Design and Implementation of a Mobile Application for Real-Time Monitoring and Evaluation of Undergraduate IT Internship Programs

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ABSTRACT
IT placement has been an issue for Penultimate Undergraduate students, they find it challenging getting a placement for their Industrial Training as they need to apply physically to some organizations. That is why this project is developing a mobile application for Undergraduate students using react native as the framework and JavaScript as the programming language. This project will help students ease the stress of physical application to organizations of their choice for Internship. Undergraduate Students can apply from the comfort of their homes for Placement. The mobile application has three users (Student, Organization and Institution supervisor). Each user must have an account, students can upload daily activities and supervisors can comment on their weekly report for students while Institution supervisor can only access and monitor the reports. The study recommends to all universities in Nigeria and companies willing to take interns, they should implement the usage of this mobile application as a way of easing the stress students go through in securing IT placement.

General Terms
Mobile Application Development, Industrial Training, Internship Management, Student Placement, Assessment Systems, Cybersecurity Education, Student Monitoring

Keywords
Mobile application, IT placement,Undergraduate students, Javascript, React native

1. INTRODUCTION
The Students' Industrial Work Experience Scheme (SIWES) is a vital component of tertiary education in Nigeria, whose objective is to expose students to industrial experience before graduation, in a bid to bridge the gap between theory and practice. Through the combination of academic training and professional practice, SIWES attempts to produce balanced graduates who are endowed with technical as well as practical competencies. [1]

Despite its significance, students typically struggle to secure suitable placements due to inefficient and outdated processes. Traditional methods, such as manually calling companies or relying on limited school-affiliated employment, are time-consuming and lack any formal system for matching students with relevant industries. Bureaucratic delays, lack of transparency, and poor communication between institutions, students, and employers also contribute to these challenges, leading to subpar learning experiences. [2]

The advancement of mobile and web-based technologies presents an opportunity to modernize the SIWES placement process. A computerized system founded on mobile apps, web portals, and intelligent algorithms has the potential to provide an efficient, user-friendly, and automated system for students to search for, apply for, and secure internships. The system has the capacity to automate administrative tasks, enhance transparency, and enhance the overall effectiveness of the SIWES program.

One of the driving forces for developing an e-SIWES placement portal is the inefficiency of the traditional system. Limited access to information is a major issue, where students rely on word-of-mouth recommendations or out-of-date university databases that do not provide comprehensive internship listings. Administrative bottlenecks also delay the placement process as approvals must go through multiple tiers of verification, which lengthens the time it takes for students to receive placements. Besides, the lack of structured placement mechanisms results in students being placed in organizations not relevant to their area of study, diminishing the quality of their industrial training.

The manual and inefficiency of the application process is also a significant challenge. Students are required to submit paper-based applications or send multiple emails to prospective employers, which is time-wasting and indefinite. Besides, monitoring and evaluating student performance during SIWES remains cumbersome, as traditional methods lack real-time supervision, systematic feedback mechanisms, and electronic evaluation tools.[3]

With Nigeria increasingly adopting mobile and web technologies, a comprehensive digital SIWES placement platform can significantly increase access, efficiency, and synergy among industries and students. By combining the capabilities of secure, AI-powered, and user-friendly features, the platform has the potential to eliminate inefficiencies of the manual platform, ensuring a more seamless, transparent, and productive SIWES experience for all stakeholders.

The objective of this study is to design a mobile application that assists penultimate students in securing better and standardized placements for their industrial training in their preferred zone or location and to implement the designed system to ensure its effectiveness.

2. RELATED WORKS
[4] Conducted a research to develop and design a web-based student internship management system for health colleges. The system would aim to cut inefficiencies in the traditional placement process, which often involved paper-based record-keeping and slow communications between students, academic institutions, and healthcare centers. The portal designed offered a complete platform for students' registration, internship application, placement monitoring, document submission, and performance measurement. Through its digitalization of these processes, the system guaranteed transparency, access, and convenience, ensuring

correct matching of the students with apt internships as well as allowing supervisors to observe progress in real time. Through this research, it was clear that web-based solutions can enormously enhance the process of managing and coordinating industrial training to the benefits of both training institutions and the students. [5] Developed a mobile application to aid internship management in bridging the gap between students, higher learning institutions, and industry partners. The app provides student registration, placement tracking, and evaluation features to ease the internship process. Through the use of mobile technology, the application enables real-time communication, which boosts coordination and monitoring. The application also features document submission, feedback collection, and auto-reporting to enhance efficiency. Generally, this innovation is designed to transform internship management by reducing administration work and overall experience for all stakeholders.

[6] Created a web-based recommendation system that aims to improve the process of student internship placement. The system integrates three filtering approaches: content-based filtering, where students are matched with internships based on their curriculum vitae and qualifications; collaborative filtering, where placements are suggested based on the preferences and previous experiences of other students with similar interests; and knowledge-based filtering, which applies pre-established rules and knowledge to personalize recommendations. By combining these approaches, the system enhances the relevance and precision of internship recommendations, where the students are being matched with organizations of relevance to their fields of study and career aspirations. The web-based system also offers immediate access to listed advertised internship opportunities, automated matching software, and interactive student, university, and industry partner dashboards. The functioning of this system attempts to ease the placement process, reduce student-internship mismatches, and improve employability outcomes by providing students with training opportunities based on their ability.

[7 & 8] Designed an intelligent system to enhance student-fitting internship placement accuracy and efficiency. Using machine learning algorithms, the system examines various variables such as students' skills, interests, and academic backgrounds to recommend best-fitting internship placements. The system architecture involves collecting detailed information regarding students, including academic history, technical skills, extracurricular activities, and personal interests. The information is preprocessed to ensure quality and consistency. Machine learning models are trained to identify patterns and correlations between student profiles and successful internship placements. Algorithms such as Support Vector Machines (SVM), Decision Trees, and Random Forests classify and predict the most suitable internships for each student. Through the automation of the placement, the system anticipates reducing time and effort often required for traditional manual matching. It also aims to maximize the satisfaction of the students through individually tailored internship proposals that align with specific career goals and skills. In addition, the system provides scalability and flexibility, supporting an increasing number of students and changing industry needs. [9] Innovated the Student Industrial Work Experience Scheme (SIWES) using blockchain technology's distributed and tamper-evident ledger. The system claims to offer an open and trustworthy framework for internship placement administration. Doing so, the approach aims to raise trustworthiness and responsibility among students, schools, and industry partners through secure records protection, verifiability, and resistance to unlawful alterations. Using blockchain in SIWES placements can make student registration, placement tracking, and performance evaluation more effective. The technology is transparent, making it possible to access information in real-time, reducing conflicts and enhancing collaboration among stakeholders. Further, the use of smart contracts can automate agreement enforcement, ensuring that all stakeholders adhere to agreed terms and conditions. This use of blockchain technology can significantly improve the effectiveness and legitimacy of internship management systems, eventually enhancing the overall educational and professional growth of the students.

[10] Presented a new approach to addressing the problems of the candidates for internships, particularly in IT-based firms. Traditional processes typically involve long search times and inefficient matching processes. In order to counterbalance these issues, the research suggests a system based on a CBR model that facilitates more effective internship matching. With the application of supervised machine learning techniques—such as data pre-processing, feature extraction, document similarity measures, and knowledge-intensive CBR pattern matching—the system optimizes the matching of intern candidate profiles with employer demands. This creates an effective and personalized matching portal providing real-time support, which may result in improved outcomes for both the firm and intern operating in the same framework. [11] Sought to automate the SIWES placement system to enhance efficiency and security. The system was designed to address typical challenges like manual application processes, transparency issues, and security risks to data. By the inclusion of security architectures, it alleviated weaknesses inherent in the traditional automated systems to promote secure data handling as well as reduce risks of unauthorized access. Applying Unified Modeling Languages (UML) for modeling systems and technologies such as HTML, CSS, JavaScript, and PHP to realize it, the system provided storage of data, retrieval, and interactive communication between students, employers, and institutions. The system allowed easy placement application, tracking, and verification procedures electronically. Nevertheless, one of its greatest drawbacks was that it had a narrow scope since it was designed for a specific institution and not a national forum to cater to all the IT students of the country. Expansion of such a system on a larger scale could further enhance accessibility and efficiency in industrial placement training. [12] Built a web-based internship management system designed to enhance coordination and efficiency in vocational school internship programs. The platform simplifies key processes like student admission, internship allocation, and performance evaluation. By facilitating effective communication between students, schools, and industry players, the platform simplifies better monitoring and controlling of internship activities. The system combines features like real-time tracking, capture of feedback, and automated reporting to guide decision-making. The system also eases administrative burden and improves transparency in handling internships. The internet-based system encourages ease of accessibility and flexibility in arranging the internship experience to ensure it is optimal for everyone.

3. METHODOLOGY

React Native will be used to design the industrial training application, which will be accessible to all students in Nigeria due to the uniqueness in the design structure. React Native is a JavaScript framework for writing real, natively rendering

mobile application for iOS and Android. React Native currently supports both iOS and Android and has the potential to expand to future platforms as well. The description of the system application will include; architecture of the system, system use case and system requirements. The architecture consists of the following parameters (App service, local cache, server and database.). Each of these parameters was designed such that undergraduate students can easily have access to the website and apply to his/her company of interest.

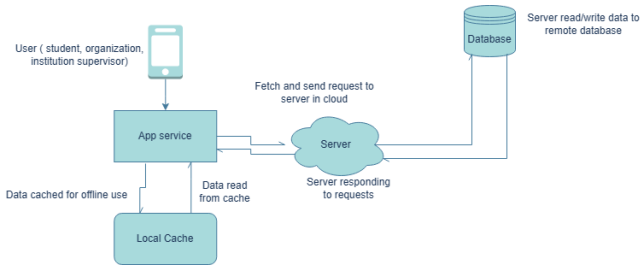

Figure 1: Data flow in a React application that uses Flux architecture.

3.1 Architecture of the System

React native is a popular JavaScript-based mobile application framework that allows you to build native rendered mobile application for iOS and Android. The framework lets you create an application for various platforms by using same codebase. It offers faster mobile development and lets your team iterate more quickly and share knowledge and resources more efficiently as it enables collaboration on the same space.

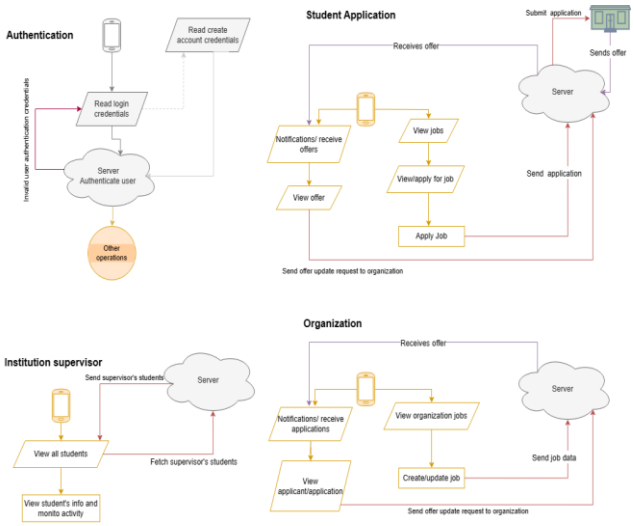

Figure 2: System Architecture

4. RESULT

The implementation of the system resulted in the successful development of a mobile application for industrial training placement with three user categories: students, organizations, and institution supervisors.

4.1 General features.

An account is created by a valid, unique email and password for verification. The email is used solely for account operations such as verification and password recovery using token. After registration, the user selects an account type: student, organization, or institution supervisor. Application settings provide users with the option to reset their password or log out. All accounts must use distinct email addresses that are not already registered.

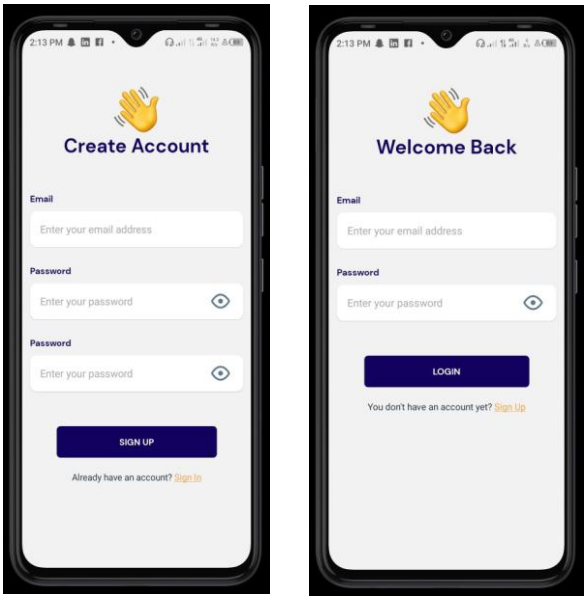

Figure 3: Creating account and Login page

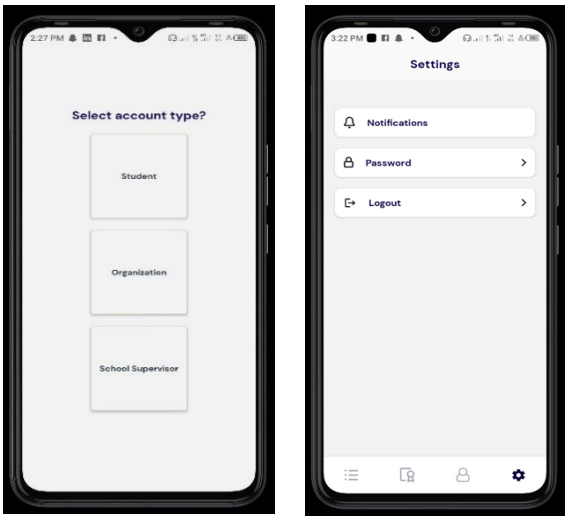

Figure 4: Account type and Settings page.

4.2For Students

Students can create profiles, apply for jobs, receive and respond to internship offers, and update their daily activity logs, which are monitored by both their assigned organization and institution supervisor.

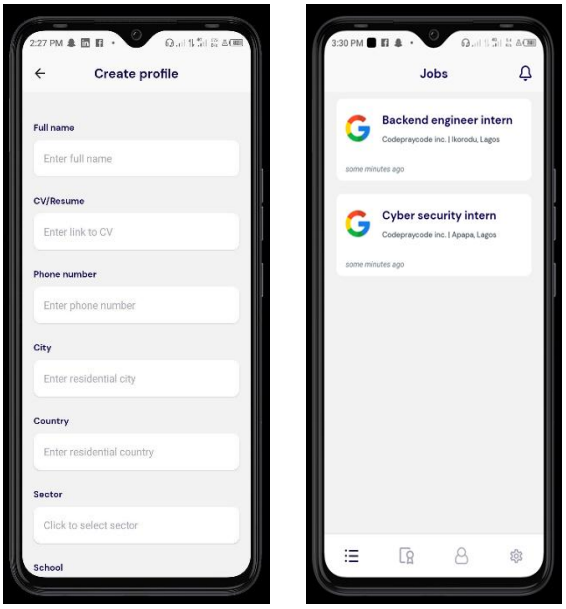

Figure 5: Creating profile and Job Application Page.

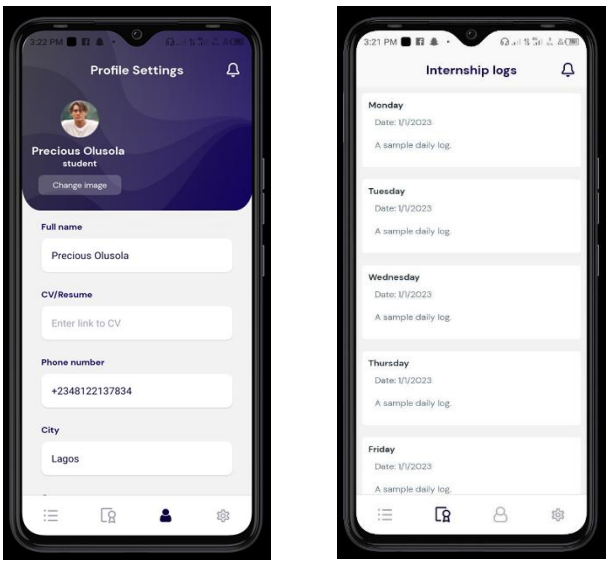

Figure 6: Profile and Internship Logs Page

4.2 For Organization

Organizations can create and manage job postings, review applications, accept or reject interns, and monitor student progress through weekly performance logs.

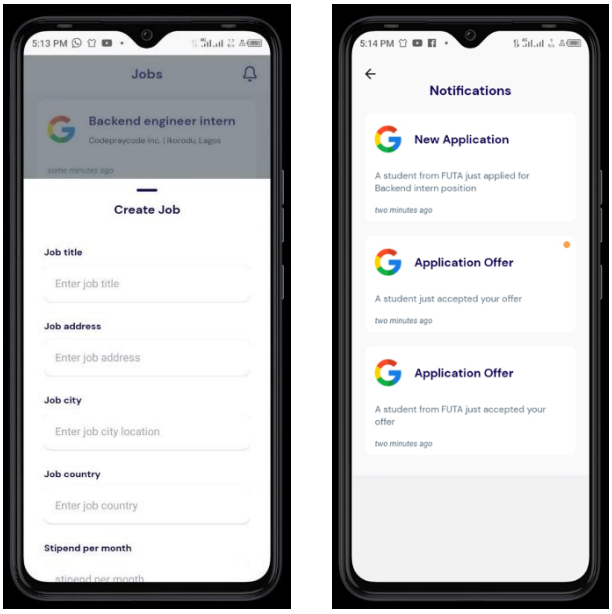

Figure 7: Creating Jobs and Interns Profile Page

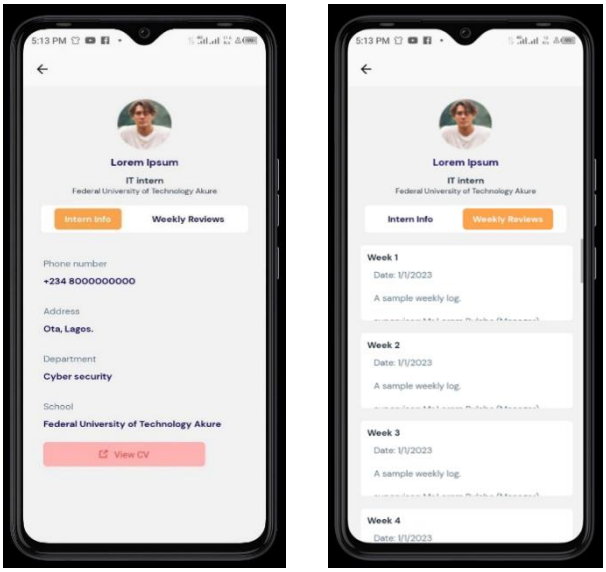

Figure 8: Internship profile and weekly review page.

4.3 For Institution Supervisor

Institution Supervisors can oversee their assigned students, review internship placements, and assess student reports based on their daily and weekly logs.

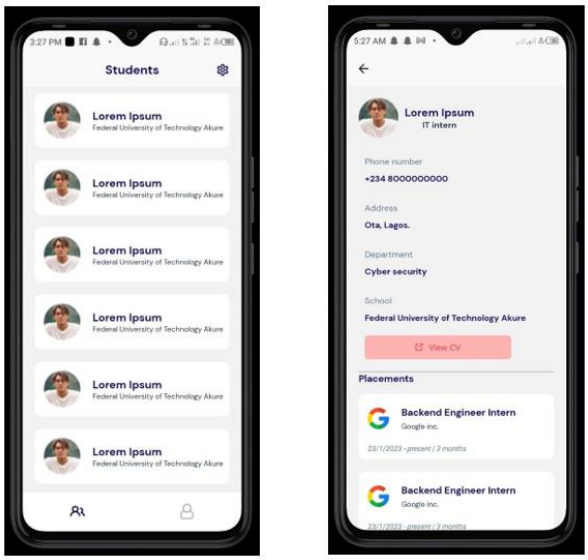

Figure 9: Viewing Interns and their Profile Page

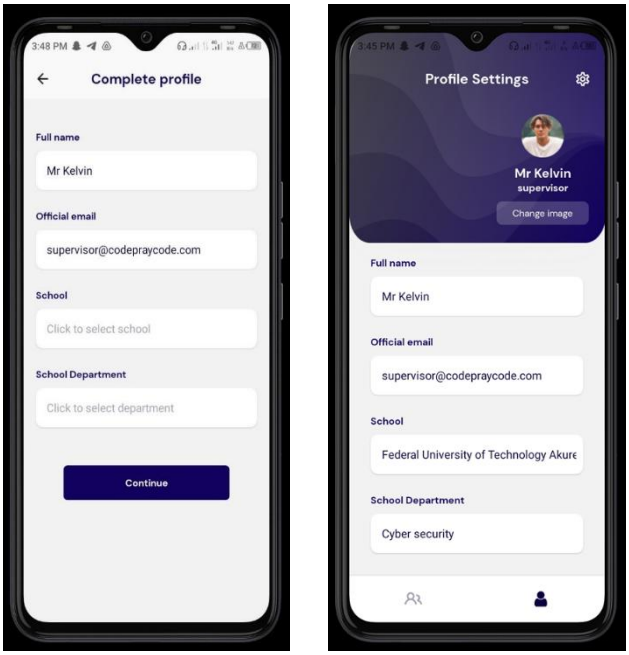

Figure 10: Supervisor profile page.

5. EVALUATION AND DATASET ANALYSIS.

5.1 Hypothetical Dataset Description

To assess the performance and user engagement of the INTERNCITY platform, a simulated dataset was created, representing 3 months of platform usage across ten Nigerian universities.

Field	Description
Student ID	Unique identifier for each student
university	Institution the student is enrolled in
Application count	Number of internship applications submitted
Offer count	Number of internship offers received
Daily log entries	Number of activity logs submitted
Weekly reviews	Reviews by organization and institution supervisor
Internship status	Accepted / Rejected / In Progress
Student satisfaction	Rating from 1 (very dissatisfied) to 5 (very satisfied)
App usage frequency	Times the student used the app per week

Table 1: Sample Dataset

Student ID	University	Application count	Offer count	Daily log entries	Weekly revison	Internship status	Student satisfaction	App usage frequency
STU001	FUTA	5	2	60	8	Accepted	4	10
STU042	UNILAG	3	1	55	7	Accepted	5	8
STU128	ABU	7	3	70	10	In progress	4	12
STU237	*OAU*	*2*	*0*	*20*	*3*	*Rejected*	*2*	*4*
STU394	*UNIBEN*	*4*	*2*	*62*	*9*	*Accepted*	*5*	*11*
STU401	OOU	6	2	68	9	Accepted	4	9
STU412	UNN	5	1	54	6	Accepted	3	7
STU425	LASU	3	1	45	5	In progress	4	6
STU437	FUTO	4	2	61	8	Accepted	5	10
STU449	UI	6	3	73	11	Accepted	5	13

5.2 Usage Statistics

- Average Applications per Student: 4.5
- Offer Rate: 70%
- Average Daily Logs per Student (over 3 months): 56.8
- Average Supervisor Reviews per Student: 7.6
- Student Satisfaction (Avg): 4.1 / 5
- App Usage Frequency: 9.8 sessions per week

5.3 Evaluation Summary

- The INTERNCITY application assessment through the simulated dataset indicates strong satisfaction and activity levels:
- Over 70% of students were placed with at least one internship, indicating that the system performs well in student-to-organization matching.
- High app usage frequency (9.8 sessions/week) and high number of log entries indicate intuitive design and meaningful interaction by students.
- 7.6 average supervisor reviews per student indicate continuous monitoring and feedback.
- A student satisfaction rating of 4.1 out of 5 suggests the success of the platform in increasing internship availability and management.
- The suggested dataset and analysis further testify to the practical usefulness of the platform, and bring the work closer to more standard academic test formats.

6. CONCLUSION

This study involved design and development of a mobile app, INTERNCITY, to remodel the Industrial Training (IT) placement process for Nigeria's penultimate year undergraduate students. The traditional process of obtaining internships has, however, been plagued by inefficiencies, paper-based applications, and non-access to placement opportunities. In response, the study recommended a digital, centralized method to mechanize the key aspects in the placement, monitoring, and assessment process.

Using React Native as the development tool and JavaScript as the central programming language, the mobile application was built with three principal user roles: students, organizations, and institutional supervisors. The application enables students to register, complete their profiles, and apply to several organizations which have been already onboarded to the platform. In the meantime, companies can post internship positions, evaluate applicants, and manage intern activity, while institutional mentors track student performance in real time and via activity reports. All interaction is recorded to a safe, centralized database.

Implementation of INTERNCITY reduces administrative and logistical efforts associated with internship applications to a large degree. It makes it transparent, increases accountability, and provides a systemized way of coordination for all concerned parties during the period of the industrial training program. The process being digital, the application increases accessibility and enables students to apply for the jobs from a remote location, which is particularly useful in geographically scattered academic campuses.

6.1 Future Scope of Research

A number of developments would enhance further the abilities and scope of the INTERNCITY platform. Smart matching algorithms using artificial intelligence or machine learning technology could help recommend internships based on students' skills, career objectives, and technical abilities. Real-time communication features such as chat or messaging functionalities would help in easy interaction between interns, supervisors, and firms. Adding a performance analytics dashboard may give the graphical view of student progress, placement distribution, and program outcomes to aid institution reporting.

Besides, the platform can be expanded to cover nationwide application, with one digital environment facilitating placement of all Nigerian universities' internships. The current university portals or academic management systems can also be incorporated to facilitate verification and monitoring. Finally, introducing offline access features would enhance the application's accessibility for students who live in places where internet is poor or unstable.

With such developments being incorporated, INTERNCITY can become a robust digital system of industrial training with the ability to cater to educational institutions, businesses, and students not only in Nigeria but in other nations with comparable issues. The study concludes that integrating such mobile systems will significantly boost the internship process, reduce placement pressure, and improve technical education institution

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