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A Secure Web-based Result Computation and Transcript Processing System for Federal Polytechnic Ukana

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ABSTRACT: *In this era of digital transformation, educational establishments must manage student records effectively while maintaining data security. This work describes how Federal Polytechnic Ukanadeveloped a safe, web-based transcript and results computation system by utilizing Agile methodology, which improved responsiveness and flexibility throughout the project. Iterative development, which allowed for constant feedback and quick adjustments to requirements that changed, was made possible by the Agile methodology. Ensuring data integrity, confidentiality, and accessibility, the system is designed to make managing academic records easier. It has an intuitive interface for both administrators and students withrole-based access control, secure authentication procedures, and data encryption to stop illegal access and data breaches are important parts of the system. The system's design, implementation, and potential advantages in terms of improved data security and operational efficiency are all covered in this paper. The system's successful implementation at Federal Polytechnic Ukana indicates that it can be scaled up to meet the needs of educational institutions looking to enhance their result management procedures.*

KEYWORDS: result computation, transcript, agile software development methodology, security.

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INTRODUCTION

In today's educational environment, academic record management is essential for schools and students. The manual processes and paper-based systems frequently used in the traditional methods of handling transcripts and results present several problems, such as inefficiency, a high risk of data loss, and susceptibility to unauthorized access. There is an urgent need for reliable and secure systems that can manage academic records effectively while guaranteeing data security and integrity as educational institutions move toward digital transformation.Like many other higher institutions, Federal Polytechnic Ukana has realized that it needs to update to a more dependable, efficient, and safe platform for its academic records management system. The goal is to create a web-based system that secures the sensitive data used in these procedures while automating the computation of student results and transcript generation. The need to reduce the risks of data breaches, illegal access, and data manipulation; all of which are common in traditional systems, is what motivated this shift to a digital system. The Agile methodology was used to accomplish this, enabling iterative development, ongoing feedback, and quick adaptation to changing requirements and obstacles (Esang et al., 2024).It provides administrators and students with an easy-to-use interface while protecting sensitive data using contemporary cryptographic techniques.A collaborative environment where developers, stakeholders, and end users actively participated in the development process was made possible by the Agile methodology. The team was able to continuously improve the system through this iterative process by using real-time feedback to make sure the result satisfied the needs and expectations of the users.The system protects data while it's in transit and at rest by using cutting-edge encryption techniques. Unauthorized access is prevented by implementing secure authentication techniques, such as multi-factor authentication. The architecture of the system is also made to allow for flexibility and scalability, which makes it a good option for educational institutions with different needs and sizes.The design and implementation of the web-based results and transcript computation system will be covered in detail in this paper. It will examine the difficulties encountered during development, the security measures put in place to protect data, and the possible effects of the system on the effectiveness of the institution's operations and data management procedures. This paper aims to contribute to the expanding body of knowledge on secure academic record management in the digital age by offering a thorough overview of the system's development. The remainder of the document is structured as follows: Section 2 presents reviewed related literature while the methodology is presented in section 3. The results and discussion of the system are in section 4 in detail and section 5 presents the conclusion of the study.

LITERATURE REVIEW

Academic institutions are responsible for the creation, management, computation, and processing of examination records of past and present students of the institution. An efficient result and transcript processing system should be able to handle result computation and transcript processing

quickly and with a very high degree of accuracy. Result computation and transcript processing systemsprovide functionalities that enable the academic institution to render efficient services in monitoring academic progress and provide a reliable avenue for students to access their results and transcriptspromptly.

Damasevicius et al. (2019) created a student clearance system to streamline the process and cut costs and time. The Unified Modeling Language (UML) is used in the system architectural design process to define the functionality and requirements of the system. The method reduces the need for in-person attendance and travel by taking on the tedious and stressful manual clearance procedure for graduating students. The digital platform increases productivity, speeds up information processing, and lowers costs associated with labor and office supplies for educational institutions. It helps to lessen operational bottlenecks brought on by difficulties with manual clearance in programs like the National Youth Service Corps (NYSC). Similar to other automated systems now in use, the system's drawbacks include unintuitive user interfaces and insufficient information provided to users. The system needs to have good fault tolerance mechanisms and a quick response time to satisfy performance requirements.

A school management system, as described by Harsha and Thyagaraja (2016), is intended to automate, integrate, and oversee all tasks about student data, particularly academic records. SQLite database is used at the back end and NET BEANS IDE 8.1 is used for front-end development of the system. To optimize system security, a symmetric data encryption paradigm is employed. Information's authenticity and integrity are greatly influenced by who has access to it. Student data management is automated by the School Management System, which makes it quick, simple, and error-free. It creates academic results, transcripts, and schedules, and simplifies student registration in addition to streamlining school management. For optimal security, the system employs symmetric data encryption. Specific details regarding the shortcomings of the designed School Management System are absent from the article.

In a comprehensive analysis of the literature, Edison et al. (2021) compared the primary large-scale agile approaches, including SAFe, LeSS, Scrum-at-Scale, DAD, and the Spotify model. According to the researchers, this is the first study to evaluate and analyze all of the measurements, tools, practices, and principles of the method consistently. It includes all extensions and changes to each technique suggested by further empirical study, in addition to the original method specifications. This comparison encompasses not only large-scale commercial approaches but also custom-built ones from companies like Ericsson, Nokia, and others. Practitioners are better equipped to decide whether commercial technique, method component, or even custom-built method best suits their needs based on the study's findings. The analysis highlights several

theoretical and practical problems with the literature now in circulation, including the emphasis placed on commercial framework practices at the expense of their fundamental ideas or even any unique methods. The application of large-scale agile methods is linked to several difficulties and success criteria. Several research gaps that need to be filled using various approaches are also identified by the study.

A student result management system developed with PHP, MySQL, HTML, CSS and a local Apache web server is presented by Ekanem et al. (2017). The software development process that was employed was the Participatory Incremental Process Model or PIP Model. The system takes care of the requirement for an automated platform that allows for the smooth and interactive management of student outcomes across all categories. It resolves the issues of effectively handling test and exam results for students, creating transcripts, scheduling classes and due dates, and granting authorizedusers secure access. Any restrictions or difficulties encountered during the creation or application of the Student Result Management System are not specifically mentioned in the article.

The goal of Abah et al. (2022) is to create a computerized examination system with a single-user mode that will be utilized by Senior Secondary Schools in Onitsha North Local Government Area, Anambra State, Nigeria. The PHP, HTML, CSS, and MySQL technologies were used to implement the system on a Windows 10 machine, which was designed according to the SSADM methodology. The method was designed to solve problems with the senior secondary school test systems in Nigeria that are now paper-based. It aimed to get rid of problems like exam misconduct, impersonation, and result compilation delays. Without a networking system, the intended system runs in single-user mode and needs to be installed on every computer used for tests. The lack of networking features in the system restricts its scalability and usage in bigger educational environments.

To quantify the performance of ongoing agile software development projects in terms of cost, time, and customer satisfaction, Tam et al. (2020) created a model made up of five people factors. The results of a study conducted with 216 agile practitioners indicate that "customer involvement" and "team capability" are the primary elements influencing the success of ongoing agile software development projects. The findings were validated by triangulating these results with a focus group using a mixed-methods technique. Teams and managers can set priorities and improve project outcomes by understanding which elements are critical to success.

The goal of Yari et al. (2017) is to conduct an analysis and develop a technical tool for MONOIL researchers to manage their profiles. A joint French-Ecuadorian program called MONOIL is tasked with keeping an eye on the environment and assessing the effects of oil contamination in Ecuador. By using a web platform, MONOIL can effectively manage the profiles of its researchers who keep an eye on the environment and assess the effects of oil pollution in Ecuador. This technology offers a single platform for researchers to interact and share their findings, while also streamlining the monitoring process. The article does not specifically limit the study effort that the MONOIL researchers have done on the application for information management.

Mishra and Alzoubi (2023) did a comparative analysis of structured software development versus agile software development. The objective of this research is to design a decision tree that will assist in determining which waterfall and agile approaches are most suited for a given software development project. Several scenarios and examples are investigated with the hybrid development methodology. The research showed that even though Agile approaches have numerous benefits, some projects or development phases may call for a mixed strategy because Waterfall is sometimes important. The viability of merging Agile and Waterfall approaches in software development management is investigated in this study.

Onibere (2013) offers a fuzzy logic approach for developing a decision support system for tracking and assessing academic program achievement in Nigerian schools. Fuzzy ideas are integrated into the multi-dimensional data schema that is created by the model, together with a meta-table structure for categorization. It discusses issues with data inconsistency and offers helpful advice via a case study. The study adds to the body of research on ICT tools for Nigerian school management by presenting a novel fuzzy logic-based approach. Additionally, it incorporates best practices and standards for systems integration. The case study improves comprehension of the practical application of the suggested paradigm.

A suggested assessment approach for School Management Information Systems (SMIS) in secondary educational institutions is presented by Amollo and Bernard (2021). Numerous organizational issues, including staff, technology systems, leadership, external circumstances, and management procedures, are included in this framework. This study looks at the problem of secondary schools' lack of knowledge about crucial success elements when implementing School Management Information Systems (SMIS). To support the effectiveness of the recommended assessment approach for SMIS deployment in secondary schools, the study does not include any empirical data or case studies. Consideration of potential barriers or limitations that educational institutions might run across while putting the assessment model into practice is absent from the

paper. The study does not include a detailed methodology or a methodical guide to implement the recommended assessment model.

The design and execution of a centralized transcript and result processing system are presented by Osunade et al. (2019). The system's goal is to get rid of mistakes and delays in transcript generation and result processing that have made students miss out on possibilities.Before being implemented across additional faculties, the system was created as a pilot project utilizing one faculty. It complies with all Nigeria Universities Commission (NUC) regulations and has been in use for more than four academic sessions. The University of Ibadan is specifically highlighted in the report as it illustrates the challenges associated with manually processing results and creating transcripts in academic institutions. These manual processes might lead to computation errors and delays in producing accurate transcripts or results, which can negatively impact students by depriving them of possibilities. It is noteworthy that the created result processing and transcript system's technical details and possible limitations are not sufficiently covered in the paper. It's challenging to comprehend the system's capabilities and any potential problems that might occur throughout its deployment without this crucial knowledge. Hopefully, morestudies will close these gaps and yield a more thorough understanding of this technology.
In Okikiola and Samuel (2016), the creation of a web-based system to streamline transcript and result generation in Nigerian educational institutions is discussed. Software development tools including WAMP (Windows, Apache, MySQL, PHP) and HTML and JavaScript were used in the creation of the system. To improve accessibility for students and maximize result and transcript generation in Nigerian universities, a web-based approach is proposed in this research. The present result and transcript creation mechanism utilized in Nigerian colleges, as well as any potential restrictions or negative aspects of the web-based system that was put in place, are not thoroughly analyzed in this research. The efficacy or efficiency of the system is not supported by any empirical data or user input.

Olamide and Joshua (2012) talk about the planning and execution of a system called Result Alert System, which uses SMS and email to notify students of their exam results. The article discusses the problem of giving students easy access to their exam results via the Result Alert System, which makes use of SMS and email technology. Specific restrictions or difficulties encountered during the development and deployment of the Result Alert System are not mentioned in the report.

A design plan for a student management system that makes use of intelligent technology (IT) and the Internet of Things (IoT) and runs in a network environment is provided by Zeng and Boontasorn (2022). The system's main goal is to alleviate the difficulties that educational

institutions encounter in supervising students, including precisely monitoring their locations and averting unfavorable situations. The article addresses how outmoded management practices make it difficult for schools to successfully manage their student bodies. This frequently results in an inability to promptly prevent unwelcome situations and maintain track of students. However this issue can be resolved with a student management system built on intelligent Internet of Things (IoT) technology. The paper has some shortcomings in discussing schools' student management challenges, outdated methods' negative effects, and privacy/security concerns in student tracking using IoT technology. Also, it lacks a thorough evaluation of the system's performance regarding scalability and robustness.

The goal of Rajegowda (2017) is to create a web-based institutional support system that will enhance Middle East College's (MEC) educational and professional environment and help the MEC community overcome its obstacles. To address the various issues that Middle East College (MEC) encounters, a report suggests a web-based institutional support system. Students and professors will have a platform to file grievances, make comments and suggestions, report misplaced items, and look for peer tutors using the proposed system. The system's deployment ought to improve MEC students' academic and professional experiences, which will ultimately boost the college's standing and general output. There is no specific acknowledgment of the paper's limitations in the sources that were cited. Instead, their primary focus is on creating and implementing Middle East College's (MEC) web-based institutional support system. The authors of these papers talk about the difficulties MEC faces and offer a way to get past them.

The study conducted by Akputu et al. (2020) titled "Policy-Driven Academic Result Computation and Transcription: Ritman University Case" focuses on addressing the inefficiencies in academic result computation and transcript generation at Ritman University, exacerbated by a burgeoning student population and dynamic curriculum. The research employs the Rational Unified Process (RUP) and a multi-tier architecture to develop a policy-driven system that can adapt to departmental policies, thereby enhancing flexibility and compliance. By utilizing technologies such as Apache, MySQL, PHP (via XAMPP), HTML, CSS, and JavaScript, the system aims to automate processes, significantly reducing processing time and errors while ensuring robust data integrity and security measures. The strengths of the study lie in its innovative approach to integrating policy-driven frameworks into academic administration, promising enhanced efficiency and accuracy in managing student records. However, challenges include the requirement for institutional approval and the necessity for comprehensive staff training to ensure optimal system utilization. These factors underscore the complexity of transitioning from existing manual or semi-automated methods to a fully integrated digital solution. Moving forward, the study recommends further testing, evaluation, and potential expansion of the system to other educational

institutions grappling with similar administrative challenges. Continuous adaptation to evolving educational policies and technological advancements remains critical for maintaining the system's effectiveness and relevance in the academic landscape.

Johnson et al. (2024) employed an intelligent analytic framework composed ofrandom forest (RF) and multiple linear regression (MLR) algorithms to predict students' academic achievement. After thorough data preparation and standardization, 664 datasets from eight departments at Federal Polytechnic Ukana were used in the study. Metrics including Mean Squared Error (MSE), Mean Absolute Error (MAE), R-squared Score (R^2), and Explained Variance Score (EVS) were used to assess the performance of both models. With lower error rates and higher prediction accuracy, RF greatly outperformed MLR, according to the data. Bar charts and scatter plots added to the evidence of RF's strong performance over MLR. This study highlights how incorporating cutting-edge machine learning methods into educational environments can offer a better understanding of students' performance and facilitate prompt and focused interventions. The results support the use of RF to improve educational outcomes and provide more accurate forecasts. In the future, studies should investigate hybrid models and enlarge the dataset to confirm that these results are applicable in a variety of educational scenarios.

METHODOLOGY

The Federal Polytechnic, Ukana is a public institution that was established in 2014 in Ukana, Akwa Ibom State. The institution has about eight programmes including Computer Science, Science Laboratory Technology, Accountancy, Statistics, Business Administration and Management, Computer Engineering, Electrical/Electronic Engineering, and Civil Engineering technology.
The result computation and transcript processing systemis built with the current technological advancements. The Agile software development life cycle (SDLC) Model is deployed in this project. Agile software development is an iterative and incremental approach to software development that emphasizes flexibility, collaboration, customer feedback, and continuous improvement. Agile methodologies are designed to adapt to changing requirements and deliver functional software quickly and efficiently. This model gives a working version early in the process and makes it less expensive to implement changes.

The use of a robust PHP framework called Laravel, and a state-of-the-art JavaScript library called ReactJS is recorded in this project. Both of them are well-known in the area of web application

development in the Open Source Software development tools and resources. The basics and required values of the system are:

i. **Scalability:** Scalability is highly important for any system. The system is also capable of growing with the school, both in terms of slowly managed growth and sudden change. The system will be designed from the beginning to scale from a single server machine running all the components up to a system involving clustered components and distributed access from a worldwide basis.

ii. **Reliability:** Scalability also requires reliability. The system is going to be capable of dealing gracefully with errors, not stopping at the first sign of trouble. Additionally, it will be easy to separately monitor the presence and performance of each of the components of the system, so that support staff can identify and deal with any error or overload that does occur.

iii. **Security:** Security is also highly important for any system. The disadvantage of making it easy to find school information is that it also makes it easy for this information to fall into the wrong hands. Defined security lines will be implemented right from the beginning. The systemis going to have the concept of user permissions. Passwords are to be stored in the database using a standard encryption algorithm.

Using Laravel and ReactJS enables the researchers to develop a system that is scalable, reliable, and secure. The database management system used is MySQL, which is scalable and robust in handling data securely.Fig 1, 2, and 3 showthe architecture, use case, and entity relationship diagrams of the system. The architectural design of the systemwhich users can feed data and view the results from the system is presented in Fig 1. The front end is the web page that the user sees and interacts with. The front end interacts with the back end, which comprises the file system and database. The run-time application self-protection (RASP) prevents attacks by rendering self-protecting action without human interventions in reaction to specific network situations such as faults, threats, etc. RASP has insight into application logic, event and data flows, and configuration, which directly affects the accuracy of detecting and deterring attacks.

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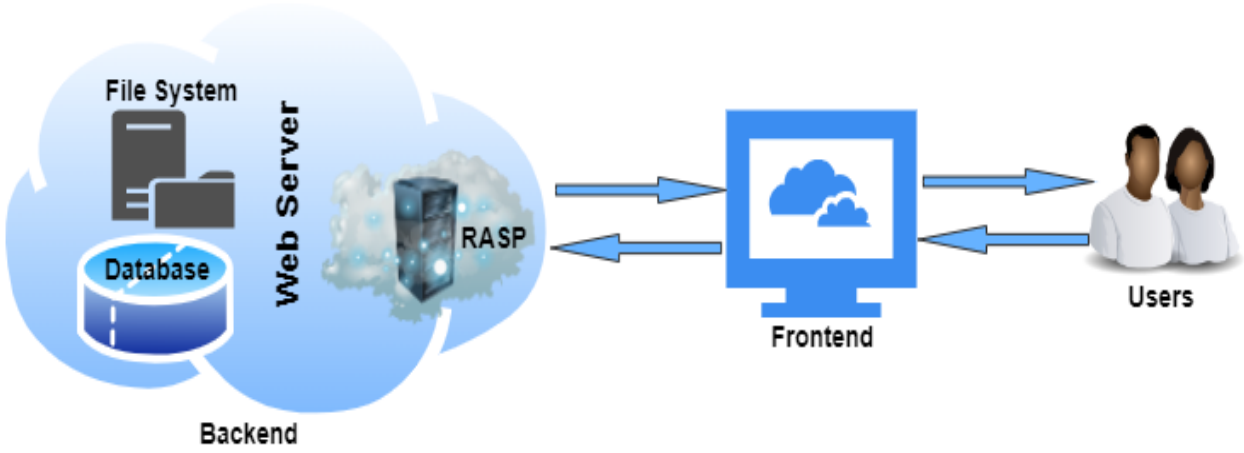

Fig 1: Architectural design of the study

The Use case diagram of the system in Fig 2 presents a graphical overview of the functionality provided by the system in terms of actors, and their goals. The use case diagram shows that the exam officer inputs students' grades, and computes final results based on entered grades and student can view their final results after the results have been approved by the Head of Department and the Dean.

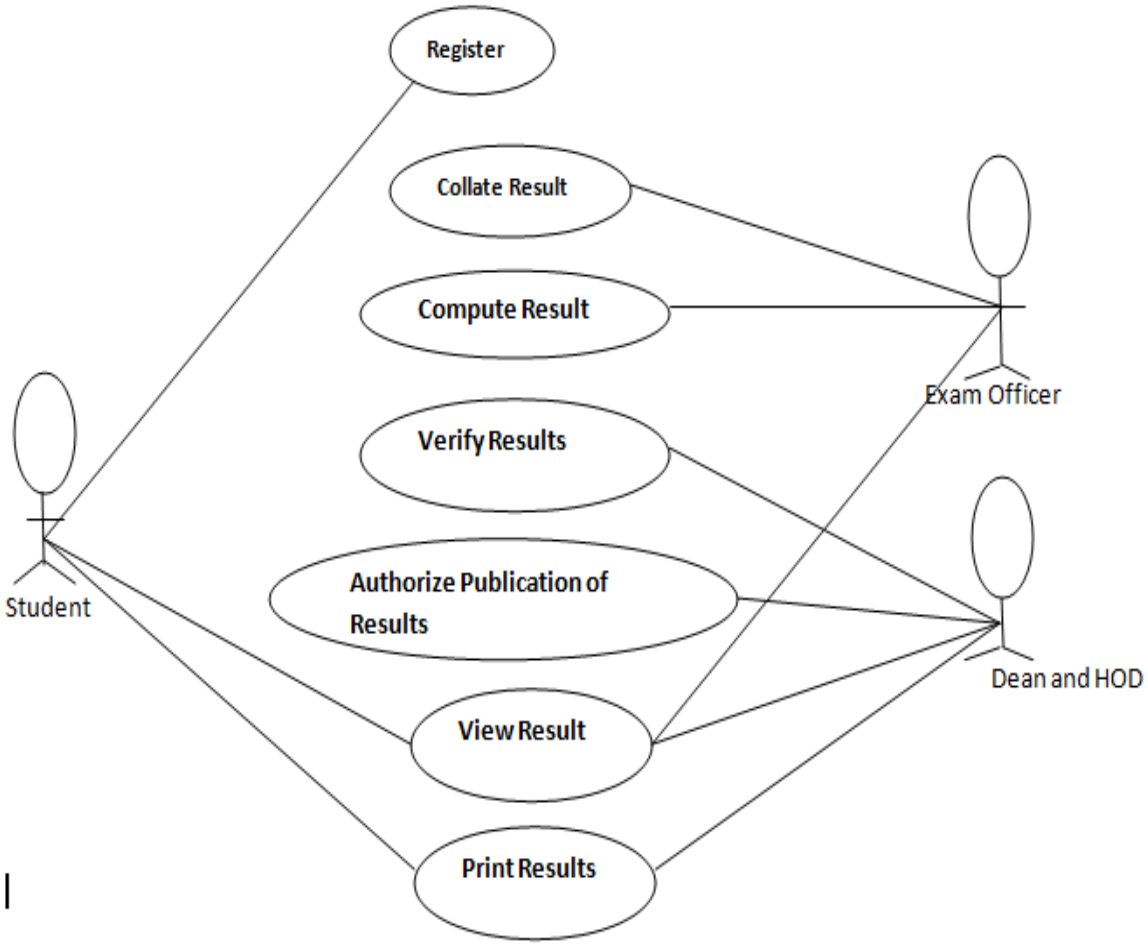

Figure 2: Use Case Diagram of the System

Fig 3 presents the entity relationship diagram of the system which consists of the following entities: (i) student (with the attributes registration number, name, department, and email), (ii) Exams officer (with the attributes Staff ID, name and Email), (iii) Head of Department (HOD) (with the attributes Staff ID, Name and Email), (iv) Dean (with the attributes Staff ID, Name, Email and facility ID), (v) Result (with the attributes Result ID, Student ID, Course code, Grade, CGPA and remark), (vi) Transcript (with the attributes Transcript ID, Student ID, Course ID, Grade, CGPA and Issue Date) and (vii) Database (with the attributes Database ID, Name and Storage). A student can have multiple results. An exam officer processes multiple results and forwardsthem to the HOD. HOD approves multiple results and sendsthem to the Dean. Dean approves multiple results and it is sent to the database. A result is associated with many courses.Multiple results contribute

to the CGPA computation. Transcripts are generated from the database.A student can have one transcript.

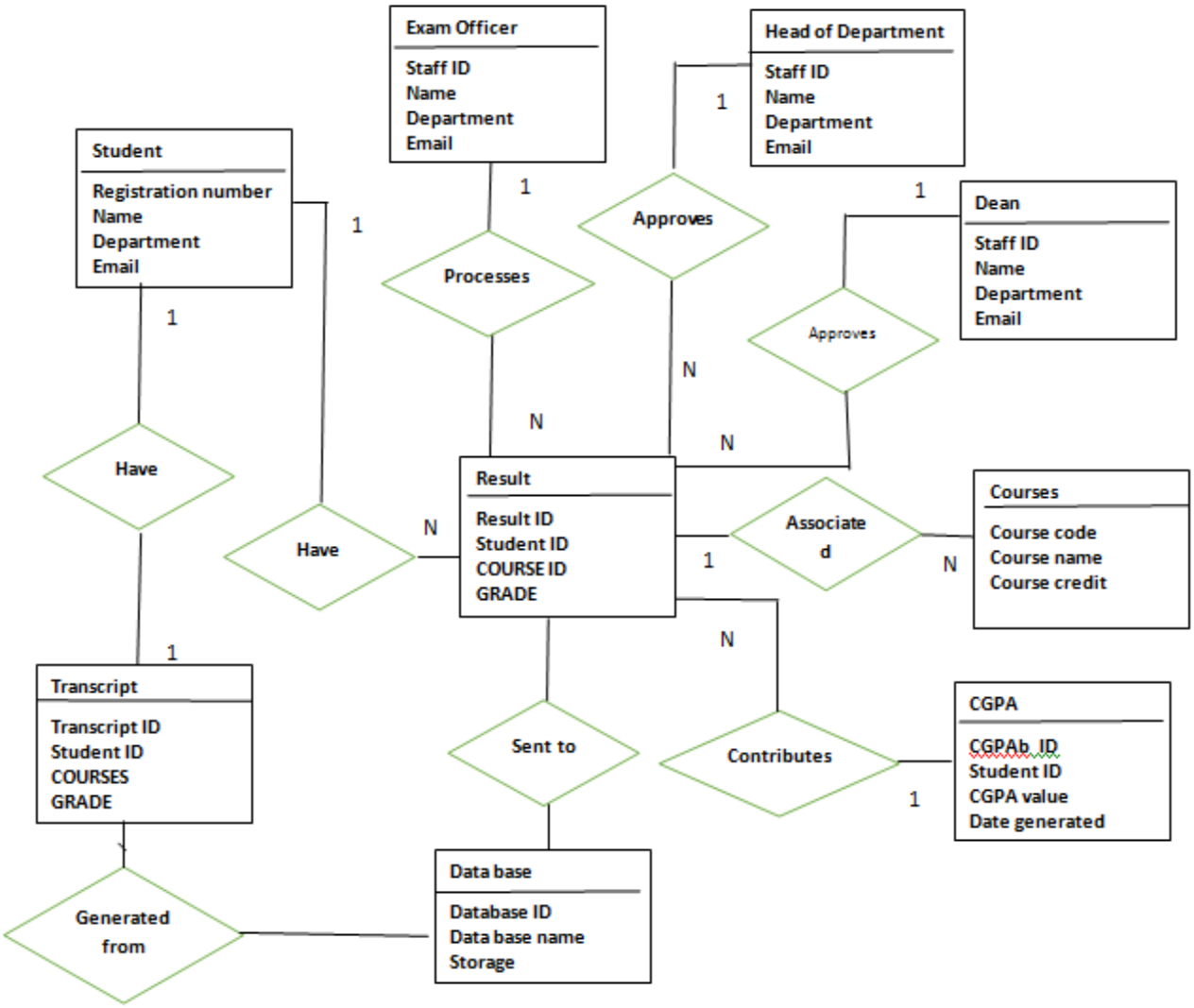

Figure 3: Entity Relationship diagram of the system

The system supports existing users to log into the system and new users can also sign up to the systems but can only complete their registration by using a link sent to their email and a temporary password. After new userslog in with their email address and the password sent to their email, the new user can then change their password. Passwords must be at least 8 characters (It must contain

a special character, a capital letter, and a number). Privileges assigned to students will be completely different from those of lecturers as well as heads of departments and deans.

The system is designed in such a way that Students arerestricted to only viewing records, continuous assessment, class attendance, and results. Students after registration may be able to modify their details only after obtaining approval from their head of department (HOD). Lecturers after submitting results cannot modify them until approval is received from the head of the department and after the HOD has approved a particular result, the HOD cannot modify such results until he/she gets approval from the Dean of the School. These privileges will ensure that results are not manipulated at will and appropriate approval must be received from the right users before changes/modifications can be made to student records.

The research work follows the following sequence:

i. Data gathering from Federal Polytechnic Ukana.
ii. Development of necessary models for the system.
iii. Creation of system design and specification.
iv. Implementation of the models and designs.
v. Testing of the system.
vi. Deployment of the system.

RESULTS

This section presents the results of the research and this is done by showing outputs of the developed results computation and transcript processing system with some explanations.

Figure 4 is the Admin Login Page. This page is a Default welcome page for all admins –Exams officer, HOD, Dean, and Super User. This page is assessed by adding‘ examsunit/login/ ’ to the default address.

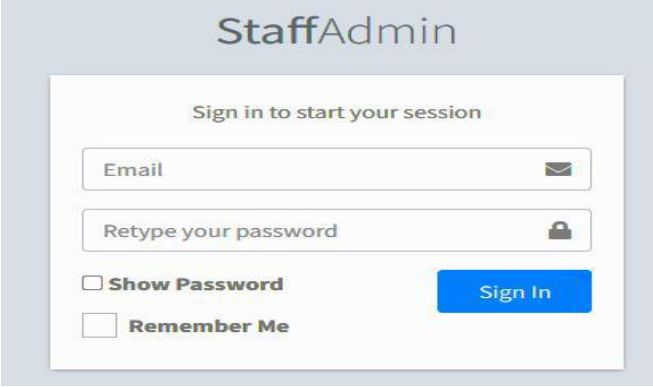

Figure 4: Admin Login Page

Figure 5 is the Dashboard for HOD**.** This is the landing page for the HOD after signing in from the admin page. With this page, the HOD can add students, add departments, add courses, initiate student suspension, assign courses to lecturers, and view and approve results.

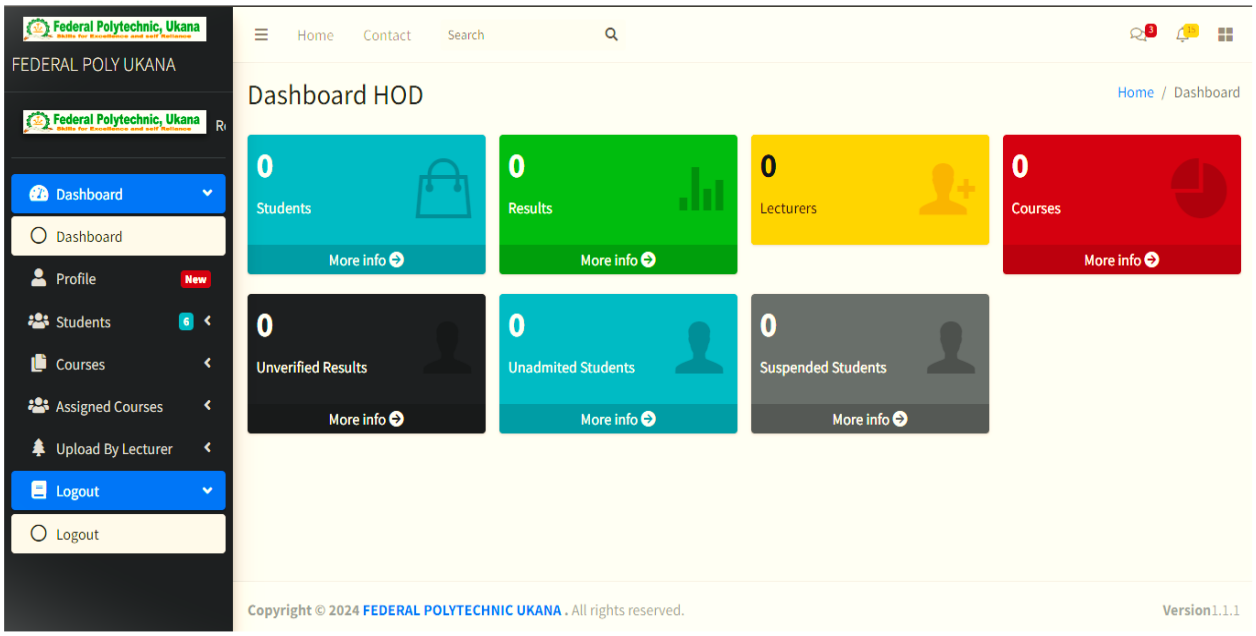

Figure 5: Dashboard for HOD

Figure 6 is the Add student page.This is the form used to add students. This function is available to those with HOD admin rights and above. After the students are added the students receive login details which are usually their email address as username and phone number as password.

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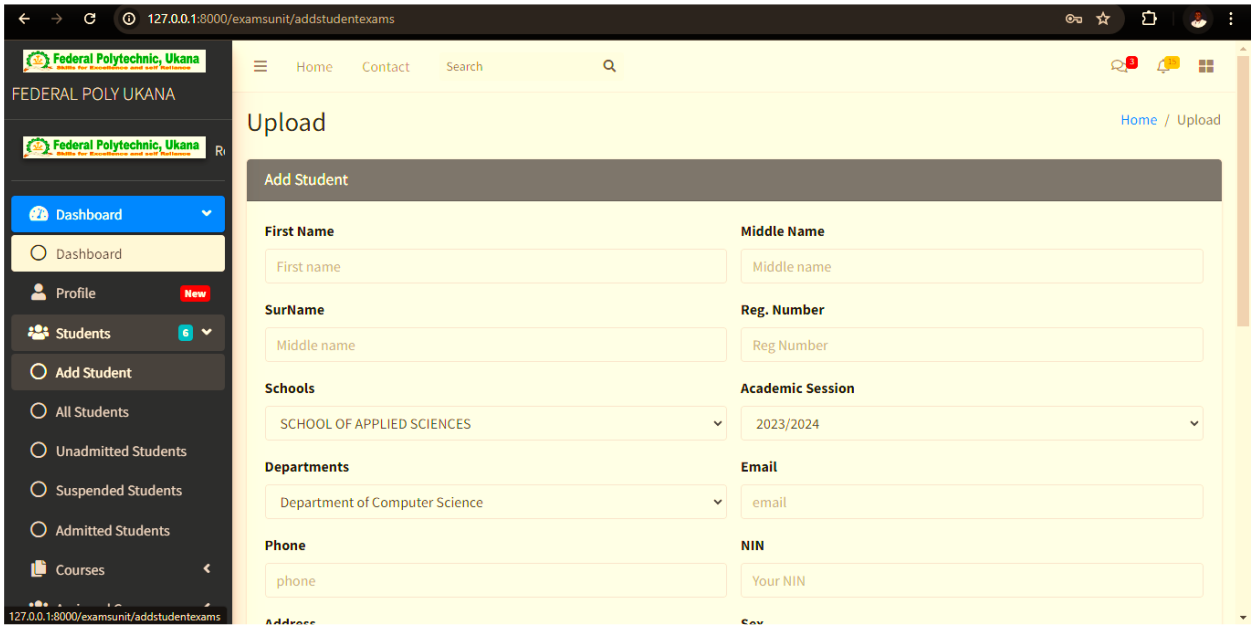

Figure 6: Add student page

The ADD COURSES FORM PAGE is depicted in Figure 7. This is a view of the departmental add courses form. This form is used to add courses to the departments. This can be assessed by all with HOD admin rights and above.

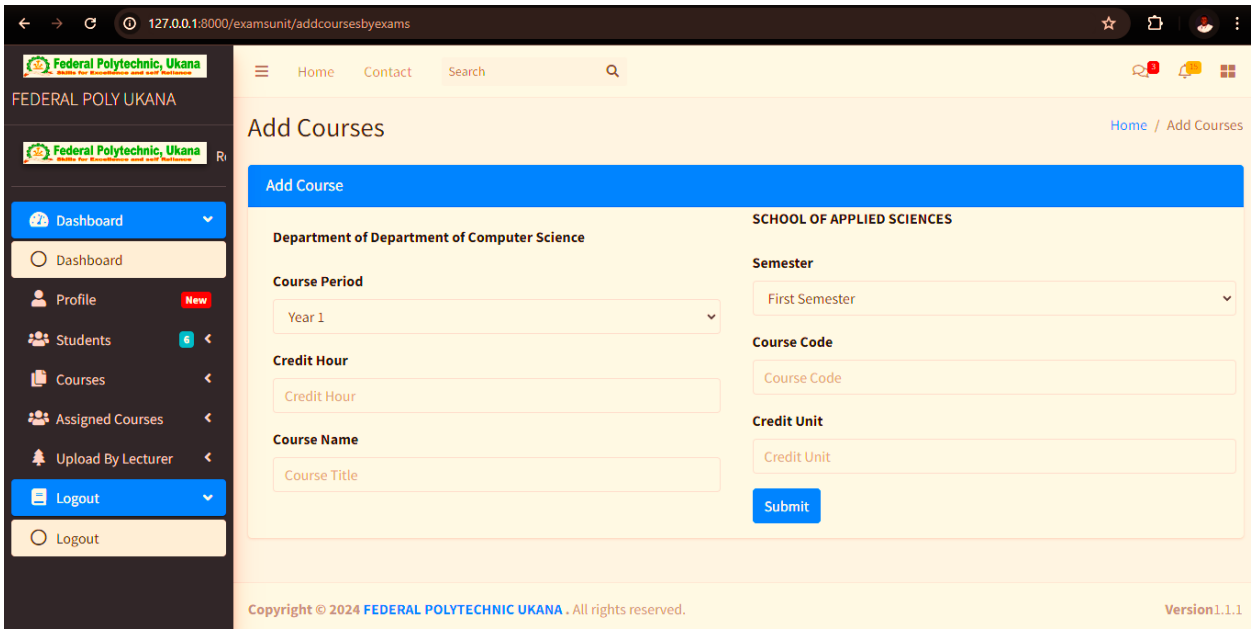

Figure 7: Add Courses Form Page

The result approval page is shown in Figure 8.Upon submission of the result by the exam officer, those with HOD admin rights and above can verify and approve the result. They can also edit the result and suspend it from this page.

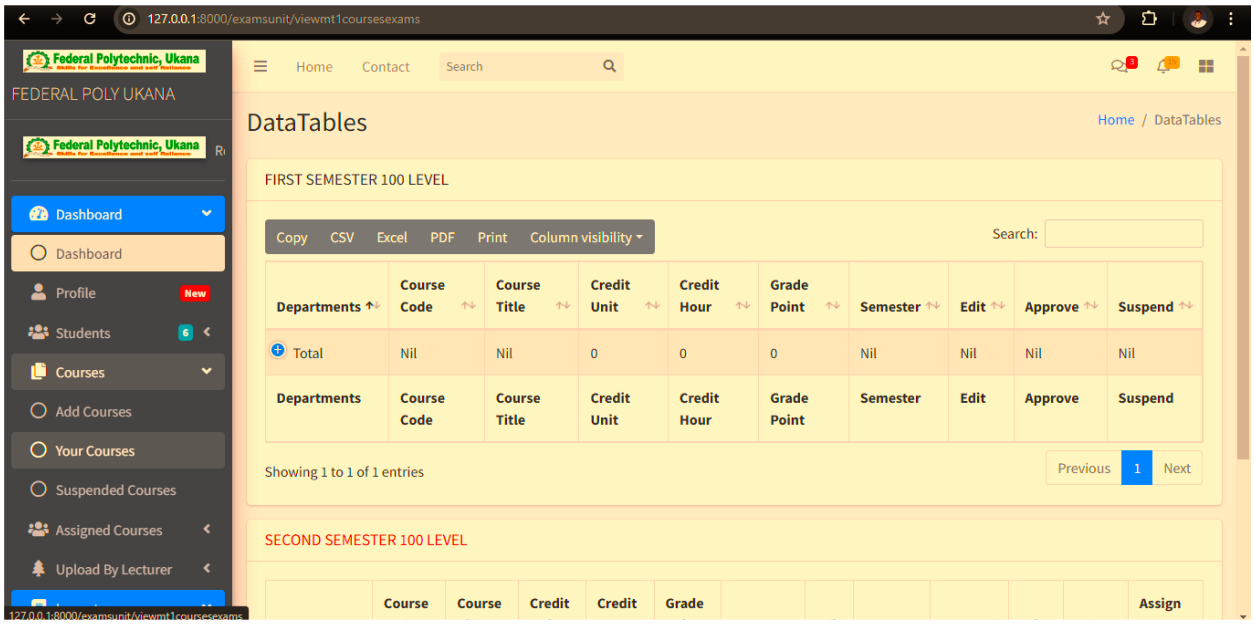

Figure 8: Result approval page

Figure 9 depicts the Overview of Lecturers by Departments.It shows an overview list of lecturers and their roles by departments. This privilege is available only to those with HOD admin rights and above.

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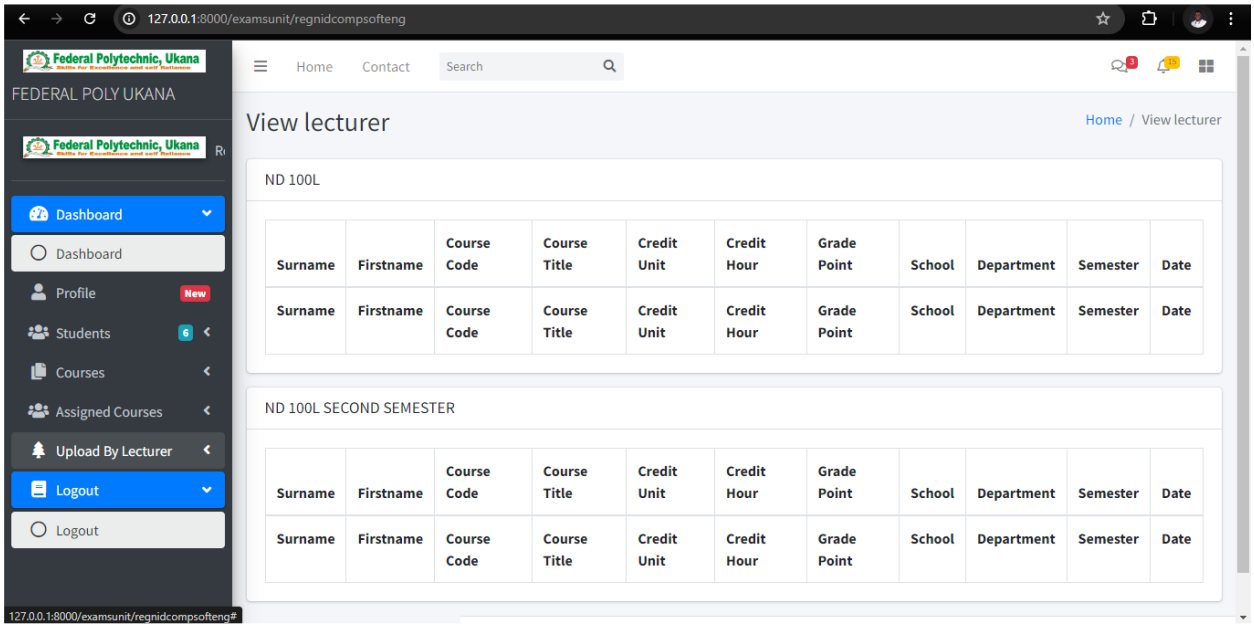

Figure 9: Overview of Lecturers by Departments.

Exam Officer's Dashboard is shown in Figure 10.This is the landing page for the Exams officer after signing in from the admin page. The Exams officer is able to view students, department courses, and lecturers. He/she can also add results either manually or as received from the lecturer. He can afterwards submit the result to HOD and Dean for verification and approval.

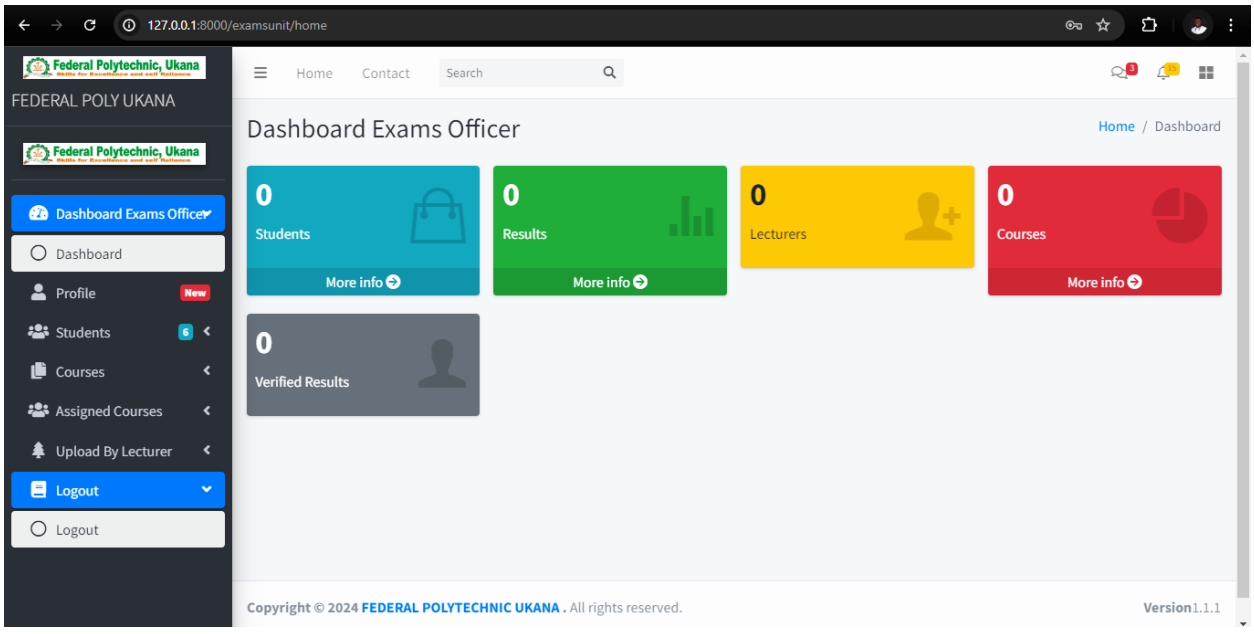

Figure 10: Exam Officer's Dashboard

Figure 11 shows the Add Student Result Form.This form is used to add results by the exams officer. He can use the search bar to search for each student manually or use the form to add students result based on registration number. This function is also useful if the course lecturer omits a student's result as well or there is an error in result computation. Only the exams officer has the admin rights.

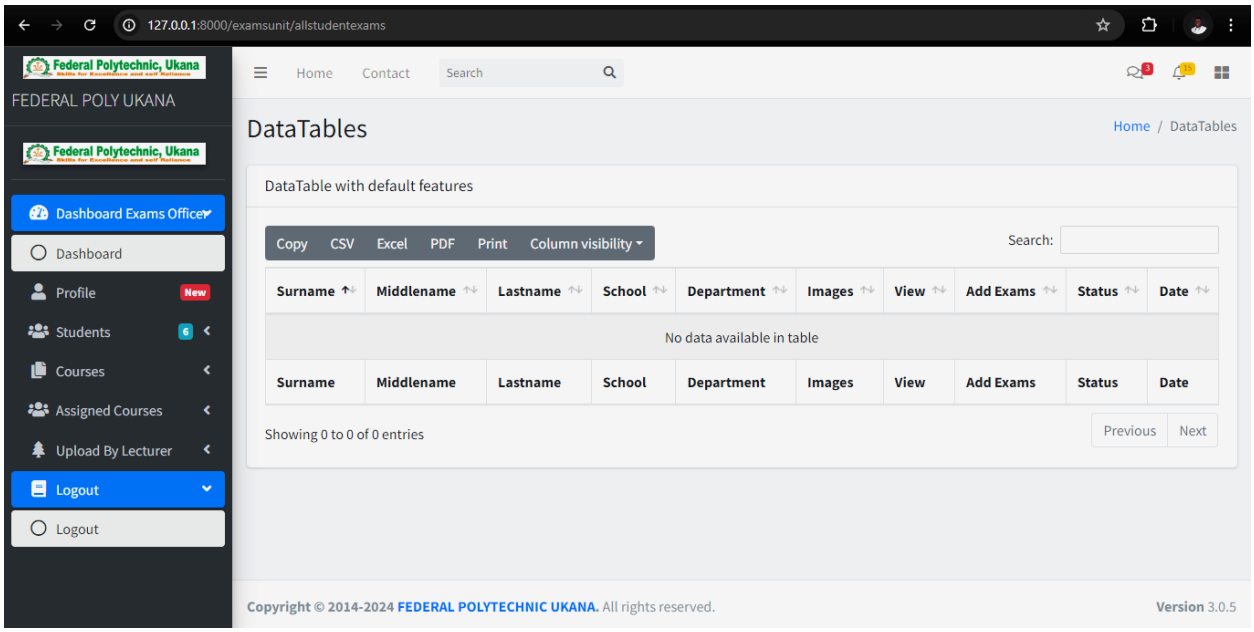

Figure 11: Add Student Result Form

Result Overview List is depicted in Figure 12. Itis an overview of computed results. This view shows a list of all students by courses. It is different from that showing result of all students by departments. This page is received by the course lecturer.

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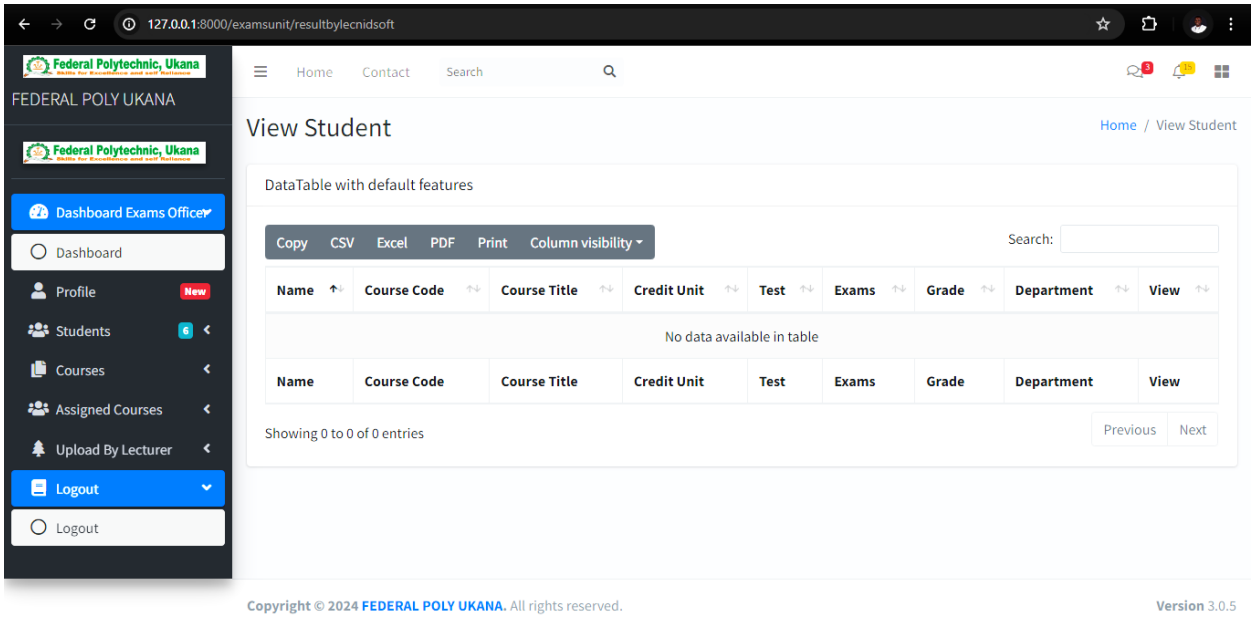

Figure 12: Result Overview List

Figure 13 shows the Dean's Dashboard. Once the Dean logs in from the admin page, this is their landing page. The dean has the authority to evaluate and approve results, add departments, add courses, authorize student suspensions, approve courses for lecturers, and add students.

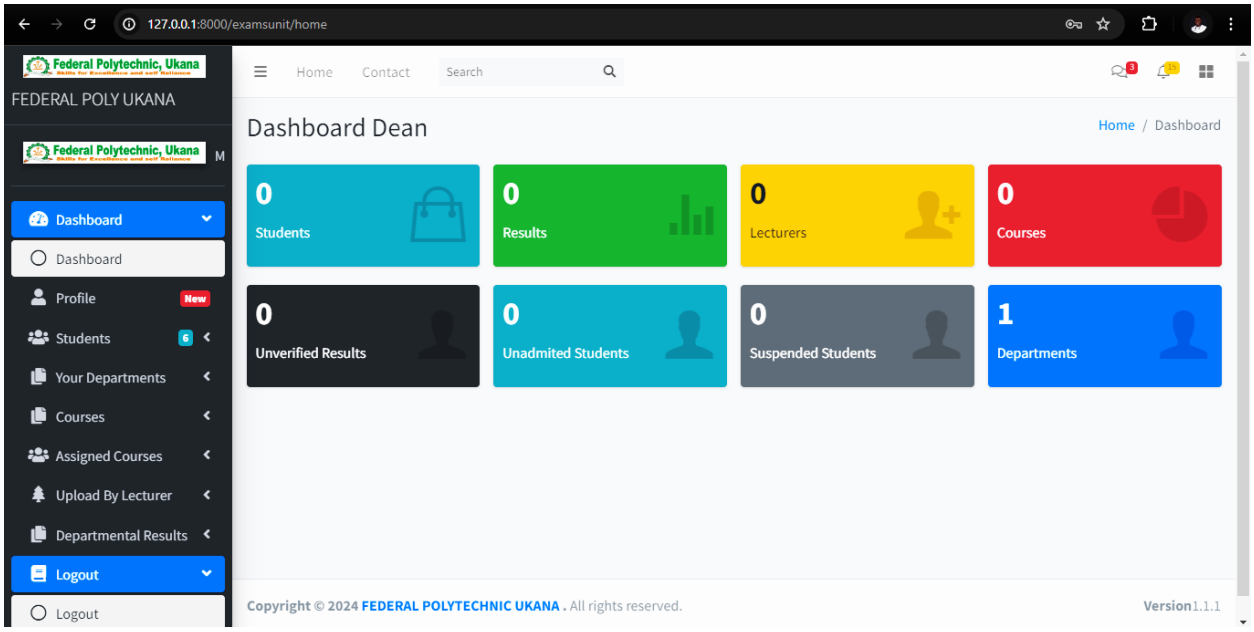

Figure 13: Dean's Dashboard

CONCLUSION

The creation of a safe Web-based results processing and transcript computation system for Ukana Polytechnic marks a substantial improvement in the way the school handles academic records. In addition to addressing the shortcomings and weaknesses of conventional record-keeping techniques, the system offers a strong framework for safeguarding private information against breaches and unwanted access. By incorporating contemporary web technologies and cryptographic methods, the system guarantees the safe, effective, and transparent management of academic records. The system's effective implementation and functioning show that it has the potential to be a flexible and scalable solution for other educational establishments looking to update their record-keeping procedures. Through the use of Agile methodology, the development team was able to react quickly to changing requirements and user feedback, producing a system that improves user experience, expedites administrative procedures, and strengthens data security.The deployment of scalable and secure systems, such as the one created for Federal Polytechnic Ukana, will be essential to supporting educational institutions' ongoing evolution in response to technological advancements and their mission to deliver high-quality education while protecting student data. To improve the system's usability and accessibility even further, future research could investigate the integration of extra feature like sophisticated analytics. Furthermore, keeping up with new security threats will be crucial to preserving the integrity of the system and guarding against potential weaknesses. Educational institutions can make sure that their academic record management systems are reliable, safe, and able to handle the changing demands of the digital age by keeping up with innovation and adaptation.

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REFERENCES

Abah, J. A., Honmane, O., Age, T. J., &Ogbule, S. O. (2022). Design of Single-User-Mode Computer-Based Examination System for Senior Secondary Schools in Onitsha North Local Government Area of Anambra State, Nigeria. *VillageMath Educational Review (VER)*, *3*(1).

Al-Saqqa, S., Sawalha, S., & AbdelNabi, H. (2020). Agile software development: Methodologies and trends. International Journal of Interactive Mobile Technologies, 14(11).

Amollo, B. O. (2021). *Evaluation of School Management Information Systems (Smis) in Secondary Schools in Siaya County* (Doctoral dissertation, JOOUST).

Arcos-Medina, G., & Mauricio, D. (2019). Aspects of software quality applied to the process of agile software development: a systematic literature review. International Journal of System Assurance Engineering and Management, 10(5), 867-897.

Akputu, O. K., Attai, K. F., Usoro, A., & Abiodun, A. O. (2020). Policy-Driven Academic Result Computation and
Transcription: Ritman University Case. Policy, 9(1).

Damasevicius, R., Maskeliunas, R., & Leon, M. (2019, October). Development of Online Clearance System for an Educational Institution. In *In Applied Informatics: Second International Conference, ICAI 2019* (p. 327).

Edison, H., Wang, X., & Conboy, K. (2021). Comparing methods for large-scale agile software development: A systematic literature review. IEEE Transactions on Software Engineering, 48(8), 2709-2731.

Ekanem, A. J., Ozuomba, S., & Jimoh, A. J. (2017). Development of Students Result Management System: A case study of University of Uyo. *Mathematical and Software Engineering*, *3*(1), 26-42.

Esang M.O., Johnson E.A., Attai K., Inyangetoh J.A., Dan E.E., Okonny E.E., Bardi I., Bassey A., and John A. (2024) Exploring Agile Methodology in Developing a Web-Based Result Computation and Transcript System: A Case Study of Federal Polytechnic Ukana, European Journal of Computer Science and Information Technology, 12 (4),1-17

Harsha, H. K. (2016). Design and Development of School Management System with Database Encryption and Decryption.

Johnson, E. A., Inyangetoh, J. A., Rahmon, H. A., Jimoh, T. G., Dan, E. E., &Esang, M. O. (2024). An Intelligent Analytic Framework for Predicting Students Academic Performance Using Multiple Linear Regression and Random Forest. European Journal of Computer Science and Information Technology, 12(3), 56-70.

Kuhrmann, M., Tell, P., Hebig, R., Klünder, J., Münch, J., Linssen, O., ... & Richardson, I. (2021). What makes agile software development agile?. IEEE transactions on software engineering, 48(9), 3523-3539.

Mishra, A., & Alzoubi, Y. I. (2023). Structured software development versus agile software development: a comparative analysis. International Journal of System Assurance Engineering and Management, 14(4), 1504-1522.

Okikiola, M. A., & Samuel, F. (2016). Optimizing the processing of results and generation of transcripts in Nigerian universities through the implementation of a friendly and reliable web platform. *Imperial Journal of Interdisciplinary Research*, *2*, 12.

Olamide, O. O., & Joshua, A. O. (2012). Design and simulation of an SMS driven microcontroller for home automation using proteus software. *Journal Computer Science Department. University of Lagos*.

Onibere, E. I. (2013). Fuzzy logic modelling of a performance evaluation system for academic programmes in Nigeria higher education. *Data Management and Security: Applications in Medicine, Sciences and Engineering*, *45*, 113.

Osunade, O., Ayinla, I. B., &Aduroja, O. O. (2019). Design and Implementation of aCentralized University Result Processing and Transcript System: Case study of UniversityofIbadan. *International Journal of Computing Sciences Research*, *2*(3), 89-101.

Perkusich, M., e Silva, L. C., Costa, A., Ramos, F., Saraiva, R., Freire, A., ... &Perkusich, A. (2020). Intelligent software engineering in the context of agile software development: A systematic literature review. Information and Software Technology, 119, 106241.

Rajegowda, P. M. (2017). Research on the Implementation of a Web-Based Institutional Support System for Middle East College: Proof of Concept Study. *Journal of Student Research*

Rindell, K., Ruohonen, J., Holvitie, J., Hyrynsalmi, S., & Leppänen, V. (2021). Security in agile software development: A practitioner survey. Information and Software Technology, 131, 106488.

Strode, D., Dingsøyr, T., &Lindsjorn, Y. (2022). A teamwork effectiveness model for agile software development. Empirical Software Engineering, 27(2), 56.

Tam, C., da Costa Moura, E. J., Oliveira, T., &Varajão, J. (2020). The factors influencing the success of on-going agile software development projects. International Journal of Project Management,38(3), 165-176.

Yari, L. V., Cedeño, C. A., & Alarcón, J. T. (2017). Aplicación para la gestión de información del investigador MONOIL, proyecto de la Universidad de Guayaquil [Application for the information management of MONOIL researcher, project of Guayaquil's University]. *International Journal of Innovation and Applied Studies*, *20*(4), 1160-1168.

Zeng, Y., &Boontasorn, N. (2022). Student management system based on intelligent technology of internet of things. In *International Conference on Cognitive based Information Processing and Applications (CIPA 2021) Volume 1* (pp. 866-876). Springer Singapore.s