadth, and there are so many potential sources of failures. Therefore, well-designed test cases covering critical functionality are necessary since thorough testing is neither pragmatic nor sustainable. Handling the right test data that is used in automated testing has become significant with growing rules and regulations in terms of data privacy and protection. This paper aims to describe the automated system tests for TeachCenter 3.0, a learning management system of Graz University of Technology.

Courses and training centers are not-formal educational environments adopted for people who have needed knowledge, skills, and attitude requirements for self-construction, career advancement, finding jobs, opening business concerns, and further education. Presently, the movement of industrialization and a nonlinear aspect of competition in employment reveal that the world is undergoing a phenomenon, called digital disruption. The current disruptive era in the training and education sector has also brought about online course and training services accessible through the service provider's website or page. These service providers have not acquired concrete shape; on the other hand, many professionals having expertise in different domains have joined their hands with specialists in information and communication technology to design training programs and courses that are available through computers, laptops, as well as through other electronic equipment. A learning management system is a web application which supports online communication, assignment submission, and return, and exchange of materials between instructors and students. It forms an essential part of many courses and training programs in information and communication technologies. The teacher, course, and training organizers are all of the opinion that the level of this model's practicability is pretty good, based on the research and development results and tested computer-based training methods. Course work and computer-based instruction outcomes can enable early childhood educators to better understand the office application computer course program.

This paper aims to establish an automated wireless system that records and maintains the students' attendance system for the modern education sector. As in 2002, 75% attendance was made compulsory by PAN India, the practice of recording and maintaining the attendance became essential. It's been 18 years since then but the conventional method remains the same that leads to a high probability of human errors, misplacement of the

documents, redundant entry of the attendance manually, more chances of students giving proxy on behalf of their classmates. The automated wireless biometric fingerprint-based student attendance system, not only upgrades the practice of the conventional method but also makes it automated and more convenient and more secure to record and maintain the attendance, as well as completely eradicating the malpractice of proxy. It is a very cheap device compared to the ones available in the general market. The whole system consists of a Fingerprint sensor, Arduino, OLED display, Arduino to USB cable, and an Android Smartphone with an app specially designed to control the device. The image enhancement and orientation of field estimation of the fingerprint image have been applied through MATLAB Fingerprint Recognition Toolbox. The whole systems working is summed up in three steps, first is the enrolment of the student, loading data of the specific group or batch whose attendance is to be recorded and finally taking the attendance, thus also saving an ample amount of time which gives the students a clear opportunity to interact with the professor and clear their doubts. And also playing a major role in Digital India by automating the system and by eradicating the use of paper which is initially made of trees contributing towards the noble act of sustainable development.

Learning Management Systems (LMS) reinforce the learning process through online classroom environments. A standard LMS supports an inclusive learning environment for academic progress with interceding structures that promote online collaborative-groupings, professional training, discussions, and communication among other LMS users. Instructors should balance active learning with the use of LMS technological resources and the use of guidelines from the qualified curriculum. An LMS allows instructors to facilitate and model discussions, plan online activities, set learning expectations, provide learners with options, and assist in problem-solving with processes for decision making. An Instructor's presence

within an LMS creates an engaging learning environment. Students can retain their autonomy, enthusiasm, and motivation with LMS use. Stakeholders of the educational community must find scientific studies to support their contributions in LMS platforms to assist scholars in learning mathematics and other academic subjects.

Synthesis of the Reviewed Literature, Studies and Systems

Local Literature, Studies and Systems

Studies provide wide aspects of information systems, management, and technology integration in educational institutions reinforcing the implementation of student records, enrollment systems, faculty and facility management. One study assesses the efficacy of the student record management system in Philippine Higher Education Institutions while many lack dedicated systems, existing practices emphasize record verification and integrity. Another study highlights the potential of Management Information Systems to optimize administrative and academic functions in schools, despite challenges such as limited budgets and user resistance. A separate analysis of school-based management satisfaction at a regional science high school shows that stakeholders are highly satisfied with curriculum and instruction, accountability, and resource management, though leadership and governance could be improved demonstrating how these technologies improve administrative efficiency and data management. The design of faculty evaluation systems and classroom management tools further illustrates how technology can streamline teaching processes and enhance instructional quality. Finally, various studies examine the challenges and opportunities for improving enrollment processes, queuing systems, and cybersecurity in educational settings. Across these studies, there is a shared emphasis on how technology

when effectively implemented can transform school management, improve student engagement, and enhance the quality of education. However, consistent challenges such as funding, resistance to change, and infrastructure limitations must be addressed for these systems to reach their full potential.

Foreign Literature, Studies and Systems

The review of related literature examines the transformative impact of advanced information systems and technology on educational institutions, focusing on enhancing management, security, and learning processes. Studies highlight the importance of Personal Information Management Systems (PIMS) in schools, designed to secure and manage sensitive data, thereby reducing human error and cyber risks. These systems aim to streamline document certification and secure data sharing, promoting trust and integrity across educational platforms.

The literature review emphasizes the benefits of integrated school management systems and automation in educational institutions. Automated systems further reduce administrative workloads by simplifying scheduling and attendance tasks, while biometric attendance solutions increase security and sustainability. Overall, this synthesis reveals a consistent theme that while technological integration in education offers numerous benefits such as efficiency, security, and enhanced user satisfaction, challenges remain. These include budget limitations, infrastructure constraints, and resistance to change, which must be addressed for educational institutions to fully realize the advantages of these systems.

CHAPTER III: SYSTEM DESIGN

Data-Flow Diagram

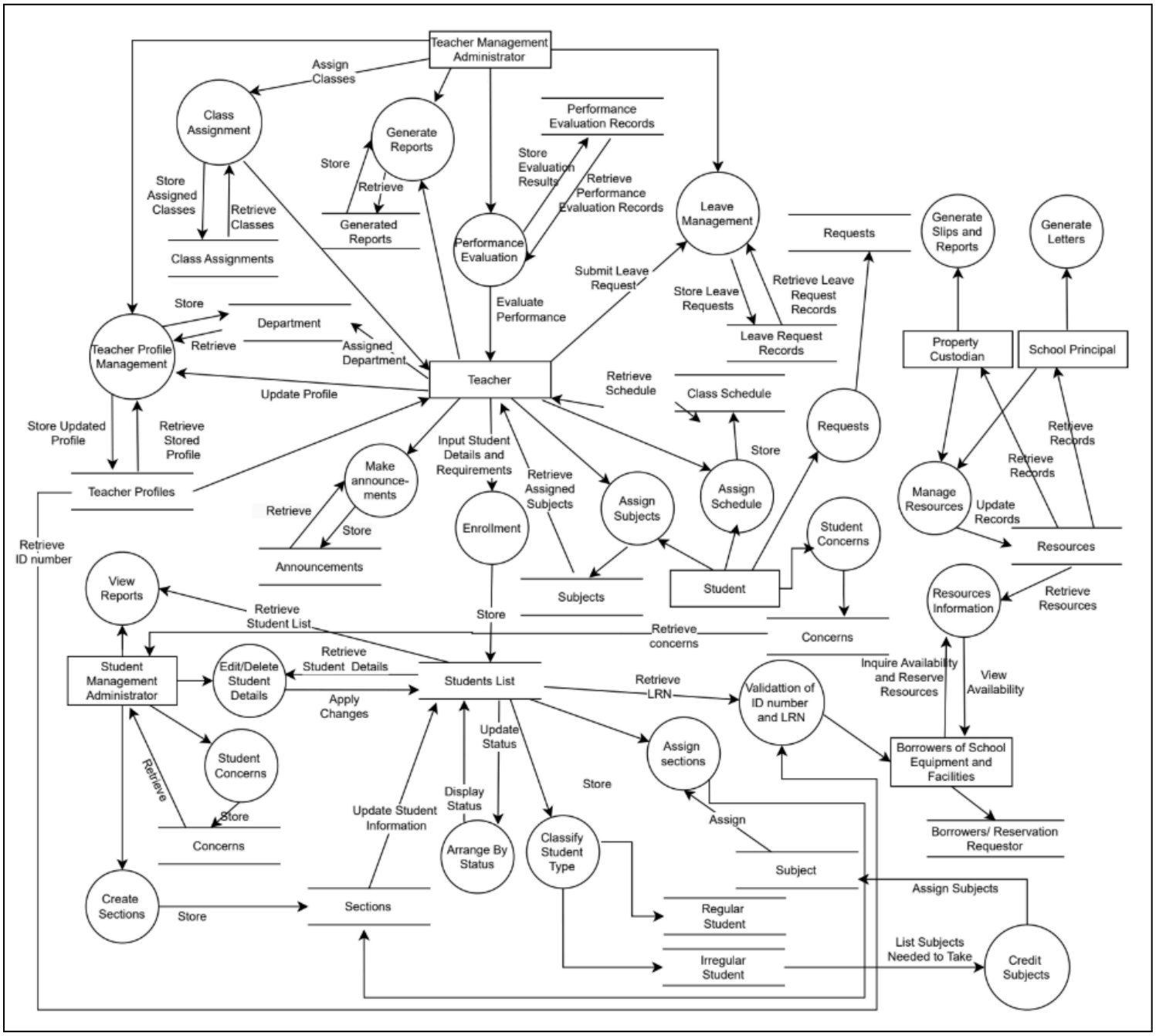

Figure 1. Data Flow Diagram

Database Schema

```
CREATE TABLE USERS (
  USERID INT PRIMARY KEY,
  LAST_NAME VARCHAR(25),
  FIRST_NAME VARCHAR(25),
  MIDDLE_NAME VARCHAR(25),
  SUFFIX VARCHAR(10),
  ROLE VARCHAR(25),
  USERNAME VARCHAR(25) UNIQUE,
  PASSWORD VARCHAR(128)
);


CREATE TABLE RESERVATION_REQUESTOR (
  REQUESTORID INT PRIMARY KEY,
  LAST_NAME VARCHAR(25),
  FIRST_NAME VARCHAR(25),
  MIDDLE_NAME VARCHAR(25),
  SUFFIX VARCHAR(25),
  EMAIL_ADDRESS VARCHAR(50),
  CONTACT_NUMBER VARCHAR(11),
  SCHOOL_ROLE VARCHAR(25),
  ID_NUMBER VARCHAR(20),
  RESOURCE_TYPE VARCHAR(25),
  REQUEST_DATE DATE,
  RESERVATION_CODE NVARCHAR(20)
);


CREATE TABLE EQUIPMENT_LIST (
  EQUIPMENTID INT PRIMARY KEY,
  EQUIPMENT_NAME VARCHAR(50),
  SERIAL_NUMBER VARCHAR(20) UNIQUE,
  UNIT_COST DECIMAL(9,2),
  EUL VARCHAR(20),
  CONDITION VARCHAR(50),
  AVAILABILITY VARCHAR(20)
);


CREATE TABLE ROOMS (
  ROOMID INT PRIMARY KEY,
  ROOM_NAME VARCHAR(50) UNIQUE,
  ROOM_TYPE VARCHAR(30),
  BUILDING VARCHAR(50),
  CAPACITY INT,
  STATUS VARCHAR(50)
);
```

Figure 2. Facility Management System Database Schema

```
CREATE TABLE BORROWED_EQUIPMENT (
  BORROWID INT PRIMARY KEY,
  REQUESTORID INT,
  EQUIPMENTID INT,
  DATETIME_BORROWED DATETIME,
  DATETIME_RETURNED DATETIME,
  DAYS_OVERDUE INT,
  RETURN_CONDITION VARCHAR(50),
  STATUS VARCHAR(20),
  USERNAME VARCHAR(25),
  REMARKS VARCHAR(50)
);


CREATE TABLE ROOM_RESERVATIONS (
  ROOMRESERVATIONID INT PRIMARY KEY,
  REQUESTORID INT,
  ROOM_NAME VARCHAR(50),
  EVENT_NAME VARCHAR(100),
  EVENT_TYPE VARCHAR(50),
  START_DATE DATE,
  START_TIME TIME,
  END_DATE DATETIME,
  END_TIME TIME,
  EXPECTED_ATTENDANCE INT,
  MESSAGE VARCHAR(200),
  STATUS VARCHAR(50),
  USERNAME VARCHAR(25),
  REMARKS VARCHAR (50)
);


ALTER TABLE BORROWED_EQUIPMENT
ADD FOREIGN KEY (REQUESTORID) REFERENCES RESERVATION_REQUESTOR(REQUESTORID),
ADD FOREIGN KEY (EQUIPMENTID) REFERENCES EQUIPMENT_LIST(EQUIPMENTID);
ADD FOREIGN KEY (USERNAME) REFERENCES USERS(USERNAME);

ALTER TABLE ROOM_RESERVATIONS
ADD FOREIGN KEY (REQUESTORID) REFERENCES RESERVATION_REQUESTOR(REQUESTORID),
ADD FOREIGN KEY (ROOM_NAME) REFERENCES ROOMS(ROOM_NAME);
ADD FOREIGN KEY (USERNAME) REFERENCES USERS(USERNAME);
```

Figure 3. Facility Management System Database Schema

```
SQL
CREATE TABLE User (
  user_id INT PRIMARY KEY,
  username VARCHAR(50),
  password VARCHAR(50),
  role VARCHAR(20)
);

CREATE TABLE Student (
  student_id INT PRIMARY KEY,
  firstname VARCHAR(50),
  lastname VARCHAR(50),
  contact_info VARCHAR(50),
  date_of_birth DATE,
  address VARCHAR(100),
  grade_level INT
);

CREATE TABLE Announcement (
  announcement_id INT PRIMARY KEY,
  content TEXT,
  date_posted DATE,
  user_id INT,
  FOREIGN KEY (user_id) REFERENCES User(user_id)
);

CREATE TABLE Section (
  section_id INT PRIMARY KEY,
  teacher_id INT,
  section_name VARCHAR(50),
  grade_level INT,
  FOREIGN KEY (teacher_id) REFERENCES User(user_id)
);

CREATE TABLE Schedule (
  schedule_id INT PRIMARY KEY,
  student_id INT,
  section_id INT,
  room VARCHAR(20),
  day VARCHAR(10),
  time_slot TIME,
  FOREIGN KEY (student_id) REFERENCES Student(student_id),
```

Figure 4. Student Management System (Database Schema)

```
  FOREIGN KEY (section_id) REFERENCES Section(section_id)
);

CREATE TABLE Request (
  request_id INT PRIMARY KEY,
  student_id INT,
  request_type VARCHAR(50),
  purpose TEXT,
  status VARCHAR(20),
  date_submitted DATE,
  date_done DATE,
  FOREIGN KEY (student_id) REFERENCES Student(student_id)
);

CREATE TABLE Concern (
  concern_id INT PRIMARY KEY,
  student_id INT,
  description TEXT,
  status VARCHAR(20),
  date_created DATE,
  date_closed DATE,
  FOREIGN KEY (student_id) REFERENCES Student(student_id)
);

CREATE TABLE Student_Section (
  student_id INT,
  section_id INT,
  PRIMARY KEY (student_id, section_id),
  FOREIGN KEY (student_id) REFERENCES Student(student_id),
  FOREIGN KEY (section_id) REFERENCES
 Section(section_id)

);
```

Figure 5. Student Management System (Database Schema)

Sitemap

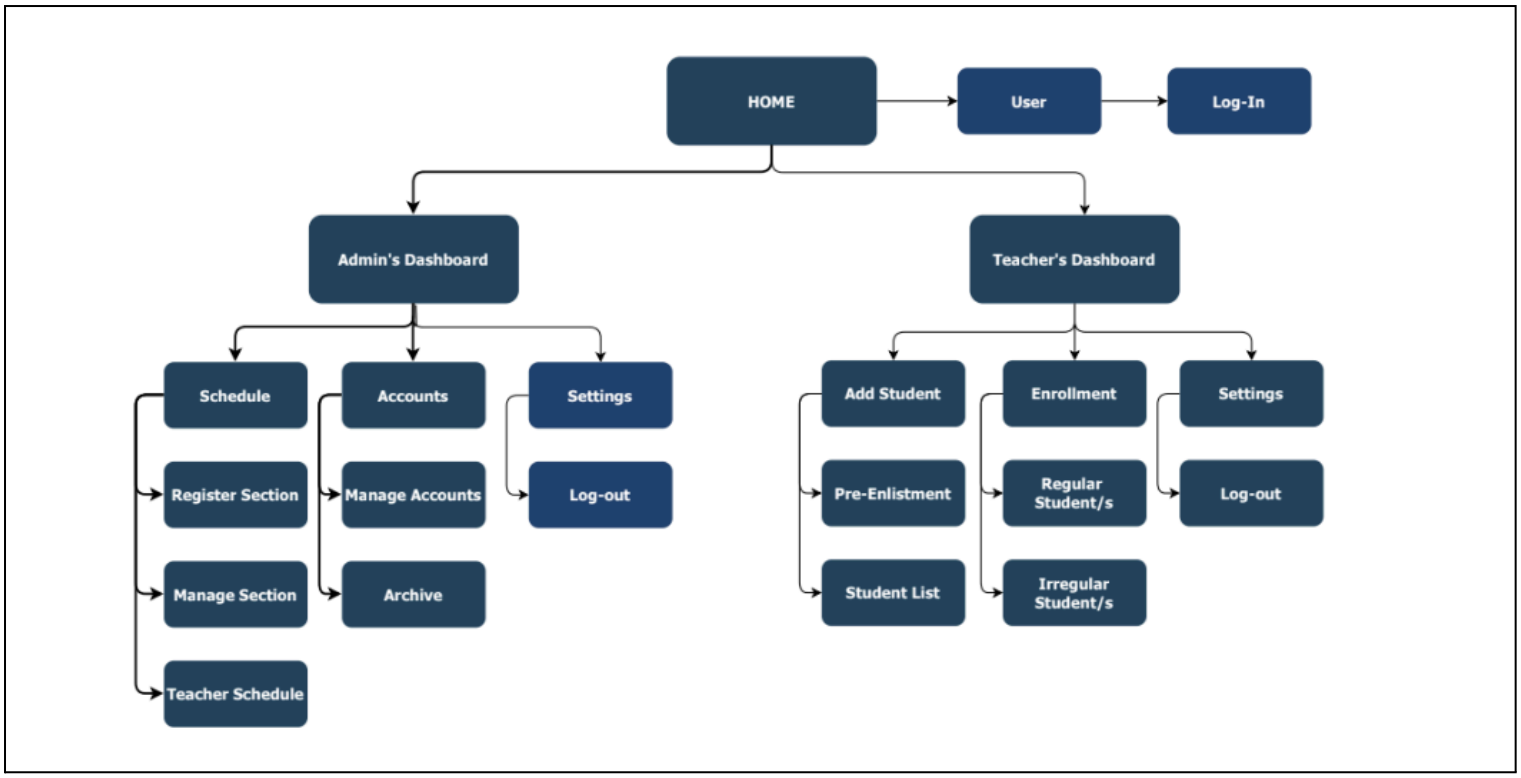

Figure 6. Enrollment Management System (Sitemap)

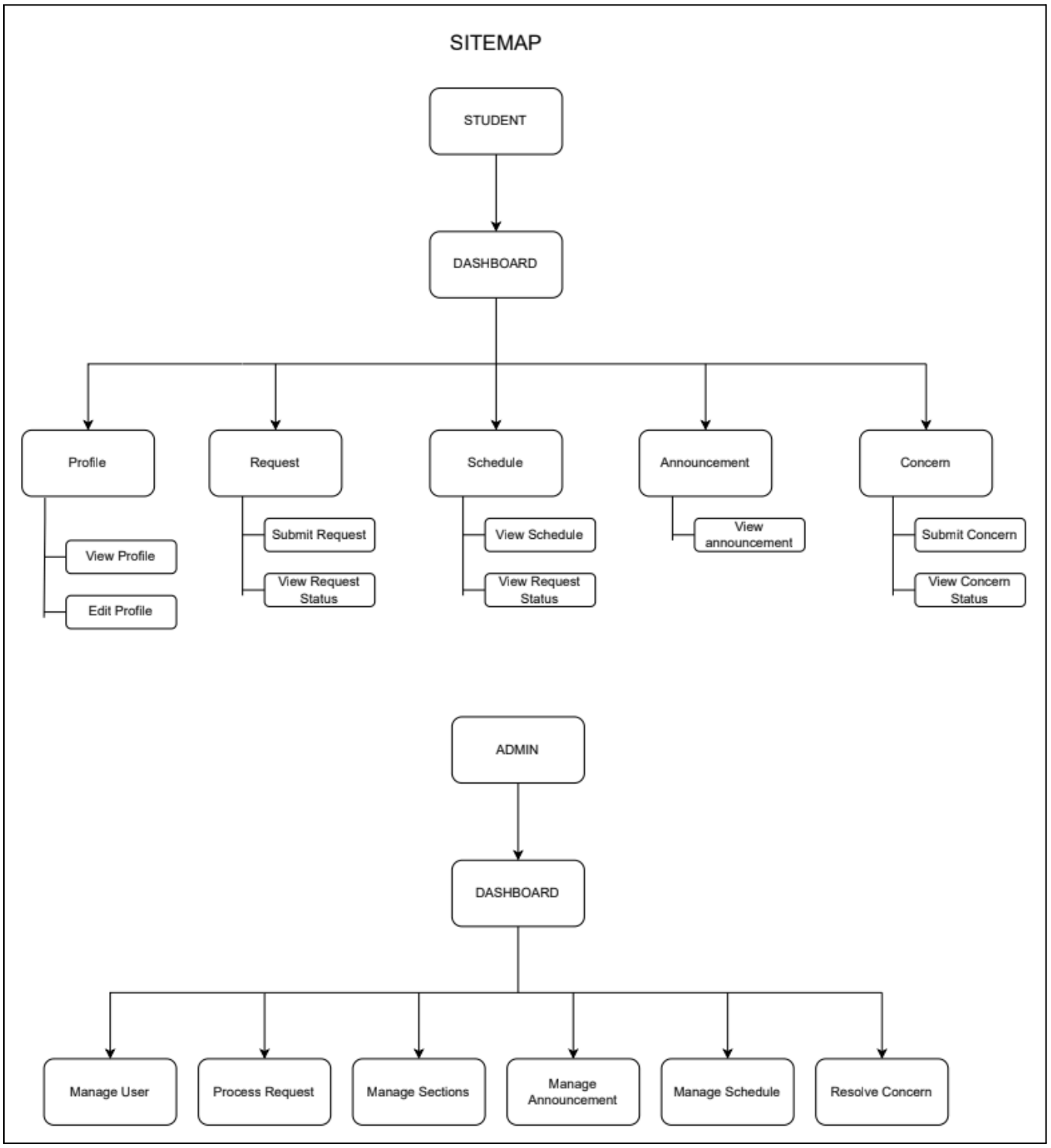

Figure 7. Student Management System (Sitemap)

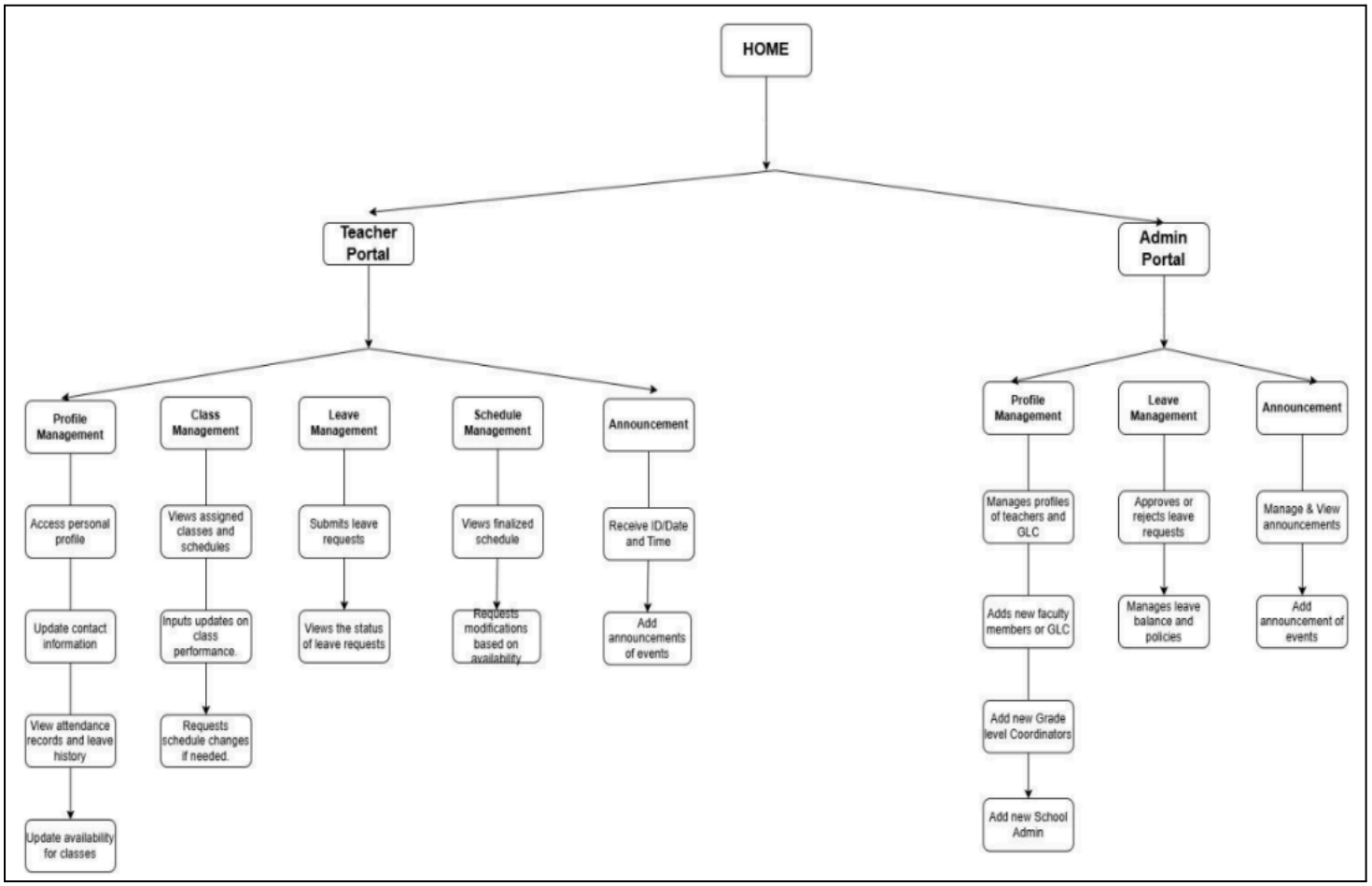

Figure 8. Faculty Management System (Sitemap)

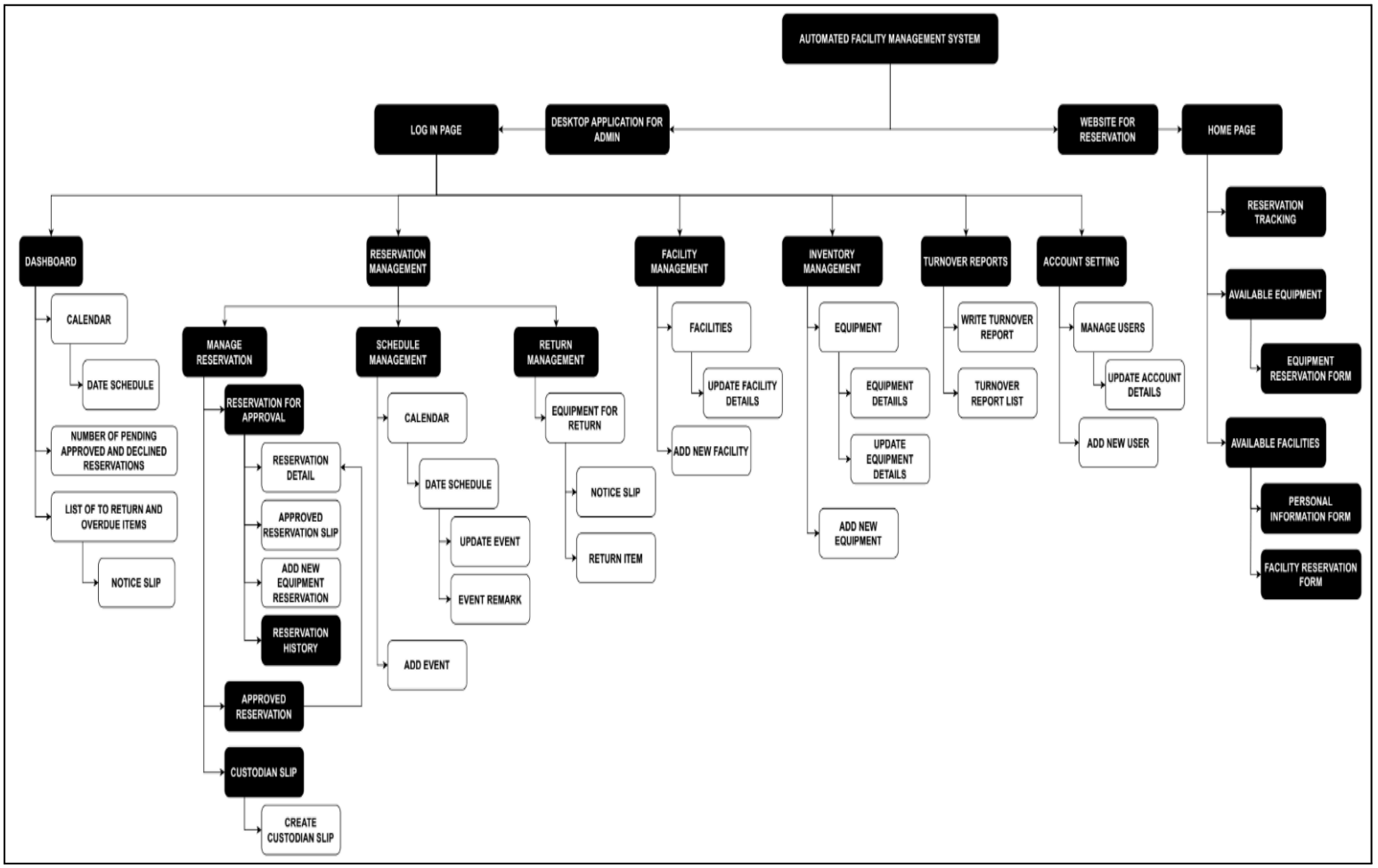

Figure 9. Facility Management System (Sitemap)

Use-Case Diagram

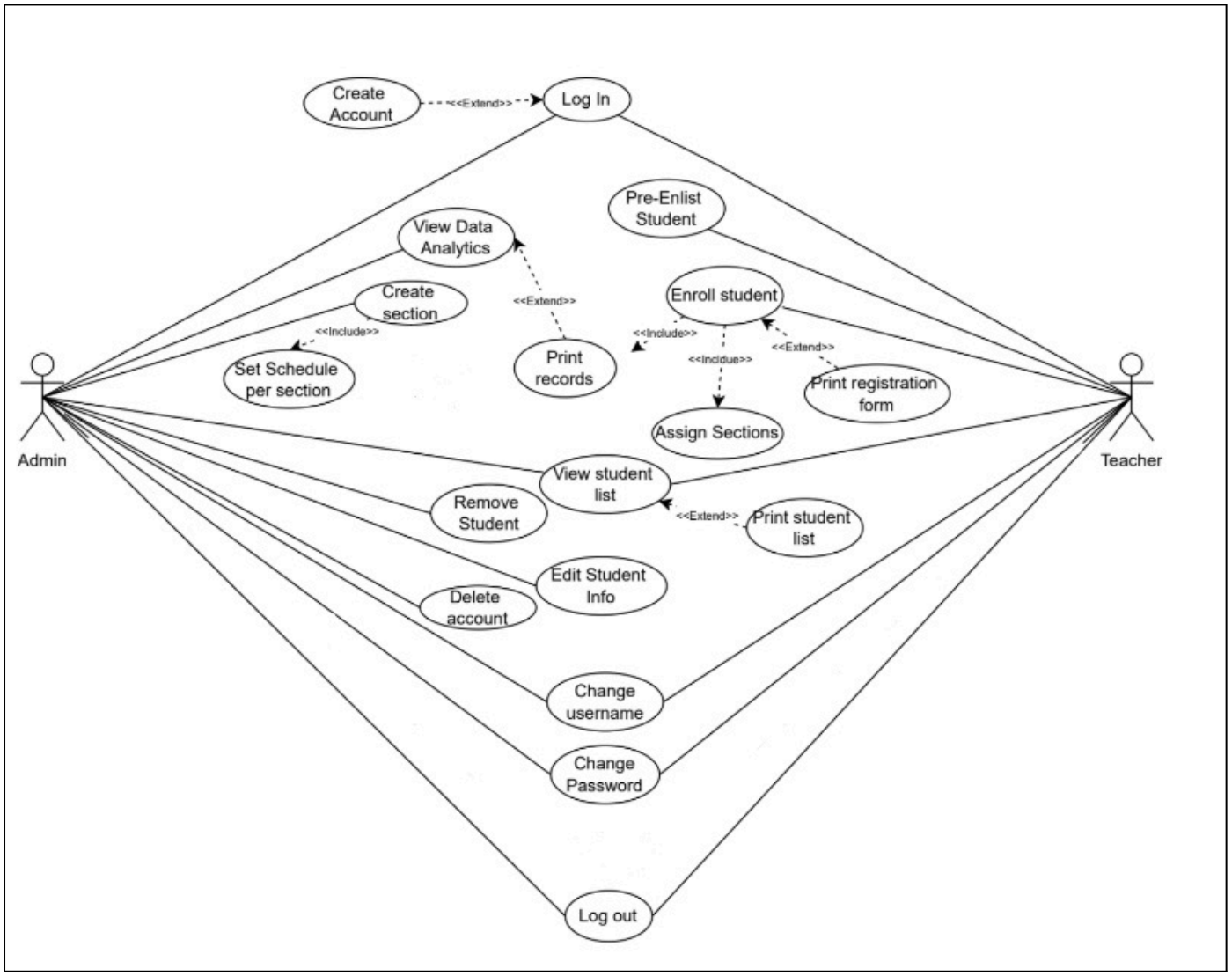

Figure 10. Enrollment Management System (Use-Case Diagram)

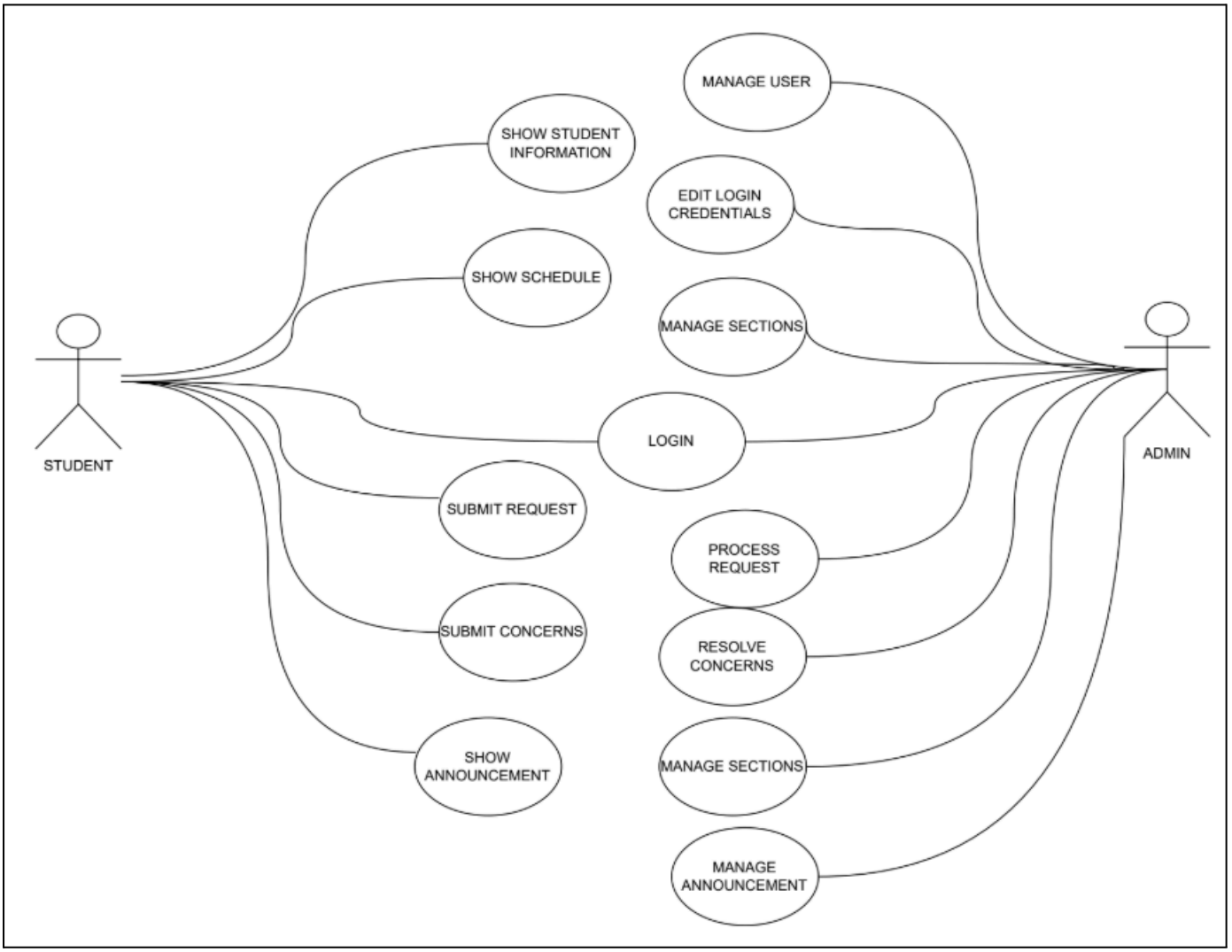

Figure 11. Student Management System (Use-Case Diagram)

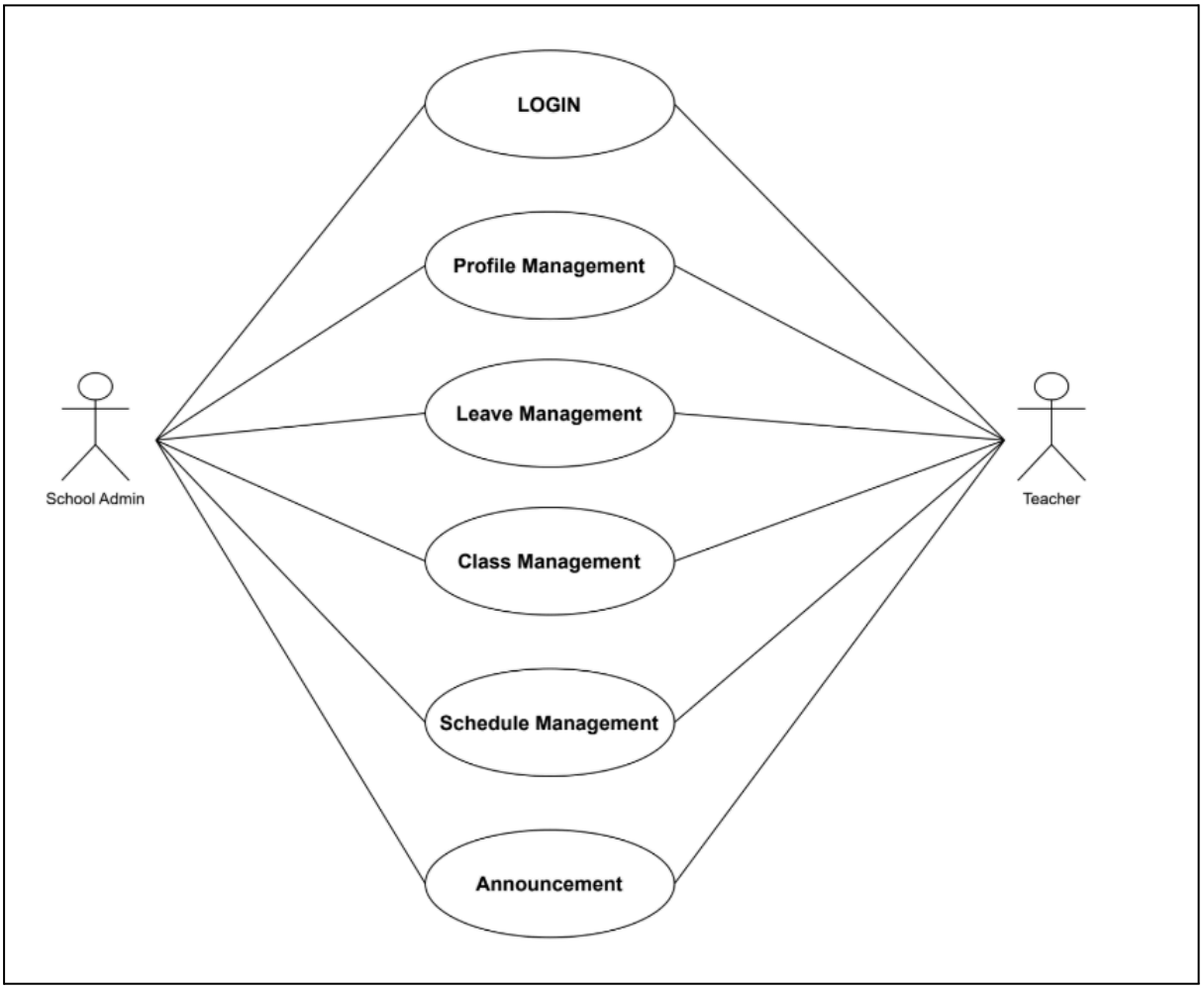

Figure 12. Faculty Management System (Use-Case Diagram)

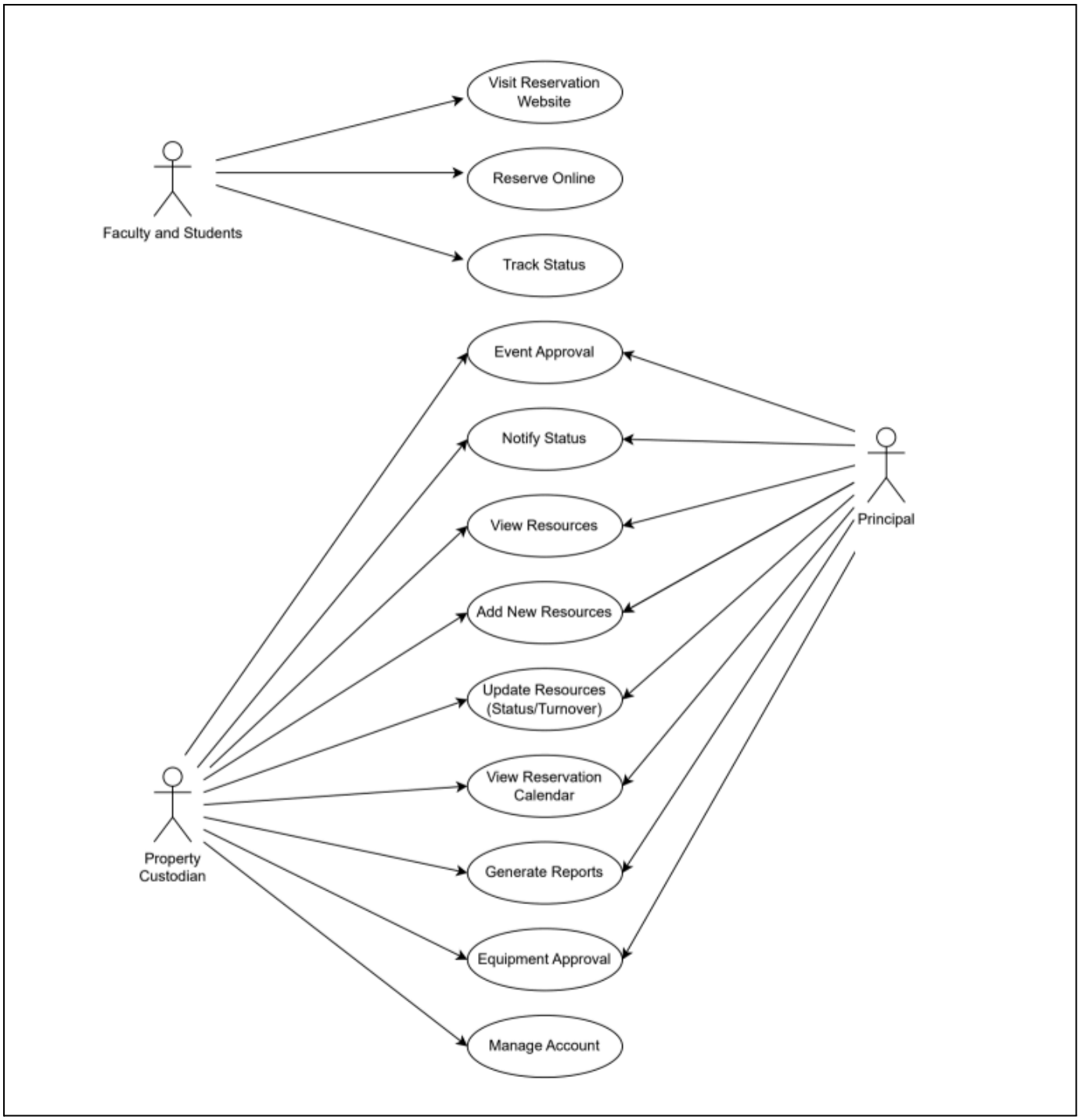

Figure 13. Facility Management System (Use-Case Diagram)

Visual Table of Contents (VTOC)

Automated Facility Management System

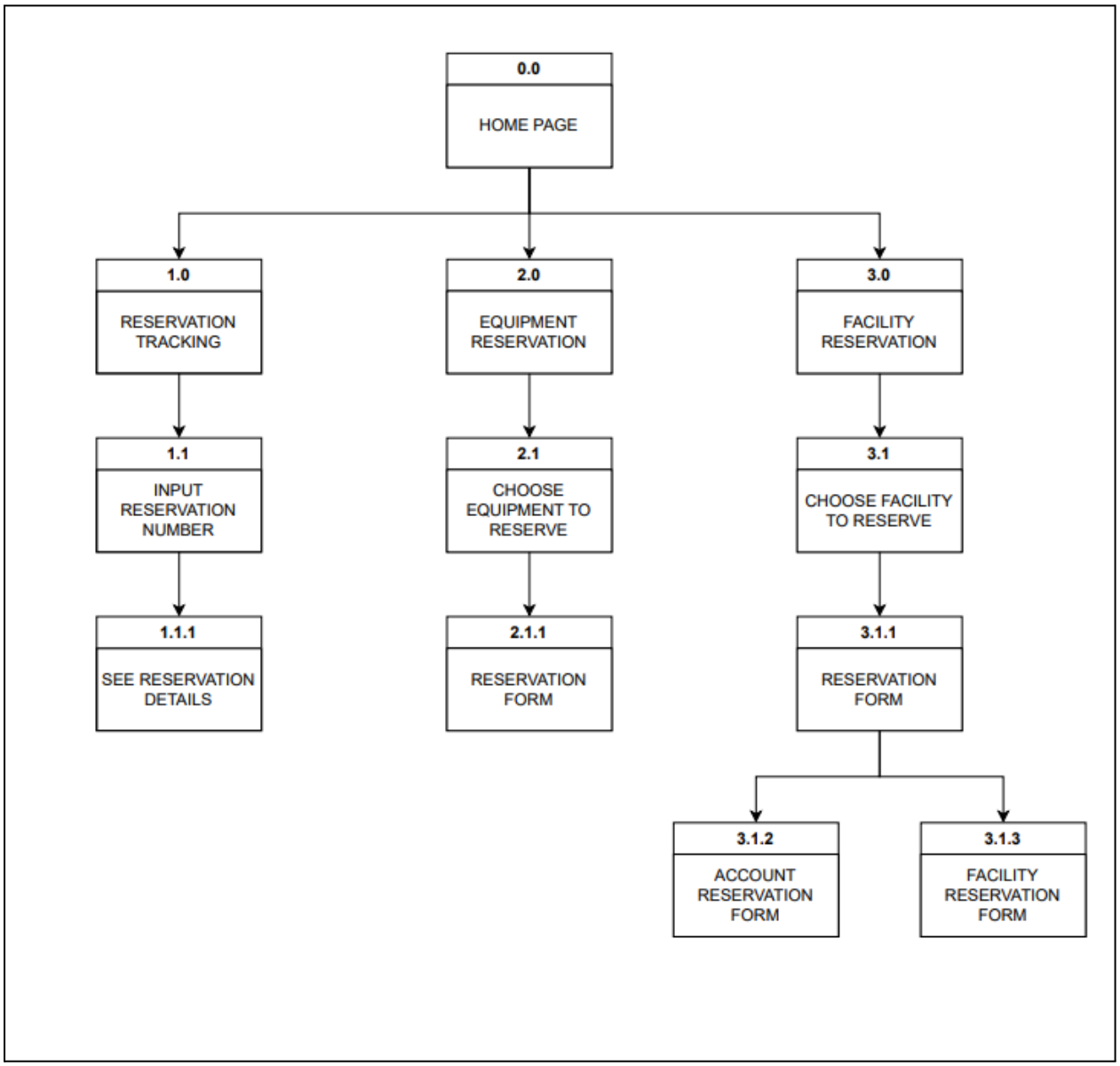

Figure 14. Facility Management System (VTOC)

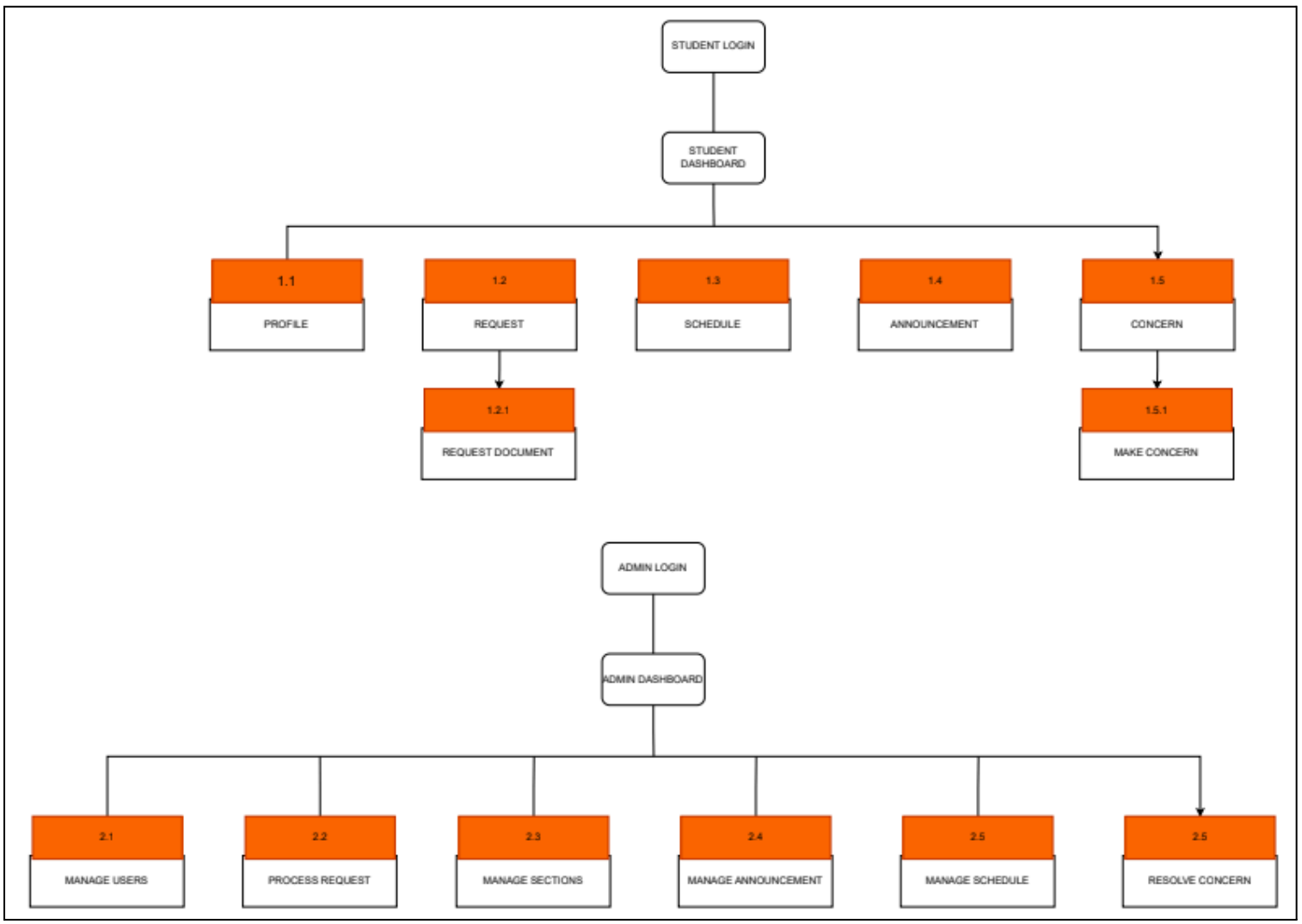

Figure 15. Student Management System (VTOC)

Entity-Relationship Diagram

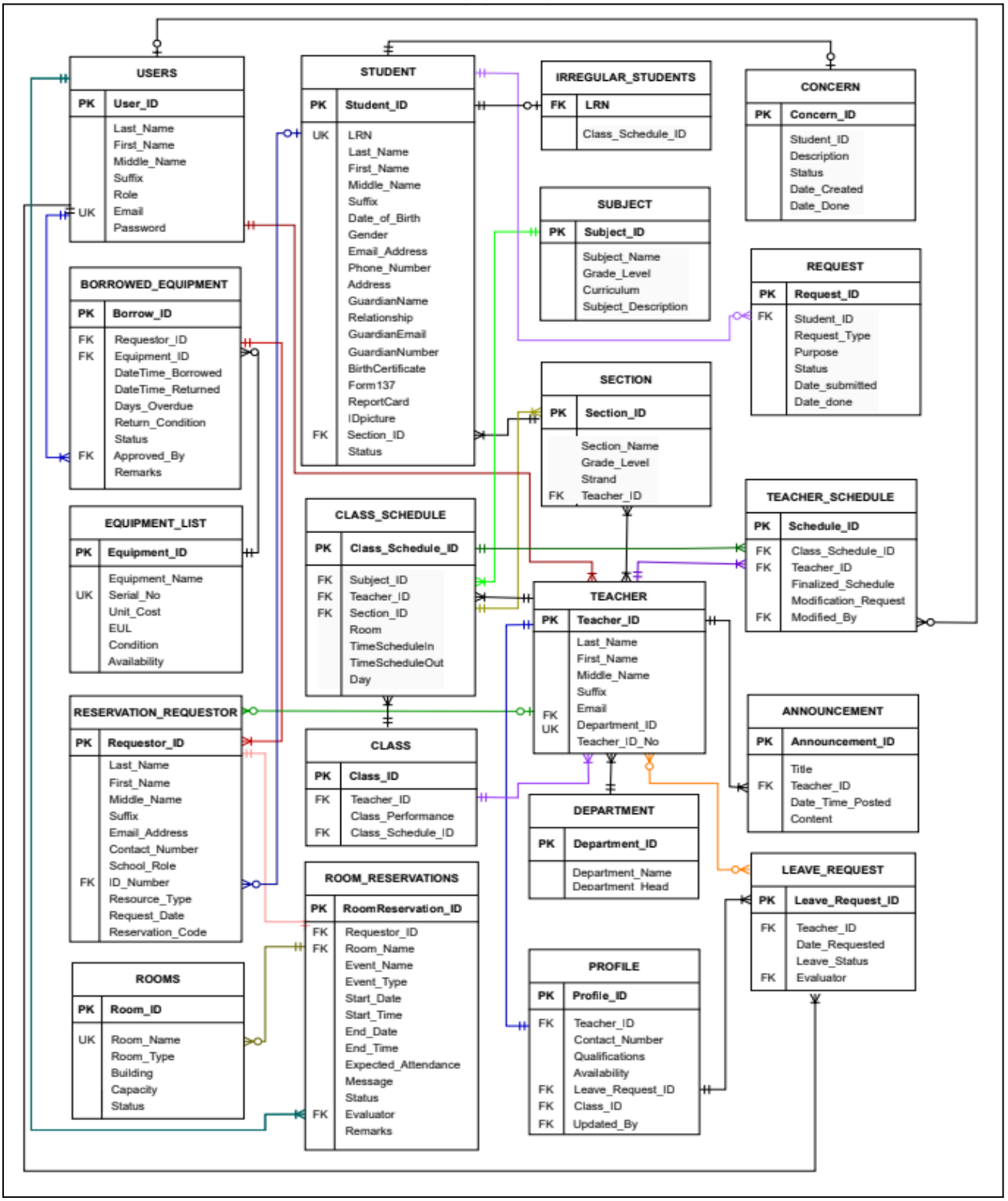

Figure 16. Entity-Relationship Diagram

Data Dictionary

USERS

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
USER_ID	INT	Primary Key	System User ID, unique identifier for each user. Auto-generated, auto-increment.
LAST_NAME	VARCHAR(25)	Not Null	Last name of the system user
FIRST_NAME	VARCHAR(25)	Not Null	First name of the system user
MIDDLE_NAME	VARCHAR(25)	Null	Middle name of the system user, optional
SUFFIX	VARCHAR(10)	Null	Name suffix of the system user, optional
ROLE	VARCHAR(25)	Not Null	Assigned privilege to the system user. Role of the user in the system.
EMAIL	VARCHAR(50)	Unique Key, Not Null	To be used as Username for log in
PASSWORD	VARCHAR(128)	Not Null	Authentication for user log in

Table 1. Users

TEACHER

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
TEACHER_ID	INT	Primary Key	Unique identifier for each teacher
LAST_NAME	VARCHAR(25)	Not Null	Last name of the teacher
FIRST_NAME	VARCHAR(25)	Not Null	Frist name of the teacher
MIDDLE_NAME	VARCHAR(25)	Null	Middle name of the teacher, optional
SUFFIX	VARCHAR(10)	Null	Teacher's name suffix, optional
EMAIL	VARCHAR(50)	Not Null	Teacher's email address
DEPARTMENT	VARCHAR(50)	Not Null	Faculty/department of the teacher
TEACHER_ID_NO	VARCHAR(20)	Unique Key, Not Null	Identification Card Number of the teacher

Table 2. Teacher

PROFILE

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
PROFILE_ID	INT	Primary Key	Unique identifier for each teacher
TEACHER_ID	INT	Foreign Key	Foreign key to table TEACHER, TEACHER_ID
CONTACT_NUMBER	VARCHAR(11)	Not Null	Contact number of the teacher
QUALIFICATIONS	TEXT	Not Null	List of teacher's qualifications
AVAILABILITY	TEXT	Null	Teacher's availability details.
LEAVE_REQUEST_ID	INT	Foreign Key, Null	Foreign key to table LEAVE_REQUEST, LEAVE_REQUEST_ID
CLASS_ID	INT	Foreign Key, Null	Foreign key to table CLASS, CLASS_ID
UPDATED_BY	INT	Foreign Key, Not Null	Foreign key to table USERS, EMAIL. Person who updated the profile.

Table 3. Teacher's Profile

SECTION

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
SECTION_ID	INT	Primary Key	Unique identifier for each section
SECTION_NAME	VARCHAR(50)	Not Null	Name of the section
GRADE_LEVEL	VARCHAR(20)	Not Null	Grade level for the section
STRAND	VARCHAR(100)	Not Null	Section's Academic Strand
TEACHER_ID	INT	Foreign Key, Null	Foreign key to table TEACHER, TEACHER_ID

Table 4. Section

STUDENT

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
STUDENT_ID	INT	Primary Key	Student ID autogenerated, auto-increment
LRN	INT	Unique Key, Not Null	Learner's Reference Number, unique identifier for the student
LAST_NAME	VARCHAR(25)	Not Null	Student's last name
FIRST_NAME	VARCHAR(25)	Not Null	Student's first name
MIDDLE_NAME	VARCHAR(25)	Null	Student's middle name, optional
SUFFIX	VARCHAR(10)	Null	Student's name suffix, optional
DATE_OF_BIRTH	DATE	Not Null	Date of birth of the student
GENDER	VARCHAR(10)	Not Null	Gender assigned at birth of the student
EMAIL_ADDRESS	VARCHAR(50)	Not Null	Student's email address
PHONE_NUMBER	VARCHAR(11)	Not Null	Student's contact number
ADDRESS	VARCHAR(100)	Not Null	Address of the student
GUARDIANNAME	VARCHAR(50)	Not Null	Name of the student's guardian
RELATIONSHIP	VARCHAR(20)	Not Null	Guardian's relationship to the student
GUARDIANEMAIL	VARCHAR(50)	Null	Guardian's email address
GUARDIANNUMBER	VARCHAR(11)	Not Null	Guardians contact number
BIRTHCERTIFICATE	BLOB	Null	Birth certificate of the student
FORM137	BLOB	Null	Form 137 of the student
REPORTCARD	BLOB	Null	Recent report card of the student
IDPICTURE	BLOB	Null	ID picture of the student
SECTION_ID	INT	Foreign Key, Null	Foreign key to table SECTION, SECTION_ID.
STATUS	VARCHAR(20)	Not Null	Enrollment status of the student

Table 5. Student

IRREGULAR_STUDENTS

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
LRN	INT	Foreign Key, Not Null	Foreign key to table STUDENT, LRN
CLASS_SCHEDULE_ID	INT	Foreign Key, Not Null	Foreign key to table CLASS_SCHEDULE, CLASS_SCHEDULE_ID

Table 6. Irregular Students

SUBJECT

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
SUBJECT_ID	INT	Primary Key	Unique identifier for the pre-enlistment process
SUBJECT_NAME	VARCHAR(200)	Not Null	Name of the academic subject
GRADE_LEVEL	VARCHAR(20)	Not Null	Grade level of the academic subject
CURRICULUM	VARCHAR(50)	Not Null	The curriculum to which the subject belongs
SUBJECT_DESCRIPTION	VARCHAR(100)	Not Null	Description of the subject

Table 7. Subject

CLASS

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
CLASS_ID	INT	Primary Key	Unique identifier for each class.
TEACHER_ID	INT	Foreign Key, Not Null	Foreign key to table TEACHER, TEACHER_ID
CLASS_PERFORMANCE	TEXT	Null	Performance metrics of the class
CLASS_SCHEDULE_ID	INT	Foreign Key, Not Null	Foreign key to table CLASS_SCHEDULE, CLASS_SCHEDULE_ID

Table 8. Class

CLASS_SCHEDULE

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
CLASS_SCHEDULE_ID	INT	Primary Key	Unique identifier for each schedule
SUBJECT_ID	INT	Foreign Key, Not Null	Foreign key to table SUBJECT, SUBJECT_ID.
TEACHER_ID	INT	Foreign Key, Not Null	Foreign key to table TEACHER, TEACHER_ID.
SECTION_ID	INT	Foreign Key, Not Null	Foreign key to table SECTION, SECTION_ID.
ROOM	VARCHAR(50)	Not Null	Assigned room for the class
TIMESCHEDULEIN	VARCHAR(50)	Not Null	Time the class is scheduled to start
TIMESCHEDULEOUT	VARCHAR(50)	Not Null	time the class is scheduled to end
DAY	VARCHAR(50)	Not Null	Day/s the class meets during the week

Table 9. Class Schedule

REQUESTS

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
REQUEST_ID	INT	Primary Key	Unique identifier for each request
STUDENT_ID	INT	Foreign Key, Not Null	Foreign key to table STUDENT, STUDENT_ID
REQUEST_TYPE	VARCHAR(50)	Not Null	The type of request of the student (e.g., certificate, transcript)
PURPOSE	VARCHAR(100)	Not Null	The purpose of the request
STATUS	VARCHAR(20)	Not Null	The status of the request (e.g., pending, approved, rejected)
DATE_SUBMITTED	DATE	Not Null	Date the request was submitted
DATE_DONE	DATE	Null	Date the request was processed

Table 10. Request

CONCERN

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
CONCERN_ID	INT	Primary Key	Unique identifier for each concern
STUDENT_ID	INT	Foreign Key, Not Null	Foreign key to table STUDENT, STUDENT_ID
DESCRIPTION	TEXT	Not Null	Description of the concern
STATUS	VARCHAR(20)	Not Null	The status of the concern (e.g., open, closed)
DATE_CREATED	DATE	Not Null	Date the concern was created
DATE_CLOSED	DATE	Null	Date the concern was closed

Table 11. Concern

TEACHER_SCHEDULE

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
SCHEDULE_ID	INT	Primary Key	Unique identifier for the teacher's schedule.
CLASS_SCHEDULE_ID	INT	Foreign Key, Not Null	Foreign key to table CLASS_SCHEDULE, CLASS_SCHEDULE_ID.
TEACHER_ID	INT	Foreign Key, Not Null	Foreign key to table TEACHER, TEACHER_ID.
FINALIZED_SCHEDULE	TEXT	Null	Details of the finalized schedule
MODIFICATION_REQUEST	TEXT	Null	Details of the modification request
MODIFIED_BY	VARCHAR(50)	Foreign Key, Not Null	Person who modified the schedule. Foreign key to table USERS, EMAIL.

Table 12. Teacher Schedule

DEPARTMENT

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
DEPARTMENT_ID	INT	Primary Key	Unique identifier for department.
DEPARTMENT_NAME	VARCHAR(50)	Not Null	Name of the department
DEPARTMENT_HEAD	VARCHAR(50)	Not Null	Name of the department head

Table 13. Department

LEAVE_REQUEST

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
LEAVE_REQUEST_ID	INT	Primary Key	Unique identifier for leave request.
TEACHER_ID	INT	Foreign Key, Not Null	Foreign key to table TEACHER, TEACHER_ID.
DATE_REQUESTED	DATE	Not Null	Date the leave was requested.
LEAVE_STATUS	VARCHAR(50)	Not Null	Status of the leave request (Pending/Approved/Rejected).
EVALUATOR	INT	Foreign Key, Not Null	Foreign key to table USERS, EMAIL. The one who updated the status of the leave request

Table 14. Leave Request

ROOM_RESERVATIONS

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
ROOMRESERVATION_ID	INT	Primary Key	Room reservation ID, autogenerated, auto-increment
REQUESTOR_ID	INT	Foreign Key, Not Null	Foreign key to table RESERVATION_REQUESTOR, REQUESTORID
ROOM_NAME	VARCHAR((50)	Foreign Key, Not Null	Foreign key to table ROOMS, ROOM_NAME
EVENT_NAME	VARCHAR(100)	Not Null	School event or activity that will need a room or venue.
EVENT_TYPE	VARCHAR(50)	Not Null	Type of event that such as examination, school program, classroom lecture
START_DATE	DATE	Not Null	Scheduled start date of the event or activity
START_TIME	TIME	Not Null	Scheduled start time of the event or activity
END_DATE	DATE	Not Null	Scheduled end date of the event or activity
END_TIME	TIME	Not Null	Scheduled end time of the event or activity
EXPECTED_ATTENDANCE	INT	Not Null	The expected number of participants in the event
MESSAGE	VARCHAR(200)	Not Null	Additional notes/message from the requestor
STATUS	VARCHAR(20)	Not Null	Status of the request, if it's approved or declined
EVALUATOR	VARCHAR(50)	Foreign Key, Not Null	Foreign key to table USERS, EMAIL. The one who approved or declined the request
REMARKS	VARCHAR(50)	Null	Remarks of the username in-charge of the reserved room, optional

Table 15. Room Reservations

ROOMS

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
ROOM_ID	INT	Primary Key	School room or venue ID, autogenerated, auto-increment
ROOM_NAME	VARCHAR((50)	Unique Key, Not Null	School's room name and number
ROOM_TYPE	VARCHAR((30)	Not Null	The type of room or venue of the room name. Can be classroom, computer laboratory, AVR, covered court, etc.
BUILDING	VARCHAR((50)	Not Null	Building where the room name is located
CAPACITY	INT	Not Null	Number of people can the room accommodate
STATUS	VARCHAR(20)	Not Null	Status of the room if it's available or not

Table 16. Rooms

EQUIPMENT_LIST

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
EQUIPMENT_ID	INT	Primary Key	Equipment ID, autogenerated, auto-increment
EQUIPMENT_NAME	VARCHAR(50)	Not Null	Name of the School Equipment
SERIAL_NO	VARCHAR(20)	Unique Key, Not Null	Serial Number of the School Equipment
UNIT_COST	DECIMAL(9,2)	Not Null	Cost of each equipment
EUL	VARCHAR(20)	Not Null	Estimated Useful Life or the period which the equipment is expected to be usable for its intended purpose.
CONDITION	VARCHAR(50)	Not Null	Condition of the School Equipment, can be functional, functional with scratches/dents, not functional but repairable, not functional cannot be repaired, or lost/missing
AVAILABILITY	VARCHAR(20)	Not Null	Availability of school equipment for borrowing

Table 17. Equipment List

BORROWED_EQUIPMENT

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
BORROW_ID	INT	Primary Key	Borrow ID of school equipment, autogenerated, auto-increment
REQUESTOR_ID	INT	Foreign Key, Not Null	Foreign key to table RESERVATION_REQUESTOR, REQUESTORID
EQUIPMENT_ID	INT	Foreign Key, Not Null	Foreign key to table EQUIPMENT_LIST, EQUIPMENTID
DATETIME_BORROWED	DATETIME	Null	Date and time on which the equipment was borrowed.
DATETIME_RETURNED	DATETIME	Null	Date and time on which the equipment was returned.
DAYS_OVERDUE	INT	Null	Number of days that have passed since the supposed return of the equipment
RETURN_CONDITION	VARCHAR(50)	Null	Physical condition of the borrowed School Equipment upon returning to the property custodian or the person in-charge. Can be functional, functional with scratches/dents, not functional but repairable, not functional cannot be repaired, or lost/missing
STATUS	VARCHAR(20)	Not Null	Status of the request, if it's approved or declined
APPROVED_BY	VARCHAR(50)	Foreign Key, Not Null	Foreign key to table USERS, EMAIL. The one who approved or declined the request.
REMARKS	VARCHAR(50)	Null	Remarks of the approver on the returned school equipment, optional

Figure 18. Borrowed Equipment

RESERVATION_REQUESTOR

FIELD NAME	TYPE & LENGTH	CONSTRAINT	DESCRIPTION
REQUESTOR_ID	INT(5)	Primary Key	Reservation requestor ID, autogenerated, auto-increment
LAST_NAME	VARCHAR(25)	Not Null	Requestor's last name
FIRST_NAME	VARCHAR(25)	Not Null	Requestor's first name
MIDDLE_NAME	VARCHAR(25)	Null	Requestor's middle name, optional
SUFFIX	VARCHAR(10)	Null	Requestor's name suffix, optional
EMAIL_ADDRESS	VARCHAR(50)	Not Null	Requestor's email address
CONTACT_NUMBER	VARCHAR(11)	Not Null	Requestor's contact number
SCHOOL_ROLE	VARCHAR(25)	Not Null	Requestor's role in school, must be a Student or Teacher.
ID_NUMBER	VARCHAR(20)	Foreign Key, Not Null	Teacher ID number or LRN for students. Foreign key to table TEACHER, TEACHER_ID_NO; Foreign Key to table STUDENT, LRN.
RESOURCE_TYPE	VARCHAR(25)	Not Null	Type of school resources to reserve/borrow, can be Equipment or Room/Venue
REQUEST_DATE	DATETIME	Not Null	Date and time on which the reservation request form was submitted
RESERVATION_CODE	NVARCHAR(20)	Not Null	Autogenerated upon submission of reservation request form. To be used by the reservation requestor to track request status.

Figure 19. Reservation Requestor

System and Program Flowchart

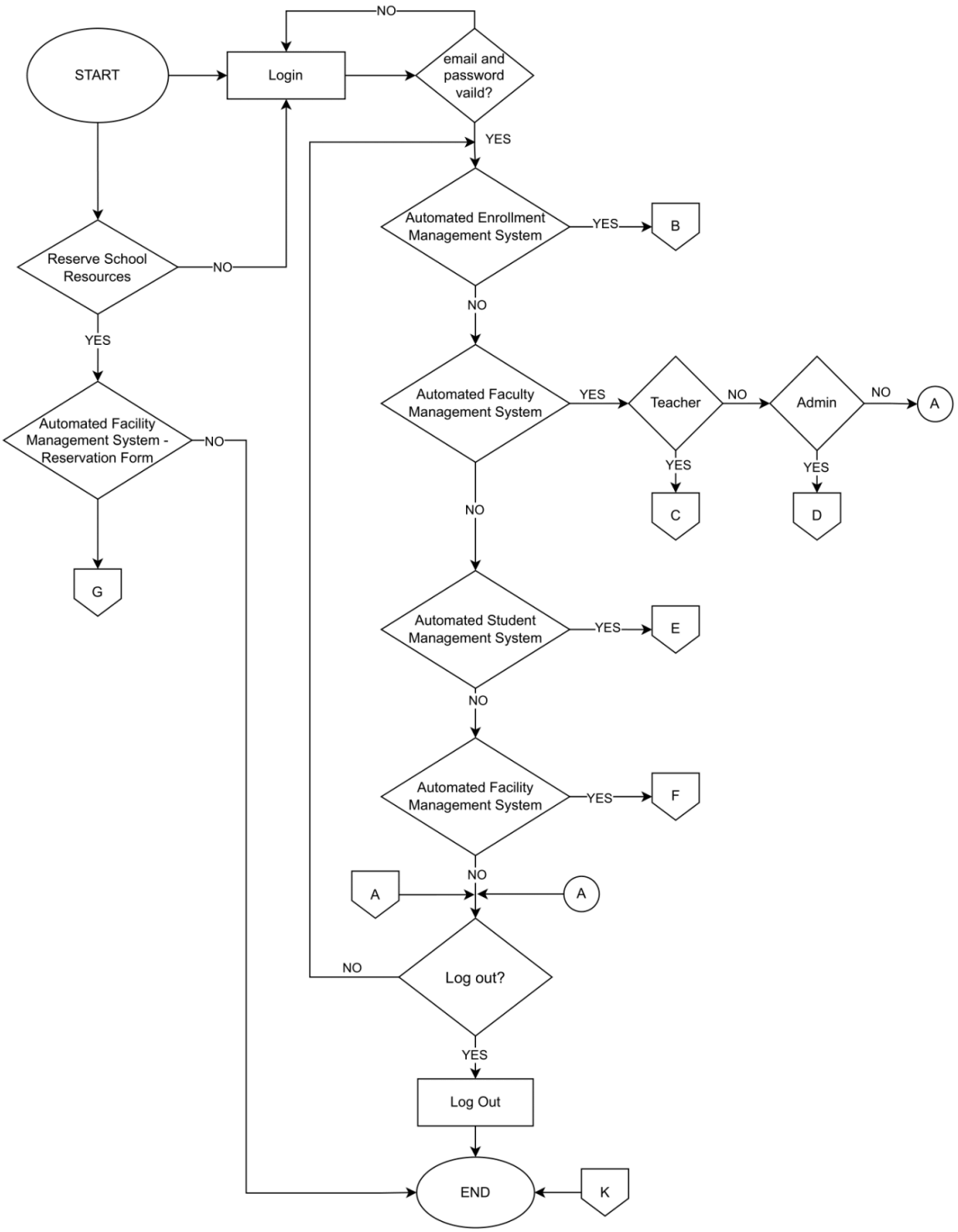

Figure 17. System and Program Flowchart

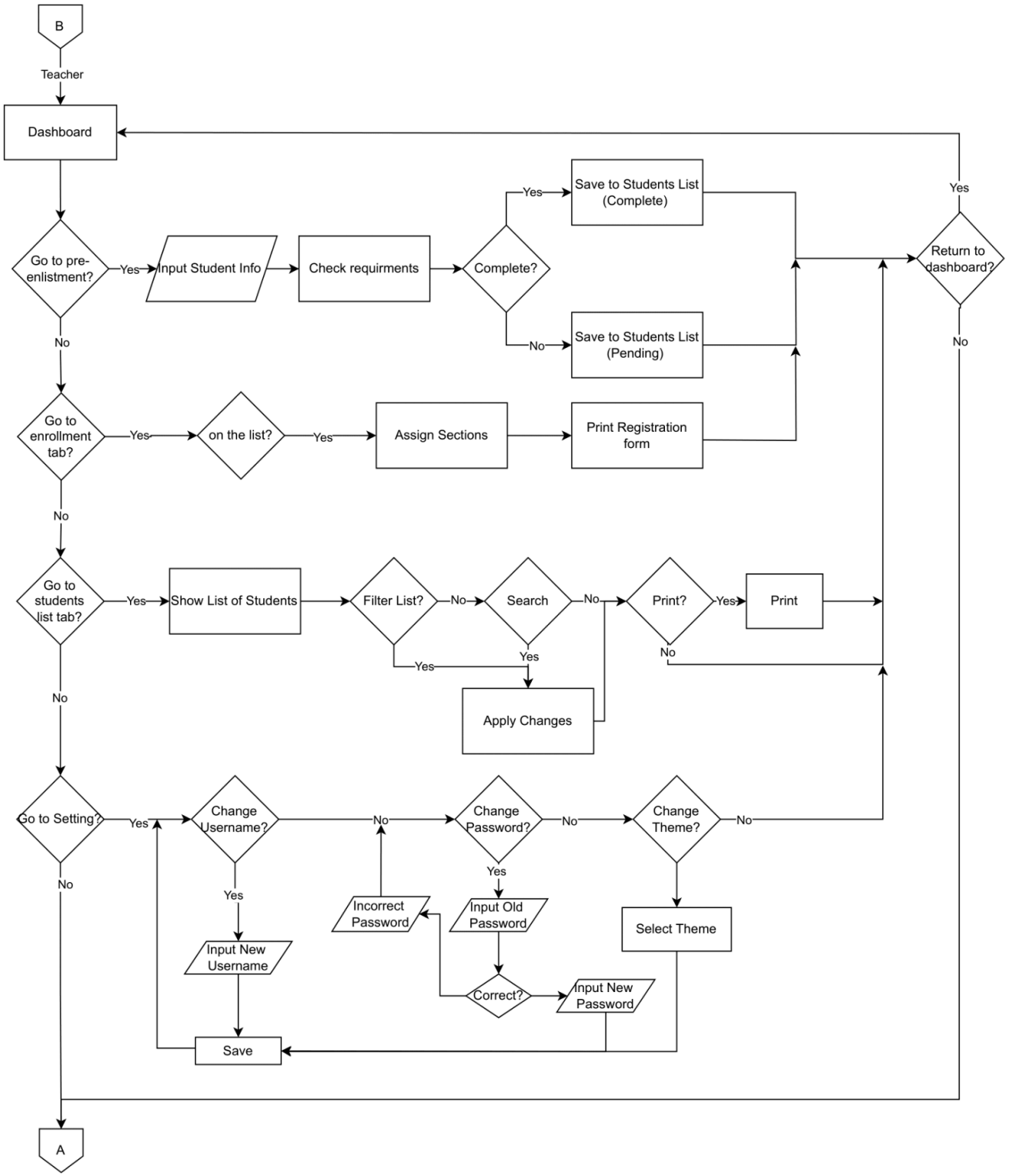

Figure 18. System and Program Flowchart

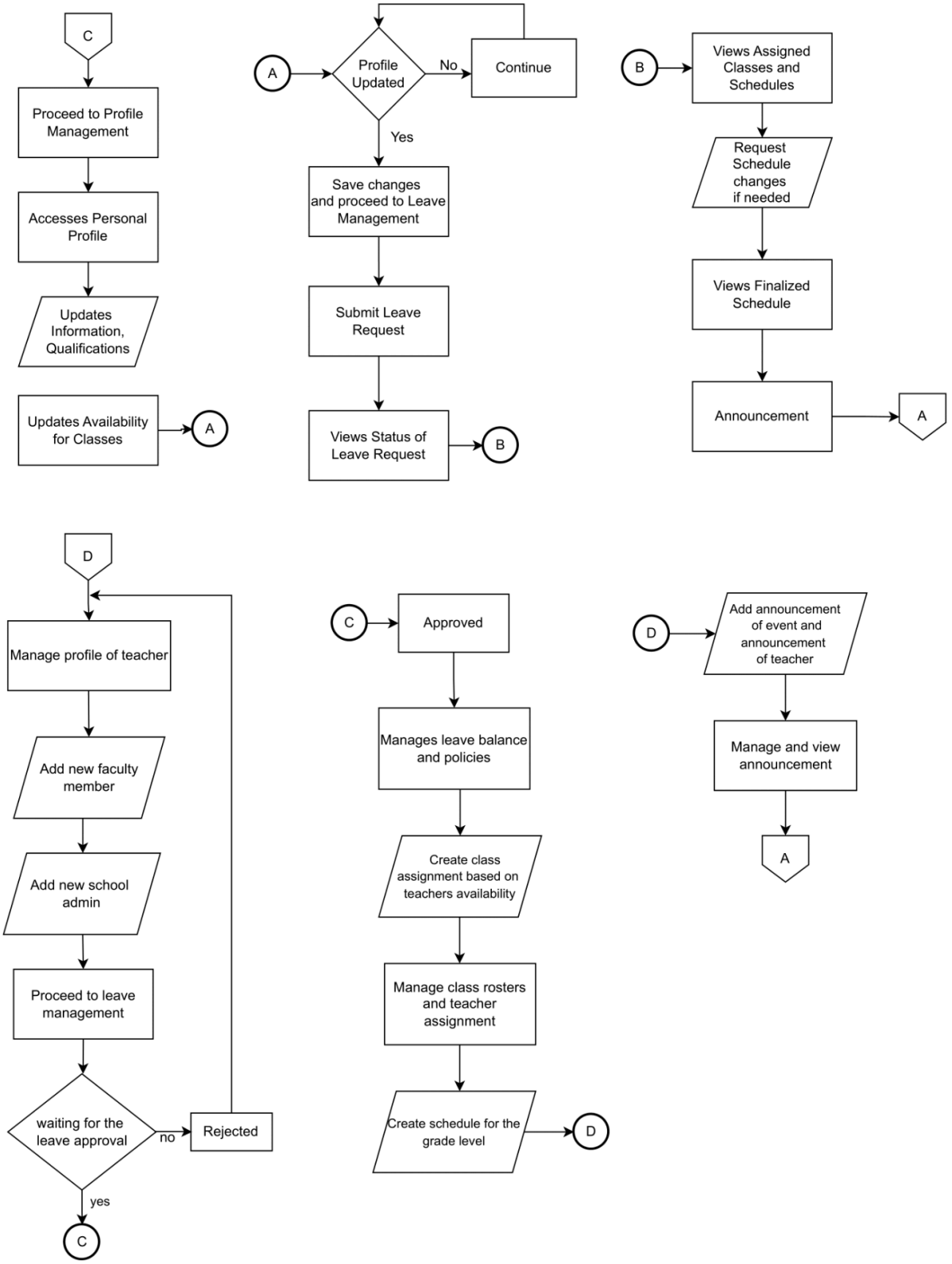

Figure 19. System and Program Flowchart

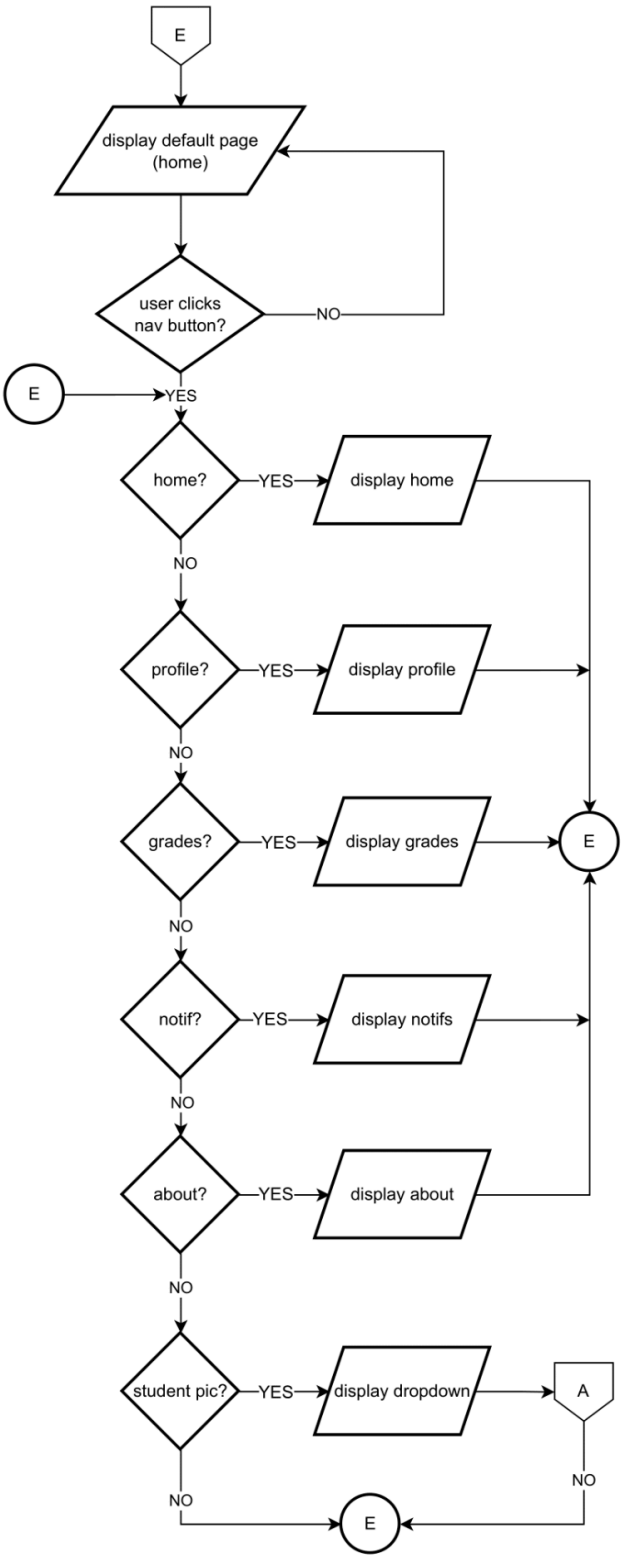

Figure 20. System and Program Flowchart

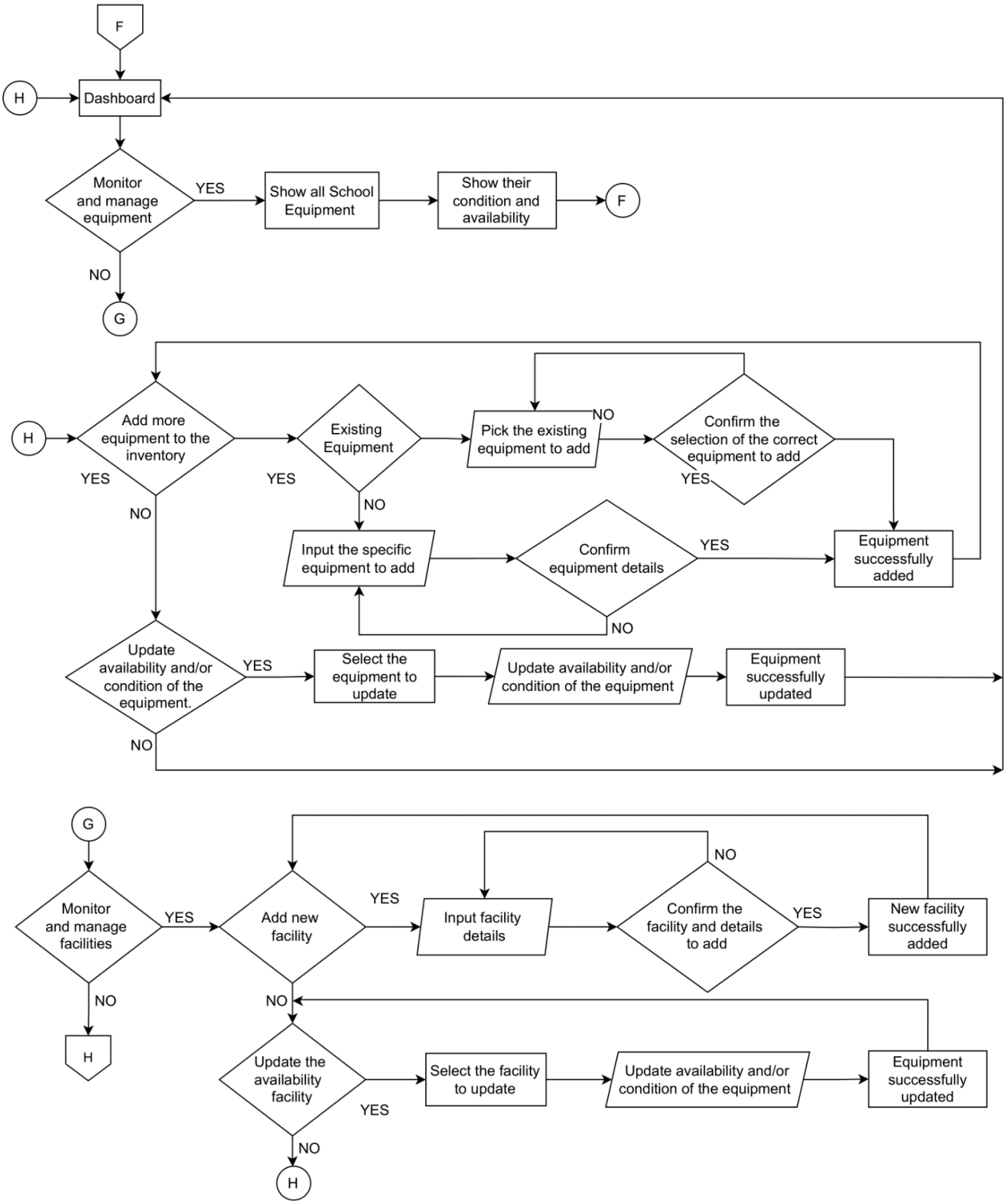

Figure 21. System and Program Flowchart

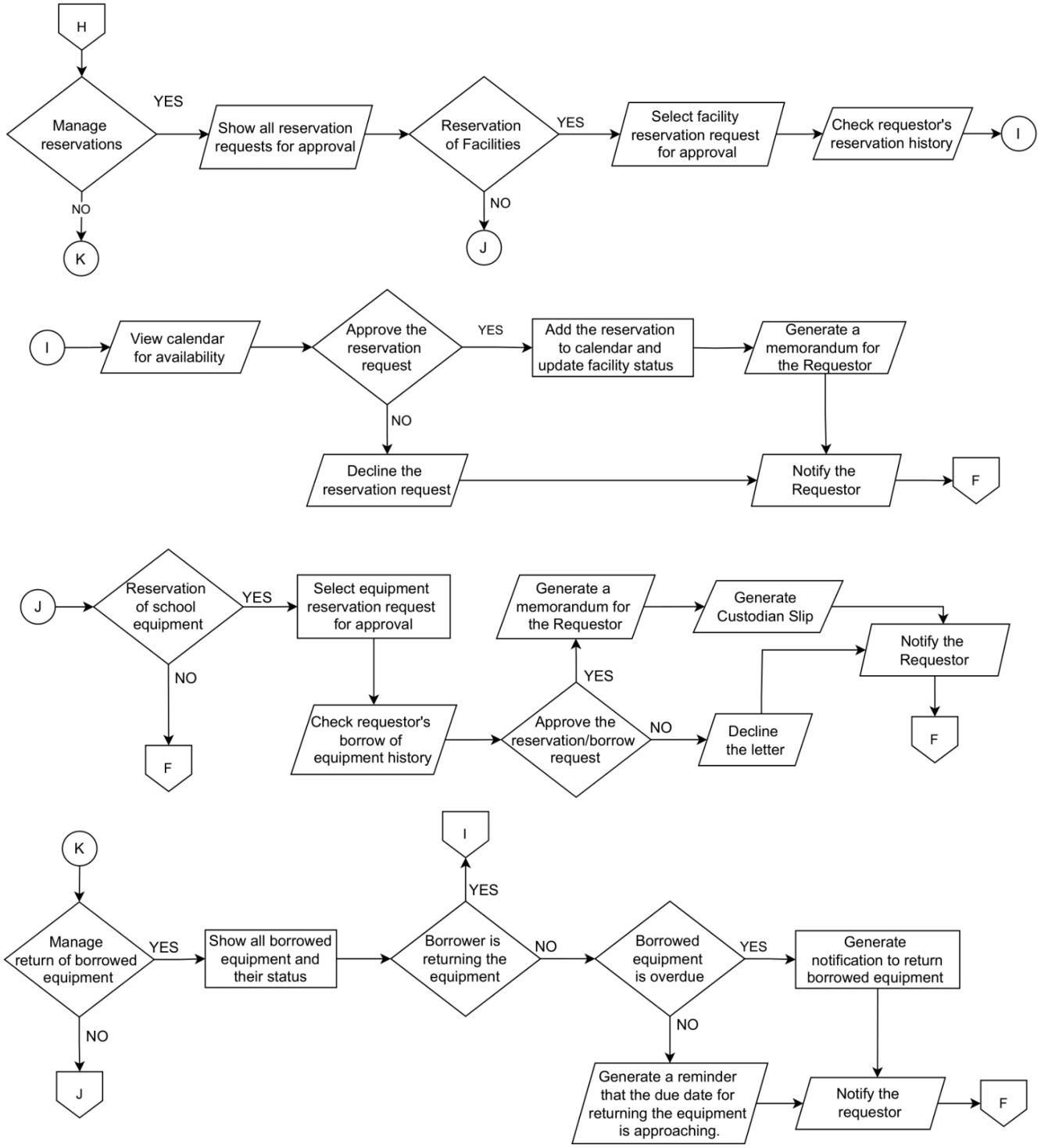

Figure 22. System and Program Flowchart

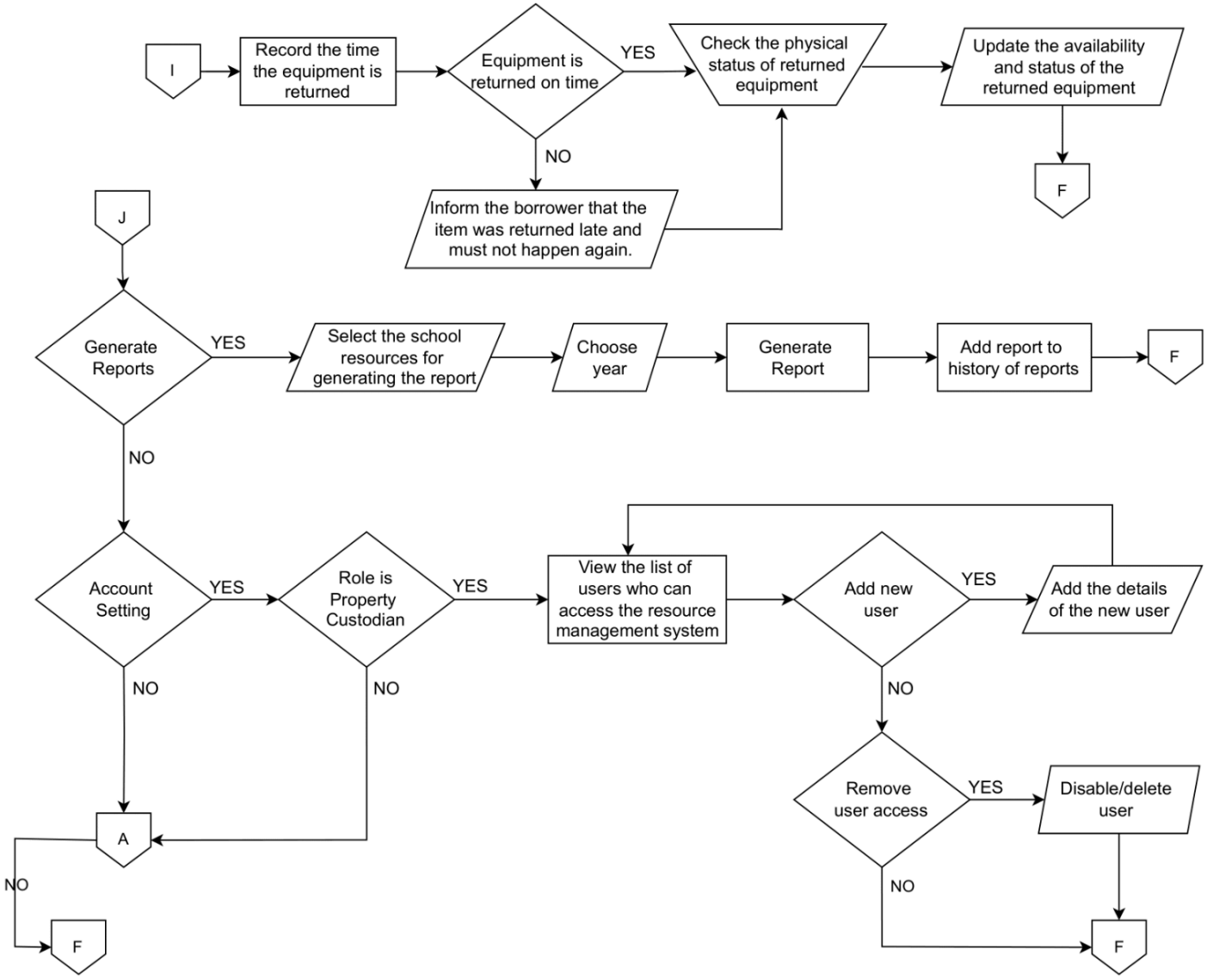

Figure 23. System and Program Flowchart

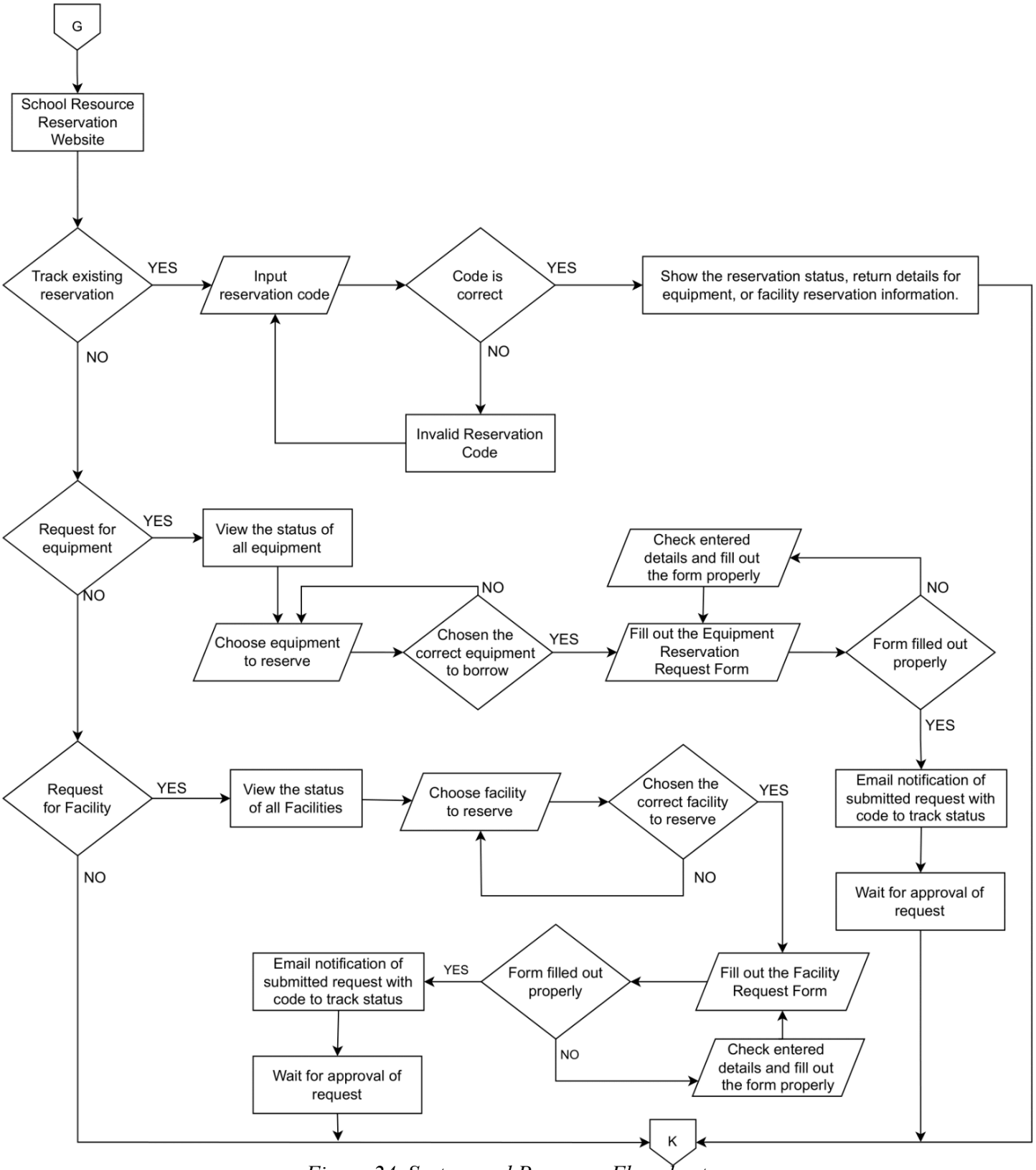

Figure 24. System and Program Flowchart

Network Layout

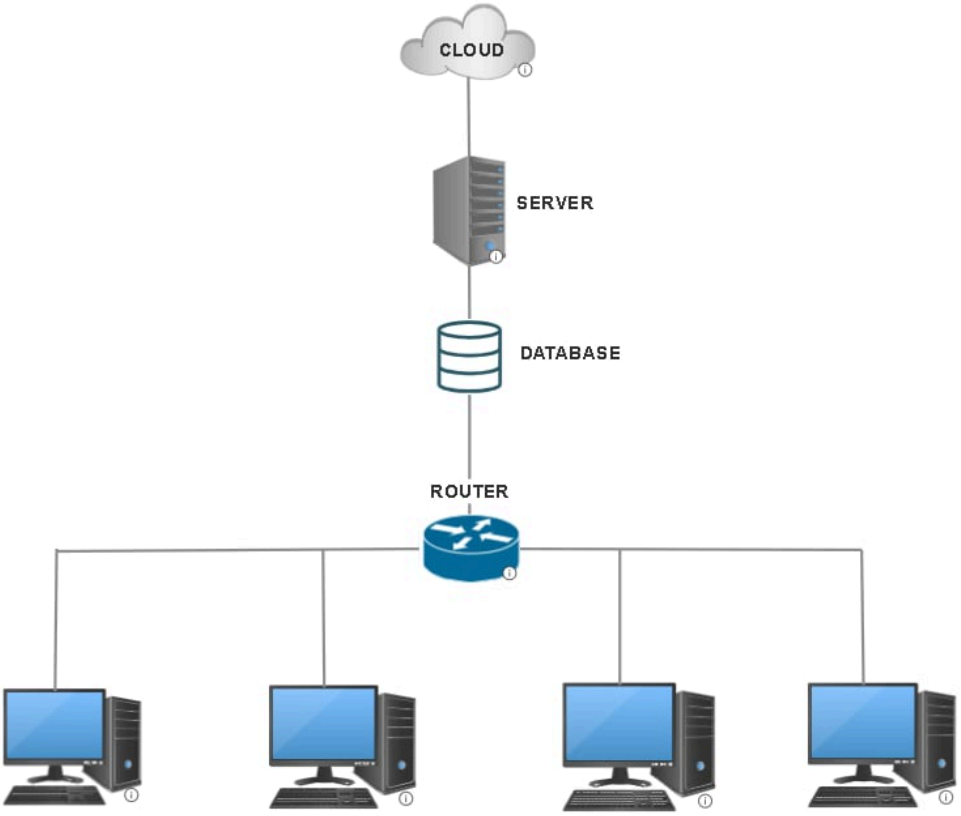

Figure 25. Network Layout

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