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# Data-Driven and AI-Based Higher Education Accreditation: International Experiences and Implications for Vietnam

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**ABSTRACT:** This paper investigates the application of data and artificial intelligence (AI) to innovate higher education accreditation in the context of digital transformation. The study employs document analysis and theoretical synthesis, combined with international experience comparison, to clarify the trend of data-driven accreditation. Findings reveal that higher education accreditation is shifting from periodic evaluation models to continuous quality monitoring based on data, with AI playing a supportive role in analysis, visualization, and early warning. However, Vietnam's accreditation system remains limited in terms of data standardization, system interoperability, and technological capacity. Accordingly, the study proposes a data- and AI-driven accreditation model built upon three pillars: institutional and governance frameworks, data and technological infrastructure, and human resource capacity, accompanied by a phased implementation roadmap. The research contributes scientific foundations and policy implications for innovating higher education accreditation in Vietnam in the digital era.

**KEYWORDS:** higher education quality; data; accreditation; artificial intelligence; digital transformation

## 1. INTRODUCTION

In the context of global digital transformation, higher education is undergoing profound changes not only in teaching but also in governance and quality assurance. The exploitation of data and digital technologies, particularly artificial intelligence (AI), is increasingly becoming a crucial factor in enhancing management efficiency, supporting decision-making, and promoting evidence-based governance models [2]. However, traditional accreditation methods still rely mainly on periodic evaluations, extensive documentation, and manual processing. This approach reveals limitations, as it lacks the capacity for continuous monitoring, depends heavily on reports, and struggles to reflect timely changes in training quality. The development of digital technologies opens opportunities to shift toward data-driven accreditation models, in which information is collected, analyzed, and utilized regularly to support quality monitoring and improvement [9]. International organizations such as UNESCO and OECD emphasize that the application of AI in education can enhance data analysis capacity, improve information visualization, and provide early warnings of quality risks, thereby strengthening transparency and the effectiveness of quality assurance systems [1,2]. At the same time, international accreditation standards such as ESG in Europe and AUN-QA in ASEAN highlight the role of data, evidence, and continuous improvement in higher education quality governance [9,10]. In Vietnam, the higher education accreditation system has been consolidated institutionally through the Law on Higher Education and various guiding regulations [3,5,8]. Accreditation activities have become widespread, contributing to improved awareness and promoting quality enhancement. Nevertheless, the application of data and technology in accreditation remains limited, particularly in terms of standardization, interoperability, and data utilization for governance [11]. This indicates that the current system has not yet fully transitioned to a data- and technology-driven accreditation model. From this reality, the study raises a central question: how can data and artificial intelligence support the innovation of higher education accreditation in Vietnam? Based on this, the paper pursues three objectives: (i) to analyze the theoretical foundations and trends of data- and AI-driven accreditation; (ii) to compare international experiences; and (iii) to propose policy implications to foster innovation in higher education accreditation within the digital transformation context.

## 2. RESEARCH CONTENT

### 2.1. Theoretical foundations of data- and AI-driven accreditation

In the era of digital transformation, higher education quality assurance is shifting from cyclical evaluation models to continuous, data-driven quality management. This approach positions data as the central foundation for monitoring, evaluation, and improvement, rather than relying solely on qualitative reports or fragmented evidence [2,9]. Conceptually, data-driven accreditation is understood as the process of utilizing structured, regularly updated data to support quality assurance and accreditation activities. Data not only serves as evidence for accreditation standards but also functions as a governance tool, enabling institutions and accrediting bodies to track quality indicators in real time and make evidence-based decisions [2]. In modern models, data fulfills three primary functions. First, it provides the basis for measuring quality through quantitative indicators such as graduation rates, student satisfaction, and learning outcomes. Second, it enables continuous monitoring, allowing early detection of quality decline or irregularities in operations. Third, data serves as the foundation for improvement, supporting institutions in

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adjusting teaching and governance activities based on empirical evidence [9]. Within the digital transformation context, AI is regarded as a key tool for analyzing and leveraging data. Applications of AI in accreditation include automated analysis of self-assessment reports, data visualization through dashboards, detection of abnormal data patterns, and forecasting quality trends [1,2]. However, international studies consistently affirm that AI plays a supportive role-enhancing efficiency and accuracy—without replacing accreditation experts [1].

Alongside its benefits, the application of data and AI in accreditation requires adherence to operational principles. Transparency and openness must be ensured throughout data collection, processing, and utilization to build trust among stakeholders. Ethical issues such as privacy, data security, and algorithmic bias must be strictly controlled. Finally, accountability must be clearly defined, particularly when AI systems are used to support decision-making in quality assurance [1,9].

In summary, data- and AI-driven higher education accreditation represents not merely a technical shift but a transformation in quality governance approaches. Data remains central, technology plays a supportive role, and human expertise continues to be decisive in evaluation and quality improvement.

**2.2. Current status of higher education accreditation in Vietnam**

In the context of digital transformation, the current state of higher education quality accreditation in Vietnam can be examined across three main dimensions: institutional framework, data and technological infrastructure, and human resource capacity. First, regarding the institutional framework: the quality assurance and accreditation system has been established on a relatively comprehensive legal foundation. The Law on higher Education, together with subordinate regulations such as Decree 99/2019/NĐ-CP, Circular 12/2017/TT-BGDĐT, Circular 13/2023/TT-BGDĐT, and Circular 04/2025/TT-BGDĐT, has contributed to shaping the management and accreditation framework [3,5]. These regulations provide the basis for accreditation implementation while raising requirements for accountability and quality improvement at educational institutions. Second, regarding data and technological infrastructure: although accreditation activities have expanded, the data systems serving accreditation remain limited. Data among universities, accrediting organizations, and regulatory agencies has not yet been fully standardized or interconnected. Most accreditation processes still rely on periodic reports and documentary evidence, making continuous monitoring and real-time data utilization unfeasible [11,13]. The absence of a national shared database indicates that accreditation continues to operate primarily in batch-processing mode, without fully leveraging the advantages of digitized data and continuous analysis. Third, regarding human resources: accreditation officers and quality assurance staff possess educational expertise, but their skills in data analysis, digital tool usage, and knowledge of emerging technologies, including AI, remain limited. This directly affects their ability to effectively exploit data in accreditation, even when certain technological tools have been introduced.

In summary, Vietnam's higher education accreditation system has made significant progress in terms of institutional development and implementation scale. However, limitations in data, infrastructure, and human resource capacity persist. These are the critical factors that must be addressed to advance toward a modern accreditation model based on data and artificial intelligence. A synthesis of the main characteristics of Vietnam's accreditation system across the three dimensions is presented in Table 1.

**Table 1. Current status of higher education quality accreditation in Vietnam across three dimensions**

| Dimension | Current status | Main limitations |
|---|---|---|
| **Institutional Framework** | Relatively comprehensive legal regulations established | No specific regulations on data and AI in accreditation |
| **Data & infrastructure** | Partial data digitization achieved | Fragmented, lacking standardization and interoperability |
| **Human resources** | Strong educational expertise | Limited data and technological capacity |
| **Accreditation scale** | Expanded in terms of institutions and programs | Still primarily cyclical evaluation |

***(Source: Author's synthesis from [3,5,8,11,13])***

Table 1 shows that although Vietnam's higher education accreditation system has achieved many positive results in terms of institutional framework and implementation scale, the foundational elements for data-driven accreditation remain incomplete. In particular, the lack of standardized and interconnected data, along with limited capacity of human resources to exploit data, are major barriers to transitioning toward a modern accreditation model. Overall, higher education accreditation in Vietnam has made significant progress and is increasingly becoming an important component of quality governance. However, the current approach still relies primarily on cyclical evaluations and has not truly shifted to continuous monitoring based on data and technology. Therefore, despite the consolidation of the legal framework and the expansion of implementation scale, the accreditation system continues to face structural limitations related to data and execution capacity. These are precisely the issues that need to be addressed in order to advance toward a data- and AI-driven accreditation model in the context of digital transformation.

**Table 2. Comparison of data- and AI-driven accreditation approaches**

| Aspect | Europe (ESG) | ASEAN (AUN-QA) | Implications for Vietnam |
|---|---|---|---|
| **Approach** | Transparency, continuous improvement | PDCA cycle, focus on learning outcomes | Transition to continuous quality governance |
| **Role of aata** | Structured data, public information | Evidence and measurable quality criteria | Standardize data and ensure system connectivity |
| **Role of AI/Technology** | Support analysis and monitoring | Support observation, control, and improvement | Implement AI as a supportive tool |
| **Implementation conditions** | Clear institutional framework, comprehensive data | Standardized processes | Prioritize data utilization before technology adoption |

***(Source: Author's analysis and synthesis from [1,2,9,10])***

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Based on the international experiences analyzed, several key points can be drawn for Vietnam. First, data must be considered the foundation of modern higher education accreditation, as it enables continuous monitoring, evaluation, and improvement. Second, artificial intelligence should be used as a supportive tool to enhance analytical and forecasting efficiency, but not to replace the role of experts in the accreditation process. Finally, the implementation of data- and AI-driven accreditation should follow a reasonable roadmap: beginning with data standardization, improving institutional frameworks, and strengthening human resource capacity, before expanding technology applications on a larger scale.

Thus, international experience demonstrates that transitioning to a data- and AI-driven accreditation model is not merely a matter of technology adoption, but a comprehensive transformation in quality governance approaches. Data, institutional frameworks, and human resources are the three decisive factors in this process.

**2.4. Proposed model of data- and AI-driven accreditation for Vietnam**

Based on the analysis of domestic realities and international experiences, this study proposes a model of higher education quality accreditation driven by data and artificial intelligence, tailored to Vietnam's context. This model does not replace the existing accreditation system but aims to enhance efficiency and transparency by integrating data and technology into quality governance processes.

The model is designed around three mutually reinforcing pillars: (i) institutional framework and AI governance; (ii) data and technological infrastructure; and (iii) human resource capacity and organizational mechanisms for implementation. First, institutional framework and AI governance provide direction and system management. This includes improving the legal framework related to data collection, sharing, and utilization in accreditation, while establishing principles of AI ethics, data security, and accountability. These are prerequisites to ensure that AI applications in accreditation are transparent and trustworthy [1,3]. Second, data and technological infrastructure form the technical foundation of the model. This pillar focuses on standardizing accreditation data, building a shared database, strengthening interoperability among systems, and developing tools to support quality monitoring. Data must be digitized, regularly updated, and exploitable for analysis, thereby supporting evidence-based decision-making [2,11]. Third, human resource capacity and organizational mechanisms ensure the feasibility of the model. This requires enhancing digital competencies among accreditation officers, quality assurance staff, and managers-particularly skills in data analysis, digital tool usage, and AI literacy. At the same time, appropriate organizational mechanisms are needed to pilot and scale up the model in practice.

These three pillars form an integrated system in which institutional frameworks provide direction, data and technology supply the foundation, and human resources ensure operational capacity. The interdependence among these elements enables the data- and AI-driven accreditation model to be effective in Vietnam's context.

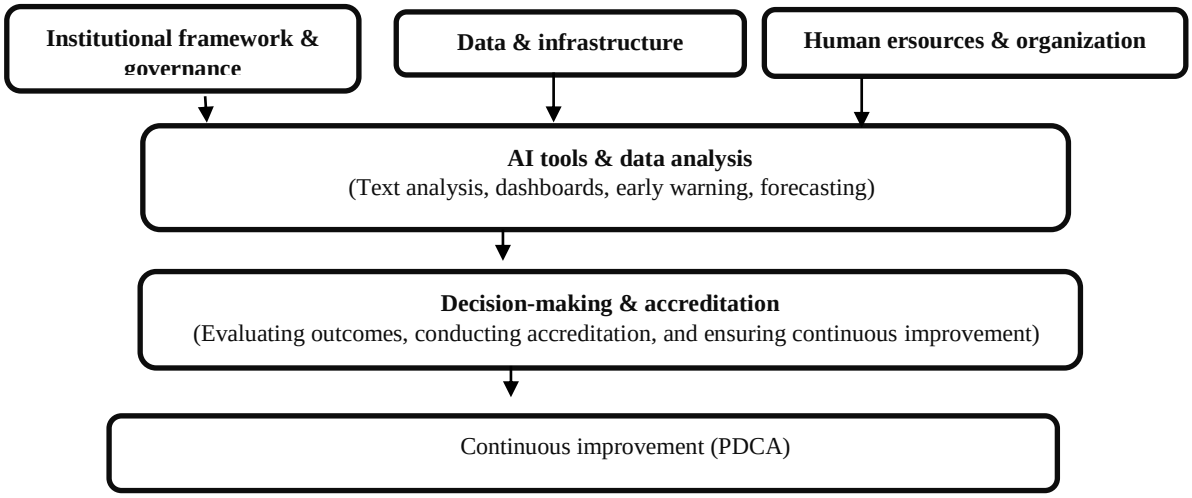



**Figure 1. Model of data- and AI-driven higher education accreditation**
***(Source: Author's proposal based on synthesis from [1,2,9])***

Based on the proposed model, the study identifies several core functions of data and artificial intelligence in the initial stage. First, dashboards should be developed to continuously monitor quality indicators, thereby supporting the tracking of key metrics and enhancing transparency in governance. Next, the application of data analysis and visualization tools will help stakeholders better understand trends as well as the effectiveness of the education system. In addition, developing early warning mechanisms is necessary to promptly detect risks related to training quality. Furthermore, gradually automating the processing and verification of evidence will contribute to reducing administrative workload and improving consistency in accreditation.

An important point is that the implementation of the data- and AI-driven accreditation model must follow a roadmap aligned with the system's readiness. In the initial phase, priority should be given to data standardization and capacity building for human resources, before expanding AI applications on a larger scale. This approach not only helps mitigate risks but also ensures sustainability in the transformation of higher education accreditation in Vietnam.

**2.5. Policy implications and implementation roadmap**

From the current state of higher education accreditation in Vietnam and the international experiences analyzed, it is clear that transitioning to a data- and AI-driven accreditation model is not merely a technological issue, but a comprehensive process of institutional, data infrastructure, and capacity development. Based on this analysis, the study proposes several policy directions suitable for Vietnam's context.

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An important orientation is to strengthen the legal framework related to data and artificial intelligence in accreditation activities. In addition to existing regulations on quality assurance and accreditation, specific provisions should be added regarding the collection, storage, sharing, and use of accreditation data. At the same time, principles of data security, transparency, ethics, and accountability in AI applications must be clearly established [1,3,7]. This forms the foundation for controlled and governance-compliant implementation of digital tools in accreditation.

Another direction is to prioritize data standardization and interoperability among higher education institutions, accrediting organizations, and regulatory agencies. Currently, accreditation data remains fragmented, inconsistent, and underutilized for quality monitoring purposes. Therefore, developing a common set of data indicators, unifying data standards, and establishing a shared data infrastructure are urgent requirements.

In addition, it is necessary to enhance digital skills among accreditation officers, quality assurance staff, and managers. These competencies should not only cover the use of digital tools but also include data analysis, interpretation of results, and risk identification when using AI-supported decision-making systems.

Based on these orientations, the study proposes a three-phase implementation roadmap. The initial phase focuses on standardizing the foundation, including legal improvements, data standardization, and digitization of evidence. The next phase is piloting, with trial implementation of tools such as quality monitoring dashboards, data analysis, and early warning mechanisms at institutions with higher readiness levels. The final phase is expansion, scaling up effective models, connecting internal quality assurance with external accreditation, and strengthening continuous data-driven monitoring.

In summary, the implementation of data- and AI-driven accreditation must follow a roadmap aligned with system readiness, in which data serves as the foundation, institutions provide the safeguards, and human resources remain the decisive factor**.**

## 3. CONCLUSION AND RECOMMENDATIONS

### 3.1 Conclusions

The study affirms that higher education accreditation is shifting from traditional evaluation models to data-driven approaches in the context of digital transformation. This change reflects increasing demands for transparency, continuous monitoring, and evidence-based quality governance. In this process, artificial intelligence is regarded as an important supportive tool, enabling data analysis, information visualization, and early warning of quality risks. However, the effectiveness of AI applications depends closely on the reliability of data, the completeness of institutional frameworks, and the execution capacity of the system. Based on theoretical analysis, domestic realities, and international experiences, the study proposes a data- and AI-driven accreditation model with three pillars: institutional framework and governance, data and technological infrastructure, and human resource capacity. This is considered a feasible orientation to gradually transform Vietnam's higher education accreditation system toward greater modernization and efficiency. The findings not only provide scientific foundations and policy implications for accreditation reform in the digital era but also open directions for future research on piloting and implementing data- and AI-driven accreditation models under Vietnam's specific conditions.

### 3.2 Recommendations

Based on the research findings, the paper proposes several specific recommendations for relevant stakeholders to promote the transformation of higher education accreditation in Vietnam toward a data- and AI-driven model.

For government authorities, it is necessary to promptly the legal framework related to data and artificial intelligence in accreditation, while issuing a common set of data indicators and standardizing procedures for data collection, storage, and sharing among universities, accrediting organizations, and regulatory agencies. Establishing a national accreditation database is an urgent requirement to ensure interoperability and real-time data utilization.

For accreditation organizations**,** efforts should be made to strengthen the application of digital tools such as monitoring dashboards, early warning systems, and data analytics to enhance supervision efficiency and reduce administrative workload. At the same time, gradual automation of evidence processing and close collaboration with government authorities are needed to pilot and scale up data- and AI-driven accreditation models.

For higher education institutions, proactive measures should be taken to standardize and digitize internal data, ensuring that evidence is comprehensive, consistent, and easily accessible. Universities should also enhance the digital competencies of quality assurance staff, particularly in data analysis and AI tool usage, while actively participating in pilot projects and fostering stronger connections between internal quality assurance and external accreditation.

For accreditors and quality assurance officers, continuous training and capacity building in digital skills, data analysis, and AI literacy are essential to support decision-making. Moreover, strict adherence to principles of transparency, data security, and accountability in the use of data and AI is mandatory to ensure the reliability of the accreditation system.

Finally, regarding international cooperation and research partnerships**,** collaboration should be expanded with organizations such as UNESCO, OECD, and AUN-QA to learn from best practices, share data, and pilot advanced accreditation models. Strengthening expert exchange and joint research will contribute to enhancing the capacity of Vietnam's accreditation system while promoting the international integration of its higher education sector.

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