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Data Governance in Digital Universities: Theoretical Foundations, Risks, And an Integrated Model for Vietnamese Higher Education

Tran Thi Ngat
Faculty of Economics, Hanoi Industrial and Trade University

Tran Thi Ngoc Yen
Faculty of Economics, Hanoi Industrial and Trade University

Dao Thi Hang
Faculty of Economics, Hanoi Industrial and Trade University

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ABSTRACT: This study examines data governance in digital universities in the context of digital transformation and university autonomy. It addresses three questions: which theoretical foundations inform university data governance; what risks arise when data are used for governance and quality assurance; and which model is appropriate for Vietnamese higher education institutions. Employing an integrative literature review and policy analysis, the paper proposes an integrated framework comprising five components: strategic autonomy and educational objectives; data architecture and interoperability standards; data analytics, artificial intelligence (AI), and dashboards; quality assurance and continuous improvement; and accountability and data protection. A four-level maturity roadmap is proposed, linking technology adoption to data standards, institutional responsibilities, quality evidence, and learners' rights.

KEYWORDS: data governance, digital university, university autonomy, accountability, quality assurance.

1. INTRODUCTION

Digital transformation is reshaping teaching, learning, and university governance, shifting the role of data from a means of recordkeeping to a foundation for decision support. Data can contribute to curriculum improvement and more effective governance. However, digital systems create value only when data are standardized, used lawfully, assigned to accountable stakeholders, and transformed into credible evidence of quality. Data governance is therefore not merely a technical matter; it also concerns decision rights, principles of data use, accountability, quality assurance, and risk mitigation [2,7]. In higher education, data can support the assessment of learning outcomes and accreditation. Conversely, inaccurate data or data interpreted without sufficient context may adversely affect learners and the academic reputation of institutions.

In Vietnam, university autonomy and digital transformation have heightened requirements for transparency, information security, and accountability. Accordingly, this study examines the theoretical foundations, identifies key risks, and proposes a data governance model suited to Vietnamese higher education, thereby shifting the focus from 'adopting technology' to 'governing data for responsible decision-making'.

2. RESEARCH CONTENT

2.1. Research methodology

This study employs an integrative literature review combined with policy analysis. This approach brings together scholarship on university governance, digital transformation, data governance, learning analytics, artificial intelligence (AI) in education, and quality assurance to develop a conceptual model informed by both academic literature and policy documents.

The literature was organized into three groups: (1) foundational studies on data governance and AI governance, including Khatri and Brown (2010) [7], Abraham et al. (2019) [2], and Gasser and Almeida (2017) [5]; (2) publications on digital education, learning analytics, and data ethics, including Slade and Prinsloo (2013) [10], Williamson and Eynon (2020) [12], UNESCO (2023) [11], and OECD (2023) [8]; and (3) policy documents and quality assurance frameworks relevant to Vietnam, including AUN-QA [3], ABET [1], and regulations on educational digital transformation [9] and personal data protection [6].

Selection criteria included direct relevance to data governance, digital university governance, or quality assurance; clear academic or policy significance; and a preference for works with a DOI, an official URL, or publication by an international organization. The selected documents were examined across four themes: decision rights and responsibilities concerning data; the role of data in autonomy and accountability; learning data, privacy, and ethics; and data as evidence for accreditation and curriculum improvement.

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2.2. Theoretical foundations of data governance in digital universities

Digital university governance involves more than introducing technology into administrative procedures; it requires redesigning decision-making processes around data, evidence, and accountability. Unlike conventional models, in which information is often dispersed and dependent on periodic reporting, digital universities continuously generate data through admissions, academic administration, learning management systems (LMS), digital libraries, surveys, finance, human resources, and industry engagement. Data governance is therefore essential to ensuring that management information is consistent, accurate, and usable.

According to Khatri and Brown (2010) [7], data governance concerns decision rights and accountability for principles of data use, data quality, metadata, access rights, and the data lifecycle. Under this view, data governance addresses 'who makes decisions and is accountable,' whereas data management addresses 'how tasks are carried out.' Within universities, responsibility for data extends beyond information technology departments to governing boards, executive leadership, faculties, administrative units, academic staff, and students.

Abraham et al. (2019) [2] conceptualize data governance in terms of organizational mechanisms, data scope, decision domains, antecedents, and expected outcomes. In higher education, organizational mechanisms may take the form of a data governance council or working group; the scope may encompass academic, student, research, and operational data; and key decisions concern data standards, access rights, reuse, security, and data quality assessment. Expected outcomes include more accurate decisions, more reliable accreditation evidence, and greater stakeholder trust.

In the context of university autonomy, data both enable institutional discretion and underpin accountability. Universities can demonstrate educational effectiveness, responsible resource utilization, and achievement of intended learning outcomes only when decisions are supported by verifiable evidence. Data governance is also directly linked to quality assurance, as frameworks such as AUN-QA [3] and ABET [1] require evidence of alignment among educational objectives, learning outcomes, curricula, teaching and learning, assessment, and continuous improvement. As quality assurance evidence increasingly takes digital form, the credibility of accreditation depends on the standardization, verification, and traceability of data. Data governance should therefore be embedded within the internal quality assurance system.

Table 1. Comparison of three approaches to university governance in the digital transformation era

Aspect	**Traditional Administrative Governance**	**Process Digitization**	**Data Governance in Digital Universities**
Basis for decision-making	Experience, internal rules, and periodic reports.	Data from individual applications or departments.	Standardized, interoperable data with clearly assigned accountability.
Role of technology	Supports document storage and exchange.	Automates certain administrative procedures.	Produces evidence, analyzes trends, and supports strategic decisions.
Accountability	Primarily through administrative reports.	Some digital processes may be traceable.	Enables explanations of data sources, processing methods, and decision rationales.
Relationship to educational quality	Indirect; largely dependent on periodic inspections.	Enables faster statistical reporting.	Directly linked to learning outcomes, student assessment, and curriculum improvement.

(Source: Authors' synthesis based on [2,3,7,8].)

Table 1 demonstrates that the fundamental difference between process digitization and data governance lies in the capacity to translate data into evidence and accountable decisions. A university with numerous software applications is not necessarily a digital university if its data remain fragmented, lack common standards, and are not used to improve quality. By contrast, data governance makes technology an integral part of academic governance rather than merely an administrative tool.

2.3. Risks and challenges of data governance in digital universities

Data governance in digital universities faces five major categories of risk. First, data fragmentation occurs when information on admissions, teaching, assessment, finance, human resources, research, and industry partnerships is stored in systems without shared identifiers, data standards, or interoperability mechanisms. This increases aggregation costs, delays decision-making, and undermines the consistency of accreditation evidence.

Second, data quality may remain inadequately controlled. Inconsistencies in data entry, outdated records, duplication, and ambiguous indicator definitions can produce inaccurate information. For example, the 'graduate employment rate' may be calculated differently across faculties unless common rules specify the survey date, the definition of employment relevant to the field of study, and the treatment of incomplete responses. When input data are unreliable, dashboards, analytical tools, and AI may generate seemingly objective yet untrustworthy results.

Third, privacy and personal data protection present significant risks. Educational data include identifying information, academic results, online activity, survey responses, and potentially sensitive personal information. Data collection and processing therefore require clearly defined purposes, limitations on use, differentiated access permissions, and appropriate safeguards. Under Vietnam's Decree No. 13/2023/ND-CP [6], higher education institutions must pay particular attention to lawful grounds for processing, data subject consent, processing logs, and responsibilities in the event of a breach.

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Fourth, data may be interpreted without adequate context. Indicators such as high failure rates, low satisfaction, or limited LMS engagement do not explain their underlying causes. If university leaders rely exclusively on quantitative measures without engaging academic staff, students, and employers, improvement decisions may be misguided. Slade and Prinsloo (2013) [10] argue that students should not be treated merely as subjects of measurement; they should have opportunities to understand, respond to, and participate in interpreting data that concern them.

Fifth, excessive reliance on analytics and AI systems without verification mechanisms can create additional risks. Algorithms can help predict dropout risk, recommend learning resources, analyze feedback, and produce quality reports. Nevertheless, their outputs may be misleading when data provenance, model limitations, and potential biases are not made explicit. Gasser and Almeida (2017) [5] emphasize that AI governance must simultaneously address technical, ethical, legal, and social dimensions. Accordingly, AI applications in universities require academic oversight, verification procedures, and clearly allocated responsibilities.

2.4. An integrated data governance model for digital universities

Drawing on the theoretical foundations and risks discussed above, this paper proposes a digital university data governance model comprising five closely interconnected components: strategic autonomy and educational objectives; data architecture and interoperability standards; data analytics, AI, and dashboards; quality assurance and continuous improvement; and accountability and data protection. The model treats data as a university-wide governance resource rather than merely a technical asset of the information technology department.

Strategic autonomy and educational objectives guide all activities relating to data collection, processing, and use. Universities should specify which decisions data are intended to support, which quality criteria they are expected to improve, and which units or individuals are accountable for using the results. Such an approach helps prevent indiscriminate data collection without a clearly defined purpose.

Data architecture and interoperability standards provide the foundation for the entire model. Universities need a shared data catalog, consistent identifiers, and common standards for students, courses, programs, academic staff, academic results, feedback, and graduate employment. The data lifecycle, from creation and updating to storage, sharing, reuse, and deletion, should also be governed by explicit rules. Once data are standardized, enterprise resource planning (ERP), LMS, customer relationship management (CRM), assessment, and quality assurance systems can be interconnected more effectively.

On this standardized data foundation, analytical tools, AI, and dashboards can help identify trends, flag risks, forecast needs, monitor learning progress, and evaluate program effectiveness. However, indicators must be tied to specific governance questions rather than merely displayed. For example, achievement of intended learning outcomes should be linked to courses, assessment methods, employer feedback, and improvement plans. AI use must also be accompanied by output validation, audit trails, and human oversight.

Data acquire genuine value only when translated into evidence for quality assurance and continuous improvement. Higher education institutions should integrate data into self-assessment, program accreditation, and course review. Quality reports should clearly identify data sources, indicator calculation methods, data limitations, and improvement decisions arising from the analysis. This enables quality assurance to move from periodic reporting toward continuous monitoring, facilitating early problem detection and timely decisions.

Accountability and data protection constitute a cross-cutting component of the model, ensuring that data are used lawfully, ethically, and reliably. Institutions should delineate the roles of data controllers, data processors, access authorizers, and data quality owners, and establish mechanisms for receiving student feedback. Accountability goes beyond the publication of indicators; it includes the ability to explain data provenance, processing procedures, decision rationales, and corrective measures when errors occur.

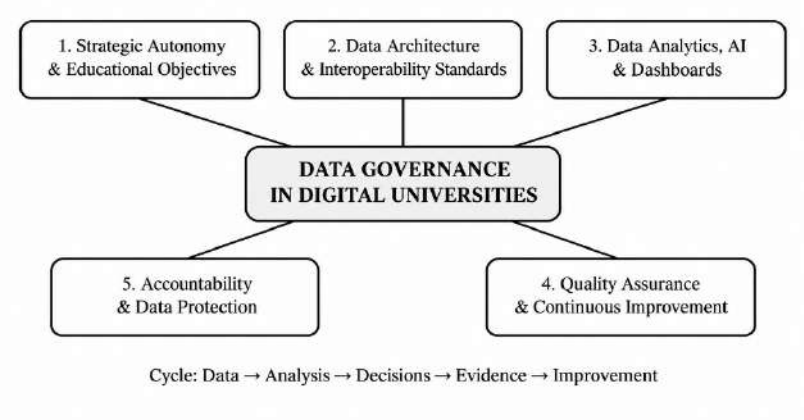


Figure 1. Data governance model for digital universities
(Source: Authors' proposal based on [2,6,7,8,10].)

Figure 1 presents data governance in digital universities as a closed-loop process. Strategic autonomy determines data needs; data architecture enables interoperability; analytics and AI support decision-making; quality assurance translates decisions into evidence for improvement; and accountability and data protection provide oversight across the entire cycle. The model's distinctive feature is its positioning of data at the intersection of governance, academic practice, technology, and law.

2.5. Implementation roadmap for Vietnamese higher education institutions

To ensure feasibility, Vietnamese higher education institutions should avoid beginning with large-scale technology investment. Instead, implementation should proceed in stages, starting with common data definitions and accountability arrangements before integrating systems and deploying advanced analytics. The proposed roadmap comprises four maturity levels: foundation, integration, data-driven decision-making, and trustworthy AI governance.

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Table 2. Roadmap for developing data governance capabilities in digital universities

Level	Key Tasks	Outputs/Evidence	Risks to Control
1. Foundation	Inventory data, identify core datasets, and issue data governance policies.	Data catalog, responsibility matrix, and access procedures.	Purposeless data collection and unclear accountability.
2. Integration	Connect ERP, LMS, assessment, quality assurance, and stakeholder feedback.	Shared standards, unique identifiers, and integrated reports.	Inaccurate, duplicate, or inconsistent data across systems.
3. Data-driven	Develop dashboards, analyze trends, and use data to improve programs.	Quality indicators, analytical reports, and decision records.	Mechanical interpretation that neglects academic context.
4. Trustworthy AI	Pilot AI for feedback analysis, early warning, and self-assessment support.	Model validation reports, usage logs, and appeal mechanisms.	Algorithmic bias, insufficient explainability, and risks to learners' rights.

(Source: Authors' proposal based on [4,6,8,11].)

The implementation roadmap comprises four levels. At the foundation level, universities should inventory their data, identify core datasets, assign responsibilities, and establish governance policies. This provides a basis for avoiding disconnected technology investments and further fragmentation. At the integration level, institutions should connect academic management, LMS, assessment, quality assurance, finance, and industry-engagement systems through shared standards and secure exchange mechanisms. This supports the development of indicators covering academic achievement, learning outcomes, satisfaction, graduate employment, and employer feedback. At the data-driven decision-making level, dashboards, trend analysis, and evidence-based reporting can inform the introduction of new programs, curriculum revisions, resource allocation, and course improvement. Nevertheless, data must support rather than replace academic judgment and stakeholder participation. At the trustworthy AI governance level, AI may help analyze feedback, predict learning risks, recommend resources, and identify anomalies. Applications directly affecting learners must be piloted, validated, explainable, and subject to appeal mechanisms; AI does not displace academic responsibility.

To support implementation, regulatory authorities should establish minimum data standards, interoperability frameworks, and personal data protection requirements, while integrating data governance into assessments of digital transformation and quality assurance. Universities should establish data governance councils or working groups, strengthen staff data competencies, and ensure that students can access information, provide feedback, correct inaccurate records, and request explanations when data are used in consequential decisions.

3. CONCLUSION

Data governance is an indispensable foundation for university governance in the digital transformation era. Technologies such as AI, ERP, LMS, and dashboards create value only when data are governed by explicit principles, responsibilities are clearly assigned, quality standards are in place, privacy is protected, and data use serves educational objectives. This paper has examined the theoretical foundations of data governance in digital universities, identified major risks, and proposed an integrated model with five components: strategic autonomy and educational objectives; data architecture and interoperability standards; data analytics, AI, and dashboards; quality assurance and continuous improvement; and accountability and data protection.

The study's principal contribution is to demonstrate that digital transformation in university governance should not be equated with the digitization of administrative processes; rather, it should be situated within a responsible data ecosystem. The proposed model may help Vietnamese higher education institutions develop context-appropriate implementation roadmaps, avoid fragmented technology investments, and strengthen evidence-based decision-making. Future studies could validate the model by surveying the data governance maturity of universities or conducting case studies across institutions at different stages of digital transformation.

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Corresponding Author: Tran Thi Ngat