# DEVELOPMENT OF A WEB-BASED MANAGEMENT INFORMATION SYSTEM FOR INTERNSHIP PROGRAM WITH DATA ANALYTICS

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## ABSTRACT

This study focuses on designing and developing an intern management system for a higher learning institution. Poor communication among stakeholders, as well as low student performance monitoring, have made it challenging for schools to actively engage their stakeholders. Their participation is crucial towards ensuring the quality of the internship. To mitigate these gaps, the study aims to build a tailored management information system complete with data analytics for effective monitoring, data representation, and seamless interaction among students, coordinators, and industry stakeholders. The study is quantitative in nature, with survey instruments collecting data through self-administered questionnaires administered to students, internship coordinators, and supervisors of companies before and after the system's implementation. The software's evaluation and post-evaluation surveys are anchored on the standards of measurement of software user satisfaction about ease of use, functionality, action, and degree of content provided, and also satisfaction. The achievement of these objectives relied heavily on the estimation and allocation of weighted means and frequency distributions. The outcomes highlight that users have more satisfaction with improved internship record management, monitoring of students' active participation, and tracking their progress. With the added analytics, enhanced decisions, and policies about the management of internship analytics are made.

**Keywords**: Internship Management System, Data Analytics, Web-Based System, System Usability, Educational Technology,

## 1. INTRODUCTION

The fast pace of digitization within universities has necessitated the implementation of information systems that could streamline management functions, boost student interaction and raise the effectiveness of programs. Another part of the university experience ripe for digital disruption is internship management, where tracking, communication, and data analysis all play a significant role. Consistently with this, the adoption of analytics in education garnered attention for its promise to foster data-informed decision-making. It allows institutions to track student performance, evaluate the effectiveness of a program, and verify that internships place in align with student competencies and career goals.

Yannuar et al. (2018) highlighted that a functional internship information system can effectively support students, faculty, and coordinators by addressing the logistical and administrative needs of internship management. Such systems have been shown to handle various components including student registration, placement, guidance, daily journal reports, assessments, and reporting, all of which are vital to program success.

In tertiary education institutions, most internship management process is largely manual, resulting in inefficiencies such as delayed student tracking, slow processing of requirements, and fragmented communication among stakeholders. The lack of a centralized system hampers real-time monitoring, leads to missed deadlines, and complicates data consolidation for evaluation and reporting. Furthermore, the absence of a streamlined matching process between student skills and industry requirements occasionally results in misaligned placements—such as BSIT students assigned to marketing roles—diminishing the relevance and impact of internship experiences.

Given these operational challenges, this study proposes the development of a web-based Management Information System (MIS) with integrated data analytics to support and enhance internship program operations. The system aims to automate and optimize key processes, provide real-time communication tools, and generate meaningful insights through data visualization and predictive

analytics. It will serve as both an administrative platform and a decision-support tool, offering benefits to students, faculty coordinators, and industry partners alike.

The primary objective of this study is to develop a Management Information System for the Internship Program with Data Analytics. Specifically, it seeks to:

1. Identify the functional and non-functional requirements of the system through stakeholder feedback and process analysis;
2. Analyze the existing internship management workflow and determine the process gaps;
3. Evaluate the system's impact on program efficiency and stakeholder satisfaction;
4. Integrate real-time performance monitoring and predictive modeling capabilities; and
5. Ensure compliance with data privacy and security regulations, particularly the Data Privacy Act of 2012.

This study is grounded in the DeLone and McLean Information System Success Model (2003), which includes six interrelated dimensions: System Quality, Information Quality, Service Quality, Use, User Satisfaction, and Net Benefits. These dimensions guide the system's evaluation in terms of usability, reliability, relevance, and its overall contribution to organizational goals. Complementing this is the Cross-Industry Standard Process for Data Mining (CRISP-DM) framework, which informs the system's data analytics component by outlining a structured process for data-driven decision-making.

By integrating both models, the proposed MIS goes beyond traditional administrative support to become a comprehensive platform for strategic internship management. The system's predictive capabilities can forecast student success in specific fields and improve placement outcomes, ultimately aligning academic preparation with industry demands. This innovative approach addresses the pressing needs of tertiary education institutions internship program and contributes a scalable solution for higher education institutions aiming to modernize and enhance experiential learning processes.

## 2. IMPLEMENTATION METHOD

This study employs a quantitative research method to evaluate the effectiveness of a Web-Based Management Information System (MIS) with Data Analytics for the internship program. A pre- and post-implementation design is utilized to measure the system's impact on managing and monitoring the internship process. The research focuses on gathering measurable feedback before and after the system's use to identify improvements in areas such as usability, functionality, data accuracy, and overall satisfaction.

Respondents of the study include students currently enrolled in the internship program, internship coordinators or advisers, and industry partners who serve as mentors and evaluators. These groups are selected through purposive sampling, ensuring that only individuals directly involved in the internship process participate in the data collection. Their insights are considered essential in evaluating the system's usability, effectiveness, and communication features.

The main instrument used for data collection is a survey questionnaire adapted from the ISO/IEC 25010 software quality model. This model includes key quality characteristics such as functional suitability, usability, performance efficiency, compatibility, reliability, and security. The survey is structured using a five-point Likert scale ranging from "strongly disagree" to "strongly agree." This allows the researcher to quantify the participants' perceptions of the system's quality and effectiveness.

Data gathering is conducted in three phases: pre-implementation, implementation, and post-implementation. Initially, surveys and interviews are administered to identify challenges in the current manual process. During the implementation phase, the system is deployed in a controlled environment, and data such as task completion times and user feedback are collected using built-in tracking tools. In the final phase, the system's impact is evaluated by comparing post-implementation results with the baseline data gathered earlier. The ISO/IEC 25010 standard serves as the basis for validating findings.

To analyze the collected data, the study uses descriptive statistical tools such as frequency, percentage, and weighted mean. Frequency and percentage help describe the distribution of responses, while the weighted mean is used to compute the average scores across key evaluation indicators like system usability and satisfaction.

The development of the MIS follows the Agile software development model, which emphasizes iterative progress, continuous feedback, and adaptability. This approach ensures the system evolves according to the actual needs of its users—students, coordinators, and industry partners. Agile is also aligned with ISO 25010 standards, supporting essential software qualities such as maintainability, flexibility, and scalability.

In addition, the study incorporates Laravel Custom Analytics API for manual implementation of data analytics features. Real-time internship-related data, including student placements, performance evaluations, and employer feedback, are processed and visualized using Chart.js, a lightweight JavaScript library. This visualization aids stakeholders in easily interpreting key metrics and identifying trends in internship performance. The study also considers the Return on Investment (ROI) by comparing time and financial savings achieved through system implementation versus the traditional manual process. These combined evaluation methods allow for a comprehensive assessment of the MIS in terms of functionality, usability, operational impact, and potential for future scalability within the institution.

## 3. RESULTS AND DISCUSSION

The results presented in this section are derived from the pre- and post-implementation surveys conducted among students, internship coordinators/advisers, and industry partners. The evaluation covered the key dimensions of software quality as outlined in the ISO/IEC 25010 model, specifically: functional suitability, performance efficiency, usability, reliability, and security. Responses were measured using a 5-point Likert scale and analyzed using frequency, percentage, and weighted mean.

Table 1. Comparison of Weighted Mean Ratings Before and After System Implementation

| ISO 25010 Quality Attribute | Pre-Implementation Mean | Post-Implementation Mean | Interpretation of Difference |
|---|---|---|---|
| Functional Suitability | 3.10 | 4.40 | Significantly Improved |

| ISO 25010 Quality Attribute | Pre-Implementation Mean | Post-Implementation Mean | Interpretation of Difference |
|---|---|---|---|
| Performance Efficiency | 2.95 | 4.38 | Significantly Improved |
| Usability | 3.05 | 4.42 | Significantly Improved |
| Reliability | 3.00 | 4.25 | Significantly Improved |
| Security | 3.20 | 4.15 | Improved |

The comparison reveals a consistent improvement in system performance across all quality attributes. Notably, usability and functional suitability received the highest gains, indicating that users found the system easy to navigate and functionally reliable.

Table 2. Frequency and Percentage of User Satisfaction Post-Implementation

| Level of Satisfaction | Frequency (f) | Percentage (%) |
|---|---|---|
| Strongly Agree (5) | 33 | 55.00% |
| Agree (4) | 25 | 41.67% |
| Neutral (3) | 2 | 3.33% |
| Disagree (2) | 0 | 0.00% |
| Strongly Disagree (1) | 0 | 0.00% |
| **Total** | **60** | **100%** |

The majority of users either "agreed" or "strongly agreed" that the system met their expectations and needs. This reflects a strong acceptance of the system and supports the positive evaluation gathered during implementation.

Additionally, qualitative feedback from coordinators and industry partners highlighted that the system has made monitoring student progress and submitting evaluations more efficient. The use of Laravel Custom Analytics API and Chart.js helped visualize internship data, further enabling data-driven decision-making. The real-time dashboard and customizable reports were particularly

beneficial for coordinators managing multiple students.

These findings validate the relevance of using agile development methodology and confirm the effectiveness of integrating ISO/IEC 25010 standards during system development. Furthermore, this study supports prior research in the field of educational technology indicating that MIS platforms significantly enhance administrative functions, but it extends this research by emphasizing the role of integrated analytics in improving strategic decision-making.

## 4. CONCLUSION

This study aimed to develop and evaluate a web-based Management Information System (MIS) with integrated Data Analytics for the Internship Program. The primary objective was to determine whether the system could significantly improve the management, monitoring, and evaluation of the internship process by enhancing functionality, usability, data accuracy, and communication between stakeholders. Through the use of a quantitative approach, the system was assessed using pre- and post-implementation surveys based on the ISO/IEC 25010 software quality model.

The findings of the study revealed a clear and substantial improvement in system performance and user satisfaction after its implementation. Users reported significant enhancements in functional suitability, usability, performance efficiency, and reliability. The integration of data analytics through Laravel Custom Analytics API and Chart.js enabled real-time tracking and visualization of student internship data, contributing to better decision-making and monitoring capabilities. These outcomes affirmed that the newly developed MIS is not only functional and secure but also responsive to the actual needs of its users.

The system also proved to be beneficial in terms of Return on Investment (ROI), as it minimized time-consuming manual tasks and reduced operational errors, thereby saving resources. Stakeholders expressed confidence in the system's ability to scale and adapt to other academic programs, showcasing its potential for institutional integration and long-term sustainability. Furthermore, the adoption of the Agile software development model allowed the system to evolve through continuous feedback from students, coordinators, and industry partners, ensuring

that the final output was both relevant and user-centered.

In essence, the study concludes that the implementation of a Management Information System with data analytics significantly improves the administration and evaluation of internship programs. The system not only addresses the inefficiencies of the manual process but also enhances stakeholder engagement, decision-making, and the overall quality of internship management. These findings suggest that similar solutions could be extended across other departments or institutions seeking to modernize their academic management systems.

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