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ACADEMIC RECORDS MANAGEMENT AND DELIBERATION SYSTEM FOR PHINMA-COC SENIOR HIGH SCHOOL

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ABSTRACT

Efficient academic records management is critical for educational institutions, yet many basic education schools in the Philippines still rely on manual, paper-based grade systems that cause transcription errors, delayed feedback, and high faculty workloads. To address this gap, this study designed, developed, and evaluated the Academic Records Management and Deliberation System (ARMDS) for the Senior High School department of PHINMA Cagayan de Oro College to automate grade uploads, real-time validation, deliberation workflows, and report generation. Utilizing a developmental research design guided by a structured System Development Life Cycle (SDLC) and an Input-Process-Output (IPO) model, the system was evaluated by eight purposively selected stakeholders using ISO/IEC 25010 software quality attributes and System Usability Scale (SUS) frameworks. The quantitative evaluation yielded an Overall Weighted Mean of 4.39 (Strongly Agree), with "Reliability" scoring highest at 4.63, reflecting high user confidence in data integrity and transactional consistency. Furthermore, objective architectural logs revealed exceptional efficiency gains: grade uploads executed in approximately 40 seconds, deliberation reports compiled in under 10 seconds, and the overall grade submission turnaround time was optimized by 96% compared to legacy paper-dependent workflows. Ultimately, the study concludes that ARMDS successfully eliminates administrative bottlenecks and clerical vulnerabilities by migrating to a real-time relational database, thereby empowering school leadership to implement early academic interventions for at-risk students.

***Keywords**: Academic Records Management, Automated Deliberation, Grade Management System, Educational Technology, Senior High School.*

1. INTRODUCTION

Efficient academic records management is essential for ensuring accurate reporting, timely feedback, and informed decision-making in educational institutions. However, many basic education institutions in the Philippines continue to rely on manual, paper-based grade management systems that are prone to transcription errors, delayed processing, and administrative inefficiencies. These limitations not only increase faculty workload but also restrict students' access to timely performance feedback, hindering early academic intervention. Recent studies have demonstrated that automated academic record systems significantly improve data accuracy, operational efficiency, and transparency in school administration. Despite these advancements, existing research has largely focused on higher education or general student information systems, with limited attention given to the integration of automated deliberation workflows within Senior High School contexts. Moreover, few systems are designed to complement existing manual practices, a critical factor in promoting user acceptance and institutional continuity. To address this gap, this study presents the design, development, and evaluation of the Academic Records Management and Deliberation System (ARMDS) for the Senior High School department of PHINMA Cagayan de Oro College. The system aims to automate grade submission, validation, deliberation processes, and report generation while providing students with real-time access to their academic performance. By streamlining academic workflows and supporting data-driven decision-making, this study seeks to demonstrate how a hybrid, role-based academic management system can enhance efficiency, accuracy, and transparency in basic education institutions.

2. METHOD

This study employed a developmental research design, which is appropriate for information technology projects focused on the design, development, and evaluation of software systems intended to solve identified organizational problems. The design emphasizes the systematic creation of a functional solution, followed by testing and evaluation to determine its effectiveness, usability, and quality. The System Development Life Cycle (SDLC) methodology was used to guide the project through a structured sequence of phases, ensuring that stakeholder requirements were accurately translated into system features. Each phase—from requirements analysis to evaluation—was iteratively refined based on stakeholder feedback to ensure alignment with institutional workflows and user needs.

The specific activities and structured operations carried out across each evolutionary milestone of the software framework are arranged in Table 1.

Table 1. *System Development Life Cycle (SDLC) Phases and Administrative Outputs*

SDLC Phase	Key Activities and Documented Outputs
Requirements Analysis	Stakeholder interviews, workflow analysis, process mapping, requirements specification.
System Design	System architecture design, database schema (ERD), data flow diagrams, user interface wireframes.
Development	Module coding for grade upload, real-time validation, deliberation management, and student portal integration.
Testing	Unit testing, integration testing, role-based functionality testing.
Implementation	System deployment, user orientation and training, initial data configuration.
Evaluation	ISO 25010 evaluation, System Usability Scale (SUS), performance and efficiency analysis.

The logical transformation layout, which covers initial data parameters, computational processes, and system outputs, follows the Input-Process-Output (IPO) model presented in Figure 1.

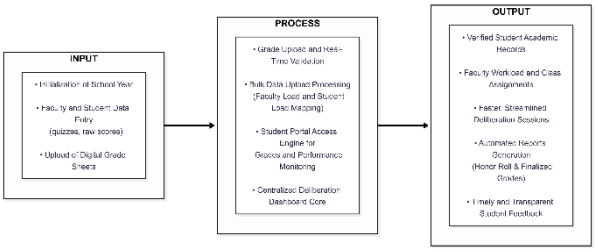


Figure 1. *Input–Process–Output (IPO) Model of the Proposed System*

The participants of the study consisted of eight individuals representing the primary user roles of the Academic Records Management and Deliberation System (ARMDS), namely an administrator, a principal, a program head, two teachers, and three students from the Senior High School department of PHINMA Cagayan de Oro College. These participants were purposively selected due to their direct involvement in academic record management, deliberation processes, and system usage. Their roles ensured that system evaluation reflected real-world workflows and perspectives across all levels of academic operations.

The study utilized ISO 25010-based evaluation questionnaires, usability surveys, and system performance logs. These instruments measured system functionality, usability, reliability, security, and efficiency. Data gathering was conducted during the initial phase of the project through stakeholder interviews and surveys to document existing academic record management workflows, recurring issues, and system requirements. The collected inputs guided system design and development, while subsequent role-based testing sessions generated additional data through user feedback and system logs for evaluation purposes.

Quantitative data from surveys, ISO/IEC 25010 evaluations, and the System Usability Scale (SUS) were analyzed using descriptive statistics, including weighted means and standard deviations, to assess system quality and user satisfaction. Qualitative data from interviews, open-ended responses, and testing observations were thematically analyzed to evaluate system effectiveness and identify areas for improvement.

3. RESULT AND DISCUSSION

The Academic Records Management and Deliberation System (ARMDS) was

successfully developed and implemented to automate key academic record management processes at PHINMA–COC Senior High School. Core system features included digital grade upload with real-time validation, centralized deliberation management, automated report generation (e.g., honor roll and danger zone summaries), and a secure student portal for real-time grade access, all of which directly addressed the inefficiencies identified during the requirements analysis. System evaluation using the ISO/IEC 25010 software quality model yielded high mean ratings across all evaluated quality attributes, indicating strong user acceptance and system effectiveness. Reliability received the highest mean rating, reflecting user confidence in system stability and data integrity, while usability also scored highly, demonstrating ease of use, learnability, and effective interface design for different user roles.

The empirical quality values gathered from the technical stakeholder evaluations are detailed in Table 2.

Table 2. *ISO 25010 Evaluation Summary (Mean Ratings)*

Quality Attribute Dimension	Mean Rating	Descriptive Interpretation
Functionality	*4.47*	*Strongly Agree*
Usability	*4.44*	*Strongly Agree*
Reliability	*4.63*	*Strongly Agree*
Efficiency	*4.34*	*Strongly Agree*
Portability	*4.05*	*Agree*
Overall Weighted Mean	*4.39*	*Strongly Agree*

Objective execution time reductions and computational stability metrics logs are detailed in Table 3.

Table 3. *Performance Evaluation Results*

Technical Performance Metric Parameter	**Measured Architectural Result**
Grade upload execution speed	~40 seconds
Deliberation report generation time	< 10 seconds
Grade submission turnaround time optimization	96% faster than manual paper processes
Operational system testing uptime index	100% stable runtime during verification

Administrative oversight is routed through an interactive Analytics Dashboard that supports institutional decision-making. The operational platform tracks a student volume of 3,914 individuals across the senior high school department, balances an active faculty load of 84 teachers, manages a total of 1,356 unique class sections during the active term, and monitors an overall performance index score of 62.26% representing the student pass rate trend.

The empirical data demonstrates that shifting from a manual grade-book ecosystem to a real-time relational database resolves clerical issues. The high 4.63 reliability score mathematically supports user confidence in data storage safety and transactional consistency. In addition, lowering the deliberation report compilation time to under 10 seconds removes administrative blockages, allowing program heads to implement early academic support for students in the academic "danger zone".

4. CONCLUSION

The study concludes that the Academic Records Management & Deliberation System (ARMDS) effectively addresses the inefficiencies of manual academic record-keeping by automating grade uploads, report generation, and student progress monitoring. The system demonstrates the practical application of IT solutions to real-world educational challenges, significantly improving accuracy, transparency, and operational efficiency within PHINMA-COC's Senior High School department,

The administration should adopt ARMDS across all Senior High School campuses to ensure operational efficiency and consistency. Future development can focus on adding mobile access and predictive analytics to enhance usability and early intervention capabilities.

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