Journal of Information Systems Engineering and Management
2025, 10(29s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Eastern Samar State University Student Application and Exam Results Tracking System

Kyla Jane E. Ocenar[1], Lourence R. Villaluz[2], Rolando R. Codilan[3]
[1]*Department of Entertainment and Multimedia Computing, Instructor*
[2]*Department of Entertainment and Multimedia Computing, Head*
[3]*Department of Computer Science, Instructor*

ARTICLE INFO

Received: 18 Dec 2024

Revised: 10 Feb 2025

Accepted: 28 Feb 2025

ABSTRACT

Introduction: Information technology has greatly improved education by making transactions faster, more accurate, and efficient. An exam result management system benefits both schools and students by restructuring data storage, analysis, and reporting, reducing workload for teachers and administrators. The researchers developed the Eastern Samar State University Student Application and Exam Results Tracking System to automate student admissions, entrance exam processing, and result management, ensuring efficiency and security.

Objectives: The objective of this study is to develop the Eastern Samar State University Student Application and Exam Results Tracking System to automate the storage of student admission data and entrance examination processes. Specifically, it aimed to create an administrator form page to track applicants, manage entrance exam permits, input exam scores, and generate printable forms for applications, permits, and results. Additionally, a student form page was developed to allow applicants to fill out application forms and access exam results. Finally, the system was evaluated using the IBM evaluation tool for end-user testing and ISO 9126 for expert testing.

Methods: This study follows the waterfall model, a structured software development approach where each phase must be completed before moving to the next. The researchers began with requirement analysis by conducting interviews with the head of the admission office to gather necessary data. The system was then designed, focusing on the graphical user interface (GUI) and system architecture, followed by development and testing with end-users to ensure functionality. Finally, the system was evaluated using the IBM usability scale for end-users and ISO 9126 for expert testing before deployment.

Results: The researchers successfully developed a tracking system for the Eastern Samar State University Borongan Campus Office of Admission Services, meeting all objectives. The system includes an administrator form page for tracking applicants, processing entrance exam permits, inputting raw scores, and generating printable forms, as well as a student form page for application submission and result viewing. Evaluation using the IBM usability survey resulted in a high satisfaction rating of 4.62, while Alpha testing with ISO 9126 yielded a 4.40 overall rating, confirming the system's functionality, reliability, and usability.

Conclusions: The developed system effectively updated student admissions and exam result management, meeting all objectives. High ratings from IBM usability testing indicate that the system is user-friendly and efficient, while compliance with ISO 9126 standards ensures software reliability and maintainability. These results confirm that the system is suitable for deployment and can enhance the university's admission process.

Keywords: Tracking system, website, programming, RAD

INTRODUCTION

Information technology plays a crucial role in modern education, significantly improving efficiency through computerized and online systems. With technological advancements, educational institutions can restructure various processes, including exam result management, making transactions more rapid, accurate, and efficient [1]. An exam

result management system benefits both schools and students by automating result processing, reducing workload, and providing better access to data. Teachers and administrators can analyze student performance more effectively, while students can receive their results instantly, reducing stress and aiding in better preparation [2]. Additionally, automated systems ensure secure access and prevent unauthorized users from mismanaging legal and official data [3].

Several studies emphasize the significance of automated examination systems in improving education management. Universities in developing countries, such as Nigeria, have adopted information and communication technologies (ICT) to enhance record-keeping and information management [4]. Similarly, Malaysia's educational institutions face challenges in handling examination-related information, with many still relying on manual processes [5]. The increasing popularity of software solutions has led to the development of various systems aimed at addressing inefficiencies in traditional admission and examination processes. Standardized entrance exams play a crucial role in assessing students' readiness for higher education, reinforcing the need for a reliable and efficient management system [6].

The Eastern Samar State University Student Application and Exam Results Tracking System was developed to address challenges in the traditional admission and entrance exam process. The system automates data storage, entrance exam result processing, and document generation, eliminating issues such as multiple data entries, misplaced documents, and human errors. It provides significant benefits by modernizing the admission system, ensuring a more convenient and efficient process for both administrators and students. Furthermore, the system was evaluated using the IBM usability tool and ISO 9126 standards, demonstrating high levels of user satisfaction and software quality. Through this innovation, Eastern Samar State University can enhance its admission and examination management, improving overall efficiency and accuracy.

OBJECTIVES

The researchers aimed to develop the Eastern Samar State University Student Application and Exam Results Tracking System to automate the existing procedure of storing student admission data and recording every process during the entrance examination period in a computerized system.

Specifically, this study aimed to:

1. Develop a form page for the administrator that allows them to track the number of applicants for admission, adopt the existing form for the University Entrance Examination Permit, input raw scores gathered from the entrance examination, and generate printable forms such as the application form, exam permit, and exam results.

2. Develop a form page for students that enables them to fill up the application form, view their exam results, and download them for future reference.

3. Evaluate the system using the IBM evaluation tool for end-user testing and ISO 9126 for expert testing to ensure its functionality, reliability, usability, efficiency, maintainability, and portability.

METHODS

A. Software Development Model

In this study, the waterfall model was used because it follows a structured Software Development Life Cycle (SDLC) that progresses logically, resembling the way water cascades down a precipice. This model develops systematically, moving from one phase to another in a sequential manner. Each phase had to be completed before proceeding to the next, ensuring clear objectives were met at every stage. Once a phase was finalized, revisiting or modifying its objectives was not permitted.

The significance of the waterfall model in this study was its ability to establish fixed requirements before the development process began, ensuring that all client specifications were clearly defined and adhered to. This structured approach provided a stable foundation for system development, minimizing unexpected changes and maintaining project efficiency.

The researchers followed the waterfall model through several key phases, including requirement analysis, system design, development, testing, and implementation, to ensure the system's functionality, reliability, and usability.

Each phase was carefully executed to achieve the study's objectives and deliver an effective Student Application and Exam Results Tracking System for Eastern Samar State University**.**

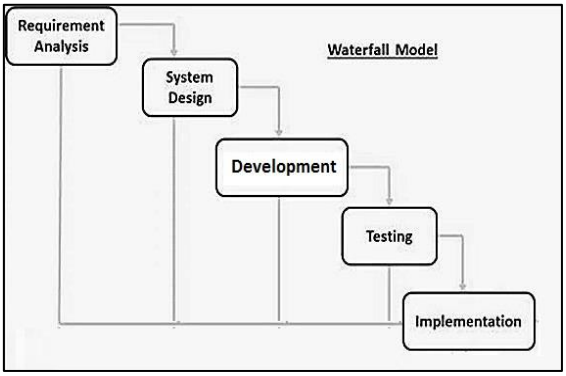

Figure 1. SDLC-Waterfall Model

Figure 1 shows the software development model used in this study, which followed the waterfall approach. The process began with requirement analysis, where the researchers conducted a face-to-face interview with the head of the admission office to gather essential data that guided system implementation. Next, in the system design phase, the researchers developed the graphical user interface (GUI) and defined the system flow and architecture. During the development phase, the focus was on creating the user interface (UI) as the foundation of the system. The testing phase involved a series of system tests, during which the researchers collaborated with end-users to assess functionality and address potential issues. Finally, in the implementation phase, the system underwent final testing before being deployed for actual use, ensuring its efficiency and reliability.

B. Data Flow Diagram

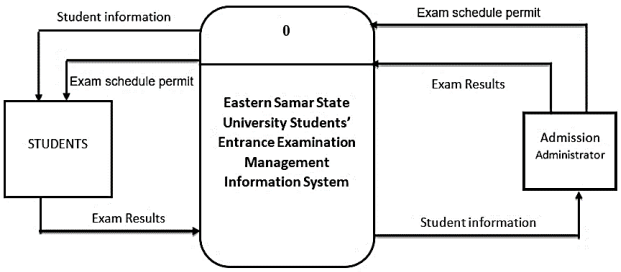

Figure 2. Contextual Data Flow Diagram

The figure illustrates the data flow diagram for the project. The process begins with students providing their information to the admissions personnel by signing up and registering, which is then stored in the database. Next, students complete the Admission Application Form, submitting all required details to the database. The server retrieves this information for the admissions personnel, who then issue an entrance exam permit to the students, specifying the examination schedule, including time, date, and location. After the exam, the testing personnel input the entrance exam results into the database. Finally, the system consolidates and displays all relevant information, allowing students to access details regarding their admission and entrance exam status.

C. System Architecture

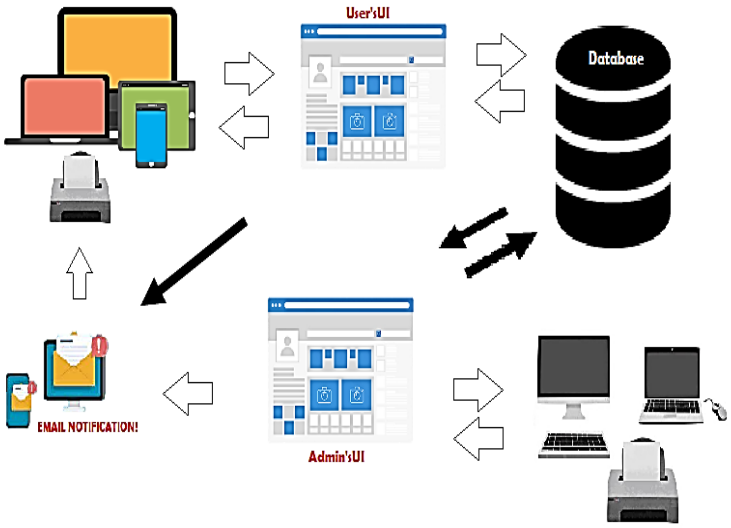

Figure 3. System Architecture

The figure illustrates the System Architecture of the Eastern Samar State University Student Application and Exam Results Tracking System. In this architecture, a user's device accesses the User Interface (UI), which is displayed on their device, while both the User UI and Admin UI interact with the central database. The User UI also sends data to the email notification system, which delivers messages to the user's device. Meanwhile, the admin device accesses the Admin UI to manage system functions. All these processes operate seamlessly through an internet connection, ensuring smooth data transmission and system functionality.

D. Instrumentation

The questionnaire utilized to evaluate the system was the IBM Computer System Usability Scale questionnaire for end-user testing. It contained a total of ten statements, each answered using a scale of 1 to 5, with 5 being the highest, indicating "strongly agree," and 1 being the lowest, indicating "strongly disagree." Additionally, the ISO 9126 standard was used for expert testing, consisting of 28 questions: five questions for functionality, five for reliability, three for efficiency, five for maintainability, and five for portability. Each question was answered using the same 1 to 5 scale, with 5 representing "strongly agree" and 1 representing "strongly disagree."

E. Data Analysis

The data analysis used in this project was the descriptive statistics mean. It was used to present the level of the system usability level answered by the target respondents, which is a total of 30 respondents coming from the students and 1 from the admission administrator.

Mean: The mean is the average of the numbers and refers to the mathematical center of the distribution. It is used for the regular distribution of interval or ratio scores. The formula is: Where

$$\sum x = sum\ of\ all\ scores$$
$$n = number\ of\ scores$$

F. Coding Scheme

For Alpha Testing (End-User Testing)

The respondents evaluated the system using IBM computer system usability based on the following scale:

Level of Agreement	Adjective Rating
5	Strongly Agree
4	Agree

3	Fair
2	Disagree
1	Strongly Disagree

For Acceptance Testing (Beta Testing or End-User Testing)

The obtained mean was interpreted using the following scheme

Numerical Rating Scale	Adjectival Rating
4.20-5.00	Strongly Agree
3.40-4.19	Agree
2.60-3.39	Fair
1.80-2.59	Disagree
1.00-1.79	Strongly Disagree

RESULTS

In this section, the system screenshots of the UI design are presented, along with the findings and results of the alpha and beta testing conducted at Eastern Samar State University Main Campus.

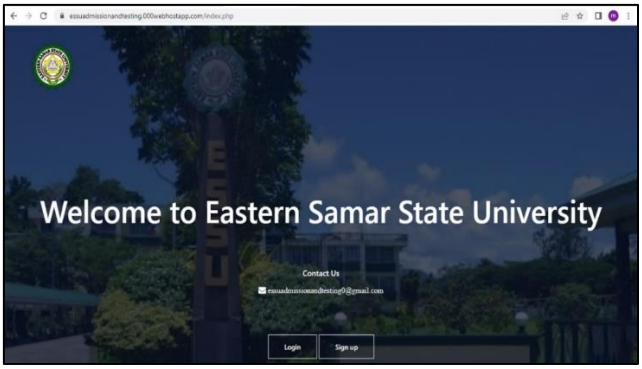

Figure 4 System Dashboard.

This figure illustrates the system's main dashboard, where users can log in or sign up to create an account.

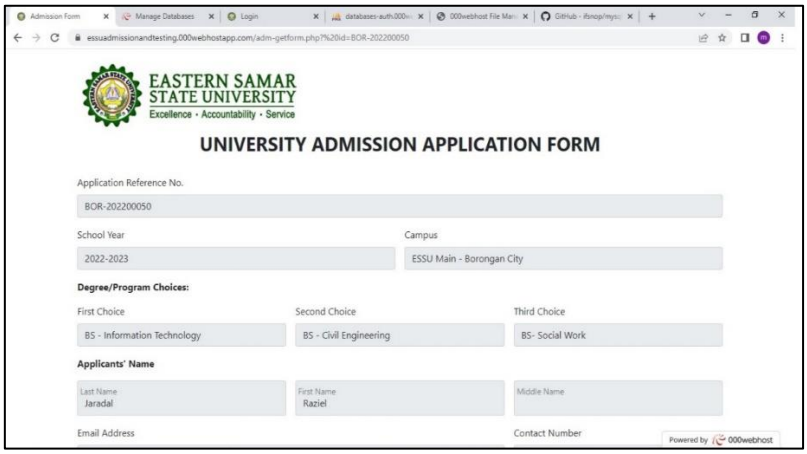

Figure 5 Admission Application Form

This figure displays the student's university admission form, which must be completed by the applicant. All required information must be accurately entered into the form.

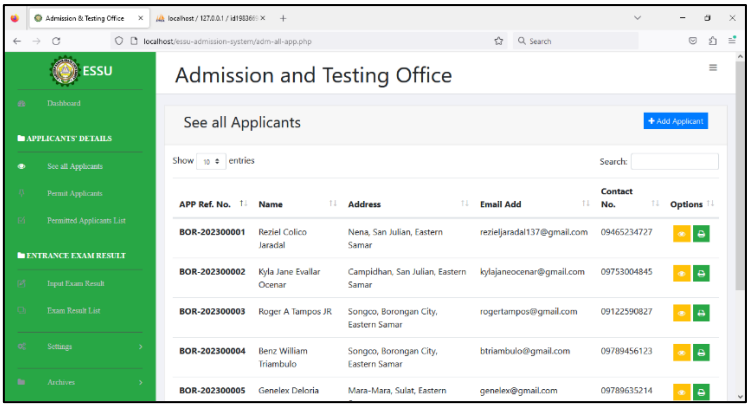

Figure 6 Administrator Page for Viewing All Applicants

This figure illustrates the interface where the administrator can view a list of all student applicants for admission.

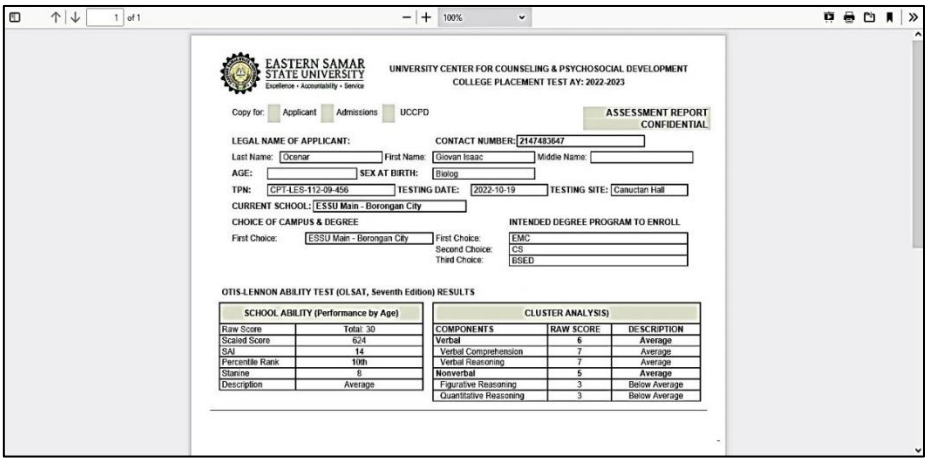

Figure 7 Administrator Page for Print Form Exam Results

This figure shows the Administrator Print Form of the student's Entrance Exam Results.

ISO 9126- Software Product Quality Model – Alpha Testing

The tables below present the results of the conducted testing and survey using the questionnaire adopted from ISO 9126-Software Product Quality Model questionnaire at the College of Computer Studies IT Department Faculties considered as IT experts

Table 1. Functionality Mean and Interpretation Result

QUESTIONS	Mean	Interpretation
1. The student can download and print the entrance exam permit form.	4.4	Fully Functional
2. The student can download and print the entrance exam result form.	4.8	Fully Functional
3. The administrator can print the Admission Application Forms of the students.	4.4	Fully Functional
4. The administrator can produce entrance exam permit form for the students.	4.4	Fully Functional
5. The administrator can produce entrance exam result form for the students.	4.4	Fully Functional
Grand Mean	4.48	Fully Functional

Table 2. Reliability Mean and Interpretation Result

QUESTIONS	Mean	Interpretation
1. The system avoids failure as a result of faults in the software.	4.2	Strongly Reliable
2. The system maintains a specified level of performance in cases of software faults or of infringement on its specified interface.	4.4	Strongly Reliable
3. The system re-establishes a specified level of performance and recovers data directly affected in the case of a failure.	4.2	Strongly Reliable
4. The system adheres to standards conventions or regulations relating to reliability.	4.4	Strongly Reliable
5. The system enables the user to understand whether the software is suitable, and how it can be used for particular tasks and conditions of use.	4.4	Strongly Reliable
Grand Mean	4.32	Strongly Reliable

Table 3. Usability Mean and Interpretation Result

QUESTIONS	Mean	Interpretation
1. The system avoids failure as a result of faults in the software.	4.4	Strongly Agree
2. The system maintains a specified level of performance in cases of software faults or of infringement on its specified interface.	4.4	Strongly Agree
3. The system re-establishes a specified level of performance and recovers the data directly affected in the case of a failure.	4.4	Strongly Agree
4. The system adheres to standards, conventions or regulations relating reliability.	4.2	Strongly Agree
5. The system enables the user to understand whether the software is suitable, and how it can be used for particular tasks and conditions of use.	4.4	Strongly Agree
Grand Mean	4.36	Strongly Agree

Table 4. Efficiency Mean and Interpretation Result

QUESTIONS	Mean	Interpretation
1. The system provide appropriate response and processing times and throughout rates when performing it's function, under stated conditions.	4.4	Strongly Agree
2. The system used appropriate amounts and types of resources when the software performs its function under stated conditions.	4.4	Strongly Agree
3. The system adheres to standards or conventions relating to efficiency.	4.6	Strongly Agree
Grand Mean	4.46	Strongly Agree

Table 5. Maintainability Mean and Interpretation Result

QUESTIONS	Mean	Interpretation
1. The system has the capability to be diagnosed for deficiency or causes of failures in the software, or for the parts to be modified to be identified.	4.4	Strongly Agree
2. The system can enable a specified modification to be implemented.	4.4	Strongly Agree
3. The system avoids unexpected effects from modification of the software.	4.4	Strongly Agree
4. The system enables modified software to be validated.	4.8	Strongly Agree
5. The system adheres to standards, conventions, relating to maintainability.	4.6	Strongly Agree
Grand Mean	4.52	Strongly Agree

Table 6. Portability Mean and Interpretation Result

QUESTIONS	Mean	Interpretation
1. The system can be adopted for different specified environments without applying actions or means other than those provided for this purpose for the software considered.	4.6	Strongly Agree
2. The system can be installed in a specified environment.	4.6	Strongly Agree
3. The system can co-exist with other independent software in a common resource.	4.6	Strongly Agree
4. The system can be used in place of another specified software product for the same purpose in the same environment.	4.4	Strongly Agree
5. The system adheres to standards, conventions, relating to portability.	4.6	Strongly Agree
Grand Mean	4.52	Strongly Agree

Acceptance Testing – System End-User

Table 7. IBM Computer Usability Satisfaction Survey

Questions	Mean	Interpretation
It was simple to use this system/website.	4.8	Strongly Agree
It was easy to access this system.	4.35	Strongly Agree
Can be easily learned by all of the users due to its user-friendly interface.	4.75	Strongly Agree
Able to show the correct records filled.	4.7	Strongly Agree
The organization of information on the system screens is clear	4.57	Strongly Agree

I like using the interface of this system.	4.5	Strongly Agree
It was convenient to submit the application for admission.	4.65	Strongly Agree
It was easy to learn to use this system	4.65	Strongly Agree
I can effectively complete the task faster using the website.	4.65	Strongly Agree
Overall, I am satisfied with how easy it is to use this system.	4.53	Strongly Agree
Grand Mean	4.62	Strongly Agree

DISCUSSION

The objective of this study was to develop the Eastern Samar State University Student Application and Exam Results Tracking System to automate the storage of student admission data and entrance examination processes. Specifically, it aimed to create an administrator form page to track applicants, manage entrance exam permits, input exam scores, and generate printable forms for applications, permits, and results. Additionally, a student form page was developed to allow applicants to fill out application forms and access exam results. Finally, the system was evaluated using the IBM evaluation tool for end-user testing and ISO 9126 for expert testing.

The results of the system evaluation demonstrate that these objectives were successfully achieved. The system's performance was assessed based on the ISO 9126 quality model, which evaluates six key aspects: functionality, reliability, usability, efficiency, maintainability, and portability. Additionally, an IBM Computer Usability Satisfaction Survey was conducted to assess user experience during BETA testing. Table 1 presents the functionality assessment, where the system achieved a weighted grand mean of 4.48, interpreted as "Fully Functional," indicating that all features operated effectively. Table 2 shows the reliability evaluation, with a weighted grand mean of 4.32, interpreted as "Strongly Agree," confirming that the system performed consistently without unexpected failures. Table 3 highlights the usability assessment, where the system obtained a weighted grand mean of 4.36, also interpreted as "Strongly Agree," demonstrating that the interface is user-friendly and easy to navigate.

Further evaluation of efficiency, maintainability, and portability is presented in Tables 4, 5, and 6, respectively. The system's efficiency was rated with a weighted grand mean of 4.46, signifying smooth operation and effective resource utilization. Maintainability received a weighted grand mean of 4.52, reflecting the system's adaptability for future updates and modifications. Similarly, portability was also rated with a weighted grand mean of 4.52, confirming that the system can be deployed across different platforms or environments. Table 7 summarizes the IBM Computer Usability Satisfaction Survey conducted during BETA testing, where the system achieved an overall weighted mean of 4.62, interpreted as "Strongly Agree." This result affirms that users found the system intuitive, accessible, and convenient.

In conclusion, the evaluation results validate that the system met its defined objectives and adhered to both ISO and IBM usability standards. The system effectively automated student admission and entrance examination tracking, providing a reliable, user-friendly, and efficient solution for students and administrators.

REFRENCES

[1] *Baba, A. (2021).* The impact of technological advances on education and examination systems.
[2] *Ralecon, P. (2021).* The benefits of exam result management systems in education.
[3] *Divya, R., Nandhini, M., Shobana, R., & Sujithra, R. (2021).* Automation systems for examination management.
[4] *Ekanem, I., Ozuomba, S., & Jimoh, R. (2009).* ICT adoption in university record-keeping in Nigeria.
[5] *Adzmi, M. A., et al. (2019).* Challenges in handling examination information in Malaysian educational institutions.
[6] Bai, X., Chi, C., & Qian, Z. (2014). The role of standardized exams in university admissions.