



## جامعة غرداية

### كلية العلوم الاقتصادية والتجارية وعلوم التسيير

بالتعاون مع مخبر أبحاث البنية الرقمية والذكاء الاصطناعي  
وتطبيقاتهما في التحول الرقمي للقطاعات الاقتصادية.

وبالإشتراك مع فرقة بحث متطلبات تطبيق حوكمة الشركات  
والتدقيق المحاسبي في المؤسسات الاقتصادية الجزائرية  
بمخبر الدراسات التطبيقية في العلوم المالية.

وبالإشتراك مع النقابة الوطنية المستقلة لمستخدمي التعليم  
العالي - فرع غرداية، ينظمون:

## الملتقى الوطني الأول (حضورى وعن بعد) حول: حوكمة مؤسسات التعليم العالي في ظل التحول الرقمي والتشريعات الحديثة.

مداخلة بعنوان:

### Digital-Era Governance in Higher Education: Insights from Finnish and Vietnamese Experiences

من إعداد الباحثة:

**الملخص من خلال المحور رقم: 10**

هدفت هذه الدراسة إلى تحليل كيف يمكن لحوكمة العصر الرقمي إعادة تشكيل مؤسسات التعليم العالي، وتحديد العناصر المحورية المؤسسية في التجارب العالمية. بالاعتماد على منهجية دراسة الحالة النوعية (فنلندا وفيتنام)، كشفت الدراسة أنه في حين يطبق كلا السياقين ركائز حوكمة العصر الرقمي - المتمثلة في إعادة الدمج، والرقمنة الشاملة، والعمليات القائمة على البيانات- عبر مسارات متباينة، فإن كلا النموذجين يحققان النجاح من خلال المواءمة الاستراتيجية بين العمليات الرقمية والامتثال التشريعي. خلصت الدراسة إلى أن الحوكمة الرقمية تُعدّ تحولا هيكليا جوهريا، وليست مجرد تحديث تكنولوجي فحسب، فهي ركيزة أساسية لتعزيز النزاهة والكفاءة الإدارية.

**الكلمات المفتاحية:** حوكمة العصر الرقمي؛

#### Abstract:

This study aimed to analyze how Digital-Era Governance (DEG) reshapes higher education institutions and to identify the characteristics of institutional transformation in global experiences. Using a qualitative, multiple-case study design (Finland and Vietnam), the research revealed that while both contexts operationalize DEG pillars; Reintegration, Holistic Digitalization, and Data-Driven Operations, through distinct pathways, both models achieve success through the strategic alignment of digital operations and legislative compliance. The study concludes that digital governance is a fundamental structural transformation, rather than a mere technological upgrade, essential for institutional to enhancing integrity and administrative efficiency.

**Keywords:** Digital-Era Governance; Higher Education; Digital Transformation; Finland; Vietnam.



## **1. Introduction:**

Contemporary higher education institutions are navigating an increasingly complex landscape defined by rapid technological advancements and evolving legal requirements. In response to these systemic vulnerabilities, scholars argue for a shift beyond New Public Management (NPM) toward the Digital-Era Governance (DEG) paradigm. This transition is no longer a matter of technological choice but a strategic necessity to overcome fragmented administrative structures and meet sovereign digital mandates (Muyters, Broucker, & De Witte, 2022, p. 199).

Despite the theoretical consensus on these shifts, there remains a critical gap in identifying integrated governance models that successfully harmonize digital imperatives with modern legislative mandates within the specific context of higher education institutions. By analyzing diverse international case studies ranging from developed to emerging contexts, this study seeks to bridge the gap between the conceptual tenets of DEG and the practical exigencies facing modern universities in the digital age.

The primary purpose of this research is to explore how the pillars of DEG are operationalized to create a unified institutional architecture. To address this objective, the study employs a qualitative, multiple-case study design, offering insights from a developed-economy model (The Finnish National Smart Campus Ecosystem) and an emerging-economy model (Hanoi University of Industry in Vietnam). By examining these diverse experiences through the DEG lens, the research addresses the main question:

- How is the DEG paradigm reshaping university governance structures, and what characterizes the institutional transformation observed in successful global experiences?

To answer this question, the study focuses on the following sub-questions:

1- In what ways are the pillars of Reintegration, Holistic Digitalization, and Data-Driven Operations operationalized to define the features of digital governance in leading universities?

2- How are legislative frameworks integrated into the architecture of digital governance within the analyzed university models?

3- What are the primary institutional challenges identified within the analyzed case studies (Finland and Vietnam), and how do they manifest during the transition toward digital governance?

## **2. Literature Review:**

Recent literature emphasizes that digital transformation is a fundamental restructuring of governance rather than a mere technical shift (Mujahidin, Zuhad, & Irawanto, 2026, p. 152). However, a gap persists in reconciling digital agility with modern legislative constraints. This review examines how international contexts navigate this nexus to achieve an integrated governance architecture.

### **2.1 Governing by Design: A Digital-Native Framework to Resolve the Autonomy-Accountability Paradox in Bangladeshi Higher Education**

This research addresses Bangladeshi higher education, where statutory self-governance is often undermined by procedural opacity. The author contends that conventional reforms are insufficient, as they fail to treat the systemic "disease" of discretionary power, advocating instead for a radical shift: re-defining digitalization as a fundamental constitutional value rather than a mere administrative tool.

Utilizing a critical legal-analytical methodology, the paper develops a Tripartite Digital Governance Model comprising: (1) the National HE Leadership Portal for meritocratic appointments; (2) an Intelligent Financial Management Information System for fiscal transparency; and (3) a National Academic Repository for performance democratization.

The core finding is the transition toward "Governing by Design." By hard-coding governance protocols into mandatory digital platforms, the model replaces human discretion with immutable procedures. The study concludes by proposing a "Digitally-Native Higher Education Act," which constitutionalizes transparency and ensures that integrity is permanently embedded in the institutional structure (Singha, 2025).

## **2.2 Graduate Student Engagement and Digital Governance in Higher Education**

This study explored the perceptions and experiences of graduate students regarding digital governance within the Turkish higher education context. Using semi-structured interviews with thirty participants, the research analyzed the practical roles, effectiveness, and challenges of digitalizing governance from a student-centric perspective.

Findings reveal a significant conceptual ambiguity among students, who often associate digital governance with general efficiency but lack a formal understanding due to its absence from academic curricula. Despite this awareness gap, participants recognized vital advantages, such as improved data management and streamlined administrative processes.

However, the study identified persistent systemic challenges, including inadequate infrastructure and a lack of formal training, which contribute to a "digital divide."

The results suggest that current student involvement remains largely superficial, highlighting a gap between the potential for transformation and the practical reality of implementation. The study concludes that without robust infrastructure and clear legislative frameworks for digital literacy, the transition to digital governance remains incomplete and fails to engage its primary stakeholders effectively (Doğan & Arslan, 2025).

## **2.3 Digital Transformation of Higher Education: Leveraging e-Governance in India**

This study examines the integration of e-Governance within the Indian higher education system as a catalyst for digital transformation. It identifies a shift from traditional administrative paradigms—characterized by bureaucratic inefficiencies—towards a streamlined "Digital Ecosystem" that leverages e-Governance for online admissions, digital records, and virtual learning to enhance institutional effectiveness.

Thematically, the paper views digital governance primarily as an administrative efficiency framework, emphasizing benefits such as transparency and resource accessibility.

However, it also addresses critical "back-end" requirements, specifically the need for robust cybersecurity measures and data protection policies.

The core finding is that while the study provides a comprehensive overview of procedural successes, it remains focused on the operational dimension of e-Governance. This highlights a gap regarding the integration of legislative frameworks with digital tools, suggesting that while the "technical" transformation is underway, the "governance-by-design" theoretical underpinning remains underdeveloped in the Indian context (Chhangani & Hussain, 2023).

These studies explore digital governance within higher education; however, they fail to fully address all DEG pillars. Therefore, it is beneficial to examine successful experiences that demonstrate the practical integration of digital transformation into university governance while maintaining full compliance with legislative mandates.

#### **2.4 Theoretical Concepts in Higher Education Governance**

University governance represents a robust concept reflecting the multifaceted ways academic institutions are steered within their political, social, and economic environments (Bratianu & Pinzaru, 2015, p. 28). Formally, it is defined as a “constitutional process through which the university settles its affairs”, encompassing the policies for decision-making and the exercise of authority in resource management (Muktiyanto & Hermawan, 2020, p. 291). This concept is analyzed through two distinct lenses: **external governance**, which manages the relationship between institutions and the state, and **internal governance**, which defines the lines of authority among stakeholders within the institution (Bai, 2022, p. 20).

#### **2.5 New Public Management Governance:**

The conceptualization of governance has evolved from Clark’s “triangle of coordination”, analyzing the interaction between state authority, the market, and academic oligarchy, toward more complex analytical models driven by NPM (Hudayberdiyev, 2024, p. 12). NPM asserts that private sector techniques can enhance public performance, compelling institutions to adopt rigorous instruments for transparency and accountability (Broucker & De Wit, 2015, p. 58).

In this evolving landscape, higher education governance is structured around the dualistic pillars of Autonomy and Accountability. This framework addresses the "definitive paradox" between institutional flexibility and state responsibility (Singha, 2025, p. 2). Specifically, the Autonomy Pillar includes organizational freedom, financial authority, and academic self-determination essential for innovation (Fiszbein & Ringold, 2015, p. 9). Conversely, the Accountability Pillar functions as a "public trust," utilizing managerial reporting and performance disclosure to meet the expectations of both government and society. Consequently, the interplay between these pillars ensures that institutions fulfill their ethical and managerial obligations in a changing regulatory environment (Pattaro, Moura e Sá, & De Kruijf, 2022, pp. 6-8).

"Building on the pillars of autonomy and accountability, several theoretical models have emerged to explain authority distribution. The most influential is Clark's Triangle of Coordination (1983), which posits that higher education systems are shaped by the interaction of state authority, the market, and the academic oligarchy. In practice, most systems function as hybrid models within this triangle, where these three forces coexist in varying degrees (Hudayberdiyev, 2024, p. 12).

Subsequent scholars have refined Clark's foundational work, developing diverse models of governance in higher education that shift between academic "self-rule" and "market-oriented" approaches (Findikli, 2017, p. 393). While further distinguishing between 'state control,' 'state supervising,' and 'New Managerialism' frameworks, these structural transitions reflect the increasing complexity of institutional steering (Dobbins, Knill, & Vögtle, 2011, p. 666).

Despite these models, operational reality—especially in developing regions—faces profound obstacles. "Good governance" is often undermined by systemic corruption, nepotism, and political interference, resulting in a non-meritocratic environment and the erosion of autonomy. These failures underscore the vulnerability of traditional frameworks to human bias (Yasmin, 2018, p. 111), consequently digital transformation and legislative

reform become mandatory mechanism to reconstruct governance through data-driven transparency and accountability (Mujahidin, Zuhad, & Irawanto, 2026, p. 152).

## **2.6 Digital-Era Governance:**

In response to systemic vulnerabilities, scholars advocate moving beyond NPM toward holistic governance capable of addressing diverse institutional logics and stakeholder expectations (Muyters, Broucker, & De Witte, 2022, p. 199). In this context, digital transformation emerges as a strategic process that necessitates a fundamental transformation of institutional structures. Consequently, DEG functions as a framework for hybrid models, such as Smart Governance and Digital Governance models, depending on technological and strategic maturity. However, realizing these models requires overcoming barriers like leadership resistance and the absence of strategic vision, necessitating a robust legislative and strategic foundation (Kamal, Jaiswal, Maurya, Yadav, & Kumar, 2026, pp. 522-524)

Dunleavy et al. define DEG as a reform constellation where IT and information systems centralizes the reorganization of public services into integrated processes (Dunleavy, Margetts, Bastow, & Tinkler, 2006, p. 468). Modernized for higher education, this paradigm has evolved from its foundational roots into a framework of Reintegration of Services, Holistic Digitalization, and Data-Driven Operations (Locsin, 2025, p. 2).

**2.6.1 Reintegration of Services:** This pillar responds to NPM-driven fragmentation by seeking to put back together administrative elements that were previously separated into discrete hierarchies unifying discrete hierarchies (Dunleavy, Margetts, Bastow, & Tinkler, 2006, p. 480). Reintegration is not a simple return to old centralization; rather, it exploits digital-era technology to unify fragmented functions and interoperable platforms by consolidating systems into shared digital services, institutions reverse "silos" and duplicated processes, strengthening institutional coherence and student-centered transparency (Locsin, 2025, p. 2).



**2.6.2 Holistic Digitalization:** Moving beyond technological replacement, this pillar serves as a structural driver that connects processes, data, and decision-making (Locsin, 2025, p. 3). This transformation reshapes institutional dynamics and operational efficiency (Shamiyeva, 2025, p. 998), creating accessible and equitable environments for students, faculty, and administrators through integrated digital workflows (Locsin, 2025, p. 3; Shamiyeva, 2025, p. 999).

**2.6.3 Data-Driven Operations:** This pillar treats data as a strategic asset, utilizing systematic collection and analysis and real-time analytics to guide institutional decision-making at every level. By analyzing enrollment and performance trends, universities design targeted interventions to improve student success and retention (Elugbaju, Okeke, & Alabi, 2024, p. 17). This is enhanced by 'Smart Campuses' using real-time analytics and predictive modeling to optimize resource allocation. Ultimately, embedding data practices across academic and administrative units ensures transparency and provides a foundation for continuous improvement (Locsin, 2025, p. 3).

### **3. Selected Case Experiences: Finland and Vietnam:**

this section examines two diverse experiences: the high-tech National Smart Campus Ecosystem in Finland and the administrative digitalization model at Hanoi University of Industry in Vietnam.

**3.1 Case 1- The Smart Campus Ecosystem (Finland):** The Finnish National Smart Campus Ecosystem (FNSCE) serves as a leading model for operationalizing DEG. Launched in 2021 as a joint initiative between eight Finnish Universities and Universities of Applied Sciences, the FNSCE project derives its strength from its capacity to accelerate the upscaling of trailblazing sustainable research-based innovations by making them accessible to Finnish-based SMEs and shortening the research-to-industry cycle, the ecosystem acts as a strategic engine for digital transformation (Abdullahi, Porras, & Haqu, 2022, p. 2). Its operationalization is analyzed through the three DEG pillars.

**3.1.1 Reintegration of Services:** The pillar of Reintegration in Finland reflects a transition from traditional oversight to a unified ecosystem that consolidates the RDI (Research, Development, and Innovation) capacities of multiple institutions. By orchestrating a platform that connects 31 universities and research institutes with the SME sector, Finland has effectively broken down traditional institutional "silos," ensuring that academic services are synthesized into a national innovation engine rather than remaining isolated efforts. This collaborative governance reconfigures the lines of authority by aligning internal institutional research with external market needs, thereby enhancing institutional responsiveness and national competitiveness. (Abdullai, Porras, & Haqu, 2022, p. 1; University of Oulu, 2021).

**3.1.2 Holistic Digitalization:** Finland's transition toward 6G and AI-driven environments exemplifies Holistic Digitalization, where campuses are redefined by IT to bridge the gap between institutional autonomy and global standards. Central to this model are Digital Twins, digital applications that model physical entities using real-time data, developed through the Internet of Things (IoT), to enable administrators to monitor operations and detect errors, re-engineering facility management into an "end-to-end" digital experience. Consequently, the campus functions as an 'innovation engine' merging digital and physical realities to enhance institutional responsiveness and global competitiveness. (Demir, 2024, pp. 208-209; University of Oulu, 2021).

**3.1.3 Data-Driven Operations:** This pillar is defined by a unified commitment to transparent data protocols across the Finnish Smart Campus alliance. Within this dynamic, digital governance manages student assessments and institutional actions through shared platforms, ensuring decision-making is grounded in verifiable data rather than human bias. This collective system of evidence-based oversight fulfills the "Accountability Pillar," maintaining institutional integrity as a "public trust" across the entire ecosystem (University, Centria, 2026; University of Oulu, 2021).

Despite its advancements, the Finnish model faces inherent limitations. Literature identifies critical barriers, including a 'lack of clarity' in shared value propositions among actors and a

'human-data gap' characterized by weak stakeholder involvement and a disconnect between RDI outputs and societal needs (Abdullai, Porras, & Haqu, 2022, p. 2).

**3.2 Case 2- Hanoi University of Industry (Vietnam)** Established in 1898 as one of Vietnam's earliest technical schools, Hanoi University of Industry (HaUI) operates under the Ministry of Industry and Trade and is renowned for its extensive expertise in engineering and economics education. In the 2024–2025 academic year, the university manages over 35,000 students across 39 majors supported by a workforce of more than 1,500 staff and lecturers (HaUI, 2025). HaUI's infrastructure includes 13 faculties, 10 training centers, and 7 functional departments (HaUI, 2024). Aligned with the national industrial revolution, the university is committed to advancing applied scientific research and training to meet evolving industry standards (Quy, 2025).

**3.2.1 Reintegration of Services:** The Reintegration pillar at HaUI reflects a deep synergy between Vietnam's national strategic mandates and institutional execution. Following a significant shift in Vietnamese higher education policy toward institutional autonomy, the university synchronized its workflows with national digitalization decrees (Nguyen & Uong, 2026, pp. 1-2; Thu, 2024, p. 57). By integrating 23 sub-systems and 517 operational processes, HaUI effectively bridges the gap between state vision and institutional reality. This digital unification allows the university to balance the academic requirements of the Ministry of Education and Training with the administrative demands of the Ministry of Industry and Trade, enabling the 1,500 staff members to shift from burdensome bureaucracy toward high-value research and market collaboration (Anh, Phuong, & Ha, 2026, p. 7; Nguyen & Uong, 2026, p. 3).

**3.2.2 Holistic Digitalization:** Holistic Digitalization at HaUI transforms the institution into a dynamic ecosystem where technology is a strategic compliance mechanism. Guided by the National Digital Transformation Program, the university's adoption of Artificial Intelligence (AI), Internet of Things (IoT), and Virtual Reality (VR) is designed to meet governmental KPIs, such as digitizing 50% of educational components by 2025 (Thu, 2024, p. 58; Locsin, 2025, pp. 10-11). This shift aligns HaUI's academic ecosystem with

the National Digital Competency Framework, while new disciplines like Semiconductor Engineering position the university as a pivotal engine for national competitiveness and global industrial standards (HaUI, 2025; HaUI, 2026).

**3.2.3 Data-Driven Operations:** The pillar of Data-Driven Operations operationalizes transparency as a bridge between institutional performance and state accountability. In line with national digital decrees, the Ministry of Education and Training envisions a "unified higher education management information system" to promote evidence-based decisions (Thu, 2024, p. 60). To fulfill this sovereign mandate, HaUI utilizes digitized financial data and management software to ensure accurate reporting, providing a foundation for data-driven decision-making and financial transparency (HaUI, 2024; HaUI, 2025).

This precision empowers both faculty and students. For faculty members, the system facilitates merit-based incentives, such as the annual allocation of VND 13 billion for outstanding academic publications. By digitizing administrative operations, the university reduced procedural workloads, allowing lecturers to focus on high-impact research, which resulted in over **1,500 scientific publications** in the 2024–2025 academic year (HaUI, 2025). Simultaneously, students benefit from an online system for real-time tracking of their academic progress and simplified administrative procedures, from enrollment to scholarship applications, fostering a "paperless" environment envisioned by government digitalization decrees (Thu, 2024, p. 59; HaUI, 2025). Furthermore, through Economic Diplomacy, HaUI aligns these data-driven outcomes with global innovation networks, ensuring institutional accountability fulfills its role as a "public trust" (HaUI, 2025; Locsin, 2025, p. 11).

Despite its sophisticated framework, HaUI faces persistent institutional bottlenecks. Critical barriers include a 'trust and market gap,' where research outputs struggle to transition from laboratory validation to commercialization. Additionally, regulatory constraints persist due to a lack of detailed legal guidance for university 'spin-off' companies, creating risks that hinder the sustainable transfer of scientific breakthroughs to the market (HaUI, 2025).

### **3.3 Synthesis: Comparative Lessons**

The contrasting cases of Finland and Vietnam provide a robust empirical validation of DEG across different socio-economic contexts, revealing critical functional differences within the three pillars. In the Reintegration pillar, Finland's approach is defined by national ecosystem orchestration, consolidating 31 institutions into a unified innovation engine, whereas Vietnam's HaUI focuses on administrative consolidation, integrating 517 internal processes to overcome bureaucratic fragmentation.

Regarding Holistic Digitalization, the distinction lies in the depth of integration; Finland exemplifies Smart Governance Model by merging digital and physical realities through 6G infrastructure and Digital Twins, while Vietnam achieves holism through a Digital Governance Model, based on strategic compliance and embedding Industry 4.0 technologies directly into its academic mission to meet sovereign mandates. Finally, Data-Driven Operations in the developed model drive environmental responsiveness and real-time error detection, whereas in the emerging model, they function as a primary tool for merit-based accountability and financial transparency.

Ultimately, these global practices prove that while the emerging model may lack the advanced 6G infrastructure and national ecosystem depth of the Finnish smart ideal, it achieves transformation through coherent institutional strategies and robust data governance. Despite these differing paths, both models ensure that institutional integrity is maintained as a "public trust" by replacing manual reporting with automated, verifiable digital trails to navigate the complex demands of the global digital economy.

### **4. Conclusion**

The theoretical and empirical analysis confirms that the shift toward DEG represents a fundamental alternative to the fragmented techniques of NPM. By operationalizing the three pillars of Reintegration, Holistic Digitalization, and Data-Driven Operations, universities transition toward an integrated digital model that restores institutional coherence. This study highlights that Digital Governance is not merely a technological

upgrade but a structural transformation where legislative frameworks are integrated into the institutional architecture.

The experiences of Finland and Vietnam provide evidence that this transition is context-dependent: the Finnish model achieves Smart Governance through technological depth (6G and Digital Twins), while the Vietnamese model (HaUI) achieves Digital Governance through administrative consolidation. Despite these differences, both models utilize automated digital trails to operationalize transparency and accountability.

Ultimately, the study addresses its research questions by identifying that a successful governance model must be grounded in measurable productivity and robust data governance. Despite persistent contextual challenges identified in the case studies, aligning internal operations with sovereign digital mandates ensures that the university remains a "public trust" in the contemporary digital economy.

To accelerate the transition toward DEG in Algeria, this study proposes the following recommendations:

- Legislative Modernization: Enacting laws that grant universities greater institutional autonomy and constitutionalize digital transparency. This ensures that legislative frameworks are inherently integrated into the digital architecture to support long-term strategic continuity.
- Governmental Incentives: Implementing performance-based funding linked to digital maturity KPIs, including financial incentives for universities that successfully implement integrated digital governance
- University-Industry Nexus: Establishing a Unified Digital Collaboration Platform to bridge the gap between academic R&D and industrial needs, facilitating the commercialization of scientific breakthroughs and strengthening ties with economic partners.

- Infrastructure and Training: Expanding high-speed connectivity and establishing Digital Strategy Offices for continuous staff training, ensuring effective interaction with digital systems.
- Stimulating Academic Competitiveness: Encouraging merit-based competition to bridge performance gaps and elevate national standards. Adopting digital governance serves as a strategic driver to optimize resources, allowing faculty and students to focus on administrative excellence and high-impact research.

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