

Automated Final Year Online Clearance System: A Case Study of a University.

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Abstract- *The process of obtaining final clearance is a critical requirement for university graduates before leaving their institutions. However, manual clearance processes are often characterized by inefficiencies, delays, and errors, causing frustration for both students and administrative staff. This study focuses on the development of an online final clearance system for university graduates, designed to streamline the clearance process, reduce paperwork, and enhance user experience. The system incorporates features such as automated document verification, progress tracking, and multi-departmental integration to ensure a seamless clearance process. The system was developed using a combination of systems, including flutter, firebase, and MySQL, and follows a structured software development methodology to meet user requirements effectively. The online clearance system aims to provide a reliable and efficient platform that benefits graduates by saving time, reducing stress, and promoting institutional efficiency. By leveraging technology, this study contributes to enhancing administrative processes in higher education institution.*

Index Terms- *Online, Clearance, Automation, Institution.*

I. INTRODUCTION

In recent years, the rapid advancement of technology has transformed various sectors, including education. Higher education institutions worldwide are increasingly adopting digital systems to streamline administrative processes, improve service delivery, and enhance student and staff user experiences (Alenezi, 2023). One major area of university administration that requires modernization is the

student clearance process. Student clearance is a procedure undertaken by graduates to ensure they have fulfilled all institutional requirements, such as returning library books, settling tuition fees, and returning equipment before they are issued their certificates. Traditionally, this clearance process is manual, involving physical documentation and in-person verification across multiple university departments. However, this manual approach has several limitations, including inefficiencies, lengthy processing times, and a high risk of human error.

Bamidele Olumilua University of Education, Science and Technology, Ikere-Ekiti (BOUESTI), like many institutions, relies on a manual clearance system that demands considerable time and effort from students and administrative staff. Students are often required to visit different departments to secure clearances, a process that can become tedious and frustrating, especially during peak times such as graduation. For University staff, the manual system creates additional administrative burdens, including the need to track and verify clearances manually, often resulting in delays and frustration on the part of the students. This inefficiency and lack of transparency in the current system have highlighted the need for an alternative approach that leverages technology to improve the student clearance experience.

An online student clearance system offers a promising solution to these challenges. By digitalizing the clearance process, universities can provide a streamlined, accessible, and efficient system for students to complete their clearance requirements online seamlessly (Essel et. Al., 2023). An online system allows students to initiate, track, and complete the clearance process remotely, thus reducing the need for physical visits to the University

Offices. Additionally, it enhances transparency by providing real-time updates on each stage of the clearance process. Administrative staff also benefit from such a system, as it automates record-keeping and reduces the likelihood of verification errors (Ibiyomi, Ajinaja & Akeem 2024).

The system integrates the clearance processes of various departments into a centralized platform, allowing staff to manage all clearance-related tasks in one place. The system supports different user roles, such as students, departmental staff, and university administrators, each with specific access rights to ensure security and privacy. Ultimately, the online clearance system aims to improve the efficiency, transparency, and overall effectiveness of the student clearance process, aligning with the university's goal of adopting digital solutions to enhance administrative functions and improve the student experience.

In universities, the student clearance process is managed through a manual, paper-based system, which has proven to be wasteful, time-consuming, and prone to human errors. Meanwhile, the majority of final year student travel after their final exams, as some do not want to renew already lapsed house rents or incur extra expenses; therefore, waiting behind for clearance from one office to another is burdensome. The traditional method of clearance, which is manual, requires students to visit multiple departments in person, often leading to delays due to long queues, misplaced documents, and inconsistent communication between departments. This process is frustrating and exhausting, particularly during peak clearance periods, when the number of final-year students increases.

The manual clearance system burdens students and places a considerable workload on university staff, who must manually verify each student's records, check clearances, and maintain accurate documentation. This approach increases the likelihood of human error and reduces the efficiency of the clearance process. Additionally, because the current system lacks real-time tracking, students are often left in the dark regarding their clearance status, leading to repeated visits to university offices to inquire about progress (Tamim et al., 2021). This

leads to inefficiency and further diminishes student satisfaction and creates additional administrative burdens for staff.

The digital age and increasing use of technology, where automation and online systems are transforming administrative practices across the education sector, make the manual clearance process at universities inefficient and outdated. There is an urgent need for a streamlined, centralized, and user-friendly online clearance system that allows students to complete the clearance process remotely, track their progress in real time, and receive timely notifications regarding pending obligations (Essel et al., 2023). Such a system would not only alleviate the frustrations associated with the current manual process but also increase administrative efficiency by automating record-keeping, minimizing human error, and reducing workload for staff.

II. LITERATURE REVIEW

An online clearance system is a web-based platform designed to streamline the process of student clearance within a university or educational institution. It enables students to complete their clearance requirements electronically, without needing to physically visit different university departments (Jibril & Umar, 2021). The system typically integrates various departmental processes, such as fee payments, library book returns, academic approvals, and any other obligations that must be met before graduation (Murtala, 2022).

Obikoya (2023) argued that online clearance systems improve efficiency by reducing paperwork, eliminating bottlenecks caused by manual processing, and speeding up the clearance process. For students, the system offers greater convenience, allowing them to complete the process from any location, at any time, and ensuring transparency throughout. For administrative staff, it simplifies record-keeping, reduces the risk of errors, and makes it easier to track progress and generate reports (Olawale, 2020).

III. CHALLENGES OF TRADITIONAL CLEARANCE SYSTEMS

Traditional student clearance systems, which involve manual processes for clearing students of all their institutional obligations before graduation, have long been the standard in many universities. While these systems have been effective to some extent, they come with several significant challenges that hinder efficiency and student satisfaction (Akinwale 2021). These challenges are particularly evident in universities where large numbers of students must undergo clearance at the same time, such as during graduation periods. Below are some of the key challenges associated with traditional clearance systems:

i. **Time-Consuming and Cumbersome Process:** One of the most significant challenges of traditional clearance systems is the sheer amount of time they require. The process often involves students physically visiting various departments, such as the library, finance, and academic affairs, where they must obtain stamps, signatures, or confirmations to indicate that they have fulfilled their obligations. This manual process can be extremely time-consuming, especially when many students are attempting to clear their records at the same time, such as at the end of an academic semester or before graduation. The delays caused by long queues, departmental bottlenecks, and administrative inefficiencies lead to frustration among students and staff alike (Adeniran, 2020).

ii. **Manual Record-Keeping and Errors:** In traditional clearance systems, records of clearance activities are often kept manually, in physical files or spreadsheets, making them prone to human error. Missing documents, misplaced records, or incorrect information can result in delays, confusion, or even cases of students being unfairly denied clearance. These errors can lead to significant administrative inefficiencies and ultimately impact the overall student experience (Murtala, 2022).

Lack of Real-Time Updates and Transparency: Another challenge with traditional clearance systems is the lack of real-time updates. Students typically have no way of knowing whether their clearance

process is progressing smoothly, and they may not be informed about which department or requirement is causing delays. This lack of transparency leads to uncertainty, as students often don't know the exact status of their clearance or when it will be completed. In some cases, students may spend days or even weeks waiting to resolve issues without being informed of where the problems lie, leading to stress and dissatisfaction (Olawale, 2020).

iii. **Increased Administrative Burden:** The manual nature of traditional clearance systems places a heavy administrative burden on university staff. Staff members must devote significant time to managing paper records, coordinating between departments, and handling student inquiries. This can divert attention from other critical tasks and increase the likelihood of errors or delays.

iv. **Vulnerability to Fraud and Misuse:** Traditional clearance systems, especially those that involve paper-based processes, are more susceptible to fraud and misuse. For example, students may forge documents or manipulate records to gain clearance unfairly, bypassing institutional requirements. The absence of secure digital records or authentication processes makes it difficult to verify the legitimacy of clearances. This vulnerability to fraud can compromise the integrity of the clearance system, undermine trust in the process, and potentially affect the university's reputation (Abdullahi, 2019).

Importance of Digital Transformation in Universities
Digital transformation has become a critical aspect of modernization within higher education institutions worldwide. As technology continues to evolve at a rapid pace, universities must adapt to these changes to stay competitive, relevant, and efficient. The importance of digital transformation in universities lies not only in its ability to streamline administrative processes but also in its potential to enhance teaching and learning, improve student engagement, and facilitate data-driven decision-making.

Enhancing Operational Efficiency: One of the primary benefits of digital transformation in universities is the enhancement of operational efficiency. Traditional manual processes, such as student registration, grading, and clearance, are often

time-consuming, prone to human error, and labor-intensive. By implementing digital systems, universities can automate many of these processes, reducing administrative workloads and speeding up the completion of tasks. For instance, an online student clearance system can replace the outdated, paper-based process, allowing students to manage their clearance requirements remotely and track their progress in real time. This not only reduces the time spent on administrative tasks but also improves the accuracy and consistency of records, which is vital for both students and staff (Adeniran, 2020).

Improving Student Experience: Digital transformation significantly enhances the student experience by offering greater flexibility, accessibility, and convenience. Students today expect to access services, information, and resources digitally, just as they would in other areas of life. By embracing technology, universities can provide students with easy access to online portals for registration, course materials, grades, and clearance processes. The ability to complete tasks like submitting assignments, paying fees, and completing clearance requirements online reduces the need for physical visits to campus offices, making processes more efficient and user-friendly (Ibrahim & Sulaimon, 2021). Furthermore, digital platforms enable universities to offer personalized learning experiences, such as adaptive learning technologies, which cater to individual student needs and progress at their own pace.

Facilitating Data-Driven Decision Making: Digital transformation enables universities to collect, analyze, and leverage data for better decision-making. Through the use of integrated systems and data analytics, universities can gain valuable insights into student performance, retention rates, and operational effectiveness. These insights can inform strategic decisions related to curriculum development, resource allocation, and student support services. For instance, data collected through an online clearance system can help identify areas where students face challenges in completing the clearance process, allowing for targeted improvements in the system or workflow (Murtala, 2022). Data-driven decision-making also allows universities to

proactively address issues, predict trends, and improve long-term planning.

Fostering Innovation and Research: Digital transformation encourages a culture of innovation within universities. With advanced technologies such as artificial intelligence (AI), machine learning, and cloud computing, universities can enhance their research capabilities and collaborate globally. For example, online research platforms, data-sharing tools, and digital libraries provide students and faculty with the resources they need to engage in cutting-edge research. Additionally, online collaboration tools facilitate seamless communication and cooperation among students, researchers, and faculty members across different locations and disciplines, fostering a more dynamic and inclusive research environment (Lindsey, 2019).

IV. METHODOLOGY

The Agile development methodology was chosen for this research. Agile emphasizes iterative development, where requirements and solutions evolve through close collaboration between the development team and stakeholders. The e-clearance portal is based on a client-server architecture. It employs Flutter for cross-platform frontend development (mobile, web, and desktop) and SQL-based database management for the backend services, such as authentication, data storage, and hosting.

The main components of the architecture include:

1. **Frontend:** The user interface, built with Flutter, provides a seamless user experience for students and clearance officers.
2. **Backend:** SQL handles user authentication, data storage, and clearance processing logic.
3. **Database:** SQL relational database manages user profiles, clearance requests, and system configurations.
4. **Users:**
 - **Students:** Submit clearance requests and track approval progress.
 - **Clearance Officers:** Verify and approve clearance requests at designated levels.

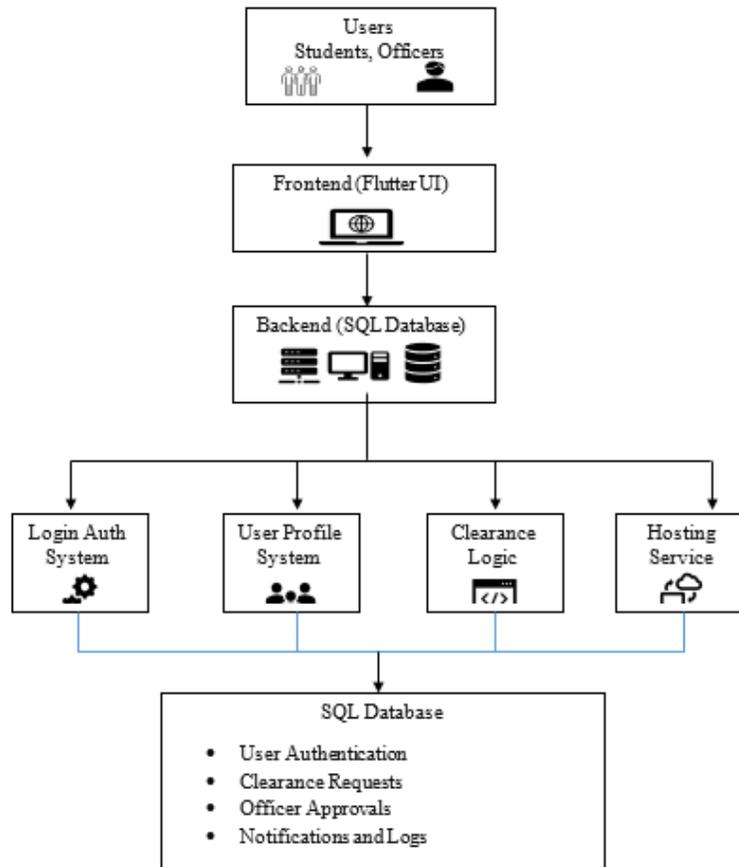


Figure 1: System Architecture

V. RESULT AND DISCUSSION

Interface Screens

User interface design is the design of computers, appliances, software applications, and websites with a focus on the user’s experience and interaction. The goal in designing a user interface is to make a great interaction between the user and the system in term of efficiency, user-friendly, compatible of the system with target users. The interfaces should be understandable and easier to use with a proper arrangement of system flow.

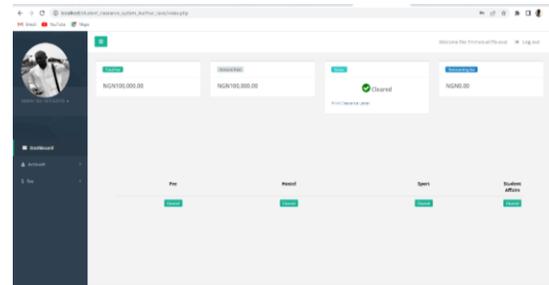


Figure 2: Interface of an online clearance system

LOGIN/REGISTRATION SCREEN

In other to gain access to this system, the users need to register or login (if they already registered) to the system.

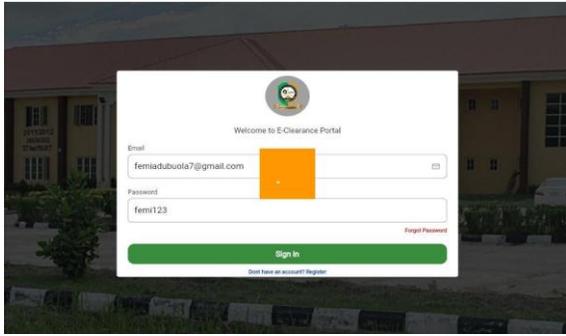


Figure 3: Login/Registration Screen

USER REGISTRATION SCREEN

This is where new users on the website register for the clearance process, and it is where the confirmation of being a student or not occurs.

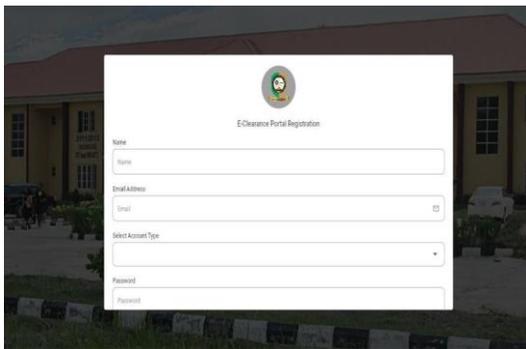


Figure 4: User Registration Screen

CLEARANCE REGISTRATION SCREEN

This is the page where the user enters their academic data and also inputs all documents to be approved by each department.

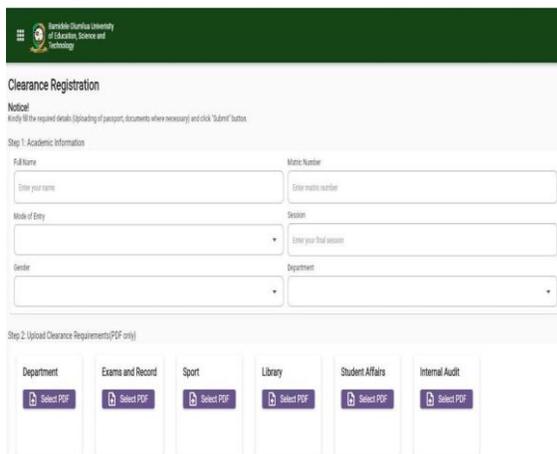


Figure 5: Clearance Registration Screen

CLEARANCE REPORT SCREEN

This page contains the status of each document submitted for approval. Once the document is approved, a green tick appears instead of the red icon in the image below.

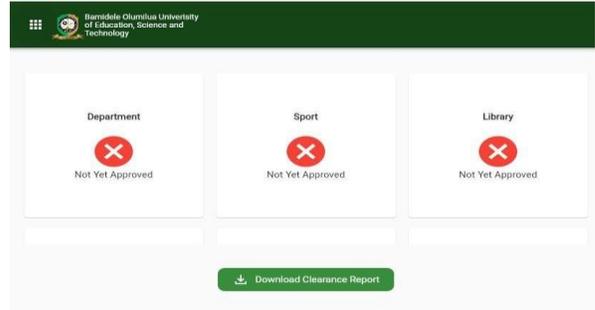


Figure 6: Clearance Report Screen

ADMIN MANAGEMENT SCREEN

This is where each admin of each department finds the students that have applied and submitted a document for clearance. There is a search bar to navigate quickly and there are sections for new applications, completed documents and rejected documents.

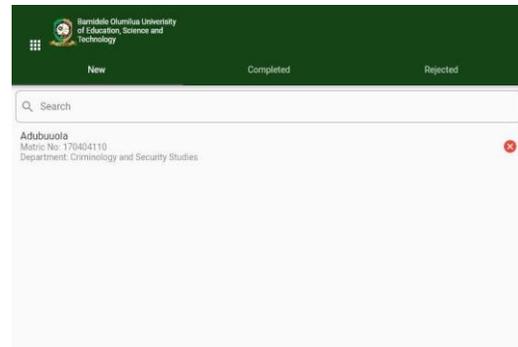


Figure 7: Admin Management Screen

ADMIN APPROVAL SCREEN

This is the page where the admin can either approve or reject a document that has been submitted.



Figure 8: Admin Approval Screen

CLEARANCE FORM REPORT

This is a pdf document generated after the successful completion of the clearance exercise, and it is generated when all the departments have approved each of the document submitted respectively. An email is sent to the student to notify the approval of all the submitted documents and the student is prompted to print the clearance form.

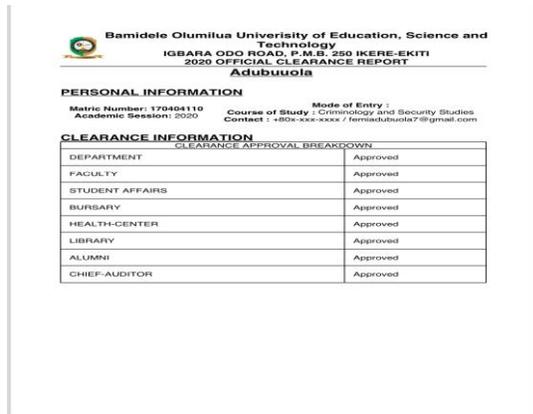


Figure 9: Clearance Form Report

The system used the program languages Dart and Flutter for the frontend, enabling the development of a highly responsive and intuitive user interface. Flutter’s cross-platform capabilities ensure that the system can be accessed seamlessly across devices, providing users with a flexible and efficient experience. For the backend, MySQL serves as the primary database, offering robust and structured data storage, while Firebase is utilized for real-time data synchronization, authentication, and secure communication. This guarantees a reliable, scalable, and efficient system architecture.

Key features of the platform include a user-friendly dashboard that facilitates interactions between graduates and various institutional departments such as the library, finance, faculty, and clearance officers. Graduates can log in securely, upload required documents, and monitor the status of their clearance in real-time. The system integrates automated notifications to keep students informed of pending or completed tasks, eliminating unnecessary delays caused by manual follow-ups. Furthermore, administrative staff can also log in as admin to manage and verify student records efficiently,

reducing the likelihood of errors and duplication of effort.

Beyond automation, the system enhances transparency by maintaining a digital log of all clearance activities. This ensures accountability at every stage of the process and provides administrators with analytics to identify errors and improve workflows. Additionally, the platform’s paperless approach aligns with sustainability goals by minimizing physical documentation and reducing the institution’s environmental footprint.

CONCLUSION

In conclusion, the development of an online final clearance system for university graduates successfully addresses the longstanding inefficiencies of the traditional clearance process in higher education institutions. The research delivers a seamless, efficient, and scalable solution that simplifies the clearance process for both graduates and administrative staff. The system’s features, such as real-time status updates, automated notifications, secure authentication, and document uploads, enhance user experience, reduce administrative errors, and foster transparency and accountability within the institution. The online final clearance system represents a significant step forward in bridging the gap between traditional practices and digital innovation in higher education.

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