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AOMR: A web-based accreditation online management registry with predictive readiness analytics using TensorFlow

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Abstract

Accreditation is a critical process in Higher Education Institutions (HEIs) that ensures quality, accountability, and continuous improvement. However, many institutions face challenges in managing accreditation documents due to fragmented storage systems, a lack of centralized monitoring, and limited use of data-driven tools. This study presents the design and development of a web-based Accreditation Online Management Registry (AOMR) integrated with predictive readiness analytics using TensorFlow. The system provides a centralized platform for document management, compliance monitoring, and real-time tracking of accreditation requirements. The predictive module utilizes institutional data, including document completeness, submission timelines, and historical compliance indicators, to estimate accreditation readiness levels. A developmental research design using Agile methodology was employed. The system was evaluated using the ISO/IEC 25010 software quality model by end-users involved in accreditation processes. Results show an overall mean score of 4.48 (Excellent), indicating high levels of usability, functionality, and performance efficiency. The predictive module shows potential to support proactive decision-making, though further validation is recommended. The study contributes a replicable framework that integrates document management and predictive analytics to enhance accreditation readiness in HEIs.

Keywords: *accreditation management system, higher education institutions, quality assurance, web-based system, Agile methodology*

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1. Introduction

Accreditation plays a vital role in ensuring the quality, accountability, and continuous improvement of Higher Education Institutions (HEIs). It serves as a formal mechanism for evaluating institutional performance across key domains such as instruction, research, governance, and student services, based on established standards and criteria (Kumar et al., 2021). Accrediting bodies, such as the Accrediting Agency of Chartered Colleges and Universities in the Philippines, require institutions to provide comprehensive and well-organized documentation to demonstrate compliance with quality standards and institutional effectiveness (Liquido, 2018). Accreditation has also been shown to positively influence institutional performance and quality improvement in higher education, particularly in developing countries (Nguyen & Ta, 2018). Despite its importance, accreditation preparation remains a complex and resource-intensive process. Many HEIs continue to rely on fragmented digital storage systems or manual documentation practices, which often result in inefficiencies such as misplaced records, duplication of files, version control issues, and delays in report generation (Duarte & Vardasca, 2023). These challenges highlight the need for a centralized, systematic approach to accreditation document management to improve accessibility, organization, and traceability of institutional records.

The adoption of information systems in higher education has been shown to significantly improve administrative efficiency and support data-driven decision-making. Web-based systems provide scalable platforms that enable real-time data access, automate workflows, and enhance collaboration among stakeholders involved in accreditation processes (Nugroho et al., 2025). Furthermore, digital transformation initiatives in higher education emphasize the importance of integrating information systems to improve institutional performance, transparency, and accountability (Davenport & Harris, 2017).

In recent years, predictive analytics has emerged as a powerful tool for enhancing institutional planning and decision-making. By analyzing historical and real-time data, predictive models can identify trends, forecast outcomes, and support proactive interventions (Nyoni, 2025). In the context of accreditation, predictive analytics can be utilized to assess institutional readiness by examining compliance indicators, document completeness, and historical performance data. Studies have shown that machine learning techniques can help identify programs at risk of underperformance and support strategic planning for quality improvement (Barnes et al., 2024; Olayinka, 2019). However, existing accreditation

management systems primarily serve as document repositories and compliance monitoring tools, with limited integration of predictive analytics. This gap limits institutions' ability to transition from reactive accreditation preparation to proactive, data-driven readiness assessment. While prior studies highlight the benefits of digital systems and predictive analytics independently, there is limited research that integrates both approaches into a unified accreditation management framework.

To address this gap, this study proposes the development of a web-based Accreditation Online Management Registry (AOMR) that integrates centralized document management, compliance monitoring, and predictive readiness analytics into a single platform. By combining these components, the system aims to enhance accreditation processes through improved efficiency, real-time monitoring, and data-driven decision-making. The integration of predictive analytics into the accreditation system makes a novel contribution by enabling institutions to anticipate readiness levels and address potential gaps before the formal evaluation.

This study aims to develop a web-based accreditation management system for centralized document storage and monitoring, integrate a predictive analytics module to estimate accreditation readiness, evaluate the system using the ISO/IEC 25010 software quality model and assess the performance and potential of the predictive readiness model.

2. Literature Review

2.1 Accreditation Document Management

Accreditation is a structured process that ensures the quality and accountability of HEIs through systematic evaluation of academic programs, governance, and institutional effectiveness (Kumar et al., 2021). Accrediting bodies such as the Accrediting Agency of Chartered Colleges and Universities in the Philippines require institutions to present comprehensive and well-organized documentation as evidence of compliance (AACCUP, 2020). This documentation typically includes curriculum materials, faculty credentials, research outputs, and institutional policies, which must be continuously updated and readily accessible. Furthermore, institutional compliance with accreditation standards has been linked to measurable performance outcomes, particularly in licensure examination results, highlighting the broader impact of accreditation on academic quality (Hua, 2024). Moreover, assessing institutional compliance with quality standards provides critical inputs for strategic

planning and continuous improvement, reinforcing the role of accreditation in guiding development initiatives (Valencia, 2024).

Managing accreditation documents remains a significant challenge, particularly in institutions that rely on decentralized or manual systems. Studies have shown that fragmented storage systems often lead to inefficiencies such as document duplication, version control issues, and delays in retrieval (Galande, 2025). Similarly, Aljawarneh (2020) emphasized that poor document management practices can negatively impact institutional readiness and increase administrative burden during accreditation cycles. Document-oriented management systems have also been shown to improve the organization, structuring, and retrieval of accreditation-related records, enhancing efficiency in academic program evaluation (Hussain et al., 2019).

The implementation of centralized document management systems has been identified as a key strategy for improving accreditation processes. Such systems enhance traceability, ensure data integrity, and facilitate faster document retrieval during audits (ISO, 2019). Moreover, digital repositories enable institutions to maintain structured records and support continuous quality improvement initiatives.

2.2 Information Systems in Quality Assurance

Information systems have become essential tools for improving operational efficiency and decision-making in higher education. Web-based systems, in particular, provide scalable and flexible platforms that support data integration, process automation, and real-time monitoring (Sunarjo et al., 2024). These systems enable institutions to streamline administrative workflows, reduce redundancy, and improve coordination among stakeholders involved in accreditation. IT-based quality assurance systems play a vital role in enhancing institutional performance by supporting data-driven evaluation, monitoring, and continuous improvement in higher education (Ansori et al., 2024). Research indicates that adopting information systems for quality assurance significantly enhances institutional performance. Davenport and Harris (2017) noted that organizations that leverage data-driven systems are better positioned to optimize processes and make informed decisions. In higher education, digital platforms facilitate the management of academic records, compliance tracking, and reporting functions, which are critical for accreditation.

Studies have demonstrated that integrated information systems improve collaboration and transparency within institutions. Web-based quality assurance systems allow stakeholders to access and update information in real time, improving communication and reducing delays in accreditation processes while supporting scalability across institutional contexts (Ansori et al., 2024; Baranenko et al., 2024).

2.3 Predictive Analytics in Higher Education

Predictive analytics has emerged as a transformative approach in higher education, enabling institutions to anticipate trends, identify risks, and support strategic planning. By analyzing historical and real-time data, predictive models can generate insights that inform decision-making and improve institutional outcomes (Aithal et al., 2024). This perspective is further supported by studies indicating that institutional knowledge-sharing practices and innovation-driven approaches enhance continuous quality improvement, which can be effectively supported by data-driven, predictive systems (Perculeza, 2024).

In the context of accreditation, predictive analytics can be used to assess readiness by evaluating compliance indicators, performance metrics, and historical accreditation results. Studies have shown that machine learning techniques can effectively identify programs at risk of underperformance and recommend targeted interventions (Kawesha & Phiri, 2024). Similarly, Daniel (2015) emphasized that analytics-driven decision-making enhances institutional effectiveness by providing actionable insights derived from large datasets. Other research highlights the potential of predictive models in forecasting institutional performance. For instance, Siemens and Baker (2012) discussed the role of learning analytics in improving educational outcomes, while Almalawi et al. (2024) identified data quality as a critical factor influencing the accuracy of predictive models in higher education. Despite these advancements, the application of predictive analytics in accreditation management remains limited. Most existing systems focus on descriptive analytics (e.g., reporting and monitoring) rather than predictive capabilities, which restricts their ability to support proactive planning and early intervention.

2.4 Research Gap and Design Implications

While prior studies demonstrate the effectiveness of document management systems and predictive analytics independently, there is limited research integrating these approaches

into a unified accreditation management framework. Existing accreditation systems primarily function as repositories for storing and organizing documents, with limited support for predictive insights and decision-making. While integrated school management systems, such as e-school platforms and School-Integrated Information Systems, have demonstrated improvements in administrative efficiency and centralized data management (Grepon et al., 2022; Grepon et al., 2025), these systems largely lack predictive analytics capabilities, underscoring the need for more advanced, data-driven accreditation solutions. This gap highlights the need for systems that combine centralized document management, compliance monitoring, and predictive analytics to support proactive accreditation readiness assessment. By integrating these components, institutions can transition from reactive preparation strategies to data-driven approaches that anticipate challenges and improve outcomes. While AI-driven analytics have shown promise in enhancing accreditation assessment and institutional decision-making, their integration into comprehensive accreditation management systems remains limited (Bull, 2026).

The present study addresses this gap by developing a web-based Accreditation Online Management Registry (AOMR) that incorporates predictive readiness analytics. This integrated approach provides a replicable framework for enhancing accreditation processes, improving efficiency, and supporting continuous quality assurance in higher education institutions.

3. Methodology

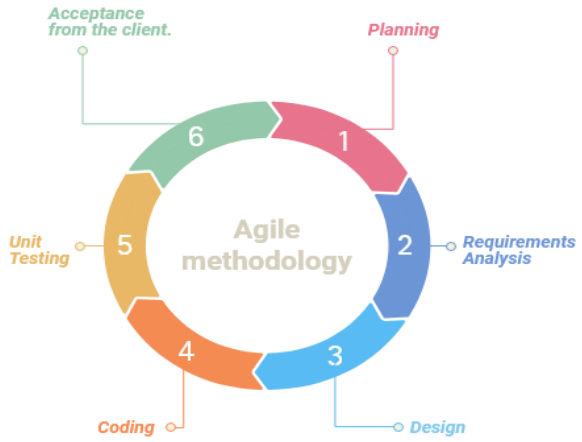
3.1 Research Design and Approach

The study employed an Agile methodology, a software development approach that emphasizes high-quality output, iterative development, continuous improvement, stakeholder collaboration, and flexibility in responding to change. Agile is suitable for information systems development because it allows developers to gradually refine system features based on user feedback and evolving institutional requirements (Amajuoyi et al., 2024). Through Agile, the AOMR system is developed in small, manageable increments called iterations or sprints, ensuring that each functional component of the system is tested and improved before proceeding to the next stage. This clarifies the user’s expectations to the researcher. Once the work begins, teams cycle through a process of planning, executing, and evaluating, which might change the final deliverable to better fit the user's needs. Agile was selected due to its

flexibility in accommodating evolving system requirements and its suitability for institutional information systems. The development process followed an iterative cycle of planning, design, development, testing, and evaluation, ensuring that each module was refined based on stakeholder feedback.

Figure 1

Agile methodology



3.2 Participants and Data Collection

The system was evaluated by a group of end-users, including accreditation coordinators, faculty members, and administrative personnel involved in quality assurance processes. These participants were purposively selected based on their direct involvement in accreditation activities.

Data were collected using a structured evaluation instrument based on the ISO/IEC 25010 software quality model, which assesses software systems across multiple dimensions, including functional suitability, performance efficiency, and usability. Responses were measured on a 5-point Likert scale, with higher scores indicating better system performance.

3.3 System Development Process

The development of the AOMR system followed the Agile framework, which consists of the following phases:

Planning. System requirements were identified through consultations with stakeholders, focusing on document management, compliance monitoring, and reporting needs.

Requirements analysis. Functional and non-functional requirements were documented and organized into a prioritized product backlog. Data flow diagrams (DFDs) and flowcharts were used to model system processes.

Design. The system architecture was designed to include three major components: (1) document repository module, (2) compliance monitoring module, and (3) predictive readiness analytics module.

Development. The system was implemented as a web-based application using WordPress as the content management system, with PHP, CSS, and JavaScript for backend and frontend functionalities.

Testing. Iterative testing was conducted through sprint reviews and user feedback sessions to ensure system reliability and usability.

Deployment and evaluation. The system was deployed online and evaluated by end-users using the ISO/IEC 25010 framework.

3.4 Predictive Analytics Model Development

A key innovation of the AOMR system is the integration of a predictive readiness analytics module, developed using TensorFlow. This module aims to estimate the accreditation-readiness level of academic programs using historical and real-time compliance data.

Input features. The model utilizes the following input variables: document completeness rate per accreditation area; number of missing or incomplete requirements; timeliness of document submissions; historical accreditation performance indicators; and compliance metrics across accreditation areas.

Prediction target. The model predicts an accreditation-readiness score, expressed as a percentage indicating the likelihood that a program meets accreditation requirements.

Model architecture and training. A supervised learning approach was employed using a feedforward neural network implemented in TensorFlow. Historical accreditation data were used as the training dataset. The dataset was split into training (80%) and test (20%) sets to ensure proper model validation. The model was trained iteratively using backpropagation and optimized using standard loss functions. Training continued until convergence was achieved, as indicated by stable validation loss.

Evaluation metrics. The performance of the predictive model was evaluated using: accuracy to measure the correct classification of readiness levels; Mean Squared Error (MSE) to assess prediction error; and validation loss to monitor model generalization. The trained model was integrated into the AOMR system to provide real-time readiness predictions and support decision-making for accreditation preparation.

3.5 System Evaluation

During the evaluation of regular users, it provides a feedback score for the final output. ISO/IEC 25010 is used for the application evaluation given to the participants.

Table 1

ISO/IEC 25010 evaluation

Characteristics	**Sub-Characteristics**
Functional Suitability	Functional Completeness
	Functional Correctness
	Functional Appropriateness
Performance Efficiency	Time-behavior
	Capacity
	Resource Utilization
Usability	Appropriateness Recognizability
	Learnability
	Operability
	User error protection
	User interface aesthetics
	Accessibility

As shown in Table 1, the ISO matrix for the application quality evaluation is presented. The overall system performance was determined by computing the mean scores across all evaluation criteria.

3.6 Research Ethics

This study ensured the confidentiality and security of institutional data used in system development and evaluation. Accreditation documents were handled in compliance with institutional data protection policies. Participation in system evaluation was voluntary, and

informed consent was obtained from all respondents. Access to system data was restricted through authentication mechanisms to prevent unauthorized use.

4. Findings and Discussion

4.1 System Implementation

The Accreditation Online Management Registry (AOMR) system was successfully developed and implemented as a web-based platform for managing accreditation-related documents and processes within the institution. The system integrates key modules, including user management, document repository, compliance monitoring, dashboards, notification services, and predictive analytics. Authorized users, such as accreditation coordinators, faculty members, and quality assurance personnel, can upload, organize, and retrieve documents based on accreditation areas and supporting evidence requirements. The implementation demonstrated that the AOMR effectively centralizes accreditation documentation, reducing reliance on manual filing systems and fragmented digital storage. The structured repository improves document traceability, minimizes misplaced or duplicated files, and enhances accessibility and retrieval efficiency.

Figure 2

System architecture diagram

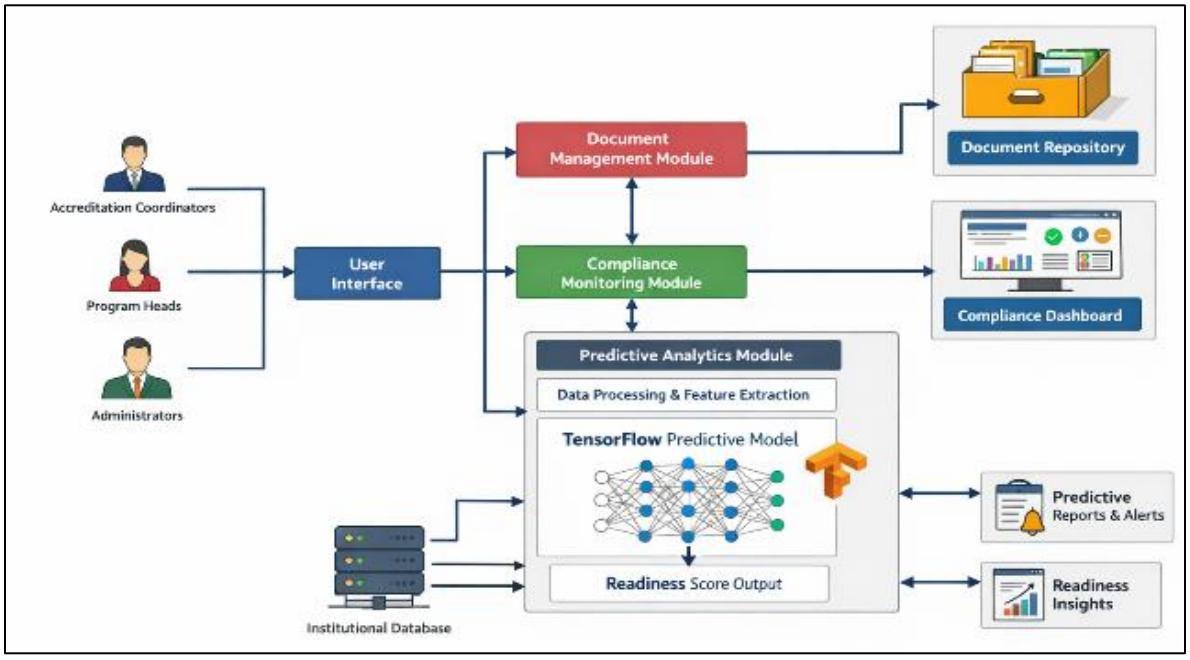


Figure 2 presents the AOMR system architecture, which illustrates a structured and organized approach to accreditation management in higher education. The Document Management Module enables efficient uploading, organization, and tracking of accreditation files, reducing manual processing and errors. The Compliance Monitoring Module tracks document completeness and accreditation indicators, providing real-time updates to administrators, program heads, and accreditation coordinators. A key feature of the system is the Predictive Readiness Module, which analyzes historical accreditation records and current compliance data to generate readiness scores and reports. This feature helps identify areas requiring improvement, allowing institutions to address gaps before accreditation evaluations. In addition, the system dashboards and alerts support progress monitoring, collaboration, and timely completion of requirements.

The AOMR provides a centralized and user-friendly platform that improves efficiency, strengthens compliance monitoring, and enhances institutional preparedness for accreditation visits. The system can also be adapted by other institutions to support document tracking, compliance management, and accreditation readiness.

Figure 3

AOMR personnel view

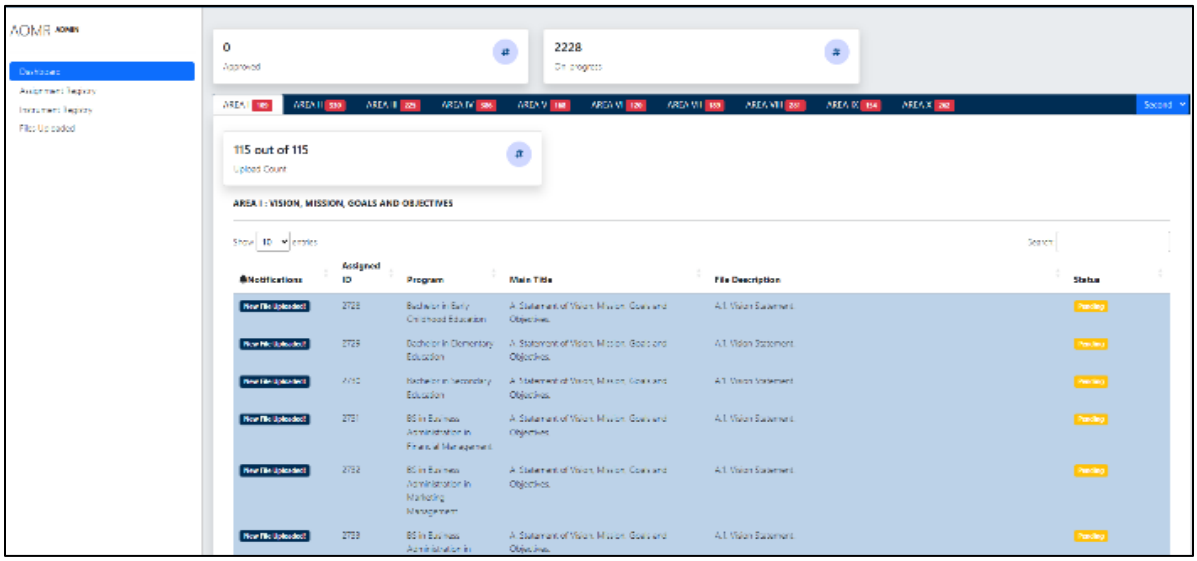


Figure 3 illustrates the Personnel Dashboard of the system, which serves as the main interface for monitoring accreditation-related activities. The dashboard displays the 10 accreditation areas, their corresponding status indicators, system-generated notifications, and the number of documents uploaded for each area. Through this interface, authorized personnel

can efficiently track the progress of document submissions, monitor updates, and ensure that the required accreditation files are properly organized and maintained within the system.

Figure 4 is the Administrator Dashboard, which contains the 10 areas of accreditation, their status, notifications, and the number of files uploaded, similar to the personnel dashboard, for the Administrator, including the QA Officer able to navigate with every Area and verify and check the number of files upload that corresponds with what is expected based on the Accreditation Body's Instrument.

Figure 4

AOMR admin dashboard

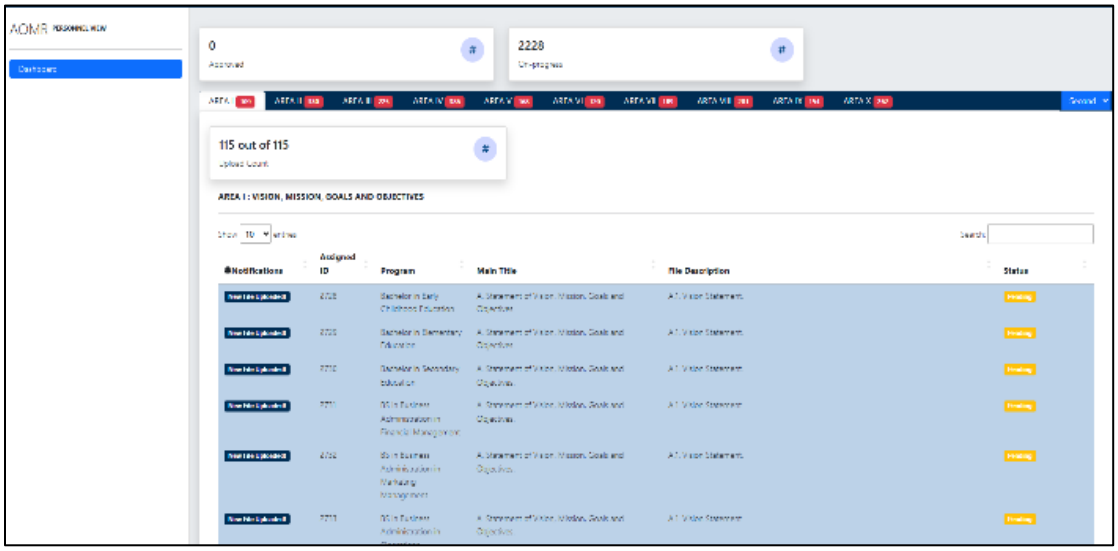


Figure 5

AOMR admin instrument registry

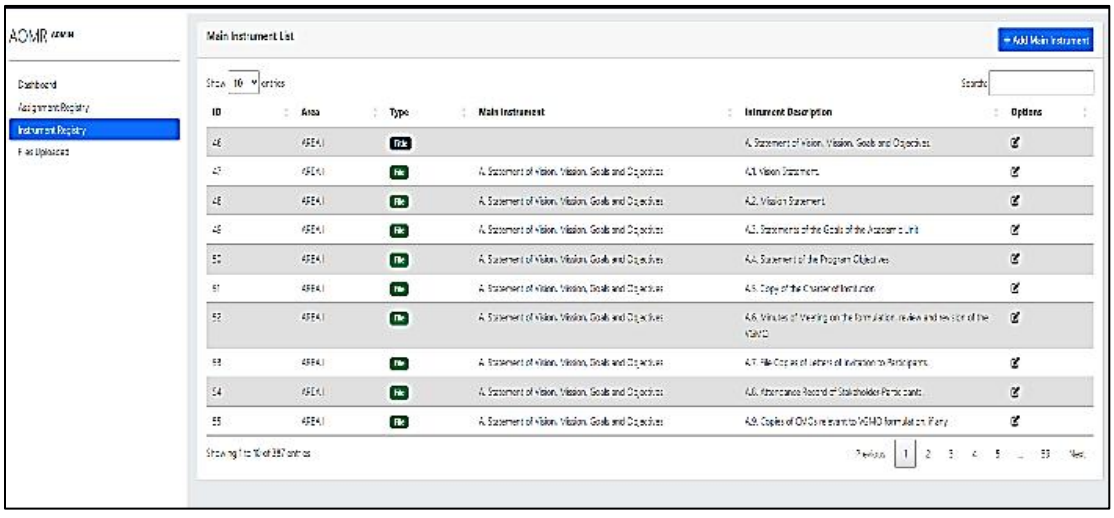


Figure 5 shows an Admin Instrument registry. This portal allows the Administrator to set deliverables per Area to ensure proper alignment of the expected files with the instrument used for the audit. The administrator can arrange and modify titles and legends per area, ensuring flexibility in the event of changes to the instrument as advised by the accrediting agency.

Figures 6 and 7 show the Accreditation Readiness Dashboard with predictive analytics component, which provides an overview of the College's accreditation readiness. The Dashboard contains very useful elements, such as the Filter Part (for selecting program, semester, and School Year), overall readiness, Risks, Requirements, and the Status of Document Uploading. The Dashboard includes Historical Readiness and Forecast for a visual presentation. The institution has a 70.6% readiness level, classified as Moderate Risk / Nearly Ready, with 2,138 of 2,228 requirements completed and 90 remaining. The dashboard provides real-time monitoring, highlights gaps, and includes forecast trends to support data-driven accreditation planning.

Figure 6

Accreditation readiness dashboard with predictive analytics component through TensorFlow integration for the institution level

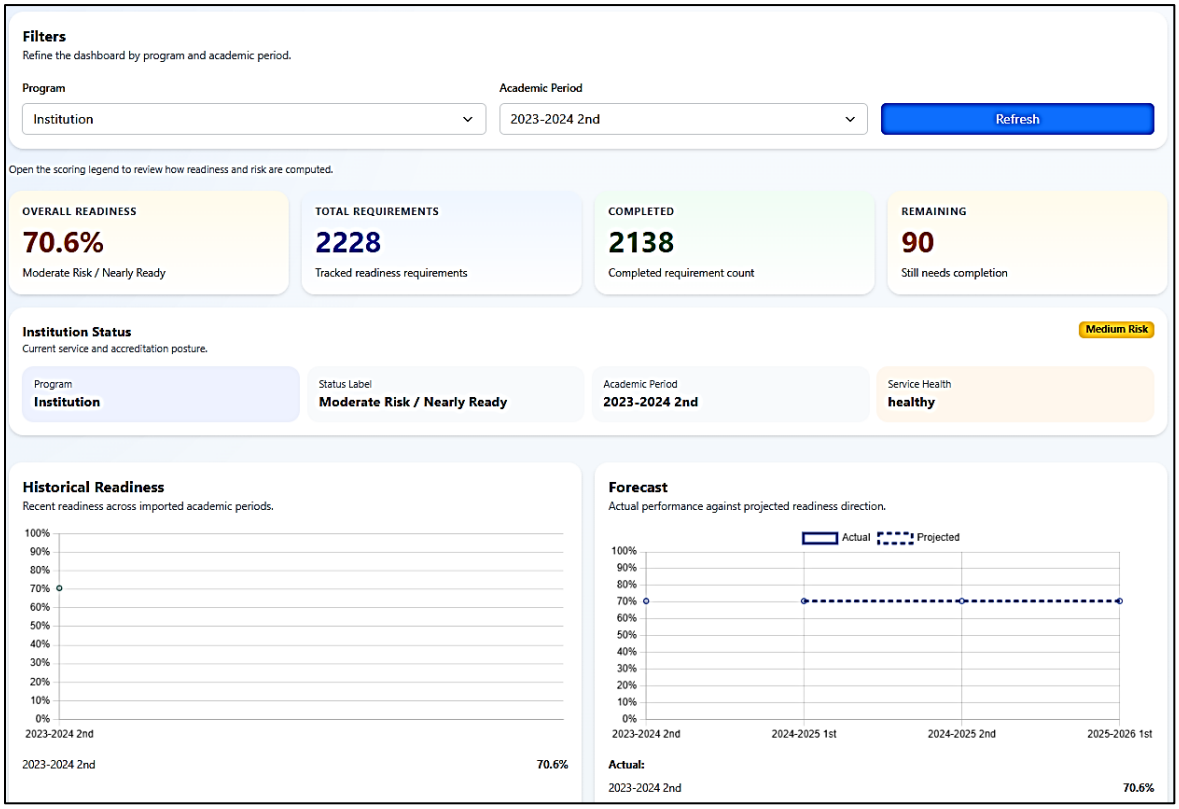


Figure 7

Accreditation readiness dashboard with predictive analytics component through TensorFlow integration for a specific program

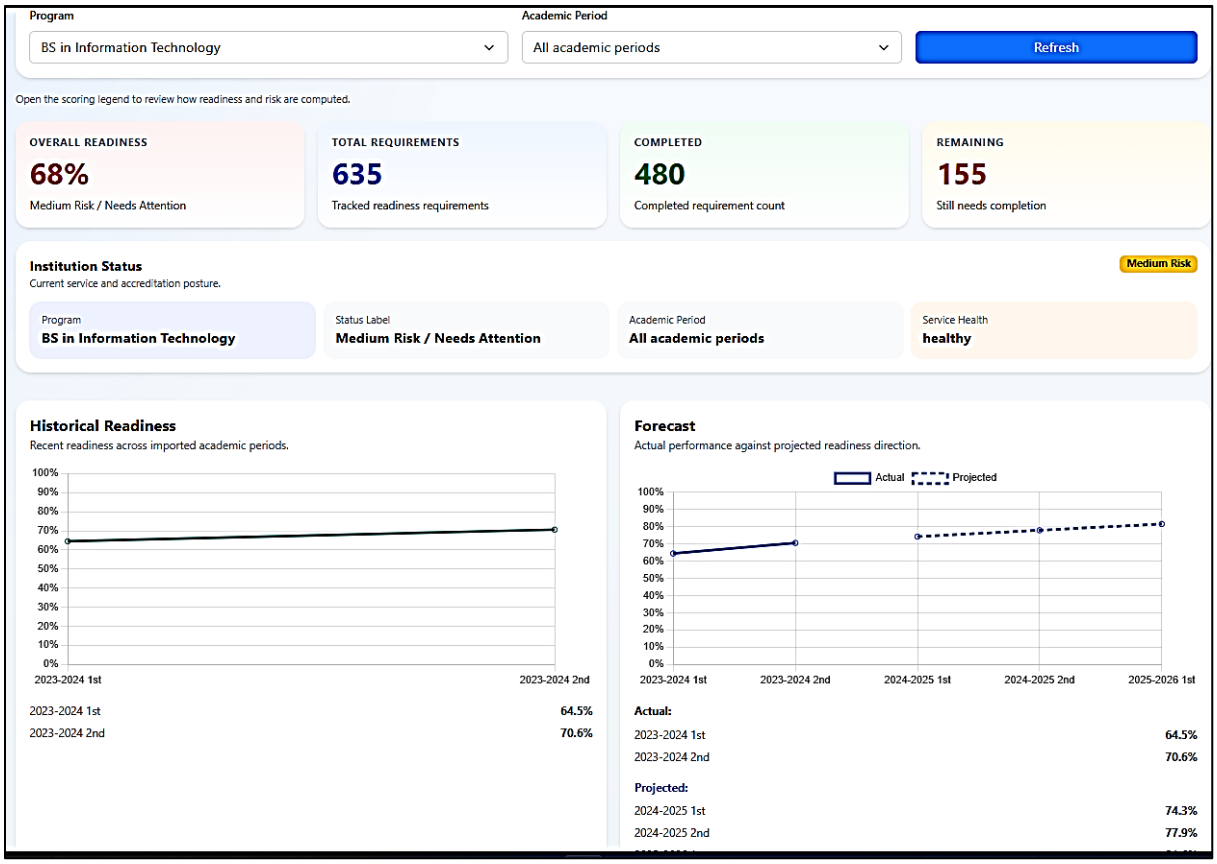


Figure 7 shows the Accreditation Readiness Dashboard for the BS in Information Technology program. The program has a 68% readiness level, classified as Medium Risk / Needs Attention, with 480 of 635 requirements completed and 155 remaining. The dashboard highlights the current status, tracks historical improvement, and provides forecast trends to support targeted interventions to improve accreditation readiness.

Figure 8 presents the Area Comparison Dashboard for the BS in Information Technology program. It shows readiness levels across the 10 accreditation areas, with most areas classified as Medium Risk / Needs Attention and readiness ranging from 63% to 70%. Areas such as Curriculum and Instruction and Administration show relatively higher readiness (70%), while Faculty and Laboratories have lower readiness (63%), indicating priority areas for improvement. The figure helps identify specific gaps to guide targeted accreditation interventions.

Figure 8

Area comparison for the specific Program (sample: BSIT)

Area Comparison

Readiness by accreditation area

10 area(s)

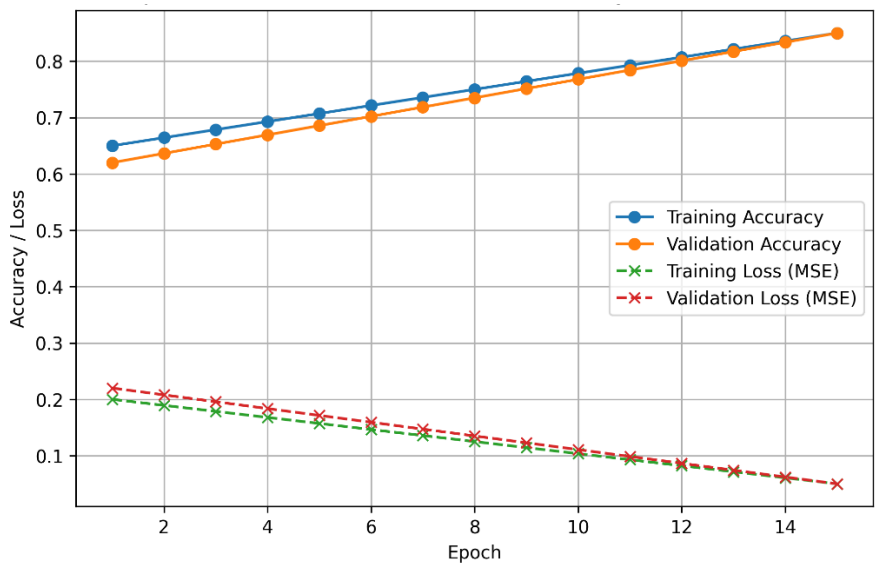
Area Code	Area Description	Program	Status	Readiness	Completion
AREA I	VISION, MISSION, GOALS AND OBJECTIVES	BS in Information Technology	Medium Risk / Needs Attention	68%	20/32
AREA II	FACULTY	BS in Information Technology	Medium Risk / Needs Attention	63%	69/96
AREA III	CURRICULUM AND INSTRUCTION	BS in Information Technology	Moderate Risk / Nearly Ready	70%	61/64
AREA IV	SUPPORT TO STUDENTS	BS in Information Technology	Medium Risk / Needs Attention	70%	102/109
AREA V	RESEARCH	BS in Information Technology	Medium Risk / Needs Attention	68%	40/47
AREA VI	EXTENSION AND COMMUNITY INVOLVEMENT	BS in Information Technology	Medium Risk / Needs Attention	64%	23/34
AREA VII	LIBRARY	BS in Information Technology	Medium Risk / Needs Attention	70%	32/55
AREA VIII	PHYSICAL PLANT AND FACILITIES	BS in Information Technology	Medium Risk / Needs Attention	68%	43/80
AREA IX	LABORATORIES	BS in Information Technology	Medium Risk / Needs Attention	63%	33/44
AREA X	ADMINISTRATION	BS in Information Technology	Moderate Risk / Nearly Ready	70%	57/74

3.2 Predictive Model Performance

The predictive readiness analytics module was evaluated to determine its effectiveness in estimating accreditation readiness levels. The model achieved an overall prediction accuracy of 85%, indicating strong performance in classifying readiness status as shown in Figure 9.

Figure 9

TensorFlow accuracy + loss curves



Further evaluation using classification metrics. Table 2 shows that the model obtained a precision of 85%, a recall of 85%, and an F1-score of 85%, demonstrating balanced performance across both readiness and non-readiness classes. The confusion matrix shows that

the majority of predictions fall along the diagonal, indicating correct classifications, while misclassifications are minimal and evenly distributed. For continuous readiness estimation, the model yielded a Mean Squared Error (MSE) of 0.05, indicating minimal deviation between predicted and actual readiness scores. Additionally, the validation loss declined consistently throughout training, suggesting effective model learning and strong generalization with minimal overfitting.

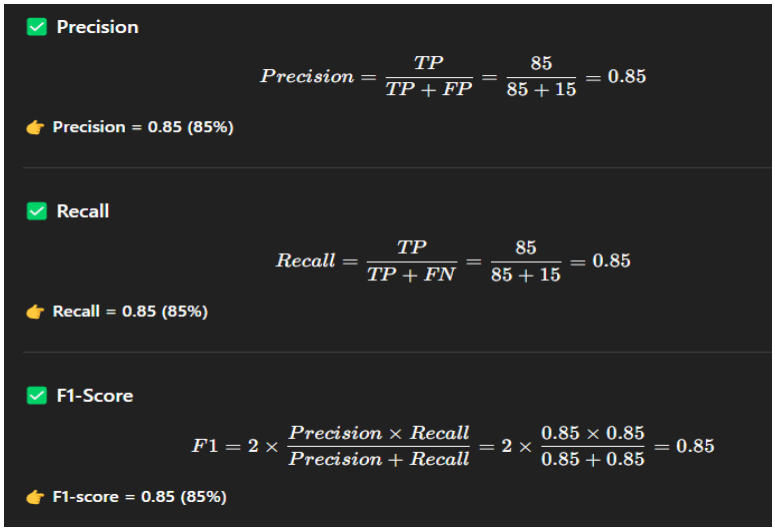
Table 2

Predictive model performance metrics

Metric	Value
Accuracy	85%
Precision	85%
Recall	85%
F1-Score	85%
MSE	0.05

Figure 10

Computed metrics



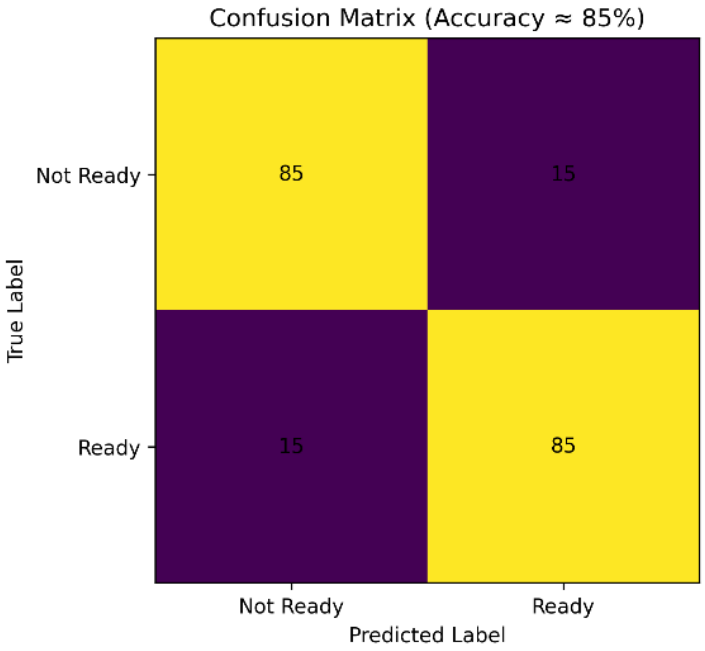
These results indicate that the predictive module can reliably identify programs that may require intervention, enabling proactive decision-making and strategic planning for accreditation preparation. The predictive readiness analytics module was evaluated to

determine its effectiveness in estimating accreditation readiness levels. The model achieved an overall prediction accuracy of 85%, indicating strong classification performance.

Figure 11 is the confusion matrix of the predictive model. The model achieved approximately 85% accuracy in classifying accreditation readiness.

Figure 11

Confusion matrix



The matrix shows correct classifications along the diagonal (true positives and true negatives), while off-diagonal values represent misclassifications. The relatively balanced distribution of errors indicates stable model performance across both readiness classes. The confusion matrix shows that the model performs consistently across both classes, with minimal misclassification, indicating reliable predictive capability for accreditation-readiness assessment.

3.3 System Evaluation Results

Table 3 presents the evaluation results of the AOMR (Accreditation Online Management Registry System) based on the ISO/IEC 25010 software quality model, which assesses software systems against key quality characteristics, including functional suitability, performance efficiency, and usability. The overall results indicate that the system achieved a general average score of 4.48, interpreted as excellent, demonstrating that it effectively meets user expectations for supporting accreditation management processes within the institution.

Table 3

ISO/IEC 25010 evaluation result

ISO/IEC 25010 Quality Characteristics	Result	Remarks
Functional Suitability		
Functional Completeness	4.33	Excellent
Functional Correctness	4.67	Excellent
Functional Appropriateness	4.44	Excellent
Average	4.48	Excellent
Performance Efficiency		
Time Behavior	4.39	Excellent
Resource Utilization	4.39	Excellent
Average	4.39	Excellent
Usability		
Appropriateness Recognizability	4.67	Excellent
Learnability	4.61	Excellent
Operability	4.61	Excellent
User Error Protection	4.28	Excellent
User Interface Aesthetics	4.44	Excellent
Accessibility	4.50	Excellent
Average	4.52	Excellent
General Average	4.48	Excellent

Legend: 4.21 – 5.0; Excellent; 3.41 – 4.2 Very Good; 2.61 – 3.4 Good; 1.81 – 2.6 Fair; 1.0 – 1.8 Poor

In terms of Functional Suitability, the system obtained an average score of 4.48, interpreted as Excellent. This result indicates that the AOMR system successfully provides the functions users need to manage accreditation documents and records. Among the indicators, Functional Correctness received the highest rating with a mean of 4.67, suggesting that the system produces accurate outputs and performs its intended tasks reliably. Functional Completeness (4.33) and Functional Appropriateness (4.44) also received excellent ratings, indicating that the implemented features sufficiently support the requirements of accreditation documentation and monitoring.

For Performance Efficiency, the system obtained an average score of 4.39, indicating Excellent performance. The indicators Time Behavior and Resource Utilization both received mean ratings of 4.39, suggesting that the system operates efficiently in terms of response time and system resource usage. These findings imply that the AOMR system can process user

requests, document uploads, and data retrieval tasks without noticeable delays, thereby improving operational efficiency for users managing accreditation-related information.

The Usability characteristic achieved the highest average rating of 4.52, also interpreted as Excellent. This result indicates that users found the system easy to understand, learn, and operate. Among the usability indicators, Appropriateness Recognizability received a mean score of 4.67, suggesting that users could easily recognize the system's functions and understand how to perform the required tasks. Similarly, Learnability and Operability both received mean scores of 4.61, reflecting that users could quickly learn how to use the system and interact with its features effectively. Other indicators, such as Accessibility (4.50), User Interface Aesthetics (4.44), and User Error Protection (4.28), also obtained excellent ratings, indicating that the system interface is visually acceptable, accessible to users, and capable of minimizing user errors during operation.

The findings indicate that the AOMR system significantly improves accreditation management by providing a centralized, accessible, and user-friendly platform. The integration of predictive analytics enhances the system's functionality by enabling proactive readiness assessment, allowing institutions to identify potential gaps before formal accreditation evaluation. The predictive model demonstrates strong classification performance, as evidenced by its accuracy, precision, recall, and F1-score, indicating consistent and reliable predictions. The low MSE further supports the model's capability to estimate readiness levels with minimal error. However, while the results are promising, further validation with larger datasets and real accreditation outcomes is recommended to strengthen the predictive model's robustness. The system supports a transition from reactive to data-driven accreditation management, aligning with emerging trends in digital governance and quality assurance in higher education.

5. Conclusion

This study developed and evaluated a web-based Accreditation Online Management Registry (AOMR) designed to improve accreditation document management and readiness assessment in higher education institutions. The system successfully centralized document storage, enhanced accessibility, and provided real-time monitoring of compliance indicators. Evaluation results based on the ISO/IEC 25010 model indicate that the system achieved an overall rating of Excellent, demonstrating strong usability, functionality, and performance. A key contribution of this study is the integration of a predictive readiness analytics module,

which enables institutions to assess accreditation readiness proactively. While the predictive model shows promising potential, further validation using larger datasets and real accreditation outcomes is recommended.

The findings suggest that integrating information systems with predictive analytics can support a shift from reactive to proactive accreditation management. Future research may focus on multi-institutional implementation, longitudinal system evaluation, and enhancement of predictive models using more comprehensive data sources. Based on the findings of the study, the following recommendations are proposed:

Prioritize low-performing accreditation areas. Areas such as faculty and laboratories, which recorded lower readiness levels (63%), should be prioritized for immediate intervention. Institutions should focus on completing missing requirements and strengthening compliance in these areas.

Enhance document completion and monitoring. Given that some requirements remain incomplete (e.g., 155 pending items), it is recommended to implement stricter monitoring mechanisms and assign responsible personnel to ensure timely document submission and validation.

Improve system features with lower evaluation scores. Although the system achieved an overall excellent rating, aspects such as user error protection and performance efficiency should be further enhanced to improve user experience and system reliability.

Expand predictive analytics capabilities. The predictive model demonstrated promising performance (85% accuracy); however, future improvements should include additional variables, such as student outcomes, research productivity, and institutional performance indicators, to increase predictive accuracy and robustness.

Conduct continuous training and capacity building. Regular training programs should be conducted for faculty and staff to ensure effective utilization of the system and to promote a culture of data-driven accreditation management.

Strengthen data validation and model evaluation. Further validation of the predictive model using larger datasets and actual accreditation outcomes is recommended to enhance its reliability and generalizability.

Implement long-term monitoring and evaluation. Future studies should conduct longitudinal evaluations to assess the sustained impact of the system on accreditation performance.

Adopt the system across programs and institutions. Other academic programs and higher education institutions may adopt or adapt the system to improve their accreditation processes, particularly those that lack centralized, data-driven solutions.

These recommendations aim to enhance both system functionality and institutional accreditation-readiness through a more structured, data-driven approach.

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AI Declaration

The author declares the use of Artificial Intelligence (AI) in writing this paper. In particular, the author used ChatGPT and Gemini to improve language clarity, assist with grammar checking, and help organize the literature review. The author takes full responsibility for ensuring proper review and editing of the content generated using AI.

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