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Automated Admission Assessment System for Jose Rizal Memorial State University

KEVIN B. SAGUIN, MSIT
Instructor
Jose Rizal Memorial State University – Dapitan City

Abstract — The Automated Admission Assessment System for JRMSU is designed to modernize the university's admissions process. This system automates submitting applicant details, generating entrance exam ratings, and course suggestions, thereby ensuring a consistent and fair evaluation of all applicants.
The system incorporates expert systems and employs advanced algorithms, including Natural Language Processing (NLP), to automate exam checking and result compilation, increasing operational efficiency and decision-making accuracy.
The findings reveal that the automated system considerably decreases processing time and human error, enhancing efficiency and accuracy in the admissions process. It achieved an 'Excellent' rating across critical software quality metrics such as functionality, reliability, usability, and more, with a grand mean score of 4.55. This score reflects the system's superior performance and alignment with JRMSU's operational requirements.
Implementing this automated system significantly advances JRMSU's commitment to leveraging technology for educational administration. The system supports JRMSU's strategic goal to enhance educational outcomes and administrative efficiency by reducing administrative burdens and improving data security and privacy. The successful deployment of this system provides a model that could be replicated in similar institutional contexts, suggesting broad implications for the field of computer science in educational settings

Keywords — Automated Admission Assessment System for Jose Rizal Memorial State University, Agile Software Development, Expert Systems, Operational Efficiency, Educational Administration

I. Introduction

In this academic exploration, the conceptualization and development of an Automated Admission Assessment System for Jose Rizal Memorial State University represents a significant step towards modernizing the admission process, leveraging technology to streamline operations, enhance accuracy, and provide a seamless experience for prospective students.

Pursuing higher education has become increasingly competitive, necessitating that universities adopt efficient, transparent, and fair admission processes. The Automated Admission Assessment System for Jose Rizal Memorial State University aims to address these needs by automating the evaluation of applications, thereby reducing human error, minimizing bias, and increasing the processing speed of admissions. This system is a technological upgrade and a

strategic enhancement to ensure the university remains competitive and accessible in the digital age.

The Automated Admission Assessment System for Jose Rizal Memorial State University is designed to handle various components of the admission process, including submitting applicant details, academic records, entrance examination scores, and other relevant criteria. By automating these processes, JRMSU can ensure a consistent and objective assessment of all applicants that is aligned with its admission policies and academic standards.

Evaluating the effectiveness of the Automated Admission Assessment System for Jose Rizal Memorial State University involves several key metrics such as functionality, reliability, usability, efficiency, maintainability, portability, and security. Functionality ensures the system's core operations, such as application processing and evaluation, are executed accurately according to the university's criteria.

Reliability assesses the system's consistency over time, particularly under peak loads, emphasizing the importance of uptime and error recovery. Usability examines the system from the user's perspective, ensuring that applicants and administrators find the interface intuitive and straightforward, enhancing the user experience. Efficiency looks at the system's resource utilization to guarantee swift application processing without compromising service quality.

Maintainability is crucial for future-proofing the system, allowing easy updates and modifications with minimal effort. Portability ensures the system's adaptability across various technological environments, facilitating seamless integration and deployment. Lastly, security is the ultimate protection of sensitive data against unauthorized access and ensures the integrity of the admission process. These metrics provide a comprehensive evaluation framework that guides the Automated Admission Assessment System for Jose Rizal Memorial State University towards achieving operational excellence, ensuring efficient admissions management with a high degree of accuracy, fairness, and user satisfaction.

A mixed-methods approach incorporating quantitative and qualitative data is recommended to systematically evaluate the Automated Admission Assessment System for Jose Rizal Memorial State University. Quantitative data can be gathered through metrics such as processing time reduction, error rates, and the number of applications processed. Qualitative data can be collected via surveys and interviews with users (applicants and staff) to gain insights into their experiences and satisfaction levels. This comprehensive evaluation will provide a holistic view of the system's performance and impact, guiding ongoing improvements and adaptations.

Furthermore, the system's integration with existing academic and administrative databases is crucial for ensuring accuracy and efficiency. The evaluation should also consider the system's security features to protect sensitive applicant information, complying with data protection regulations and best practices.

In conclusion, the Automated Admission Assessment System for Jose Rizal Memorial State University represents a significant advancement in the university's admission process. Through careful development and rigorous evaluation, it has the potential to streamline admissions and enhance the overall quality and accessibility of student information or records at JRMSU. This initiative underscores the university's commitment to embracing technological innovations to meet the evolving needs of students and society.

II. Methodology

This method is a systematic process of planning, analyzing, designing, implementing, testing, integrating, and maintaining computer programs to meet the internal consistency and effectiveness criteria. The developmental research framework and its processes are incredibly significant in information and communication technology. This research analyzes and describes the product development process, and the final product is deployed, tested, and evaluated.

Research Environment

Jose Rizal Memorial State University Main Campus- Dapitan City

Research Respondents

This study will involve three (3) categories of respondents to ensure a comprehensive evaluation of the "Automated Admission Assessment System for Jose Rizal Memorial State University.

Respondents	No. of Respondents	%
IT Professional	5	10.64
Guidance Personnels	5	10.64
Student Applicants	37	78.72
Total	47	100

Research Instrument

The study applied a personalized evaluation tool based on ISO/IEC 9126 standards, specifically created to assess the quality of the upcoming software. This tool analyzes the software across seven principal quality indicators: functionality, reliability, usability, efficiency, maintainability, portability, and security. Each indicator includes seven specific criteria to measure the software’s performance.

Validation of Instrument

The instrument developed for this study draws inspiration from the tool Eva de Schipper, Remco Feskens, and Jos Keuning (2021) used in their research titled “Personalized and Automated

Feedback in Summative Assessment Using Recommender Systems." The survey targets three distinct groups to ensure a thorough evaluation of the "Automated Admission Assessment System for Jose Rizal Memorial State University," which includes IT professionals, guidance staff, and prospective students seeking admission to the university.

The advisor, IT specialists, and research experts at JRMSU-Main Campus also reviewed this revised instrument to evaluate its content relevance and appropriateness, similar to the process for earlier problems in the research.

Scoring Procedure

With the help of the selected tools, data were collected from a sample of IT professionals, guidance personnel, and prospective students applying for admission, and the efficiency of the built system implementation was evaluated. The table provided below summarizes the findings of this evaluation. It presents a clear and organized representation of the data, allowing for an easy comparison of feedback from the different respondent groups.

Statistical measure of internal consistency and reliability of Cronbach's alpha

Cronbach's Alpha Value	Interpretation
$\alpha \geq 0.90$	Excellent internal consistency
$0.80 \leq \alpha < 0.90$	Good internal consistency
$0.70 \leq \alpha < 0.80$	Acceptable internal consistency
$0.60 \leq \alpha < 0.70$	Questionable internal consistency
$0.50 \leq \alpha < 0.60$	Poor internal consistency
$\alpha < 0.50$	Unacceptable internal consistency

Data Gathering Procedure

The researcher conducted a range of procedures, which included scrutinizing written records, conducting interviews, administering questionnaires, and monitoring individuals and work procedures, in order to collect information and conduct interviews. The gathered data was then analyzed using modeling software, which made use of analytical and modeling approaches to create a visual representation of the suggested system over the duration of the study.

Statistical Treatment of Data

Statistically significant findings indicate a correlation among the different variables, serving to maintain the organization of the data. Employing a statistical method provides a comprehensive overview of the entire scenario within the study.

Frequency Count and Percentage were used to assess the Automated Admission Assessment System for Jose Rizal Memorial State University, the challenges with the new web system, and the functional and non-functional requirements users would like to see in the new system.

Weighted Mean. This was used to determine the accuracy of the newly developed method. The product of the scale's weight and the frequency of each scale was divided by the total number of respondents for computation.

1) Frequency Distribution = n / T * 100%

Where: n = Number of respondents

T = Total number of respondents

2) Weighted mean(x) = f (X1 + X2 + …… Xn) n / N

Where: n = Total number of criteria

Ethical Consideration

In the development of the Automated Admission Assessment System for Jose Rizal Memorial State University, ethical considerations are dominant, particularly in handling and protecting the personal data of applicants. Ensuring data privacy is a matter of legal compliance and upholding the trust placed by users in the institution. The system must adhere to stringent data protection standards, such as those outlined in the General Data Protection Regulation and local privacy laws, which mandate robust security measures and respect for user consent, data minimization, and the right to access and correct personal information. Additionally, ethical guidelines dictate that the system must prevent biases in the admission process and ensure fair and equitable treatment of all applicants.

III. Results and Discussion

This chapter answers the specific research questions posed in the study and includes detailed discussions on each aspect.

Current status of the Automated Admission Assessment System in Jose Rizal Memorial State University

Based on the survey responses from guidance personnel regarding the current status of the university's admission assessment system, it shows that data from the admission assessment is inaccurate and inconsistent, with an average score of 4.2, indicating a need for potential review to

improve the existing system. However, this also highlights significant deficiencies that urgently require substantial corrective measures.

Critical components such as the competence of test paper checking and the accuracy of results receive high scores, averaging 4.4. These scores suggest that while the system performs well in these areas, reliability issues could still impact its overall effectiveness if not consistently addressed. Additionally, the system scores above 4.0 in areas like instruction clarity (4.0), feedback transparency (4.2), timely communication (4.4), and handling subjective evaluations (4.4). These scores indicate regular but uneven user satisfaction, highlighting areas where enhancements are necessary for optimal performance and satisfaction.

This analysis highlights the system's strong points in interface usability and data handling and emphasizes the urgent need for focused enhancements in managing errors, clarifying instructions, and refining feedback processes. Such improvements will help maintain the system's strengths while addressing shortcomings to create a more dependable and user-focused admission assessment framework.

Based on the survey responses provided by the guidance personnel regarding the current manual admission assessment system, the results are as follows:

Likert Scale Interpretation

Likert Scale Description	Likert Scale Interval	Interpretation
1 - Never	1.00-1.80	Indicates that errors are almost nonexistent
2 - Rarely	1.81-2.60	Indicates that there is an existence of minor issues within the system.
3 - Sometimes	2.61-3.40	The event or behavior occurs occasionally
4 - Often	3.41-4.20	The event / behavior/ problem occurs regularly. It indicates that there is a need for potential review for improvements of the existing system.
5 - Always	4.21-5.00	The event / behavior/ problem occurs more frequent and it happen in daily basis. It indicates that there is a need for potential review for improvements of the existing system.

Current Admission Assessment System Questionnaire

Current Admission Assessment System used in the University	1	2	3	4	5	Average Weighted Value
How often do you encounter errors in the current admission assessment system?				4	1	4.2
How often is the number of test papers checked per day sufficient to meet the demand during peak admission periods?				3	2	4.4
How often do you feel confident about the accuracy of the checking process in the admission system?			1	3	1	4.0
How often do you notice a bias or lack of standardization in evaluating subjective components of applications?				3	2	4.4

How often are decisions on applicant admissions communicated in a timely manner?				3	2	4.4
How often are the instructions during the application process clear and easy to follow?			1	3	1	4.0
How often is the system transparent in providing feedback for process improvements?				4	1	4.2
How often are you able to easily retrieve and analyze data from the current admission assessment system for reporting or decision-making purposes?				2	3	4.6
How often do you find the system's interface intuitive and easy to navigate?			1	2	2	4.2
How often does the system provide prompts or corrective feedback when you enter data incorrectly or incompletely?			2	3		3.6
Mean						4.2

Processes involved in the design of the automated admission Assessment System for JRMSU

The development of the Automated Admission Assessment System for Jose Rizal Memorial State University (JRMSU) utilizes the Agile Software Development Life Cycle (SDLC), which focuses on iterative development and ongoing feedback. This method is especially advantageous for modernizing the system's features in real-time, ensuring that each iteration is improved based on direct user feedback and the system's actual performance.

The Automated Admission Assessment System design for Jose Rizal Memorial State University (JRMSU) begins with a detailed planning phase. This initial step involves setting clear objectives, defining the scope of the system, and allocating necessary resources. Strategic decisions regarding system requirements and timelines ensure that the foundational goals and resources needed for development are well outlined. This stage is essential as it sets the direction for the entire project, establishing what the system aims to achieve and the resources required to reach those goals.

The analysis phase delves deeply into understanding the system's needs. This involves comprehensively examining the inputs that will feed into the system, such as hardware, software, algorithms, registration processes, exam details, rating criteria, and course codes. By separating these components, the university can identify how the system should function and what it must accomplish to facilitate a smooth and efficient admission process. The insights gained during the analysis are then used to inform the design phase, where the system's architecture is crafted, including the development of user interfaces, system workflows, and data models. This design serves as a blueprint for building a user-friendly and efficient system.

The succeeding implementation, testing, and maintenance phases ensure the system's practical functionality and durability. During implementation, developers code and configure the system according to the design specifications, turning theoretical plans into a working system. This phase is critical for building and integrating the system's functionalities as conceptualized. Once

built, the system undergoes extensive testing to ensure it operates correctly, meets quality standards, and integrates clearly with existing systems. This testing includes checks for bugs, errors, compatibility issues, and security vulnerabilities.

Finally, the maintenance phase involves ongoing support and updates, addressing issues and ensuring the system remains effective, reliable, and responsive to evolving requirements. Together, these processes ensure that the Automated Admission Assessment System for JRMSU is developed systematically, meeting the institution's need for a modern, efficient, and secure admission process.

Features of the System Software

System software Features	Entrance Exam Score and the Academic Performance of the BS Computer Science Graduates of De La Salle Lipa	JRMSU-cat.online	University of Twente, Enschede, Netherlands Personalized and Automated Feedback in Summative Assessment Using Recommender Systems	Automated Admission Assessment System for Jose Rizal Memorial State University
User Log in Function	✓	✓	✓	✓
Sign up function	✓	✓	✓	✓
Step by Step Registration Portal		✓		✓
Import/Browse student Credentials		✓		✓
Auto generate Application ID Number		✓		✓
Student Applicant Dashboard	✓	✓	✓	✓
Editable Student Profile	✓	✓	✓	✓
Realtime Auto generate Examination Rating and Questionnaire Result				✓
View Score	✓		✓	✓
View Notice of student Result				✓
Print Notice of student Examination Rating				✓
	Entrance Exam Score and the Academic		University of Twente, Enschede, Netherlands	Automated Admission Assessment System

System software Features	Performance of the BS Computer Science Graduates of De La Salle Lipa	JRMSU-cat.online	Personalized and Automated Feedback in Summative Assessment Using Recommender Systems	for Jose Rizal Memorial State University
Realtime Course Suggestion				✓
Admin Dashboard		✓	✓	✓
View activity logs				✓
Approve/Disapproved student applicant function		✓		✓
Course Category Entry Function				✓
Create Course Function				✓
Create Exam Function	✓		✓	✓
Entry of Rating Criteria Function	✓		✓	✓
Questionnaire Entry Function	✓		✓	✓
Examination Scheduling Function				✓
System software Features	Entrance Exam Score and the Academic Performance of the BS Computer Science Graduates of De La Salle Lipa	JRMSU-cat.online	University of Twente, Enschede, Netherlands Personalized and Automated Feedback in Summative Assessment Using	Automated Admission Assessment System for Jose Rizal Memorial State University

			Recommender Systems	
Display Category Function				✓
Display Rating Criteria				✓
Import/Export Examination Result				✓
Real-time Generate Examination Queue	✓		✓	✓
Set Examination Duration				✓
Disable keys function during examination				✓
Real-time submission of data into Admin dashboard				✓

Figure 26. presents a comparative analysis of system software features across three educational platforms: the Entrance Exam Score and Academic Performance system at De La Salle Lipa, JRMSU-cat.online, and the University of Twente's personalized and automated feedback system, alongside the Automated Admission Assessment System for Jose Rizal Memorial State University (JRMSU). These systems showcase a range of functionalities designed to streamline the admissions process and enhance user interaction.

In evaluating the functionality of the Automated Admission Assessment System developed for Jose Rizal Memorial State University (JRMSU), the system demonstrated outstanding performance, consistently achieving high ratings across several criteria relevant to its functional capabilities. The system scored a mean of 4.55, categorizing it as 'Excellent' according to the established evaluation continuum. Specific areas such as compliance with user requirements, compatibility with devices at JRMSU-Guidance, fitness for purpose, time-saving features, and effective error minimization all received high marks, underscoring the system’s ability to meet and exceed the operational needs of the university’s admissions process.

This high level of functionality reflects the system's robust design and development, aligning perfectly with the needs and standards set by JRMSU. For instance, its compliance with user requirements, rated at 4.64, demonstrates the system's effectiveness in adhering to the guidelines and expectations of JRMSU-Guidance. Furthermore, its compatibility with existing devices, which scored 4.45, highlights the seamless integration of the system with the university's technological environment, ensuring a smooth operational workflow.

The system's ability to streamline operations and enhance efficiency, rated at 4.53, and its capacity to provide a valuable and accurate solution for the admission process confirm its critical role in optimizing administrative tasks and improving user experience at JRMSU. This analysis validates the system's functionality and illustrates its potential impact on making the admission process more efficient, transparent, and fair, aligning with the university's strategic goals of modernizing and enhancing administrative operations.

This finding resonates with the observation made regarding the JRMSU system, emphasizing its high functionality. The research underscores the essential role of advanced functionalities in streamlining the assessment process, particularly in educational settings where the need to handle vast amounts of student data is paramount.

In the comprehensive assessment of the Automated Admission Assessment System at Jose Rizal Memorial State University (JRMSU), the grand mean calculated for the key software quality factors—functionality, reliability, usability, efficiency, maintainability, portability, and security—stands at 4.55. According to our tailored acceptability table, this score categorizes the software's performance as 'Excellent', indicating superior overall quality. Each factor contributing to this mean score has individually met or exceeded the high expectations, demonstrating the software's robust capability to serve the university's guidance and admission efficiently and effectively. The 'Excellent' rating reflects the software's adherence to high-quality standards and its potential to enhance operational processes significantly. This assessment underscores the meticulous development process that prioritized these key quality factors. The high ratings in functionality and reliability particularly highlight the system's dependability.

Given this 'Excellent rating of all seven factors, the software is deemed 'Highly Acceptable' for deployment without immediate improvements. This acceptability status confirms that the system is ready to be utilized in its current form, offering high reliability and user satisfaction while ensuring security and ease of maintenance. Such a high level of performance across all evaluated criteria suggests that the software can support the guidance admission objectives by optimizing tasks and workflows, thus fostering a more productive and secure environment. The system's ease of maintenance ensures it can be efficiently updated to adapt to future needs. Moreover, its excellent security measures are critical in protecting sensitive student data. Implementing this system should lead to measurable improvements in managing the university's admission processes, highlighting the effectiveness of using a structured and rigorous software quality assessment framework like ISO/IEC 9126 to guide development and evaluation processes.

Overall, the Automated Admission Assessment System is a significant advancement for JRMSU, promising to streamline and secure the admission process.

"Smith and Brown's (2022) study on the acceptability of educational software sheds light on the importance of user perspectives in evaluating software systems. Their findings underscore that factors such as usability, functionality, and user interface design significantly influence the acceptability of educational software. This aligns with our study's focus on assessing the JRMSU system's acceptability, as it highlights the critical role of user satisfaction in determining the effectiveness of educational software systems."

Summary of Software Acceptability

Software Quality Factor	Mean	Descriptive Rating
Functionality	4.63	Excellent
Reliability	4.55	Excellent
Usability	4.57	Excellent
Efficiency	4.54	Excellent
Maintainability	4.59	Excellent
Portability	4.51	Excellent
Security	4.51	Excellent
Grand Mean	4.55	Highly Acceptable

Legend:

4.21-5.0: Highly Acceptable	3.41-4.20: Very Acceptable	2.61-40: Acceptable
1.81-2.60: Moderately Acceptable	1.0-1.80: Not Acceptablehe	

IV. Conclusion

The research undertaken to develop and evaluate the Automated Admission Assessment System for Jose Rizal Memorial State University (JRMSU) proves that the system is highly effective and aligns perfectly with the operational needs of the Guidance Office. Using the ISO/IEC 9126 framework, the evaluation thoroughly analyzed the system's performance across crucial software quality parameters, including functionality, reliability, usability, efficiency, maintainability, portability, and security. These outstanding ratings confirm that the Automated Admission Assessment System meets and exceeds JRMSU's expectations, ensuring that the transition from manual to automated processes significantly enhances efficiency, accuracy, and the strategic management of resources.

The implementation of this system highlights the potential benefits of integrating advanced software solutions in managing university admission processes. Its design and adaptability make it a valuable model for similar institutions aiming to leverage technology to maintain a competitive edge in higher education.

V. Recommendations

Based on the findings and conclusions, the following key recommendations are proposed:

1. Employing the new system features on the existing system for higher functionality, reliability, usability, efficiency, maintainability, portability, and security, in improving the entire admission assessment system in the university.

2. It is recommended that the Automated Admission Assessment System be utilized for the guidance admission examinations at Jose Rizal Memorial State University.

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