

**DESIGN AND IMPLEMENTATION OF A WEB-BASED FACULTY COMPLAINT
MANAGEMENT SYSTEM FOR THE FACULTY OF COMPUTING**

BY

ALLASSEH PEACE EHIGATOR

PSC2105304



DEPARTMENT OF COMPUTER SCIENCE

FACULTY OF PHYSICAL SCIENCES

UNIVERSITY OF BENIN

NOVEMBER, 2025.

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**A PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF COMPUTER
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**IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF A
BACHELOR OF SCIENCE (B.Sc.) DEGREE IN COMPUTER SCIENCE**

NOVEMBER, 2025

CERTIFICATION

This is to certify that this project work was carried out by ALLASSEH PEACE EHIGIATOR with Matriculation Number PSC2105304 under my supervision. It is adequate and satisfactory, both in scope and content, for the award of Bachelor of Science (B.Sc.) Degree in Computer Science of the University of Benin

Dr. (Mrs.) G. O Aziken
(Project Supervisor)

Date

APPROVAL

This project work is hereby approved in partial fulfillment of the requirements for the award of Bachelor of Science (B.Sc.) Degree in Computer Science from the University of Benin.

DR. ROSEMARY USIOBAIFO, PHD
(Head of Department)

Date

DEDICATION

This work is dedicated to God Almighty, whose guidance, wisdom, and strength have been my foundation.

To my loving parents, Mr. and Mrs. Ehigiator for their endless support, sacrifices, and encouragement, your belief in me has been my greatest motivation.

I also express my deepest gratitude to my mentors and educators, for their invaluable guidance and wisdom throughout my studies, and to the incredible friends I have made along this journey, whose kindness, support, and shared experiences have made this path even more meaningful.

This is for all of you.

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ABSTRACT

The management of student complaints in many tertiary institutions relies on fragmented, manual processes that lead to inefficiencies, delayed resolutions, and a lack of transparency and accountability for course representatives and faculty administration. This project addresses this systemic challenge by designing and implementing a web-based Faculty Complaint Management System. The system provides a centralized platform featuring three distinct user roles (Administrator, Lecturer, Course Representative) and utilizes PHP, MySQL, and Bootstrap for development. Its core functionality includes secure, role-based access control, an intuitive interface for course representative complaint submission and real-time status tracking, and robust administrative tools for user management and automated complaint routing based on lecturer assignments.

The methodology involved a systematic approach from requirements analysis and UML-based design to implementation with best practices for data integrity and security, including password hashing and protection against common web vulnerabilities. Rigorous testing across multiple levels including unit, integration, system, and user acceptance testing validated the system's functional reliability and usability. The completed system successfully replaces the manual process, providing transparency, accountability, and efficiency through centralized tracking, activity logging, and statistical reporting capabilities. The solution contributes a validated, context-specific application of open-source technology to enhance administrative service delivery in higher education.

Keywords: Complaint Management System, Web Application, Course Representatives, Higher Education Administration, PHP, MySQL, Role-Based Access Control

CHAPTER ONE

INTRODUCTION

1.0 BACKGROUND TO THE STUDY

Information and communication technology has transformed how institutions manage their operations and interact with stakeholders. In the educational sector, particularly in tertiary institutions, effective communication between students and faculty members is crucial for maintaining academic excellence and addressing challenges that may hinder the learning process (Laudon & Laudon, 2020). However, traditional approaches to handling complaints and grievances in universities have proven to be inadequate, inefficient, and often frustrating for all parties involved, with manual processes creating significant challenges in documentation, accountability, and timely resolution (Uwah & Etim, 2024).

The Technology Acceptance Model provides a robust framework for understanding how users adopt and utilize new technologies in educational settings (Granić & Marangunić, 2019). This framework is particularly relevant as it demonstrates that successful implementation depends on users perceiving both the usefulness of the system and its ease of use. In African higher education contexts, research emphasizes that information communication technology solutions in sub-Saharan African universities must address infrastructure limitations while improving administrative efficiency (Mtebe, 2015). Contemporary studies demonstrate that web-based complaint systems can overcome the challenges posed by manual processes when appropriately designed for institutional contexts (Uwah & Etim, 2024). Recent African implementations validate that digital complaint systems achieve higher adoption rates when designed with local contexts and stakeholder needs in mind (Simelane-Mnisi et al., 2025).

In Nigerian universities, the typical organizational structure places course representatives as the intermediary between students and the administration. These elected students serve as the

voice of their classmates, responsible for channeling concerns, complaints, and suggestions to appropriate authorities, particularly lecturers and heads of departments. Each academic level (100 Level to 400 Level) in every department has a designated course representative, creating a network of student leaders who play a vital role in maintaining smooth academic operations.

Traditionally, when students encounter problems ranging from inadequate lecture materials, poor classroom facilities, unclear grading systems, to more serious academic grievances, they report these issues to their course representatives. The course representative is then expected to compile these complaints and present them to the relevant lecturer or the Head of Department through physical meetings, written letters, emails, or informal communication channels such as WhatsApp groups and phone calls. This manual process, while seemingly straightforward, is fraught with numerous challenges that undermine its effectiveness. Course representatives often struggle to keep track of multiple complaints from their classmates, especially when dealing with issues affecting different courses or requiring responses from different lecturers. Physical documentation can be lost, emails may be overlooked or buried in crowded inboxes, and verbal communications during corridor encounters are easily forgotten.

From the lecturers' perspective, receiving complaints through fragmented channels makes it difficult to prioritize issues, track which complaints have been addressed, and maintain records of resolutions for future reference. Ineffective mechanisms for capturing and responding to student concerns often result in service failures within higher education systems (Msosa, 2021). The Head of Department, who typically oversees the complaint resolution process, faces an even greater challenge. In a typical faculty structure with multiple departments, each having four levels of students with their respective course representatives, the volume of complaints can be overwhelming. Furthermore, the absence of a centralized system creates accountability gaps. When a complaint is submitted but receives

no response, it becomes difficult to determine whether the issue was received, who was responsible for addressing it, and at what stage the resolution process stalled.

Complaint management serves as a critical feedback mechanism that enables administrators to identify and address systemic issues affecting the quality of education delivery. However, many African universities still rely on outdated manual processes that fail to provide the transparency and efficiency required in the digital age. The implementation of web-based management systems has been shown to significantly improve service delivery in various organizational contexts, including educational institutions. Additionally, integrated web-based complaint systems consolidate feedback from multiple channels, enabling institutions to analyze patterns and address root causes systematically (Oghenekaro et al., 2023). Research demonstrates that adoption of such systems in African institutional settings is facilitated when implementation strategies account for local infrastructure conditions and user preferences (Gamede et al., 2021).

The need for a systematic, transparent, and efficient complaint management system in tertiary institutions cannot be overstated. Research demonstrates that tertiary institutions implementing web-based complaint systems experience improved response times and enhanced accountability structures (Okokpujie et al., 2021). Web-based campus complaint systems significantly enhance communication channels and institutional responsiveness (Fabiya et al., 2022). It is against this background that this project seeks to develop a web-based Faculty Complaint Management System specifically designed for the Faculty of Computing. The faculty comprises five departments—Cybersecurity, Information Technology, Data Analytics, Computer Science, and Artificial Intelligence, with each department having four course representatives across four academic levels (100L, 200L, 300L, and 400L), totaling twenty course representatives. The system provides role-based access for three categories of users: administrators (typically the Head of Department or Dean), course

representatives who submit complaints on behalf of their departmental students, and lecturers assigned to handle complaints from specific departments. By automating complaint submission, assignment, tracking, and resolution processes, the system aims to transform how academic grievances are managed in the Faculty of Computing.

1.1 Statement of the Problem

The Faculty of Computing currently manages student complaints through informal and fragmented communication channels such as WhatsApp messages, verbal reports, handwritten notes, and individual emails. This manual approach makes it difficult to track, document, and resolve complaints efficiently. Course representatives often repeat the same complaint multiple times without confirmation of receipt or feedback, leading to frustration and distrust among students. Lecturers receive complaints inconsistently and cannot easily prioritize or manage them. Administrators also face challenges in assigning complaints to the appropriate lecturer across the five departments and monitoring progress without a centralized tracking system. As a result, many complaints are delayed, forgotten, or unresolved, leading to slow response times and lack of accountability. There is also no reliable record that allows the faculty to analyze trends, identify recurring academic issues, or evaluate lecturer responsiveness. This absence of transparency, documentation, automation, and structured workflow shows the need for a centralized web-based complaint management system that can support real-time tracking, automated routing, reporting, and accountability within the faculty.

1.2 Aim of the Study

The aim of this study is to design and implement a web-based Faculty Complaint Management System that centralizes complaint submission, automates lecturer assignment

based on departmental structure, and provides transparent tracking, notification, and reporting features for effective resolution management within the Faculty of Computing.

1.3 Objectives of the Study

The objectives of this project are to:

- i. Develop a secure role-based login and user management system.
- ii. Implement a structured complaint submission and assignment workflow.
- iii. Design user-friendly and responsive interfaces for all user roles.
- iv. Provide complaint tracking, notifications, activity logging, and reporting features.

1.4 Significance of the Study

This system provides value to multiple stakeholders. Understanding technology acceptance patterns is essential for ensuring that all user groups adopt and effectively utilize the system (Kemp et al., 2024). The combined application of the Technology Acceptance Model and the DeLone and McLean IS Success Model provides comprehensive evaluation frameworks for assessing both user adoption intentions and actual system performance across multiple dimensions (Wahyuningsih et al., 2024).

Course Representatives and Students benefit from structured submission and real-time visibility of complaint status, reducing repeated follow-ups and building trust in administrative processes. Lecturers receive an organized interface where all assigned complaints can be easily accessed and responded to, reducing confusion and improving response efficiency. Faculty Administrators experience reduced manual workload through automated complaint routing, real-time monitoring across all departments, and evidence-based decision making through analytics and reports. System evaluation frameworks provide structured approaches for assessing how such systems contribute to organizational

effectiveness through improved information quality, system quality, and user satisfaction (DeLone & McLean, 2016).

For Institutional Quality Assurance, it serves as a continuous feedback mechanism, supporting quality assessment, resource planning, and policy development across the faculty. The systematic collection and analysis of complaint data enables institutions to identify patterns indicating systemic issues requiring policy intervention rather than individual lecturer responses, thereby supporting institutional learning and continuous improvement. In Academic Research and Software Development Practice, the project contributes a replicable case model for digitalizing academic administration using open-source technologies in resource-constrained educational environments. Contemporary implementations of student complaint systems in African institutions demonstrate the feasibility and benefits of such approaches, particularly when implementation strategies account for institutional adoption readiness (Oghenekaro et al., 2023; Okokpujie et al., 2021).

1.5 Scope of the Study

The system is specifically designed for the Faculty of Computing, consisting of five departments: Cybersecurity, Information Technology, Data Analytics, Computer Science, and Artificial Intelligence. The system supports three user categories: administrators, lecturers, and twenty course representatives (four per department across 100L, 200L, 300L, 400L). The system provides core features including secure authentication, complaint submission, automated routing, lecturer response, complaint tracking, notification alerts, administrative dashboards, activity logs, and basic statistical reporting. The system is implemented using PHP, MySQL, Bootstrap, and JavaScript and deployed in a local network environment.

1.6 Definition of Terms

To ensure clarity and common understanding throughout this document, the following key terms are defined:

1. **Course Representative:** An elected or appointed student leader who serves as the official liaison between all students in a specific department and academic level and the faculty administration. In this system, each of the five departments has four course representatives (one per level: 100L, 200L, 300L, 400L), totaling twenty course representatives for the Faculty of Computing. They are responsible for submitting complaints on behalf of their departmental classmates.

2. **Faculty of Computing:** The academic unit within the university comprising five specialized departments: Cybersecurity, Information Technology, Data Analytics, Computer Science, and Artificial Intelligence. This faculty serves as the organizational boundary for the complaint management system.

3. **Complaint:** A formal expression of concern, dissatisfaction, or grievance regarding any aspect of academic experience within the Faculty of Computing, submitted by a course representative on behalf of their departmental students. Complaints may relate to teaching quality, facility conditions, administrative processes, examination matters, or any other academic concern requiring attention and resolution.

4. **Administrator:** The Dean, Head of Faculty, or designated administrative personnel with full system access. Administrators are responsible for managing all users (course representatives and lecturers), assigning lecturers to departments, overseeing all complaints across the faculty, and generating reports. This role represents the highest level of authority within the system.

5. **Lecturer:** A faculty member or teaching staff assigned by the administrator to receive and respond to complaints originating from one or more specific departments within the Faculty of Computing. Lecturers provide solutions, explanations, or action plans to address issues raised by course representatives.

6. **Department:** One of the five academic divisions within the Faculty of Computing: Cybersecurity, Information Technology, Data Analytics, Computer Science, or Artificial Intelligence. Each department has four course representatives (one per academic level) and one or more assigned lecturers.

7. **Academic Level:** The year of study for students, designated as 100 Level (first year), 200 Level (second year), 300 Level (third year), or 400 Level (fourth year). Each level in each department has one course representative in this system.

8. **Role-Based Access Control (RBAC):** A security mechanism that restricts system access and functionality based on the user's assigned role (administrator, lecturer, or course representative). RBAC ensures users can only perform actions appropriate to their position and view only information relevant to their responsibilities.

9. **Complaint Status:** The current state of complaint in its resolution lifecycle. The system uses three primary status values:

Pending: Newly submitted complaint awaiting lecturer's action

In Progress: Complaint currently being investigated or addressed by the assigned lecturer

Resolved: Complaint fully addressed with response provided and marked as complete

10. **Assignment:** The administrative process of designating specific lecturers to handle complaints from particular departments. When a lecturer is assigned to a department, all

future complaints submitted by course representatives from that department are automatically routed to that lecturer.

11. **Activity Log:** A chronological, tamper-evident record of all significant actions performed within the system, including user logins, complaint submissions, lecturer assignments, status changes, and resolutions. Each entry includes timestamp, user identification, and action details for audit and accountability purposes.

12. **Dashboard:** A customized overview interface that presents role-specific metrics, statistics, and quick access to primary functions. Administrators see faculty-wide statistics and management tools; course representatives see their complaint submission history and statuses; lecturers see their assigned complaint queues.

13. **Automated Routing:** The system features automatically assigning newly submitted complaints to appropriate lecturers based on pre-configured department-lecturer mappings, eliminating the need for manual routing decisions by administrators for each individual complaint.

14. **Notification:** An in-application alert message generated by the system to inform users of important events such as new complaint submissions (for administrators), new assignments (for lecturers), or responses received (for course representatives). Notifications appear within the system interface when users log in.

15. **Web-Based System:** An application accessed through web browsers (Chrome, Firefox, Edge, Safari) over a network connection rather than installed as standalone software on individual computers. This allows platform-independent access from various devices including desktops, laptops, tablets, and smartphones.

16. **Responsive Design:** A web design approach ensuring the user interface automatically adapts its layout and appearance to provide optimal viewing and interaction experience across different screen sizes and devices, from large desktop monitors to small smartphone screens.

17. **Authentication:** The process of verifying the identity of a user attempting to access the system, typically through username/email and password credentials, ensuring only authorized individuals can log in.

18. **Session:** A temporary, secure connection maintained between a user's browser and the server during a single visit to the application. Sessions store user-specific information (such as their role and ID) across multiple page requests without requiring repeated login.

19. **Database Schema:** The organizational structure of the database defining how data is stored, organized, and related. This system uses six tables (users, complaints, departments, lecturer assignments, activity log, notifications) with defined relationships and constraints.

20. **XAMPP:** An open-source web server solution package bundling Apache HTTP Server, MySQL database, PHP interpreter, and other tools, providing an integrated development environment for creating and testing web applications on local computers without requiring separate installations or complex configurations.

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

This chapter presents a comprehensive review of existing literature relevant to the development of the Faculty Complaint Management System. The review examines scholarly work, theoretical frameworks, and practical implementations that inform the design and development of this project. The literature reviewed spans recent publications from 2015 to 2024, ensuring that the theoretical and practical foundations reflect current best practices, emerging trends, and contemporary challenges in educational technology and complaint management systems. The chapter is organized into six main sections covering conceptual frameworks, theoretical foundations (TAM and DeLone-McLean IS Success Model), complaint management systems in African and Nigerian universities, web technologies and development approaches, comparative analysis of related systems, and identification of gaps in existing literature that this project addresses. The review demonstrates that while complaint management systems are well-established in commercial and service sectors, their adaptation to the specific organizational structures and cultural contexts of African higher education, particularly at the faculty level with course representative intermediaries, remains an area requiring further research and practical implementation. This project contributes to filling this gap by developing a contextualized solution that aligns with existing governance structures while leveraging modern web technologies to improve transparency, accountability, and efficiency in academic complaint handling.

2.1 CONCEPTUAL FRAMEWORK

2.1.1 Complaint Management in Higher Education

Complaint management in higher education institutions serves as a critical feedback mechanism that enables administrators to identify service gaps, address student concerns, and continuously improve the quality of education delivery (Msosa, 2021). Unlike commercial organizations where complaints primarily relate to products or services, academic complaints encompass a broader spectrum including pedagogical issues, facility conditions, administrative processes, assessment fairness, and interpersonal dynamics between students and faculty.

Msosa (2021) examined service failure and complaints management in higher education institutions, identifying complaint handling as an essential component of institutional quality assurance. The study emphasized that complaints, when properly managed, provide valuable insights into areas requiring improvement and serve as early warning indicators of potential systemic problems. According to Widjanarko and Adi (2019), effective complaints handling models in higher education must function as instruments of public service, incorporating clear accountability structures, defined escalation pathways, and regular performance monitoring. Their research on complaints handling in Indonesian public universities revealed that institutions with formalized complaint management processes demonstrated higher levels of student satisfaction and institutional trust compared to those relying on informal channels.

The role of student voice, particularly when channeled through elected representatives, plays a vital role in institutional governance and quality assurance. Okokpujie et al. (2021) observed that in Nigerian tertiary institutions, course representatives serve as intermediaries who aggregate individual concerns into collective issues requiring institutional attention, thereby filtering noise and prioritizing matters affecting multiple students. However, Uwah

and Etim (2024) noted that traditional complaint handling methods in Nigerian universities—including physical letters, emails, informal meetings, and messaging applications—create significant challenges in documentation, accountability, and timely resolution.

Contemporary literature distinguishes between reactive complaint management, which responds to issues as they arise, and proactive complaint management, which uses complaint data analytics to identify patterns and address root causes before problems escalate (Salemme, 2020). The manual processes currently employed in many Nigerian universities for handling complaints present several critical limitations. Fabiyi et al. (2022) identified key problems including difficulty in tracking complaint status, absence of accountability mechanisms to ensure timely responses, lack of comprehensive documentation for historical analysis, inefficient routing of complaints to appropriate personnel, and inability to generate reports for strategic planning. Web-based complaint management systems offer solutions to these challenges by centralizing complaint submission, automating routing and notification processes, providing transparent status tracking, maintaining comprehensive audit trails, and enabling data-driven analysis of complaint trends.

2.1.2 Digital Transformation in Educational Administration

Digital transformation in higher education extends beyond the mere digitization of existing processes to encompass fundamental rethinking of how institutions operate, communicate, and deliver value to stakeholders (Laudon & Laudon, 2020). Administrative systems that were once paper-based or email-dependent are being replaced by integrated web platforms that provide transparency, accountability, and data-driven insights. This transformation is particularly significant in developing country contexts where digital solutions can leapfrog intermediate stages of administrative evolution, moving directly from manual systems to sophisticated digital platforms.

Laudon and Laudon (2020) define management information systems as integrated systems that serve management at all levels of an organization by providing information for decision-making and facilitating organizational functions. In the context of educational administration, these systems encompass student records management, course registration, examination processing, financial management, and increasingly, complaint and feedback management. The authors emphasize that successful information systems must align with organizational strategy, support business processes, and deliver measurable value to stakeholders—principles equally applicable to educational institutions as to commercial enterprises.

The adoption of web-based administrative systems in African higher education has accelerated in recent years, driven by increasing student populations, growing expectations for service quality, and recognition that manual processes cannot scale effectively. Mtebe (2015) examined the adoption and usage of learning management systems in sub-Saharan African higher education institutions, identifying critical success factors including stakeholder involvement in system design, adequate technical infrastructure, comprehensive user training programs, institutional policies mandating system use, and ongoing technical support. Gamede et al. (2021) found that successful technology integration requires attention to three interconnected dimensions: technological readiness (availability of devices, internet connectivity, compatible software), organizational support (institutional policies, training programs, technical assistance), and user acceptance (perceived usefulness, ease of use, personal innovativeness).

The transformation of complaint management from manual to digital systems exemplifies broader digital transformation in educational administration. Uwah and Etim (2024) developed an online students' complaint management system demonstrating several advantages: centralized storage of all complaints in a single database, automated routing of complaints to appropriate personnel, real-time status tracking enabling students to monitor

complaint progress, comprehensive audit trails documenting all actions taken, and reporting capabilities for identifying trends requiring systemic intervention. Oghenekaro et al. (2023) emphasized that digital complaint management systems improve operational efficiency, institutional accountability, and student satisfaction, with students expressing greater confidence when they could submit complaints through formal digital channels and track their progress transparently.

The scalability advantages of digital systems are particularly important in African universities experiencing rapid enrollment growth. Fabiyi et al. (2022) noted that manual complaint management becomes increasingly unmanageable as student populations grow, with administrators overwhelmed by complaint volumes and unable to maintain consistent tracking. However, digital transformation in African higher education faces significant contextual challenges. Mtebe (2015) identified infrastructure limitations including unreliable internet connectivity, frequent power outages, inadequate server capacity, and limited device availability as major barriers. Despite these challenges, the COVID-19 pandemic demonstrated both the necessity and feasibility of digital administrative systems in African universities.

The selection of appropriate technologies requires careful consideration of institutional context. Laudon and Laudon (2020) outline key factors including compatibility with existing systems, scalability, security features, cost of ownership, availability of technical expertise, and user interface design. For resource-constrained African universities, open-source technologies such as PHP, MySQL, and Bootstrap offer cost-effective solutions with extensive community support.

2.1.3 Student Representation and Complaint Channels

In Nigerian tertiary institutions, course representatives serve as intermediaries between students and faculty administration. Okokpujie et al. (2021) describe course representatives as elected student leaders who channel concerns, complaints, and suggestions to appropriate authorities, particularly lecturers and heads of departments. Each academic level in every department has a designated course representative, creating a network of student leaders who facilitate communication between students and faculty.

Traditionally, when students encounter problems—ranging from inadequate lecture materials and poor classroom facilities to unclear grading systems—they report these issues to their course representatives. Fabiyi et al. (2022) document that course representatives compile these complaints and present them to relevant lecturers or the Head of Department through physical meetings, written letters, emails, or informal communication platforms. However, the manual processes involved create numerous inefficiencies that undermine effective complaint resolution.

The fragmented nature of communication channels poses significant problems. Okokpujie et al. (2021) observed that course representatives struggle to maintain organized records of multiple complaints, especially when dealing with issues affecting different courses. Physical documentation can be lost, emails may be overlooked, and verbal communications are easily forgotten. From the lecturers' perspective, receiving complaints through multiple informal channels creates management difficulties. Fabiyi et al. (2022) note that lecturers find it difficult to prioritize issues, track addressed complaints, and maintain resolution records.

The Head of Department faces even greater challenges, as the volume of complaints from multiple departments can be overwhelming (Uwah & Etim, 2024). Furthermore, the absence of a centralized system creates significant accountability gaps. Salemm (2020) emphasizes

that effective complaint management requires clear responsibility assignment, documented communication, and verifiable resolution processes. However, in manual systems, when a complaint receives no response, it becomes difficult to determine whether the issue was received, who was responsible, and at what stage the resolution process stalled.

The digitalization of complaint channels offers solutions by providing centralized platforms where course representatives can submit complaints with confidence that submissions are properly received, recorded, and routed to appropriate personnel. Uwah and Etim (2024) demonstrate that web-based systems enable automatic acknowledgment of complaint receipt, transparent status tracking, documented assignment of responsibility, and audit trails that support accountability.

2.2 THEORETICAL FRAMEWORK

2.2.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), originally developed by Fred Davis in 1989, provides a robust theoretical framework for understanding and predicting user adoption of information systems and technology. TAM has become one of the most widely cited and empirically validated models in information systems research, with applications spanning diverse organizational contexts including educational institutions (Schorr, 2023). The model's enduring relevance stems from its parsimony—explaining technology acceptance through two primary constructs—and its consistent predictive validity across different technologies, user populations, and cultural contexts.

Davis (1989) posited that two fundamental factors determine whether users will accept and actively use a new technology: perceived usefulness and perceived ease of use. Perceived usefulness refers to the degree to which a person believes that using a particular system would enhance their job performance or help them accomplish tasks more effectively.

Perceived ease of use refers to the degree to which a person believes that using the system would be free from effort, requiring minimal learning and cognitive load. According to the model, these two beliefs directly influence users' attitudes toward the technology, which in turn affect their behavioral intention to use it, ultimately determining actual system usage.

Recent systematic reviews have confirmed TAM's continued relevance in contemporary technology contexts. Granić and Marangunić (2019) conducted a comprehensive systematic literature review of TAM applications in educational contexts, analyzing 114 studies published between 2010 and 2018. Their analysis demonstrated that TAM remains highly relevant for predicting educational technology adoption, with perceived usefulness consistently emerging as the strongest predictor of acceptance intention.

Kemp et al. (2024) tested a novel extended educational technology acceptance model incorporating student attitudes as a mediating factor. Their research found that students' general attitudes toward technology significantly influence how they perceive specific educational systems' usefulness and ease of use. In educational settings, perceived usefulness encompasses multiple dimensions including whether systems help students learn effectively, access resources conveniently, and achieve better academic outcomes. Al-Rahmi et al. (2021) examined TAM in the context of e-learning systems, confirming that both perceived usefulness and perceived ease of use significantly predict students' intention to use e-learning systems, with perceived usefulness exhibiting stronger influence.

Schorr (2023) emphasized TAM's importance for digitalization research, particularly in understanding why some digital transformation initiatives succeed while others fail. Systems may be technically sophisticated yet fail to achieve widespread adoption if users do not perceive them as useful or if they require excessive effort to operate effectively. This insight is particularly relevant for complaint management systems in educational institutions, where

success depends on voluntary adoption by course representatives, lecturers, and administrators.

In the context of this Faculty Complaint Management System, TAM provides a valuable framework for understanding and promoting user acceptance across three distinct user groups. Course representatives assess whether the system makes complaint submission easier and provides transparency into complaint status. Lecturers evaluate whether it helps them manage complaints more efficiently than email or informal communications. Administrators assess the system's usefulness for oversight functions, including whether it provides comprehensive visibility into complaint volumes and generates reports that inform strategic decision-making.

The implications of TAM for system design are clear: maximizing perceived usefulness requires ensuring that the system delivers genuine value to each user group, solving real problems they experience with current complaint handling methods. Maximizing perceived ease of use requires intuitive interfaces, clear navigation, and minimal required training. Granić and Marangunić (2019) emphasize that successful educational technology implementation requires iterative design processes that involve actual users in prototype testing. Additionally, demonstrating system benefits through pilot programs can increase acceptance by enhancing perceived usefulness, while providing comprehensive training addresses perceived ease of use concerns.

2.2.2 DeLone and McLean Information Systems Success Model

The DeLone and McLean Information Systems Success Model provides a comprehensive framework for evaluating information system effectiveness and organizational impact. Originally proposed in 1992 and updated in 2003, the model has become one of the most widely cited frameworks in information systems research, offering a multidimensional approach to assessing system success (DeLone & McLean, 2003). The model's strength lies

in its recognition that information system success is a complex, multifaceted construct requiring holistic evaluation across multiple interdependent dimensions.

The updated model identifies six critical dimensions of information systems success: system quality, information quality, service quality, system use, user satisfaction, and net benefits. These dimensions have causal relationships, with quality dimensions influencing usage and user satisfaction, which in turn determine the net benefits the system delivers. System quality refers to desirable characteristics like reliability, response time, ease of use, functionality, and security. Information quality addresses characteristics of system outputs, including accuracy, completeness, relevance, timeliness, and format appropriateness. Service quality encompasses the responsiveness, reliability, empathy, and competence of support personnel. System use measures the extent and manner in which users employ the system. User satisfaction represents users' overall evaluation of their experience. Net benefits represent the ultimate measure of success, assessing the extent to which the system contributes to stakeholder success.

Recent research has extensively validated the model in educational contexts. Rulinawaty et al. (2024) investigated the model's influence on Learning Management System effectiveness in Indonesian higher education, finding strong empirical support for the proposed relationships. Al Naqbi (2024) employed a mixed-method approach combining quantitative surveys with qualitative interviews to examine post-implementation success. Simelane-Mnisi et al. (2025) applied the model in South African universities, confirming its cross-cultural validity and finding that information quality emerged as the strongest predictor of student satisfaction. Wahyuningsih et al. (2024) integrated TAM and DeLone and McLean models, using TAM to predict initial acceptance and DeLone and McLean to assess post-adoption success.

The implications for the Faculty Complaint Management System are substantial. The model provides a comprehensive evaluation framework encompassing technical quality, information quality, and service quality. Measurable net benefits might include reduced complaint resolution time, increased response rates, higher student satisfaction, reduced administrative workload, and improved accountability through documented histories. The model's recognition of interdependencies emphasizes that high system quality is necessary but not sufficient—the system must also provide high-quality information and adequate support. Furthermore, the feedback loops emphasize the importance of continuous improvement through monitoring all dimensions, collecting user feedback, and making iterative enhancements based on actual usage patterns.

2.3 COMPLAINT MANAGEMENT SYSTEMS IN HIGHER EDUCATION

2.3.1 Global Practices and Implementations

Universities worldwide have implemented various approaches to complaint management, recognizing its importance for quality assurance, student satisfaction, and institutional improvement. Msosa (2021) conducted comprehensive research on service failure and complaints management in higher education institutions, identifying complaint management as an essential component of institutional quality assurance frameworks. The study revealed that effective complaint management systems share several common characteristics: clearly defined submission channels, transparent tracking mechanisms, defined response timeframes, escalation procedures for unresolved complaints, and systematic analysis of complaint data to identify recurring issues requiring institutional intervention.

Widjanarko and Adi (2019) examined complaints handling as an instrument of public service in higher education, proposing that effective models must incorporate key elements including accessibility through multiple submission channels, prompt acknowledgment with tracking

codes, thorough investigation, appropriate resolution, follow-up to ensure satisfaction, and periodic review for systemic improvements. They emphasized that systems must balance accessibility with accountability, providing clear guidance while maintaining low barriers to submission for genuine issues.

Salemme (2020) outlined ten essential steps for effective complaint management synthesizing best practices from various contexts, emphasizing that success requires both appropriate systems and appropriate organizational culture. The integration of complaint management with broader quality assurance frameworks represents another global best practice, with leading universities incorporating complaint data into their quality review processes. Technology plays an increasingly important role in implementing these best practices through digital systems that provide accessible online submission, automated acknowledgment, systematic routing, transparent tracking, comprehensive documentation, and analytical capabilities. However, research consistently emphasizes that technology must be implemented thoughtfully, aligned with institutional context and user needs, and combined with stakeholder engagement, comprehensive training, supportive policies, and ongoing monitoring.

2.3.2 African Higher Education Context

The African higher education landscape presents unique contextual factors including infrastructure challenges, resource constraints, varying digital literacy levels, and cultural dimensions affecting communication patterns. Successful implementations address these through thoughtful system design and strategies tailored to local realities.

Uwah and Etim (2024) designed an online students' complaint management system for Nigerian institutions using open-source technologies—PHP, MySQL, and Bootstrap—eliminating prohibitive licensing costs. Evaluation revealed significant benefits including

decreased complaint resolution time from six weeks to less than two weeks and substantially increased student satisfaction. Oghenekaro et al. (2023) developed a web-based integrated system with role-based access, sophisticated categorization capabilities, and automatic routing to appropriate units. Okokpujie et al. (2021) implemented a system addressing the course representative intermediary structure in Nigerian universities, restricting submission to designated representatives to ensure submissions reflected genuine collective issues.

Mtebe (2015) identified success factors including stakeholder involvement, technical infrastructure adequacy, comprehensive training programs, and institutional policy support. Mtebe emphasized that African universities should favor open-source technologies over proprietary solutions given resource constraints and the importance of local control.

2.3.3 Faculty-Level Systems

While most literature addresses institution-wide complaint management systems, faculty-level systems offer distinct advantages through customization tailored to specific organizational structures, disciplinary cultures, and operational requirements.

Fabiyi et al. (2022) developed a web-based system incorporating features enabling faculty-specific customization. Their research recognized that different faculties face distinct complaint types, requiring configurable complaint categories and customizable routing rules. For computing faculties, specialized categories might include laboratory access, software licensing, network connectivity, course content difficulties, and project supervision, enabling precise classification and analytical reporting identifying discipline-specific patterns.

Okokpujie et al. (2021) emphasized that faculty-level systems enable closer alignment with departmental structures and governance arrangements. In Nigerian universities, faculties comprise multiple departments with four academic levels and elected course representatives, creating a hierarchical structure that faculty-level systems can model explicitly. This

organizational modeling supports complaint analytics disaggregated by department and level, lecturer assignment reflecting departmental affiliations, and multi-level reporting organized along departmental lines. Faculty-level systems also accommodate discipline-specific workflows and processes differing from university-wide norms, while the technical sophistication in computing faculties presents both opportunities for faster adoption and challenges from higher user expectations for system quality.

2.4 WEB TECHNOLOGIES FOR COMPLAINT MANAGEMENT SYSTEMS

2.4.1 Server-Side Technologies

The architectural design of web-based complaint management systems fundamentally influences their performance, scalability, maintainability, and security. Modern web applications typically employ multi-tier architecture that separates concerns into distinct layers, each with specific responsibilities and technologies.

Laudon and Laudon (2020) describe the three-tier architecture comprising presentation tier, application tier, and data tier. The presentation tier encompasses user interface components running in web browsers. The application tier contains business logic that processes requests and enforces workflows. The data tier manages persistent storage in database management systems. This separation enables technology substitution within individual tiers, facilitates distributed deployment, and supports independent maintenance.

For complaint management systems, the presentation tier implements role-specific interfaces, the application tier implements complaint handling workflows including validation and automated routing, and the data tier stores user accounts, complaint records, and departmental structures. Technology selection reflects development team expertise, deployment constraints, cost, and maintainability. Uwah and Etim (2024) implemented their system using PHP for

server-side programming, MySQL for database management, and Bootstrap for responsive frontend design.

The development approach typically follows iterative methodologies emphasizing short cycles and frequent feedback. Uwah and Etim (2024) followed a systematic process beginning with requirements analysis through interviews and surveys. System design translated requirements into database schemas, interface mockups, and workflow diagrams. Implementation involved coding in modules tested independently. Testing verified functionality through unit testing, integration testing, system testing, and user acceptance testing. Deployment involved installing on production servers, typically following phased approaches beginning with pilot testing before full rollout.

2.4.2 Database Management Systems

Database design represents one of the most critical aspects of complaint management system development, as the database structure fundamentally determines what information can be stored, how efficiently it can be retrieved, and how reliably the system maintains data integrity. Relational database management systems provide structured storage with well-defined relationships between entities, enabling complex queries, ensuring consistency through constraints, and supporting transactional operations.

Laudon and Laudon (2020) emphasize that database design begins with understanding relevant entities and their relationships. For complaint management systems, core entities include users, departments, academic levels, complaints, responses, and activity logs. Oghenekaro et al. (2023) designed their database schema including a users table storing account information with role-based access control, a complaints table storing comprehensive complaint information, a departments table maintaining organizational structure, an

assignment table implementing lecturer-department relationships for automated routing, and an activity log table documenting system actions for accountability.

Database normalization principles guide design decisions to eliminate redundancy and maintain consistency, though strategic denormalization can improve performance for common queries. Indexing enables rapid lookup of records and dramatically improves query speed for large datasets. Foreign key constraints enforce referential integrity, preventing orphaned records. Transaction management ensures data consistency when operations involve multiple database changes. Database backup and recovery procedures are essential for protecting against data loss.

2.4.3 Frontend Frameworks and Responsive Design

User interface design profoundly influences system adoption, usability, and user satisfaction. Even technically sound systems can fail if interfaces are confusing or frustrating to use. Effective interface design requires understanding user needs and creating layouts and interaction patterns that enable users to accomplish objectives efficiently with minimal cognitive load.

Role-based interface customization represents a key design principle for multi-stakeholder systems. Okokpujie et al. (2021) implemented separate dashboard interfaces tailored to each user role, with course representatives receiving streamlined interfaces for complaint submission, lecturers receiving organized interfaces displaying assigned complaints, and administrators receiving comprehensive dashboards with system-wide metrics. Responsive design ensures interfaces function effectively across devices. Gamede et al. (2021) emphasized that in African educational contexts, responsive design is particularly important because many students access systems primarily from mobile devices.

Form design significantly impacts data quality and user frustration. Well-designed forms employ clear labeling, logical ordering, appropriate input controls, validation providing immediate feedback, and help text providing guidance. Visual hierarchy guides users' attention through size, color, position, and contrast, while accessibility considerations ensure interfaces can be used by individuals with diverse abilities. Performance optimization influences perceived usability through techniques including minimizing HTTP requests, compressing images, and implementing browser caching. User testing with representative users provides invaluable insights, with iterative design producing significantly more usable interfaces.

2.4.4 Security Considerations

Security considerations are paramount for complaint management systems handling sensitive information. Inadequate security can result in unauthorized access, data breaches, or system disruptions. Comprehensive security requires authentication, authorization, data protection, input validation, and system hardening.

Authentication verifies user identity before granting access. Uwah and Etim (2024) implemented password hashing using cryptographic algorithms, employing one-way mathematical functions transforming passwords into hash values from which original passwords cannot be recovered. Authorization determines what authenticated users are permitted to do. Al Naqbi (2024) emphasized that robust authorization controls are essential. Role-based access control (RBAC) assigns permissions to roles: course representatives can submit complaints and view their submissions, lecturers can view assigned complaints and post responses, and administrators have comprehensive permissions.

Authorization enforcement must occur at both presentation and application layers. Session management maintains authenticated state using secure session identifiers with automatic

expiration. Input validation protects against attacks. Uwah and Etim (2024) prevented SQL injection through prepared statements, while XSS prevention requires output encoding. CSRF protection requires unpredictable tokens validating submitted requests. Data encryption protects information through HTTPS. Access logging creates audit trails documenting system activities. Regular security updates address vulnerabilities, and the principle of least privilege extends to system configuration.

2.5 REVIEW OF RELATED SYSTEMS AND IMPLEMENTATIONS

2.5.1 Comparative Analysis of Existing Systems

Several web-based complaint management systems have been developed for Nigerian and African tertiary institutions in recent years, each addressing similar challenges but with varying approaches, features, and technological implementations. This section presents a comparative analysis of key implementations documented in recent literature, identifying their strengths, weaknesses, and lessons applicable to the Faculty Complaint Management System.

Uwah and Etim (2024) designed an online students' complaint management system for Nigerian tertiary institutions using PHP, MySQL, and Bootstrap. The system provided core functionality including user registration with role-based access control, complaint submission through structured web forms, automated email notifications, complaint status tracking, administrative dashboards, and comprehensive activity logging. The implementation achieved measurable improvements with average complaint resolution time decreasing from approximately six weeks to less than two weeks. However, the system faced adoption challenges including initial user resistance, continued use of informal channels, and occasional access difficulties due to unreliable internet connectivity.

Oghenekaro et al. (2023) developed a web-based integrated system emphasizing multi-stakeholder involvement. Key features included sophisticated complaint categorization with automatic routing to responsible units, status workflow management, comprehensive notification systems, role-specific dashboards, and analytical reporting tools. The integrated approach reduced fragmentation but created challenges including extensive training requirements and greater maintenance burden. Fabiyi et al. (2022) implemented a system designed for flexibility and customization, allowing administrators to define institution-specific complaint categories and customize routing rules. Notable features included priority-level assignment, attachment support, escalation mechanisms, comprehensive search capabilities, and data export functions. Okokpujie et al. (2021) developed a system specifically addressing the course representative intermediary structure, restricting complaint submission to designated course representatives.

Analysis reveals several consistent patterns: all implementations employed open-source technologies (PHP and MySQL), implemented role-based access control, emphasized complaint tracking and status visibility, and incorporated automated routing. However, systems exhibited notable limitations including lack of faculty-level customization, absence of sophisticated reporting capabilities, no mobile-specific optimization, and no integration with other institutional systems.

Lessons from existing implementations emphasize that successful systems must balance accessibility with accountability (Msosa, 2021), require stakeholder involvement throughout development (Mtebe, 2015), must address technical infrastructure adequacy challenges, need comprehensive training and user support (Gamede et al., 2021), require institutional policy support and change management (Okokpujie et al., 2021), and need dedicated resources for ongoing maintenance and sustainability. Data-driven improvement emerged as an

underutilized opportunity, with most systems not systematically analyzing collected data to drive institutional improvement.

2.5.2 Lessons from Existing Implementations

The documented implementations provide valuable lessons for future complaint management system development spanning technical design, organizational implementation, user adoption, and sustainability considerations.

Msoa (2021) emphasized that successful systems must balance accessibility with accountability, ensuring complaints can be easily submitted while maintaining verifiable audit trails. The optimal balance involves streamlined submission processes with minimal barriers combined with comprehensive backend logging operating transparently without imposing user burden. Mtebe (2015) identified stakeholder involvement throughout the development lifecycle as critical. Effective involvement includes requirements gathering through interviews and surveys, participatory design sessions, prototype testing with representative users, and iterative refinement incorporating feedback before deployment.

Technical infrastructure adequacy emerged as a recurring challenge across African implementations. Unreliable internet connectivity prevents system access, while frequent power outages disrupt server operations unless addressed through backup power or cloud hosting. Addressing infrastructure challenges requires honest assessment of institutional capabilities, potentially involving cloud hosting solutions, incremental deployment, or hybrid online-offline approaches.

Training and user support proved essential for achieving adoption. Gamede et al. (2021) found that comprehensive training programs addressing varying digital literacy levels, providing hands-on practice, and offering ongoing support significantly improved adoption rates. Institutional policy support and change management were frequently underestimated

factors. Okokpujie et al. (2021) noted their implementation required explicit policies designating the web-based system as the official complaint channel, with informal complaints redirected to system submission.

System maintenance and sustainability beyond initial deployment require dedicated resources and planning. Sustainable deployment requires identifying responsible personnel for ongoing administration, allocating budget for hosting and updates, documenting system architecture, and establishing processes for users to report issues. Data-driven improvement emerged as an underutilized opportunity. While systems collected extensive data, most did not systematically analyze it to drive institutional improvement. Regular analysis can reveal recurring issues requiring systemic intervention, departments generating disproportionate complaint volumes, and seasonal patterns suggesting predictable stress points.

2.6 GAPS IN EXISTING LITERATURE AND SYSTEMS

2.6.1 Limited Focus on Faculty-Level Implementations

The predominant focus in existing literature addresses institution-wide systems designed to serve entire universities. While comprehensive systems offer advantages in centralized data collection, they often fail to accommodate specific organizational structures and operational requirements of academic units. Fabiyi et al. (2022) developed a campus-wide system with some configurability, but the literature provides limited guidance on systems specifically designed for faculty-level deployment. Faculty-level systems enable tailoring to unique characteristics of specific disciplines, such as computing faculties facing distinctive complaint types including software licensing issues and programming course difficulty.

2.6.2 Insufficient Attention to Course Representative Intermediary Role

Most existing systems assume direct student-to-administration submission models. Okokpujie et al. (2021) represent a notable exception, but their implementation focuses on enabling

representative submission without deeply examining implications for system design, workflow management, or accountability mechanisms. The course representative model differs fundamentally from individual submission models, as representatives aggregate concerns from multiple students. Existing literature provides limited guidance on how systems should support the representative intermediary role beyond basic submission capabilities.

2.6.3 Inadequate Treatment of Multi-Level Department Structures

Nigerian universities organize faculties into departments, with each department comprising four academic levels, creating a three-tier hierarchy—Faculty → Department → Level. Mtebe (2015) discussed organizational structures in African higher education but focused primarily on institutional and faculty levels without detailed attention to internal departmental organization. Existing literature generally addresses departmental organization but does not explicitly examine the level sub-structure or its implications for complaint routing, analytics, representative management, and level-specific reporting.

2.6.4 Limited Evaluation of Long-Term System Sustainability

Most documented implementations report on initial development and short-term evaluation, typically covering six months to one-year post-deployment. Uwah and Etim (2024), Oghenekaro et al. (2023), Fabiyi et al. (2022), and Okokpujie et al. (2021) all describe system functionality and initial outcomes but do not address long-term sustainability. Critical questions remain unanswered: Do initial adoption rates sustain or decline? How do systems evolve in response to changing requirements? What maintenance burdens emerge? Longitudinal studies examining sustained system use would provide valuable insights for institutions planning implementations.

2.6.5 Insufficient Examination of African-Specific Contextual Factors

Complaint management systems in African higher education face specific contextual factors inadequately addressed in existing research, including infrastructure challenges (unreliable connectivity, power outages), mobile-first design needs where smartphone ownership exceeds computer availability, cultural dimensions affecting willingness to formally complain, resource constraints necessitating open-source solutions, and large student-to-staff ratios creating scalability imperatives. Mtebe (2015) examined these factors for learning management systems but complaint management systems have received less attention regarding contextual adaptation.

2.6.6 Lack of Open-Source, Replicable Faculty-Level Systems

Despite widespread interest, few open-source, replicable complaint management systems specifically designed for faculty-level deployment with course representative structures are documented in accessible repositories with implementation guides. An openly documented faculty-level system could significantly lower barriers for institutions seeking to implement similar solutions.

The identified gaps—limited faculty-level focus, insufficient attention to course representative intermediaries, inadequate treatment of multi-level structures, limited sustainability evaluation, insufficient examination of African contexts, and lack of open-source systems—collectively justify the Faculty Complaint Management System, which addresses these gaps through faculty-level deployment, explicit support for course representative structures, modeling of multi-level departmental organization, emphasis on Nigerian university contexts, and comprehensive documentation supporting replication.

CHAPTER THREE

SYSTEM ANALYSIS AND DESIGN

3.0 Introduction

This chapter explains the analysis and design of the Faculty Complaint Management System. It compares the current manual complaint-handling process with the proposed system, highlights the problems in the existing structure, and presents a more efficient, centralized and automated solution. The design focuses on ensuring the system is easy to use, scalable, secure, and able to serve the needs of the admin, course representatives and lecturers.

3.1 System Analysis

3.1.1 Existing System

The existing complaint management approach is largely manual. Course representatives usually gather complaints and forward them to the Admin through physical letters, emails or informal WhatsApp communication. The admin then forwards the complaint to the lecturer concerned, who responds through the same channels. This process lacks proper organization, documentation and timely follow-up, leading to delays and misunderstandings.

3.1.2 Problems in the Existing System

The current system has several limitations. First, complaints are scattered across multiple platforms, making them difficult to track. Second, the manual forwarding process causes slow response times. Third, there is no proper accountability or monitoring method to know which lecturer has handled a complaint and how long it took. Also, past complaint records are not well documented, making it difficult to review previous issues. As the number of students and complaints increases, the system becomes more stressful to manage.

3.1.3 Justification for the New System

A new system is necessary to solve these issues. The proposed web-based system centralizes all complaints on one platform where course representatives can submit complaints and track their progress. The admin can easily assign complaints to lecturers, while lecturers can respond directly within the system. The new system improves accountability, reduces delays, improves documentation, allows report generation, and reduces administrative workload.

3.2 Requirements Specification

3.2.1 Functional Requirements

The admin will be able to manage user accounts, view and assign complaints, track their status and generate reports. Course representatives will be able to submit complaints, assess the status of their submissions and receive feedback. Lecturers will be able to view complaints assigned to them, respond to them and update their status.

3.2.2 Non-Functional Requirements

The system will be easy to use and accessible across different devices. It will implement secure login and access control to protect user information. The system will be reliable, support multiple users at once and maintain regular backups. It will also be designed in a modular manner to allow easy maintenance and future upgrades.

3.2.3 User Requirements

The Admin requires full oversight and control of complaint operations. Course representatives need a simple and transparent complaint submission process. Lecturers require an organized system where they can easily view and respond to complaints easily.

3.3 SYSTEM DESIGN

3.3.1 System Architecture

The Faculty Complaint Management System follows three-tier architecture:

Presentation Tier: HTML5, CSS3, Bootstrap 5, JavaScript.

Application Tier: PHP for server-side logic, session management, complaint routing and input validation.

Data Tier: MySQL database storing user information, complaints, responses and activity logs.

[User Browser] ↔ [Web Server (Apache/XAMPP)] ↔ [PHP Application Logic] ↔
[MySQL Database]

3.3.2 Database Design

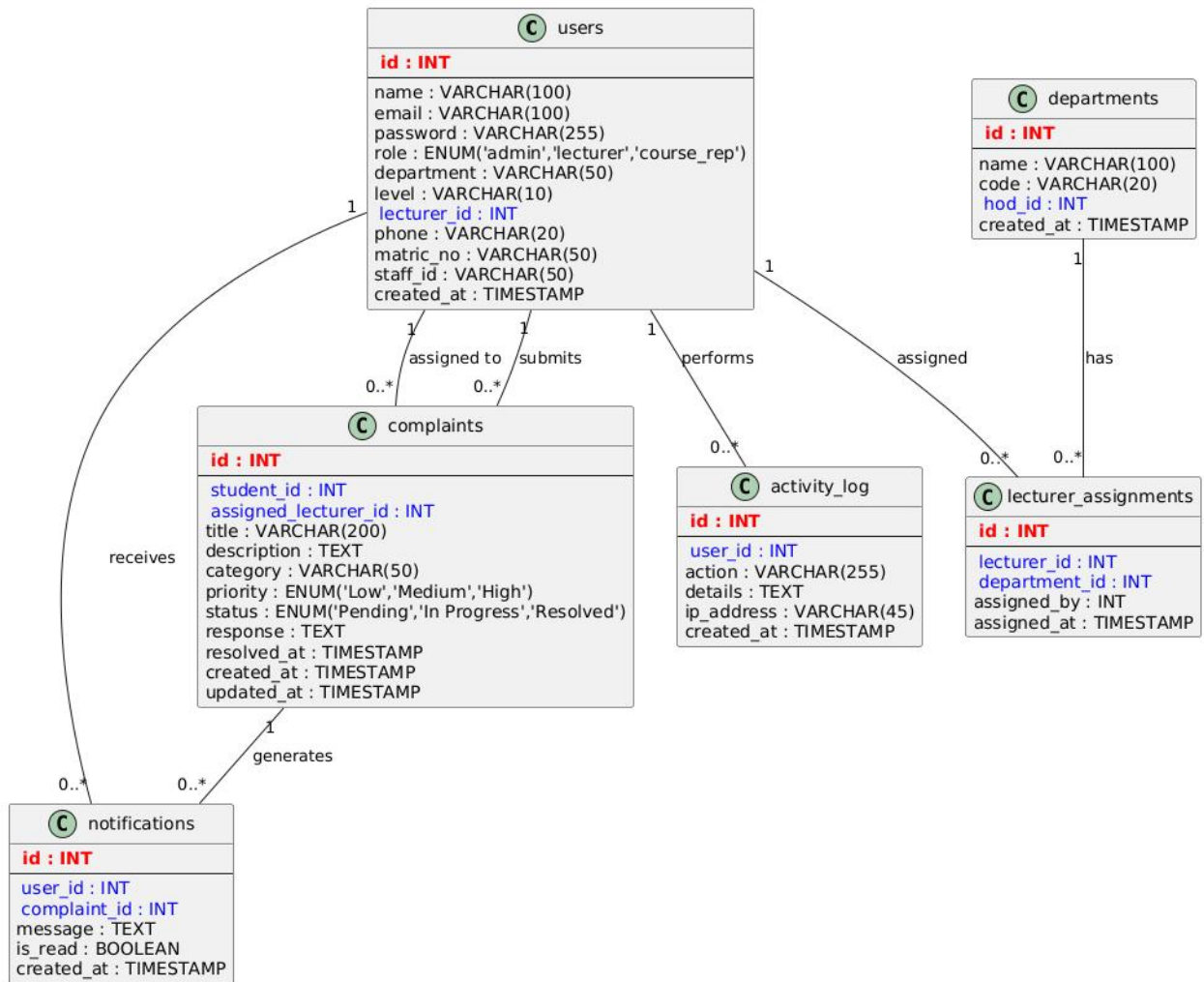


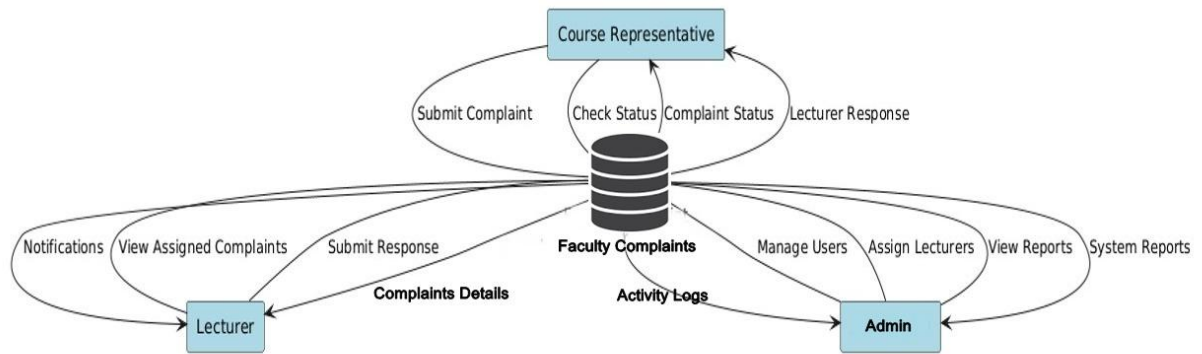
Figure 3. 1: Database Design

Database Schema (Detailed Table Structure)

3.3.3 Process Modeling

Data Flow Diagram (DFD) - Context Level (Level 0)

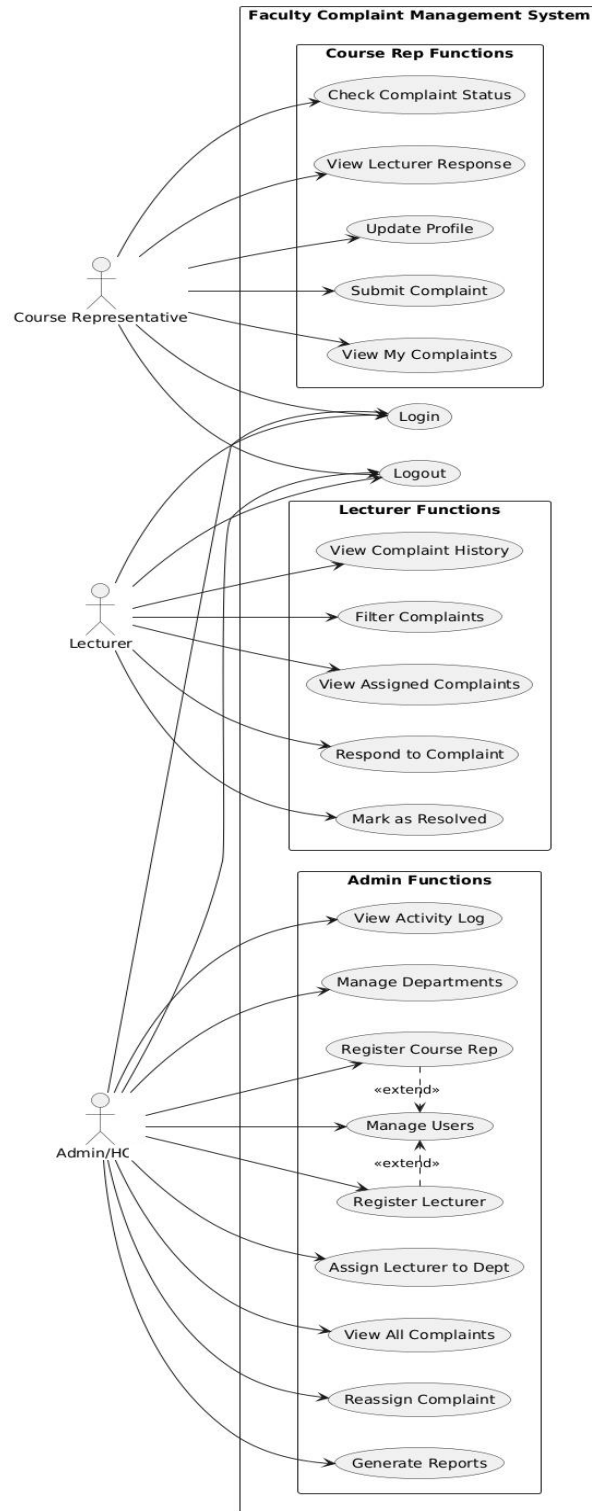
Figure 3. 3 : Data Flow Diagram (DFD) - Context Level (Level 0)



3.3.4 Behavioral Modeling

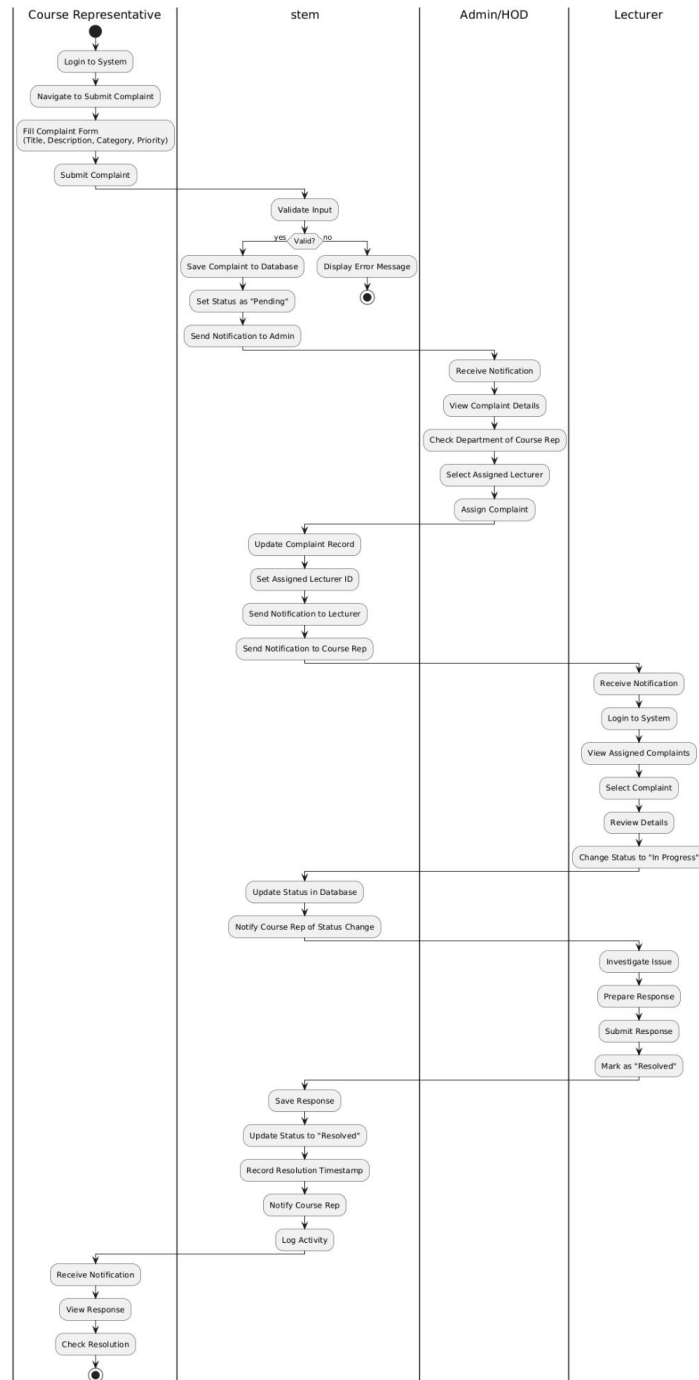
Use Case Diagram

Figure 3. 4 : Use Case Diagram



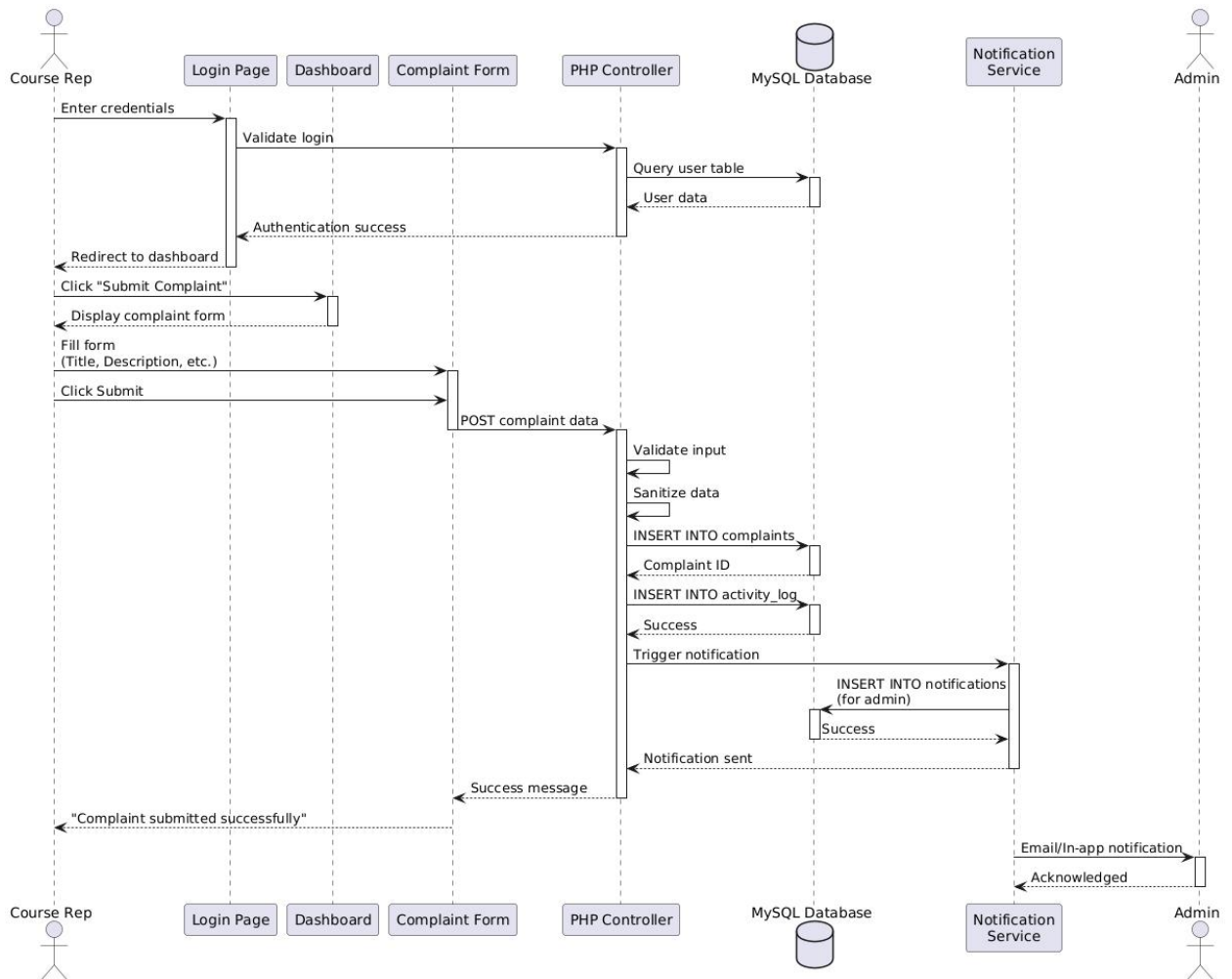
Activity Diagram (Complaint Submission and Resolution Flow)

Figure 3. 5 : Activity Diagram (Complaint Submission and Resolution Flow)



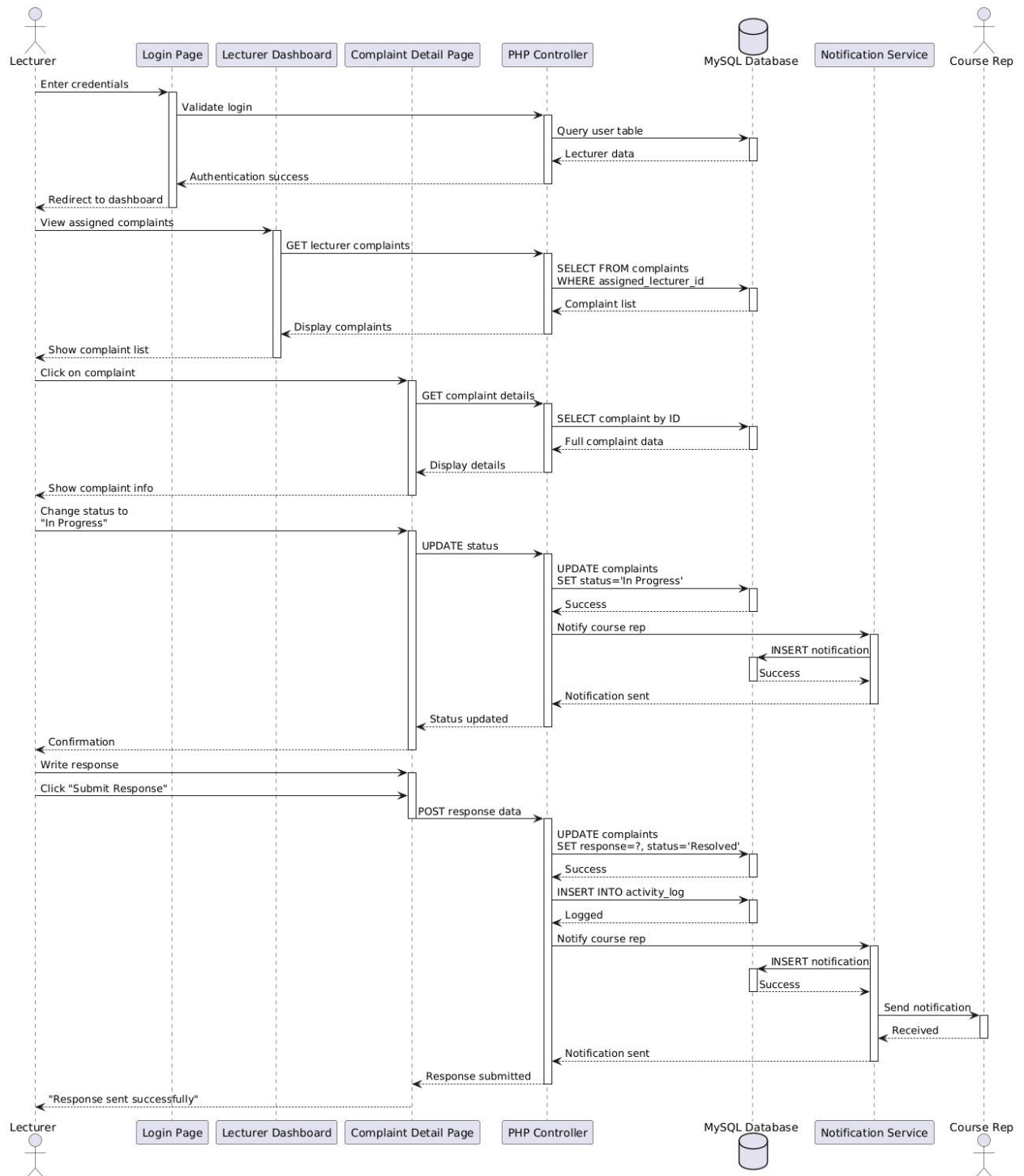
Sequence Diagram (Course Rep Submits Complaint)

Figure 3. 6 : Activity Diagram (Complaint Submission and Resolution Flow)



Sequence Diagram (Lecturer Responds to Complaint)

Figure 3. 7 : Sequence Diagram (Lecturer Responds to Complaint)



3.4 SYSTEM DEVELOPMENT TOOLS AND TECHNOLOGIES

3.4.1 Programming Language (PHP)

PHP was used because it is free, open-source, integrates easily with MySQL, has strong and provides built-in features for handling security tasks such as password hashing and session control.

3.4.2 Database Management System (MySQL)

MySQL was used due to its reliability, speed and scalability. It supports ACID transactions, and works seamlessly with PHP.

3.4.3 Front-End Technologies

HTML5 and CSS3 were used for structure and styling. Bootstrap 5 ensured responsiveness consistency. JavaScript handled client-side validation and interactivity.

3.4.4 Development Environment

The project was developed using XAMPP, phpMyAdmin, Visual Studio Code and Git for version control.

3.5 Limitations of the Study

The system was designed for one faculty and would require changes to support university-wide use. It provides only internal notifications and does not support file attachments. Reporting features are basic. Lecture assignments are manual. There is no automatic escalation for overdue complaints. The system does not integrate with other university platforms. The interface is available only in English. Deployment on a live server may require additional configuration.

Despite these limitations, the system improves complaint submission, tracking and resolution, offering centralized, transparent and organized workflow.

CHAPTER FOUR

SYSTEM IMPLEMENTATION AND TESTING

4.0 Introduction

This chapter discusses the implementation and testing of the Faculty Complaint Management System. The design specifications were converted into a functional web-based application. The development environment, installation procedures, database setup and system modules are explained. The chapter also outlines the testing methodology used to verify that the system performs correctly, meets user requirements and operates efficiently.

4.1 System Implementation

4.1.1 Implementation Environment

The system was developed locally using a personal computer running Windows 10/11 with at least 8GB RAM and an Intel Core i5 processor. XAMPP provided Apache, MySQL and PHP in an integrated environment. phpMyAdmin handled database operations. The system was tested using Chrome and Firefox. Visual Studio Code was used for writing and managing source code, with Git for version tracking.

4.1.2 System Installation and Configuration

XAMPP was installed and Apache/MySQL services started. A project directory named `complaint_system` was created in the `htdocs` folder. Subfolders were used to separate admin, lecturer and student interfaces. A database named `complaint_db` was created in phpMyAdmin. Configuration files were updated with database connection details. Basic security measures such as input validation and prepared statements were implemented.

4.1.3 Database Implementation

The database was created based on the earlier schema. It contains tables for users, departments, complaints, activity logs and notifications. Data types, primary keys and foreign key constraints were defined. Indexes were added to frequently queried fields. Sample user accounts and test complaints were inserted to support testing. Backups were generated using phpMyAdmin's export function.

4.1.4 Module Implementation

Authentication Module

Manages login, logout and session handling. Users log in using credentials verified against hashed passwords. Successful authentication creates a session storing the user's role, restricting access appropriately. Session timeout enforces automatic logout after inactivity. Logout destroys the session and redirects to the login page.

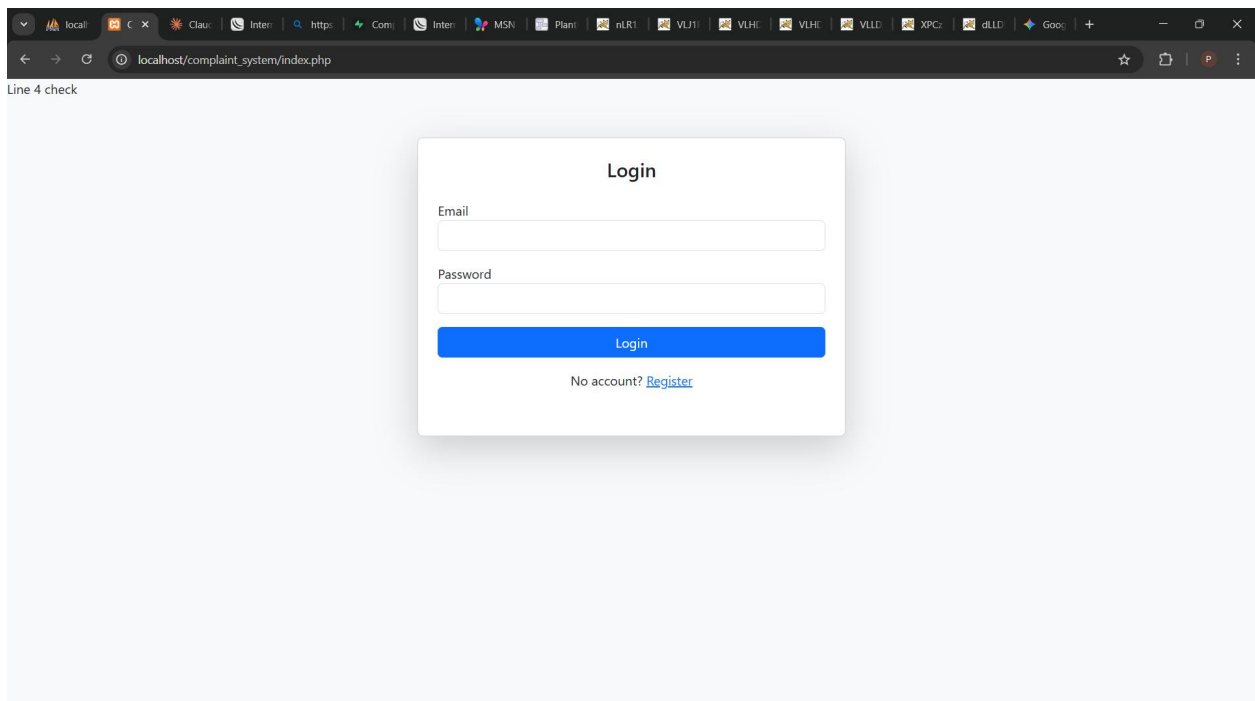


Figure 4. 1 : User Login Interface

4.1.4.2 Admin Module

The admin accesses a dashboard displaying statistics such as number of course representatives, lecturers, pending and resolved complaints. The admin can view all complaints, assign lecturers, manage user accounts and monitor lecturer activity. The dashboard also summarizes complaints by department and status. The activity log displays recent system actions.

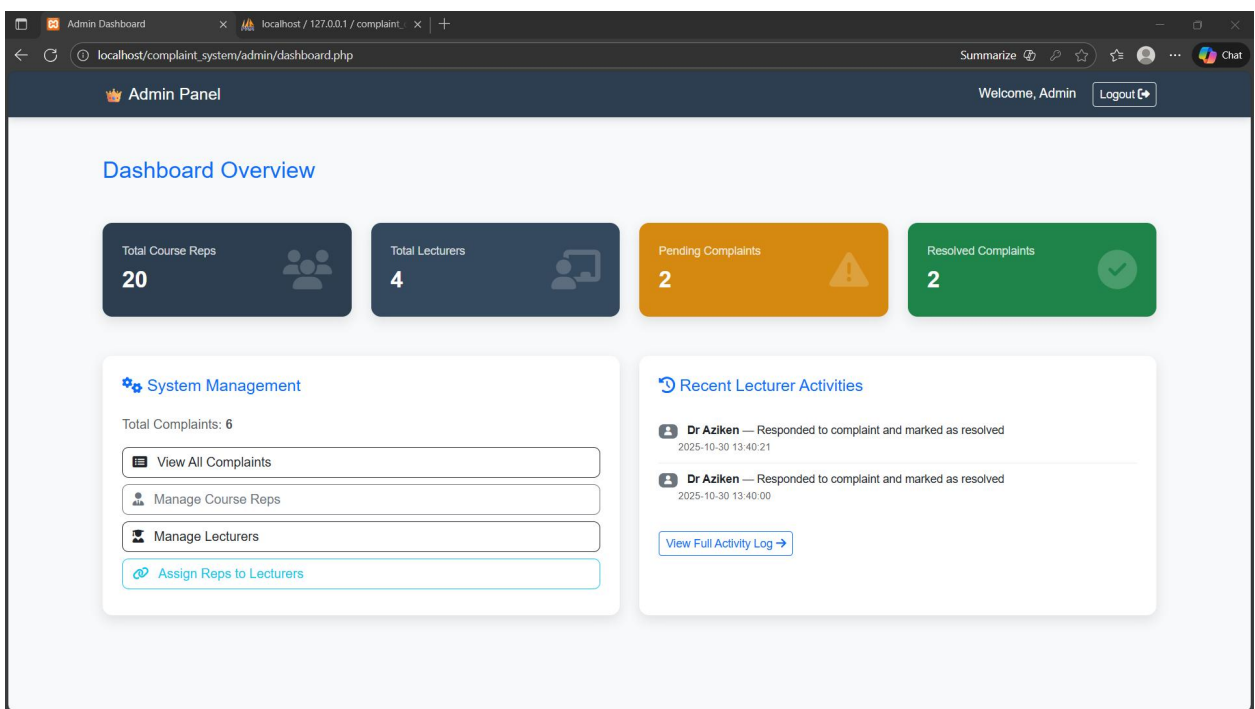


Figure 4. 2 : Admin Dashboard with System Statistics

User Management

Allows the admin to view and manage all users. The admin can filter by role, edit details, reset passwords and remove users. Course representatives and lecturers can be registered, with validation preventing duplicate accounts. Lecturers can be assigned or reassigned to departments.

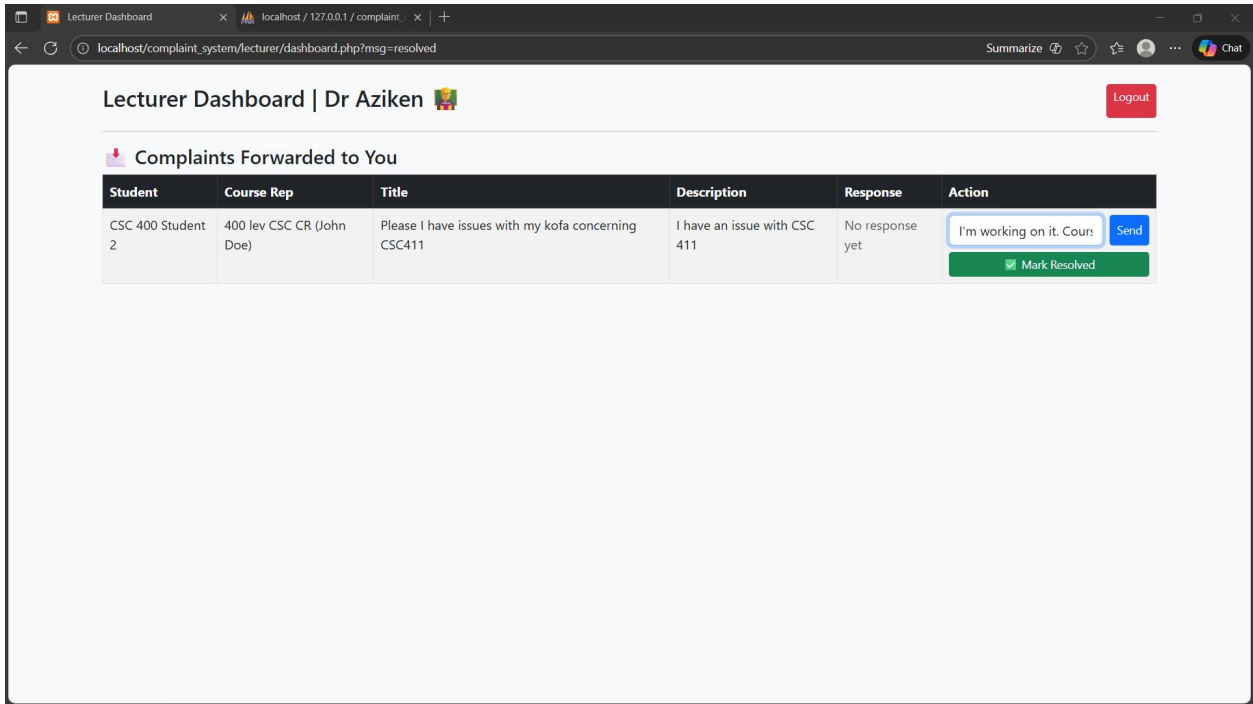


Figure 4. 3 : Lecturer Assignment Interface

Lecturer Module

Lecturers can view assigned complaints, respond to them and update their status. They also have access to a complaint history section showing previously resolved cases.

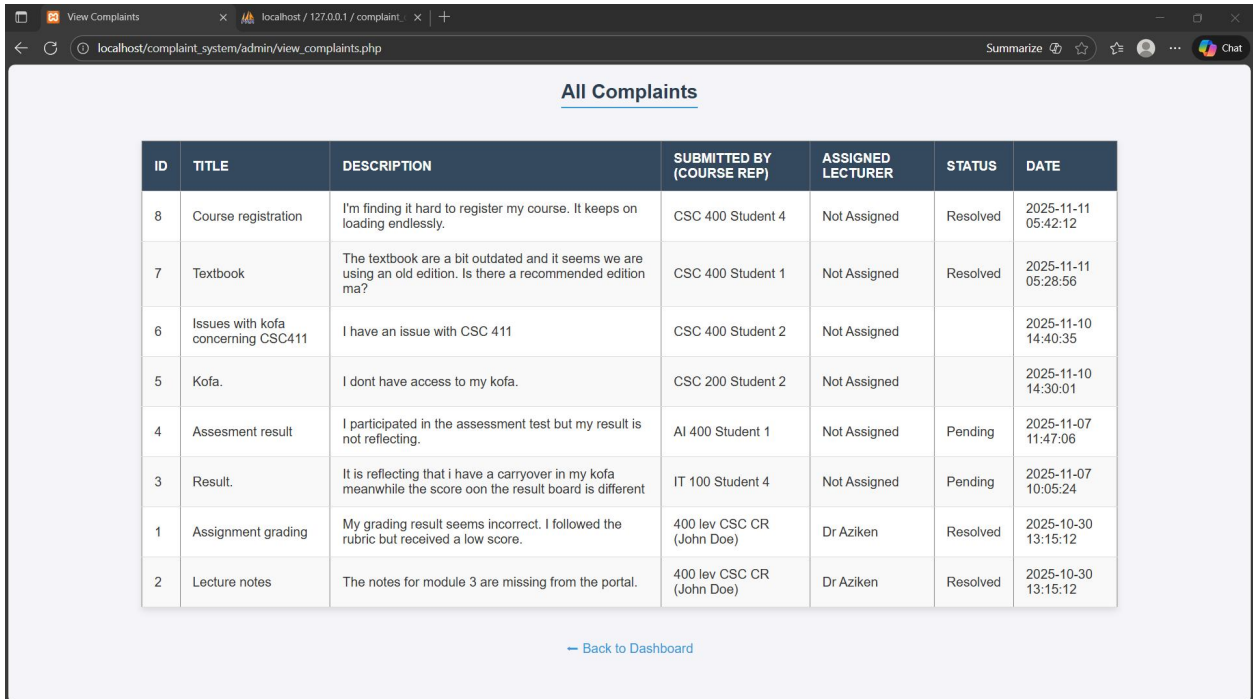
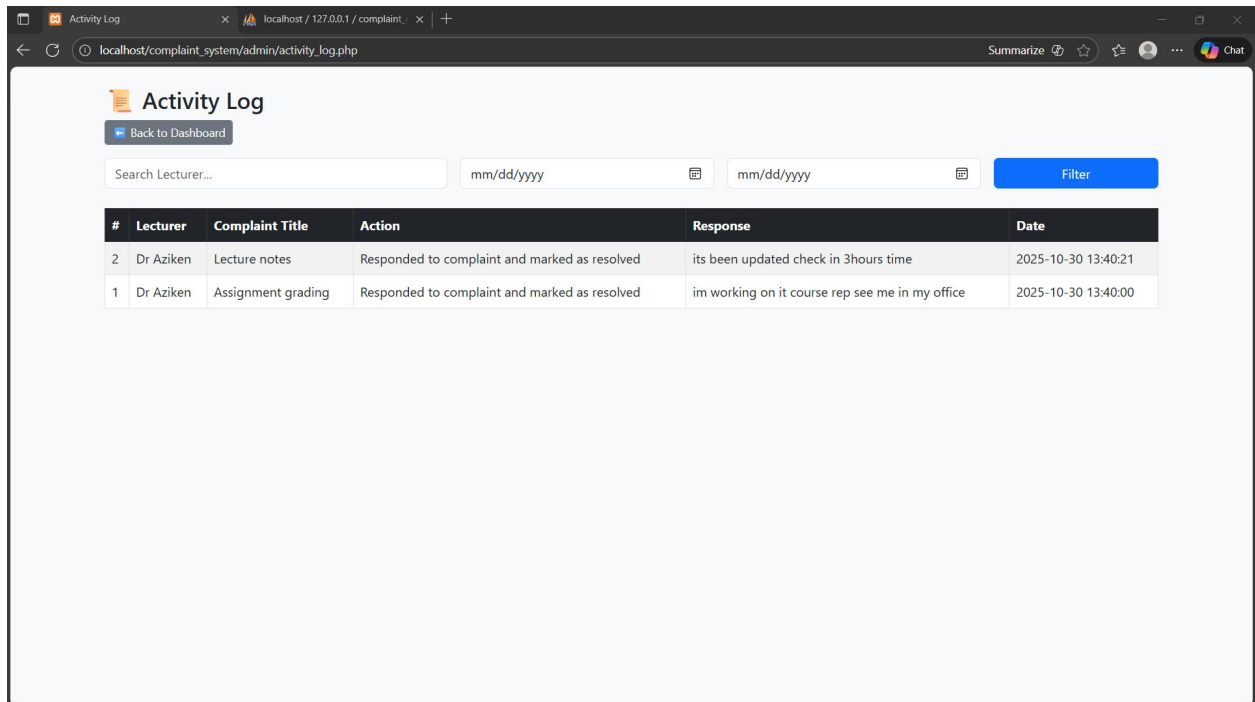


Figure 4. 4 : All Complaints View with Filtering Options

Complaint Management (Admin View)

The admin can view all complaints on a table with filters for department, level, status, date and priority. Each complaint includes options for viewing full details or reassigning them to a lecturer. Detailed views show complaint description, submission timestamp, lecturer response and timeline of updates.



The screenshot displays the 'Activity Log' interface in a web browser. It features a search bar for lecturers and two date filters. Below the filters is a table with the following data:

#	Lecturer	Complaint Title	Action	Response	Date
2	Dr Aziken	Lecture notes	Responded to complaint and marked as resolved	its been updated check in 3hours time	2025-10-30 13:40:21
1	Dr Aziken	Assignment grading	Responded to complaint and marked as resolved	im working on it course rep see me in my office	2025-10-30 13:40:00

Figure 4. 5 : System Activity Log Interface

4.1.4.3 Activity log Interface

Provides a detailed audit trail of user actions including timestamps, user role and type of action. This supports transparency and accountability.

4.2 SYSTEM INTERFACES (SCREENSHOTS)

This section presents the graphical user interfaces of the Faculty Complaint Management System. Each interface is designed with user experience in mind, featuring clean layouts, intuitive navigation, and responsive design that adapts to various screen sizes. The interfaces

are built using Bootstrap 5 framework, ensuring consistency and modern aesthetic throughout the application.

4.2.1 Admin Dashboard

The admin dashboard serves as the central command center for system administrators. It provides comprehensive oversight of all system activities through visually appealing metric cards and interactive elements.

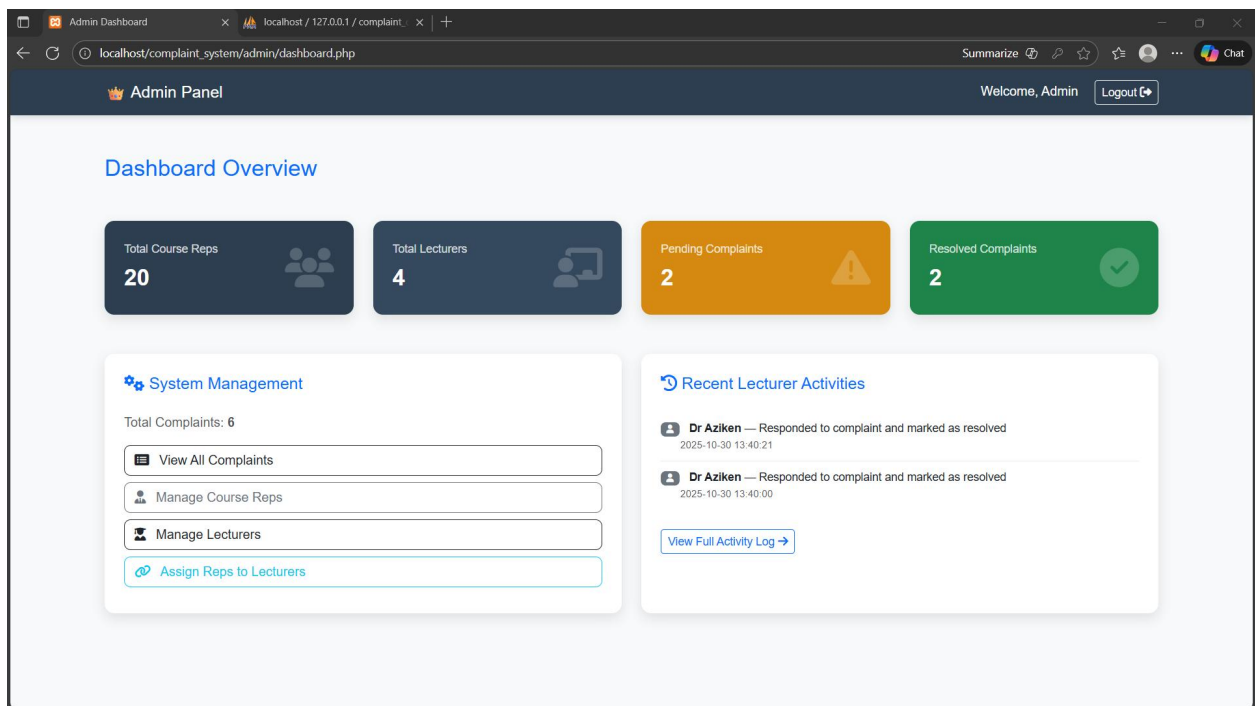


Figure 4. 13 ; Admin Dashboard Interface Showing System Metrics and Quick Action Buttons

4.2.2 Course Rep Dashboard

The course representative dashboard offers a personalized view of the user's complaint submission history and current status of issues they've raised on behalf of their classmates.

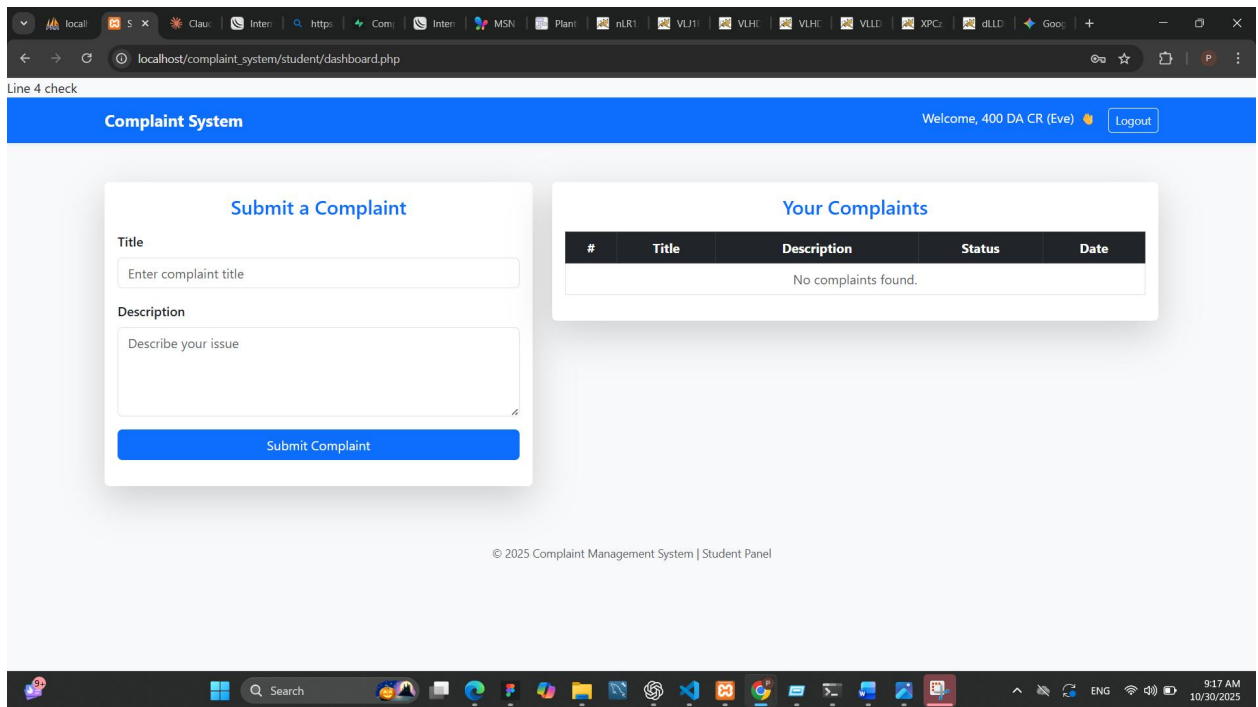


Figure 4. 14 : Course Representative Dashboard

4.2.3 Lecturer Dashboard

The lecturer dashboard provides faculty members with an organized view of all complaints assigned to them, enabling efficient prioritization and response.

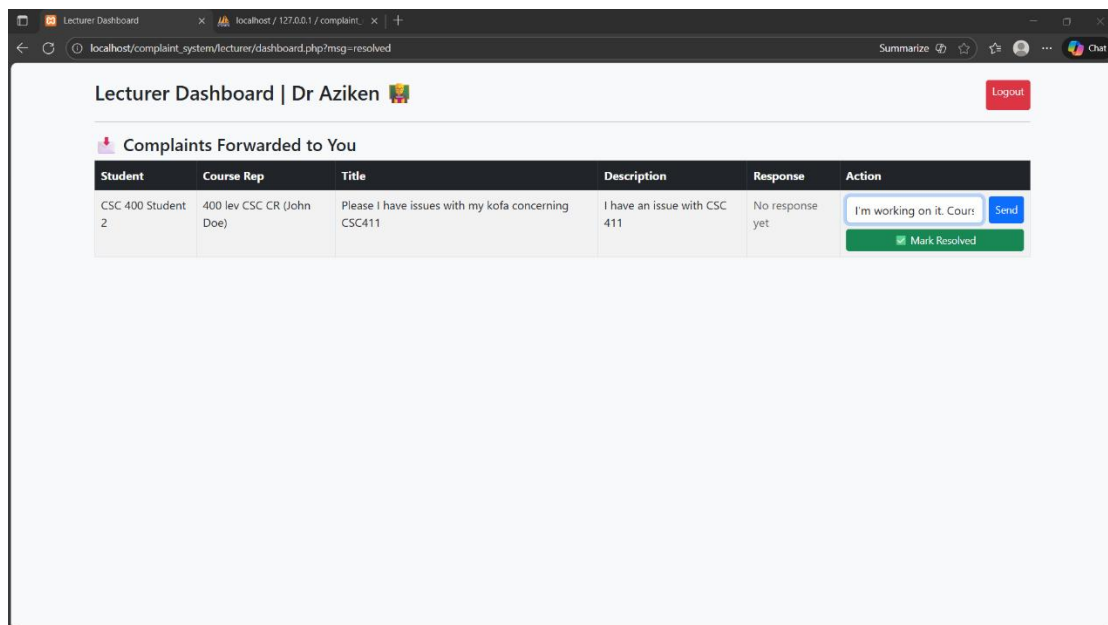
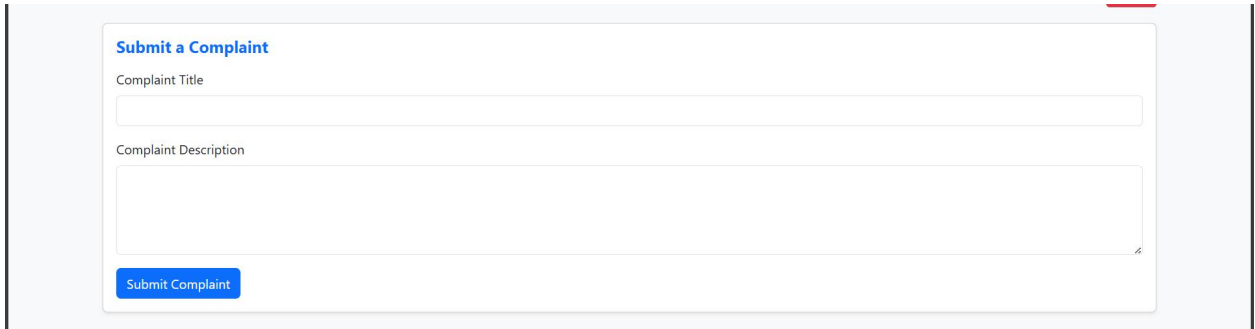


Figure 4. 15 : Lecturer Dashboard Displaying Assigned Complaints and Performance Metrics

4.2.4 Complaint Submission Interface

This interface allows course representatives to submit new complaints with all necessary details through a user-friendly form with built-in validation.

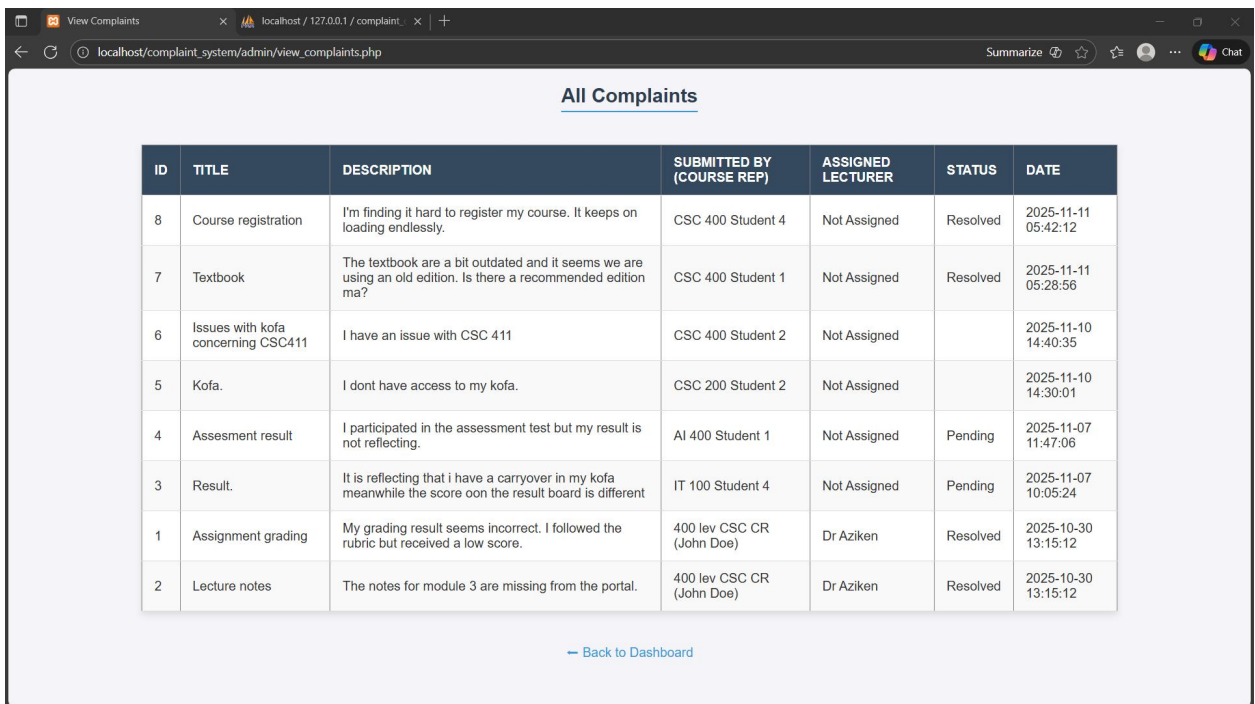


The screenshot shows a web form titled "Submit a Complaint". It contains two text input fields: "Complaint Title" and "Complaint Description". Below the description field is a blue button labeled "Submit Complaint".

Figure 4. 16 : Complaint Submission Form with Category and Priority Selection

4.2.5 Complaint Management Interface (Admin)

The admin complaint management interface provides powerful tools for overseeing all complaints, including filtering, sorting, and assignment capabilities.



The screenshot shows a web browser window displaying the "All Complaints" page. The page features a table with the following data:

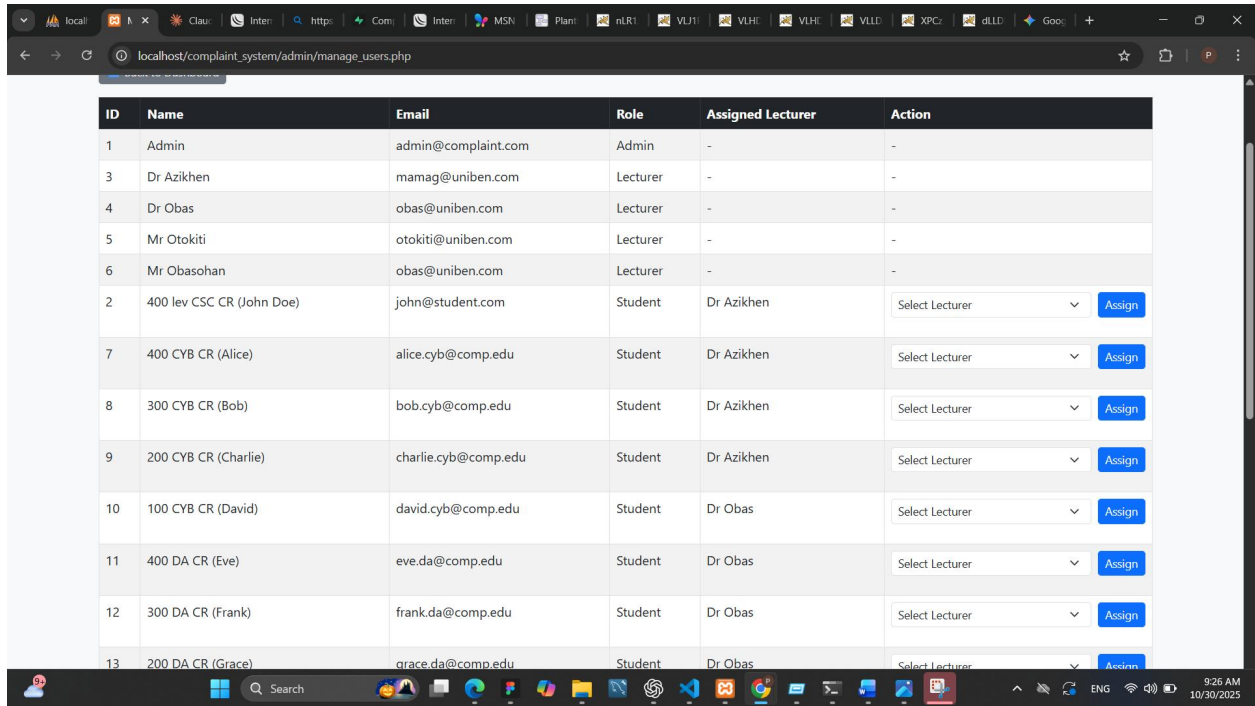
ID	TITLE	DESCRIPTION	SUBMITTED BY (COURSE REP)	ASSIGNED LECTURER	STATUS	DATE
8	Course registration	I'm finding it hard to register my course. It keeps on loading endlessly.	CSC 400 Student 4	Not Assigned	Resolved	2025-11-11 05:42:12
7	Textbook	The textbook are a bit outdated and it seems we are using an old edition. Is there a recommended edition ma?	CSC 400 Student 1	Not Assigned	Resolved	2025-11-11 05:28:56
6	Issues with kofa concerning CSC411	I have an issue with CSC 411	CSC 400 Student 2	Not Assigned		2025-11-10 14:40:35
5	Kofa.	I dont have access to my kofa.	CSC 200 Student 2	Not Assigned		2025-11-10 14:30:01
4	Assesment result	I participated in the assessment test but my result is not reflecting.	AI 400 Student 1	Not Assigned	Pending	2025-11-07 11:47:06
3	Result.	It is reflecting that i have a carryover in my kofa meanwhile the score oon the result board is different	IT 100 Student 4	Not Assigned	Pending	2025-11-07 10:05:24
1	Assignment grading	My grading result seems incorrect. I followed the rubric but received a low score.	400 lev CSC CR (John Doe)	Dr Aziken	Resolved	2025-10-30 13:15:12
2	Lecture notes	The notes for module 3 are missing from the portal.	400 lev CSC CR (John Doe)	Dr Aziken	Resolved	2025-10-30 13:15:12

At the bottom of the table, there is a link: [← Back to Dashboard](#)

Figure 4. 17 : Admin View of All Complaints

4.2.6 User Management Interface

This comprehensive interface allows administrators to view, edit, and manage all user accounts across the three roles: admin, lecturers, and course representatives.



ID	Name	Email	Role	Assigned Lecturer	Action
1	Admin	admin@complaint.com	Admin	-	-
3	Dr Azikhen	mamag@uniben.com	Lecturer	-	-
4	Dr Obas	obas@uniben.com	Lecturer	-	-
5	Mr Otokiti	otokiti@uniben.com	Lecturer	-	-
6	Mr Obasohan	obas@uniben.com	Lecturer	-	-
2	400 lev CSC CR (John Doe)	john@student.com	Student	Dr Azikhen	Select Lecturer <input type="button" value="Assign"/>
7	400 CYB CR (Alice)	alice.cyb@comp.edu	Student	Dr Azikhen	Select Lecturer <input type="button" value="Assign"/>
8	300 CYB CR (Bob)	bob.cyb@comp.edu	Student	Dr Azikhen	Select Lecturer <input type="button" value="Assign"/>
9	200 CYB CR (Charlie)	charlie.cyb@comp.edu	Student	Dr Azikhen	Select Lecturer <input type="button" value="Assign"/>
10	100 CYB CR (David)	david.cyb@comp.edu	Student	Dr Obas	Select Lecturer <input type="button" value="Assign"/>
11	400 DA CR (Eve)	eve.da@comp.edu	Student	Dr Obas	Select Lecturer <input type="button" value="Assign"/>
12	300 DA CR (Frank)	frank.da@comp.edu	Student	Dr Obas	Select Lecturer <input type="button" value="Assign"/>
13	200 DA CR (Grace)	grace.da@comp.edu	Student	Dr Obas	Select Lecturer <input type="button" value="Assign"/>

Figure 4. 18 : User Management Table with Role-Based Filtering and Action Buttons

4.2.7 Lecturer Assignment Interface

This interface enables administrators to assign lecturers to specific departments, ensuring complaints are routed to the appropriate faculty members.

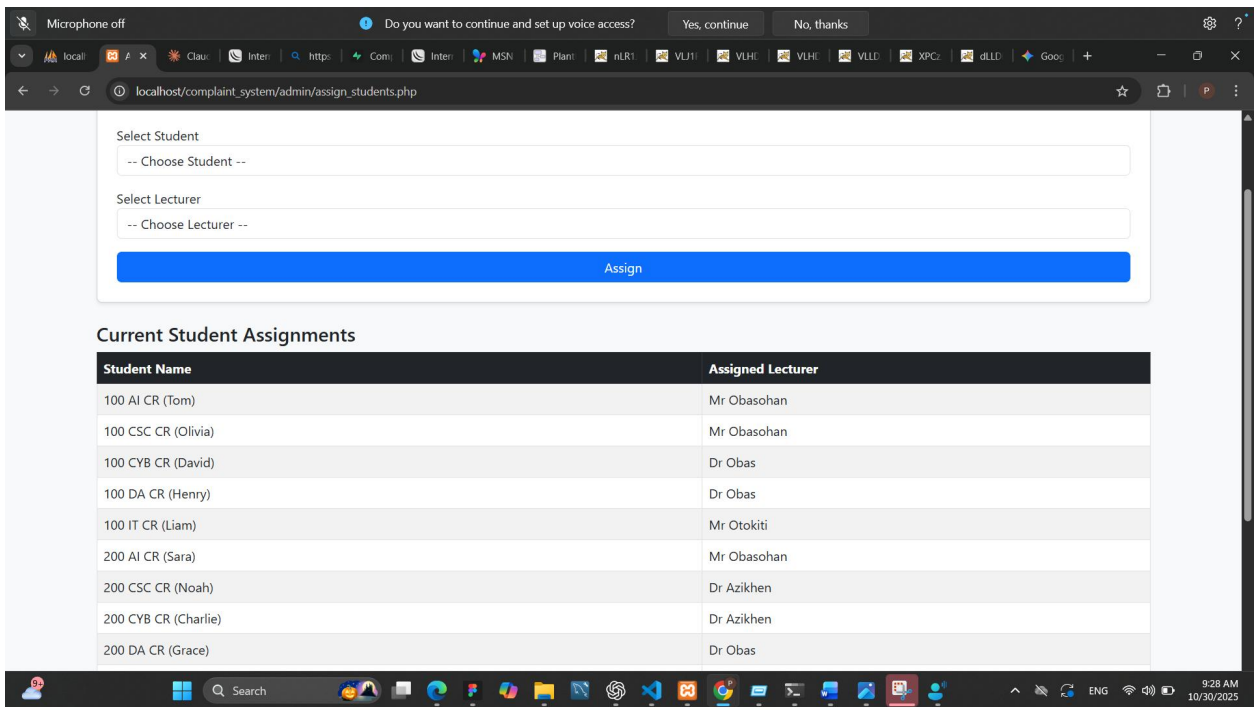


Figure 4. 19 : Lecturer-Department Assignment Management Page

4.2.8 Activity Log Interface

The activity log provides a detailed audit trail of all system actions, crucial for security monitoring and accountability.

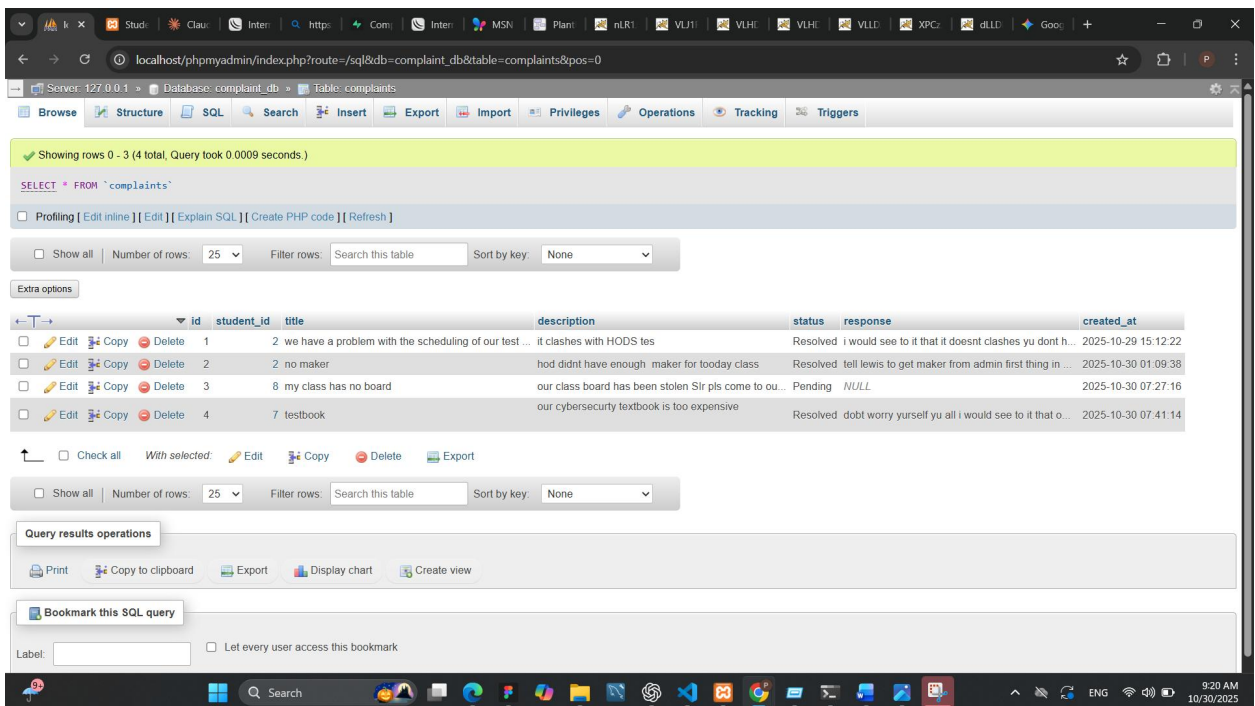


Figure 4. 20 : System Activity Log Showing Timestamped User Actions(from database)

4.3 SYSTEM TESTING

System testing confirmed that the system performs according to requirements. Tests verified functionality, performance, security and usability.

4.3.1 Testing Methodology

Testing included both manual and automated checks. Manual testing verified navigation, user interface behavior and interactions. Automated scripts tested repeated operations and database consistency. Testing used sample data representing multiple departments, lecturers, course representatives and complaints.

4.3.2 Unit Testing

Verified individual functions such as authentication, input validation and database operations. Issues found during unit testing were fixed immediately.

4.3.3 Integration Testing

Ensured that modules interact correctly. Complaint submission, assignment and lecturer response processes were tested end-to-end. Issues such as notification synchronization and permission checks were resolved.

4.3.4 System Testing

Evaluated overall functionality from the user perspective. The system responded well under multiple sessions. Security tests confirmed that SQL injections, unauthorized access and cross-site scripting attempts were blocked. Session management worked correctly.

4.3.5 User Acceptance Testing (UAT)

Real users tested typical tasks such as submitting complaints and responding to them. All users confirmed that the system was easy to use and met their needs. Recommendations for future improvements were noted.

4.4 SYSTEM DEPLOYMENT

4.4.1 Deployment Process

Deployment involved preparing the server environment, configuring database credentials and uploading the system files. The database schema was imported into the production server. Initial user accounts were created, and the system was reviewed to ensure all modules functioned correctly.

4.4.2 System Requirements

Deployment requires a server with Apache, PHP and MySQL support. Clients require a modern browser with JavaScript enabled. A stable network connection ensures proper communication between users and the server.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary, conclusions and recommendations arising from the development of the Faculty Complaint Management System. It reflects on the key stages of the project, evaluates the extent to which the system met its objectives, identifies challenges encountered, and suggests future enhancements and institutional strategies for broader adoption.

5.1 Summary of the Study

The project addressed the inefficiencies of the former manual complaint handling process used in many tertiary institutions, where complaints were often communicated through informal and fragmented channels. This resulted in delayed responses, lack of accountability, weak documentation, and difficulty in monitoring complaint trends.

A web-based solution was therefore designed and implemented to centralize complaint submission, routing, tracking and resolution. The system was developed using a three-tier architecture with PHP for server-side logic, MySQL for database management, and Bootstrap for a responsive user interface. The system includes separate modules for the administrator, lecturers, and course representatives, each with role-based access to relevant functionalities.

Testing confirmed that the system successfully meets all functional and non-functional requirements. Complaint submission, assignment, response tracking, reporting, notification, and activity logging all performed reliably. User acceptance testing demonstrated that the system is easy to use and provides significant improvement in transparency and turnaround time.

Overall, the system achieved the goal of providing a structured, accountable and efficient mechanism for handling academic complaints.

5.2 Conclusion

The development of the Faculty Complaint Management System demonstrates that digital automation can significantly improve administrative efficiency and service delivery in educational institutions. By centralizing complaint management, the system promotes transparency, reduces delays, enhances accountability, and strengthens communication between students, lecturers, and administrative staff.

The user-centered approach adopted during design resulted in an interface that is intuitive and accessible, contributing to strong user acceptance. The use of open-source tools ensured that the system is affordable to deploy and maintain, especially in resource-constrained institutions. Security considerations such as password hashing, prepared statements, role-based access control and session management ensured that complaint data remains protected.

In conclusion, the system successfully resolves the limitations of the manual complaint-handling process and provides a foundation that can be expanded with additional features in the future.

5.3 Challenges Encountered

The project faced several challenges including managing time constraints, designing an efficient relational database, ensuring system security while maintaining usability, and achieving consistent appearance across different browsers. Generating realistic test data, configuring session handling, optimizing database performance, and balancing documentation detail also required careful attention. These challenges were resolved through iterative testing, research, and structured development practices, contributing to a more robust final system.

5.4 Recommendations

5.4.1 System Enhancement Recommendations

Future versions of the system should consider:

- Implementation of email or SMS notifications for real-time alerts.
- Support for file attachments to provide evidence alongside complaints.
- More advanced search, reporting and analytics features.
- Real-time dashboard updates and push notifications.
- Development of a mobile application for improved accessibility.
- Inclusion of automated complaint escalation rules based on duration or priority.
- Integration with institutional systems such as LMS or student records portals.

5.4.2 Recommendations for Institutional Deployment

For successful adoption, institutions should:

Deploy the system in phases starting with pilot departments.

Conduct training sessions for all user groups.

Establish clear policies for complaint timelines and escalation.

Assign a system administrator to manage upkeep and support.

Perform routine maintenance and data backups.

Collect ongoing user feedback to guide incremental improvements.

5.4.3 Recommendations for Future Research

Further research may explore the use of AI for automated complaint categorization, mobile-first interface optimization, comparative studies across different institutions, scalability models for large universities, and data privacy frameworks for sensitive educational records.

5.5 Contributions to Knowledge

The project contributes to academic and practical knowledge by demonstrating how complaint management workflows can be digitally transformed in Nigerian tertiary institutions. It provides reusable system architecture, a tested database schema, role-based access implementation patterns, and structured documentation and testing templates that can serve as references for future system development projects.

5.6 Final Remarks

The Faculty Complaint Management System successfully improves transparency, accountability and efficiency in complaint handling within the academic environment. Beyond solving a specific administrative challenge, the project illustrates how appropriate use of technology can enhance communication, strengthen institutional trust, and support data-driven decision making. The system provides a strong foundation for continued enhancement and broader institutional deployment.

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