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AN ONLINE RESULT PROCESSING AND CHECKING PORTAL, FOR THE DEPARTMENT OF COMPUTER SCIENCE, EDO STATE UNIVERSITY IYAMHO, EDO STATE

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ABSTRACT

The processing and dissemination of students' academic results are critical functions in higher educational institutions. Nigerian universities, including the Faculty of Science at Edo State University Iyamho, result processing is still largely handled using manual or semi-automated methods such as spreadsheets and informal digital platforms. These approaches are prone to delays, computation errors, data inconsistency, poor security, and limited accessibility for students. Such challenges negatively affect academic transparency, efficiency, and students' confidence in the result management process. This work focuses on the design and implementation of an online Result Processing and Checking Portal tailored to the operational needs of the Faculty of Science at Edo State University, Iyamho. The system allows lecturers to upload students' scores, automatically computes GPA and CGPA, and enables course advisors to verify and approve results before publication. Students can securely access their academic records in real time; A descriptive and developmental research methodology was adopted for the study. Data was collected through observations, interviews, and review of existing result processing procedures within the faculty. The system design incorporates role-based access control, automated validation, and secure database management to enhance accuracy, reliability, and data security. The system also supports institutional digital transformation and aligns with modern best practices in academic administration. The system was developed using the Agile Software Development Methodology. Agile allows the system to be developed in small, manageable increments while continuously incorporating feedback from students, lecturers, and administrative staff. This ensures that the final product meets the actual needs of its users, reduces errors, and allows modifications during development without significant delays or cost overruns and it was built incrementally using the MERN stack (MongoDB, Express.js, React.js, Node.js). Evaluation result indicates that the developed system improved result processing and checking compared to the existing manual approach.

Keywords: Students' academic results; Nigerian universities; Faculty of Science;

1 INTRODUCTION

The rapid advancement of information and communication technology (ICT) has significantly transformed the way organizations operate across the world. In the education sector, ICT has become an essential tool for improving teaching, learning, research, and administrative activities (Doctor, 2022; Mushi, 2021). Universities now rely heavily on computerized systems to manage large volumes of data, improve service delivery, and enhance operational efficiency (Oliokwe et al., 2022). One of the most critical areas where ICT has proven highly useful is in the management of students' academic records, particularly the processing and checking of examination results. Academic results represent the official record of a student's performance throughout their period of study (Anyiam et al., 2020; Esang et al., 2024).

These records play a vital role in important academic decisions such as promotion to the next level, graduation, probation, withdrawal, and eligibility for scholarships or further studies (Anyiam et al., 2020). As a result, the accuracy, security, and accessibility of students' results are of great importance to students, lecturers, administrators, and the institution. Any error or delay in result processing can negatively affect students' academic progress and the credibility of the university (Esang et al., 2024). In many Nigerian universities, including Edo State University, Iyamho, the processing and management of examination results have traditionally been carried out using manual or semi-automated methods (Sani et al., 2020). These methods often involve lecturers computing students' scores manually or with basic spreadsheet applications and submitting them to departmental offices for collation. Results are then reviewed, approved, and sometimes displayed on notice boards or released after a long administrative process. While this approach may have been manageable when student populations were relatively small, it has become increasingly inefficient due to the growing number of students and academic programs within universities (Shaibu & Folake, 2022).

The departments of computer science, handles a substantial amount of academic data every semester, including continuous assessment scores, examination scores, grade points, grade point averages (GPA), and cumulative grade point averages (CGPA). Managing these records manually places a heavy burden on lecturers and administrative staff and increases the likelihood of errors and inconsistencies. Manual result processing systems are prone to several challenges. These include miscalculation of scores and grades, duplication of records, loss or misplacement of result sheets, and delays in compiling and releasing results. (Anyiam et al., 2020; Esang et al., 2024).

In addition, the manual display of results on notice boards exposes students' academic records to unauthorized persons, thereby compromising confidentiality and privacy (Patel & Modi, 2022; Ugwuanyi, 2025). Students are also required to physically visit departmental offices or notice boards to check their results, which can be stressful, time-consuming, and inconvenient, especially when results are delayed or removed. With the increasing adoption of digital technologies in higher institutions, online result processing and checking portals have emerged as effective solutions to the limitations of manual systems (Patel & Modi, 2022).

A result processing and checking portal is a web-based platform that allows authorized users such as administrators, lecturers, and students to securely access and manage academic results (Rainy et al., 2023). Through such a system, lecturers can upload students' scores, administrators can review and approve results, and students can conveniently check their results online using secure login credentials. Edo State University, Iyamho, was established with a strong vision of leveraging modern technology to support academic excellence and efficient administration. In line with this vision, there is a growing need for a robust and reliable result processing and checking portal that aligns with the university's academic structure and operational standards. Implementing such a system within the Faculty of Science would promote efficiency, accuracy, transparency, and security in result management. It would also reduce administrative workload, minimize errors, and improve students' satisfaction by ensuring timely access to academic results.

This study therefore focuses on the design and implementation of a result processing and checking portal for the Faculty of Science, Edo State University, Iyamho. The system is automate the computation, storage, and retrieval of students' academic results while ensuring data integrity, confidentiality, and ease of access. By adopting this digital approach, the faculty can enhance its academic administration processes and support the university's commitment to technological advancement and quality education.

2 LITERATURE REVIEW

Anyiam et al. (2020) developed An Enhanced Result Processing and Checking System for Public Universities using 2FA and TOTP. They developed an enhanced result processing and checking system specifically for public universities. The system was designed to improve the reliability, security, and accuracy of student result management by integrating a two-factor authentication (2FA) and time-based one-time password (TOTP) mechanism. It uses a combination of ASP.Net, JavaScript, XML, HTML, CSS, and Android technologies to create a platform where lecturers can upload student scores, collate results, compute grades, and publish them online. Students are able to securely check their results, while

university administrators and exam departments can use the system for informed decision-making and result oversight. The authors report that the system achieved high-performance metrics, including accuracy, speed of access, security, ease of use, and time efficiency, showing improvements over traditional methods of result processing and dissemination. Despite its improved authentication and performance, the system's reliance on a combination of multiple technologies and platforms (web + Android) may complicate deployment and maintenance in universities with limited technical staff or infrastructure support.

Sani et al. (2020) worked on development of a Web-Based Results Generating and Processing System for Tertiary Institutions. They introduced a web-based results generating and processing system aimed at overcoming the tedious manual methods used for managing academic results in tertiary institutions. The researchers utilized HTML5 for the client interface, PHP for server-side processing, and MySQL for the database. The system allows lecturers to upload results individually, and it automates the computation of grade point averages (GPA) and cumulative grade point averages (CGPA). This design was intended to reduce the workload on exam officers, enhance accuracy, and eliminate redundancy in result processing. By facilitating online access to results, the system aimed to improve the efficiency and transparency of academic result handling in schools. Although the system automates GPA and CGPA calculations, it does not address advanced security features such as encrypted access or multi-factor authentication, putting student data at risk of unauthorized access.

Wakil (2021) developed an Advanced Automated Result Processing and Management System that aims to improve the weaknesses of traditional result computation at Mai Idris Aloom Polytechnic, Geidam. The system was designed using the XAMPP full stack, with HTML, CSS, and JavaScript for the front end, and PHP with MySQL database for backend storage. Two separate modules were created, one for lecturers to enter students' scores and automatically generate course grades, and another for the departmental exams officer to compute Grade Point (GP), Cumulative Grade Point Average (CGPA), and generate transcripts. The system is intended to enhance reliability, convenience, and accessibility of student result information while eliminating the security concerns associated with manual processing. It also includes features for secure user authentication and comprehensive result data storage in a centralized database, improving the administrative workflow and reducing the chances of missing or inaccurate results. Although the system improves automation and data integrity, it still relies on traditional web technologies without advanced security mechanisms such as encryption for data in transit and at rest, making it potentially vulnerable in environments where data security is critical.

Elibarick (2021) developed An Online Results Management System for an Academic Institution: Case Study of Kampala International University School of Computer Studies. Elibarick Mushi investigated how academic results were managed at the School of Computer Studies, Kampala International University. Observational and interview data revealed that the existing result handling processes were fragmented and inefficient. To address this, the researcher proposed an online results management system that enables students, lecturers, and examination officers to interact digitally with result data. The system supports roles for data entry, result computation, and access control, making result input, processing, and viewing far more streamlined than the previous manual methods. By providing a platform accessed through a web interface, the study aimed to eliminate redundancies, reduce processing time, and improve overall administrative efficiency in result management. While the proposed system introduces online accessibility, it does not fully address fundamental security concerns, such as role-based encryption practices or secure session management, which are necessary when handling sensitive academic records.

Ezema & Ogbuokiri (2022) developed an online result processing system designed for secondary schools to replace manual computations and storage of student performance data. The work focused on converting traditional paper-based and spreadsheet result management into a centralized web-based solution that automates grade computations, result storage, and retrieval. By using PHP for scripting, MySQL for database management, and standard web interface technologies, the system provides a centralized, efficient platform that reduces manual workload and enhances the accessibility of student results. The authors demonstrated that digitizing result management in schools leads to improved accuracy, timeliness of result release, and reduced data errors compared to manual processing. This system was developed for secondary schools rather than higher education institutions and therefore may not address the complexity of university result processes such as semester GPA, CGPA computations, course weighting, and faculty-level result approval mechanisms required in universities. It also lacks advanced security measures like multi-factor authentication needed for secure access.

3 METHODOLOGY ADOPTED

The methodology chosen for this study is the Agile Software Development Methodology. Agile was selected because it emphasizes iterative development, flexibility, and close collaboration with end-users, which makes it highly suitable for building a web-based Result Processing and Checking Portal. Unlike traditional waterfall approaches, Agile allows the system to be developed in small, manageable increments while continuously incorporating feedback from students,

lecturers, and administrative staff. This ensures that the final product meets the actual needs of its users, reduces errors, and allows modifications during development without significant delays or cost overruns.

3.1 System Design

The proposed system design for the Result Processing and Checking Portal focuses on creating a secure, automated and user-friendly platform for managing academic results within the Department of Computer Science, at Edo State University, Iyamho. The design adopts a three-tier architecture, consisting of the presentation layer (frontend interface), application layer (backend logic and GPA/CGPA computation), and data layer (centralized database). Students, lecturers, course advisors, and administrators are assigned specific roles with access permissions tailored to their responsibilities. Lecturers can upload and validate results, course advisors review and approve them, administrators oversee system operations and students can view their academic records securely. The design emphasizes automation of grade calculations, error prevention, data security and real-time accessibility, ensuring efficiency, accuracy and transparency. Overall, this design provides a structured and scalable framework for implementing an effective result processing and checking portals.

3.2 Structure of Proposed System

The proposed system is structured around three main user roles: administrators, lecturers (including course advisors), and students. Administrators oversee the overall operation of the portal, manage user accounts, and monitor system integrity. Lecturers are responsible for uploading student grades, reviewing automated calculations, and ensuring result accuracy before approval. Course advisors act as intermediaries, verifying and authorizing results before final publication. Students access the system through a secure login to view their results, GPA/CGPA, and historical academic records. The portal uses a centralized database-driven architecture, where all information is stored securely, and a responsive frontend interface for user interactions. Data flows from lecturers to the database and is then made accessible to students and administrators, ensuring a seamless, organized, and secure process for result processing and checking.

4 RESULTS IMPLEMENTATIONS

Figures 2, 3, 4,5,6, and 7 provide some of the implementation results/outputs of the system.

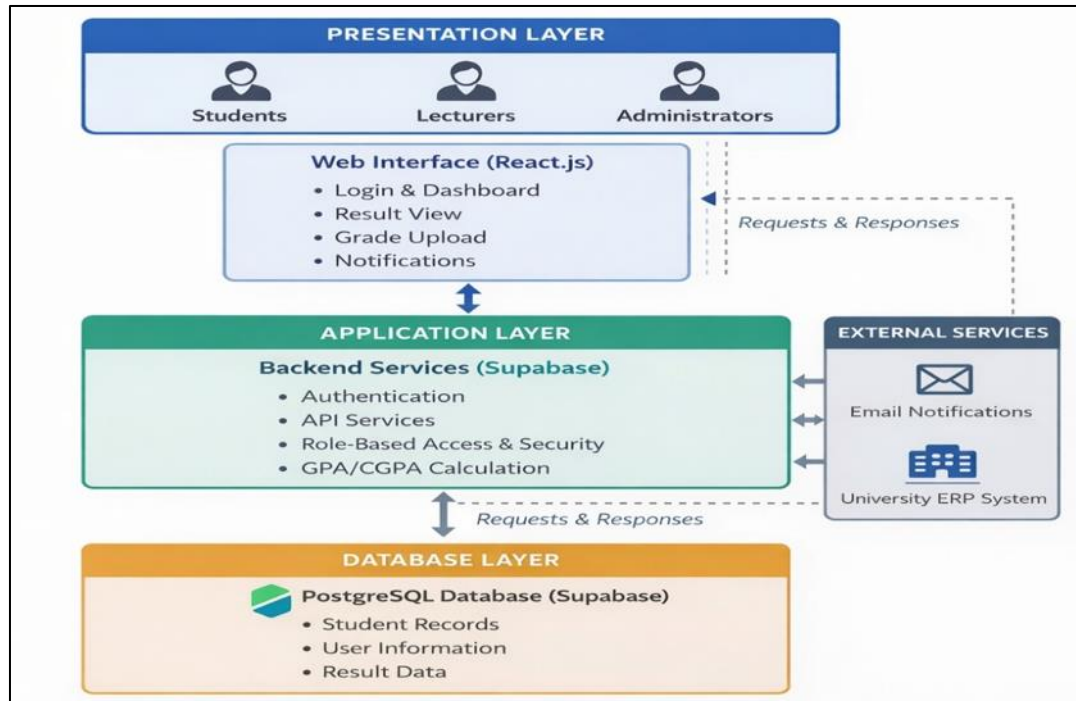


Figure 1: System Architecture

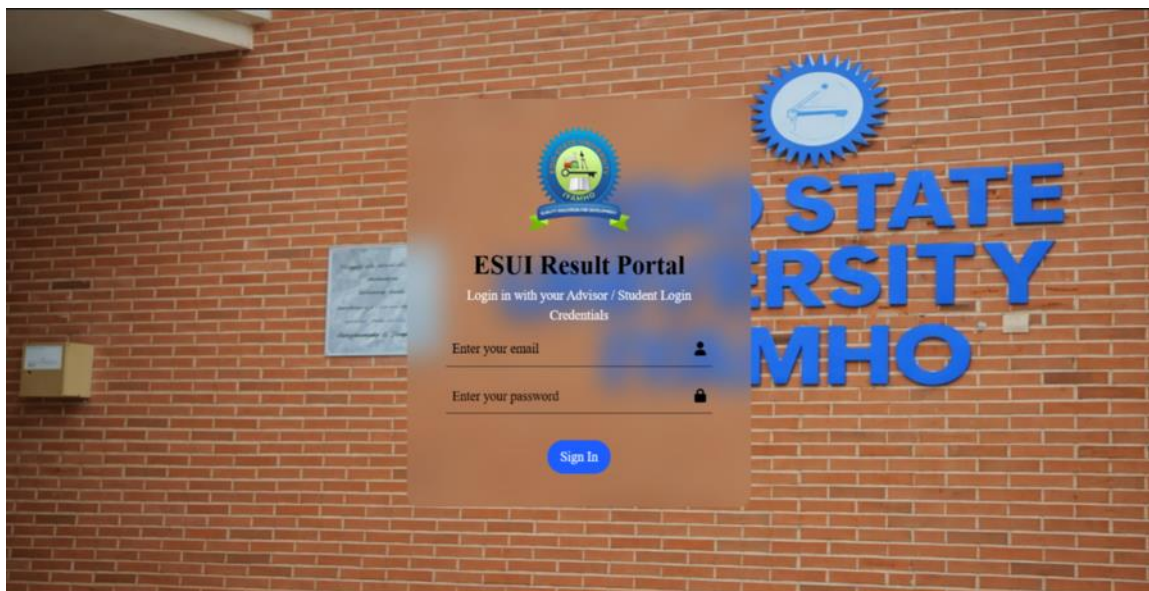


Figure 2: Login Page

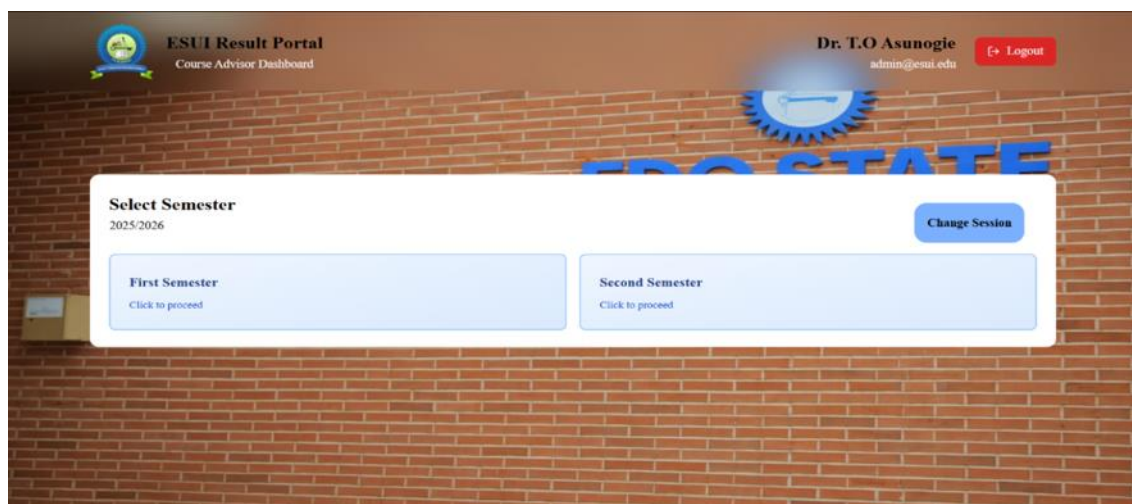


Figure 3: Select Semester Page.

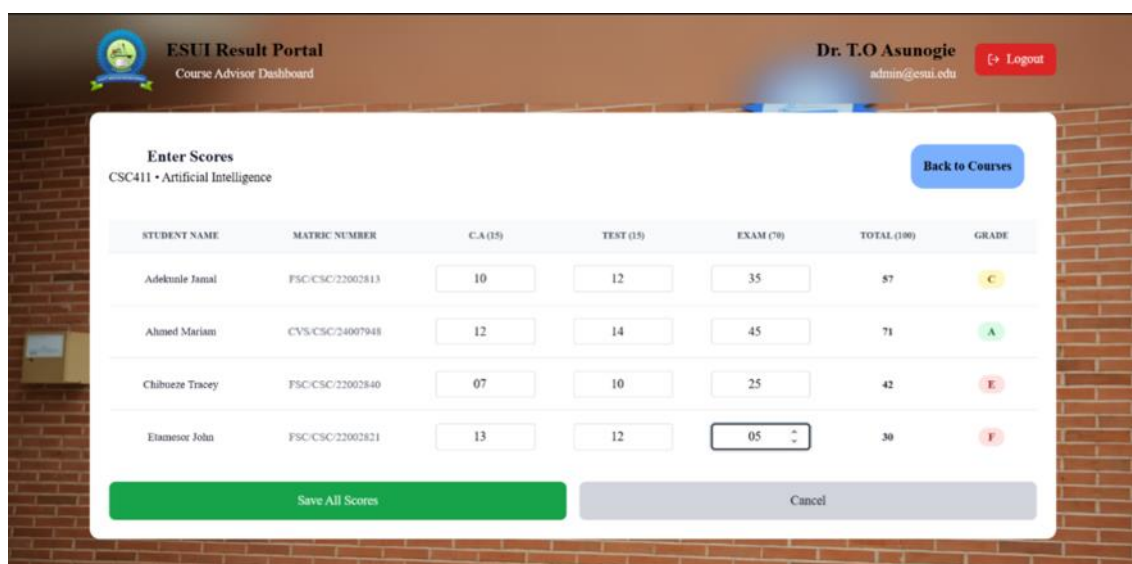


Figure 4: Result Upload Module

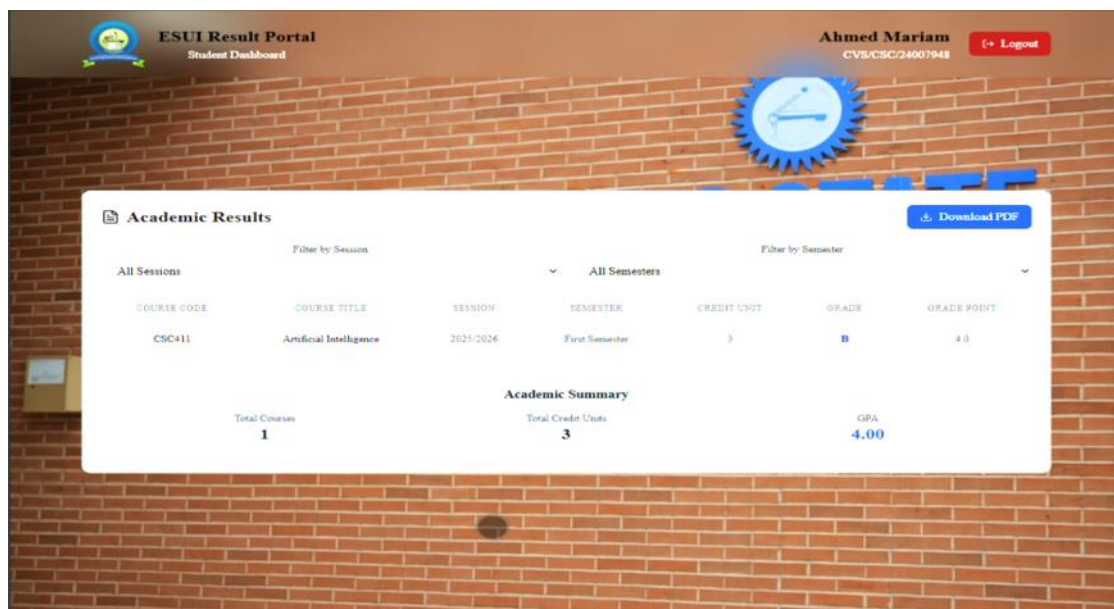


Figure 5: Student Result Dashboard Display

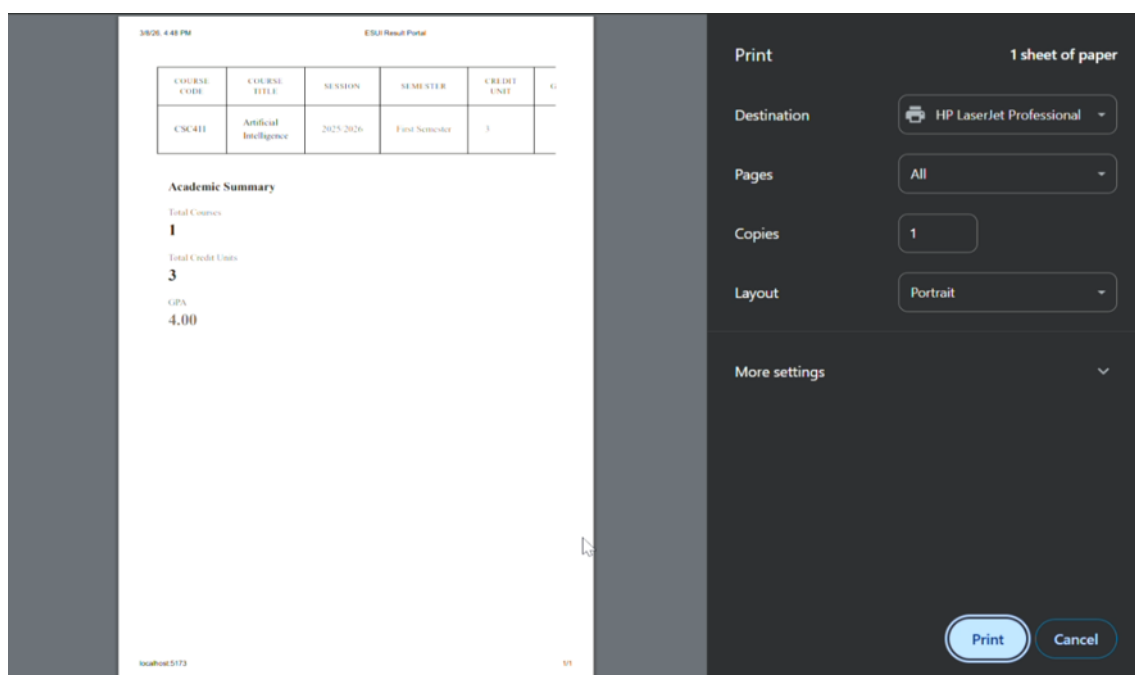


Figure 6: Student Result Display

The screenshot shows a web application interface for a database. At the top, there's a header with 'FREE', 'ESUI Result Portal', 'main', and 'PRODUCTION' status. A 'Connect' button and a 'Feedback' link are also present. A search bar and a user profile icon are on the right. The main area is titled 'Table Editor' and shows a list of tables: 'public.results', 'public.academic_sessions', 'public.courses', 'public.semesters', and 'public.users'. The 'results' table is selected, and its data is displayed in a table format. The table has columns: 'course_code' (text), 'course_title' (text), 'credit_unit' (int4), and 'grade' (text). The data shows four rows for 'CSC411' with the title 'Artificial Intelligence' and credit units of 3, with grades E, C, B, and A respectively. The bottom of the interface shows pagination: 'Page 1 of 1', '100 rows', and '4 records'. There are also buttons for 'Data' and 'Definition'.

course_code	course_title	credit_unit	grade
CSC411	Artificial Intelligence	3	E
CSC411	Artificial Intelligence	3	C
CSC411	Artificial Intelligence	3	B
CSC411	Artificial Intelligence	3	A

Figure 7: Centralized Database Display of Results

5 RESULTS AND EVALUATION

The implementation of the result processing and checking portal was successfully completed, and the system was tested to ensure it meets the functional and performance requirements. The course advisor was able to upload student scores efficiently, with the system automatically calculating totals and assigning grades according to the defined grading scale. Students could log in using their matriculation numbers and passwords to view results for individual courses or for all courses in a given session and semester. The PDF download and print functionalities also worked correctly, allowing students to obtain physical or digital copies of their results. Evaluation of the system was carried out based on its usability, accuracy, and responsiveness. Feedback from test users indicated that the dashboard interfaces were intuitive, the data entry process was straightforward, and the results displayed were accurate and consistent with expectations. The session and semester selection feature functioned correctly, enabling users to view previous academic periods without errors. Overall, the system achieved its objectives by providing a secure, centralized, and automated platform for managing and accessing student academic results, significantly improving on the limitations of the previous manual process.

6 CONCLUSION

The study successfully developed a web-based result processing and checking portal that addresses the inefficiencies of the traditional manual system. By integrating modern technologies such as React with TypeScript for the frontend and Supabase for the backend, the system provides a reliable and user-friendly interface for both course advisors and students. The implementation demonstrated that course advisors can efficiently upload and manage student results, while students can easily access, view, and download their academic records. The portal also ensures data accuracy and security by preventing unauthorized modifications and by calculating grades automatically based on defined scoring rules. Testing confirmed that the system is functional, responsive, and meets the intended objectives. In conclusion, the portal provides an effective, centralized, and modern solution for result management, improving accessibility, reducing errors, and enhancing overall efficiency in the academic result processing workflow.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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Disclosure of conflict of interest

The authors declare no conflicts of interest regarding this manuscript.

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