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From Review to Action: Towards an Analytical Framework for University Digital Governance in Morocco

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Abstract: Rapid development of digital transformations in higher education driven by artificial intelligence (AI) technologies necessitates revision of the current models of governance, decision making, and internal auditing processes. Although many models of digital governance and intelligent auditing have already been introduced worldwide, most of them were created in high-tech settings and are poorly adapted to the conditions prevailing in developing countries such as Morocco. The paper aims at filling this research gap by offering an evaluation model of the transferability of the AI-based governance models to the Moroccan context of higher education. For this purpose, a hybrid literature review method including systematic analysis of the relevant studies (2023–2025) and narrative integration is used to identify, compare, and evaluate the available models of governance, intelligent auditing and Intelligent Process Automation (IPA). These models are evaluated on the basis of conceptual evaluation matrix, considering four factors including the extent of automation, regulation portability, feasibility, and acceptability. It has been seen that governance models which have been validated locally have a higher potential of implementation owing to compliance with the country's laws and institutional norms while those with high automation require adjustments because of constraints related to infrastructure, interoperability problems, and lack of digital skills. Furthermore, three implementation scenarios have been proposed for Morocco.

Keywords: Digital Transformation; Artificial Intelligence; Intelligent Governance; Information Systems Audit; Process Automation; Moroccan Universities

1. Introduction

The digital transformation of higher education is a very important issue for the universities, which should be used to improve their governance, effectiveness, quality, and sustainability. The most recent advancements in the area of AI, Intelligent Process Automation, big data analytics and cloud-based information systems are changing the way the management of academic, administrative and financial processes at universities is done. Digital technologies are not just some tools, but they represent a very valuable asset that can help to make universities more transparent and accountable [1,2].

International organizations like United Nations Educational, Scientific and Cultural Organization (UNESCO), the Organisation for Economic Co-operation and Development (OECD), and the European Commission emphasize that digital transformation should be seen not as a technological upgrade but a full-scale governance reform which implies organizational changes, stakeholder engagement, ethical supervision, and continuous learning. Therefore, many universities adopt the use of artificial intelligence in the form of governance models that facilitate automation of administrative processes, quality assurance, resource optimization, regulatory compliance, and strategic planning.

In this respect, Intelligent Process Automation is one of the most innovative tools that can be used in university governance. The combination of robotic process automation, machine learning, natural language processing, intelligent agents, and predictive analytics will help universities automate complicated processes without losing traceability, consistency, and decision-making capacity. Latest empirical studies show that intelligent automation can effectively decrease administrative burden, speed up document processing, enhance audit quality, and increase organizational responsiveness. Furthermore, AI-based governance frameworks enable real-time monitoring of institutional performance and give managers new analytic tools which were not available through traditional information systems [3,4].

Nonetheless, current digital governance frameworks have been largely developed and tested in highly mature contexts, especially in Europe, North America and East Asia. Almost all existing models presuppose the presence of advanced digital infrastructure, high institutional interoperability, mature regulatory ecosystem, and significant investments in digital competencies. Thus, the direct application of these models to the countries with developing higher education systems turns out to be problematic due to significant differences between contextual variables, including institutional capabilities, technological readiness, governance tradition, and socio-economic constraints [5,6].

Morocco becomes one of the most interesting cases for this research since over the last decade the Moroccan government has implemented several strategic national initiatives in order to accelerate the digital transformation of higher education and promote its governance, quality assurance, digital services, and research performance [7]. However, Moroccan universities continue facing many structural problems including fragmentation of information systems, heterogeneity of digital infrastructures, insufficient institutional interoperability, low digital competencies, cybersecurity threats, and changing regulatory requirements. All these problems make the implementation of advanced AI-based governance systems more difficult and require the adaptation rather than simple adoption of international models [8].

There are some recent Moroccan studies which examine various aspects of digital transformation of universities including IT governance, cybersecurity strategies, absorptive capacity, and artificial intelligence. However, while providing valuable empirical insights on various aspects of digital transformation, the reviewed papers demonstrate notable fragmentation and are mainly concentrated on technological or managerial aspects. What is more, the international scientific literature has developed numerous governance frameworks, intelligent auditing models and automation architectures, but there is still a lack of research aimed at integration of all these models and assessment of their applicability in different contexts [9].

Such lack is significant since, while there is plenty of information about different digital governance models, intelligent auditing systems and automation technologies, there is an absence of recommendations on how these tools should be evaluated and adapted. In particular, there is no framework which would consider technological readiness, regulatory compliance, organizational readiness and other contextual factors during assessment of intelligent governance models. This problem is especially critical for Morocco, since successful digital transformation implies not only the adoption of technologies but also institutional change.

In order to address this research gap, the proposed study focuses on development of a theoretical framework for evaluation of potential applicability of AI-based governance models and intelligent auditing models in Moroccan universities. Unlike the majority of researches devoted to innovation of technologies, this study is not focused on introduction of a new tool, but rather aims at synthesis of results of recent scientific researches on governance models, identification of their strengths and weaknesses and assessment of their transferability using multidimensional evaluation framework.

The methodological foundation of the study is built upon hybrid literature review combining both narrative and structured synthesis. Such approach enables identifying the most popular governance models and consider-

ing some contextual factors which cannot be taken into account in the context of traditional systematic literature reviews. Next, the reviewed studies will be evaluated according to four dimensions—degree of automation, regulatory portability, technical feasibility and organizational acceptance. This study contributes in three ways. First, it gives a coherent analytical synthesis of recent research on AI-enabled university governance, intelligent auditing, and Intelligent Process Automation. Second, it introduces a contextual evaluation framework that helps decision makers to make an assessment of the applicability of governance models based on the local conditions. Third, it introduces implementation scenarios that are applicable for the needs of Moroccan universities.

Accordingly, the following research questions guide the research process:

RQ1. Which digital governance and intelligent auditing models are proposed for higher education institutions in the era of artificial intelligence?

RQ2. How can Intelligent Process Automation enhance governance performance, institutional auditing, transparency, and operational efficiency?

RQ3. Which governance models are characterized by the highest transferability potential for Moroccan universities taking into account their technological, organizational and regulatory context?

Further, this paper will be divided into sections as follows: Section 2: research methodology; Section 3: synthesis of governance models; Section 4: presentation of the proposed evaluation framework and its implications for Moroccan higher education institutions [10]; Section 5: conclusion.

Conceptual Framework

The digital transformation of higher education is defined by three main components: digital governance, intelligent auditing and intelligent process automation. These aspects are aimed at one common goal, improvement of transparency, efficiency and resilience of institutions in the era of cognitive technologies. This approach is based on recent literature, for example, Cheong et al. [11], who state the importance of intelligent automation as a strategic tool in complex educational contexts.

The digital governance of higher education includes mechanisms, standards and practices of strategic information technologies management. It embraces the management of information systems, decision making through data analysis and institutional accountability [12]. The doctoral research by Tranfield et al. [13], underlines that digital governance should develop in tandem with digital practices, considering organizational, pedagogical and policy-related aspects of every particular institution. Digital governance in emerging contexts like Morocco is faced with certain structural barriers which include fragmented platforms, low level of digital competences and lack of interoperable frameworks. According to El Ferouali et al. [14], these barriers are the main obstacles for the alignment of pedagogical objectives with technological resources.

Intelligent auditing is the next step in development of traditional verification and evaluation practices. It includes the application of advanced technologies like artificial intelligence (AI), natural language processing (NLP) and robotic process automation (RPA) [4]. Research of Kokina et al. [5] proves that robotic process automation allows software agents to perform routine tasks through mimicking of human behavior on digital interface, thus increasing traceability, reactivity and reliability of internal controls. Intelligent auditing also allows algorithmic supervision of processes for the detection of anomalies and regulatory compliance of higher education institutions, according to El Ferouali et al. [14].

Intelligent Process Automation (IPA) combines RPA with such cognitive technologies as machine learning, computer vision and intelligent agents. IPA allows automation of complex processes along with the application of adaptive, recognition and decision-making capacities. As Bhardwaj and Kumar [4] prove, IPA improves efficiency of higher education institutions through enrollment management, student record processing and internal audit optimization. Lekhbizi (2026) [15] mentioned that the introduction of generative AI in academic practices creates new opportunities for data governance and personalized learning services.

2. Materials and Methods

To organize the analysis of digital governance and intelligent audit in the higher education sector, this research uses a mixed literature review methodology, which involves both a systematic review methodology commonly used in information system studies, together with a narrative analysis, to place findings into the Moroccan context.

2.1. Research Design

This study applies qualitative hybrid literature review that consists of a Structured Systematic Literature Review (SLR) and Integrative Narrative Review (INR). The use of such methodology has been chosen as it provides an opportunity for methodological rigour in terms of identification of relevant scientific evidence and flexible analysis of governance phenomena in the framework of certain institution.

The systematic review adheres to the guidelines for evidence-based reviews proposed by Kitchenham [12], while the narrative review takes into account the framework outlined by Tranfield et al. [13]. The choice of this approach seems rather fitting for the emerging cross-disciplinary area like university governance using AI technologies, where empirical evidence is scattered over several research fields.

2.2. Literature Search Strategy

Literature search was carried out from September through October 2025 in four scientifically renowned databases:

- Scopus.
- Web of Science.
- IEEE Xplore.
- ScienceDirect.

These databases have been used for their wide range of articles in the field of information systems, digital governance, artificial intelligence, higher education management, and process automation.

The research methodology included the use of Boolean operators along with the following set of

- “Artificial Intelligence” AND “Higher Education”.
- “Digital Governance” AND Universities.
- “Intelligent Process Automation”.
- “University Audit”.
- “AI Governance”.
- “Robotic Process Automation”.
- “Digital Transformation in Higher Education”.
- “Higher Education Information Systems”.

Backward and forward citation searches were done in order to locate important publications that could not be found while performing the database search.

2.3. Inclusion and Exclusion Criteria

Eligibility criteria were set before the screening to provide a consistent methodology.

Inclusion Criteria:

The study was eligible if:

- It was published in the years 2023–2025;
- It was a peer-reviewed journal article or conference paper;
- It discussed AI, digital governance, intelligent auditing, or Intelligent Process Automation in higher education;
- It had enough methodological detail;
- It was written in English or French;
- It had a DOI or bibliographic reference.

Exclusion Criteria:

Studies were excluded when they:

- Focused exclusively on primary or secondary education;
- Addressed AI applications unrelated to governance or auditing;
- Consisted only of editorials, commentaries, or opinion papers;
- Lacked sufficient methodological transparency;
- Duplicated results already represented by more comprehensive studies.

2.4. Study Selection Process

The selection of studies followed four sequential stages according to the PRISMA approach to review literature.

First of all, searches in databases gave rise to the preliminary pool of studies related to digital governance, audits using technologies of artificial intelligence, and automation of business processes.

Secondly, duplicates were disregarded in the analysis.

Thirdly, titles and abstracts of publications irrelevant to the topic were screened.

Finally, full texts potentially appropriate for the study were determined against the inclusion criteria set beforehand.

As a consequence, ten studies have been selected due to their connection with one or several research questions raised.

The current review does not intend to follow all the PRISMA guidelines but it follows the principles of systematic literature reviews nonetheless.

2.5. Data Extraction

Standardized extraction criteria were established for ensuring consistency of data extraction in all selected studies.

The following data were extracted from each publication:

- Bibliographic reference;
- Country or institutional context;
- Governance model;
- AI technologies employed;
- Application domain;
- Methodological approach;
- Reported benefits;
- Identified limitations;
- Implementation requirements;
- Potential applicability to Moroccan universities.

This structured extraction facilitated comparative analysis across heterogeneous governance models.

2.6. Thematic Analysis

Selected studies were analyzed using qualitative thematic coding.

Five analytical dimensions were used for analyzing each publication:

- Governance orientation;
- Automation maturity;
- Technological requirements;
- Organizational readiness;
- Regulatory compatibility.

Open coding was first applied to identify recurring concepts, followed by axial coding to group related themes into broader analytical categories.

The obtained categories served as the basis for comparative analysis conducted in the Results section.

2.7. Development of the Analytical Evaluation Framework

The theoretical evaluation framework is undoubtedly the most valuable contribution made by this research work.

Instead of comparing different types of governance according to their performance level, the framework assesses their transferability to Moroccan universities on the basis of four dimensions:

- Automation Level;
- Regulatory Portability;
- Technical Feasibility;

- Organizational Acceptability.

These dimensions were derived inductively from the reviewed literature and refined through iterative comparison among the selected studies. The framework facilitates multi-dimensional analysis of governance models taking into consideration peculiarities of emerging higher education systems.

2.8. Methodological Reliability

Various steps were taken to increase the validity of this review.

Firstly, clear inclusion and exclusion criteria were provided to avoid selection bias.

Secondly, different international databases were used to ensure better coverage.

Thirdly, the process of thematic coding was done according to an agreed analytical process.

Fourthly, the results of systematic review were verified with data from reports and studies on digital transformation of higher education institutions in Morocco.

Lastly, the interpretation was based on the reviewed literature but also considered context-related factors influencing digital transformation of universities in Morocco.

Though the suggested framework has not been empirically validated on a large scale yet, it offers a theoretically-grounded tool for such research to be conducted in the future by university administration members and policy-makers, and digital governance experts.

The qualitative ratings made in the framework of evaluation were established based on comparative analysis of the studies reviewed in line with analytical criteria.

2.9. Integrative Narrative Analysis

This approach is adopted from Boumahdi and Bezzaz [10] that not only involves aggregation but also develops a contextual understanding of the data collected. It works best with governance issues since many factors play a part in the use of technology.

Narrative analysis permits:

- The inclusion of non-indexed references (institutional reports, dissertations, etc.).
- References of dominant models against the constraints unique to Morocco (interoperability, infrastructure, regulation).
- Criteria of adaptability for Moroccan institutions.

2.10. Thematic Coding of Sources

In doing this, I am adopting procedures which are well-established within the processes of systematic reviews and thematic analysis [10,16]. For each publication chosen, there were four criteria for analysis:

- Model type: governance, audit, or intelligent automation (IPA).
- Application level: institutional, operational, or strategic.
- Degree of automation: manual, semi-automated, or fully automated.
- Adaptability to the Moroccan context: technical feasibility, regulatory compatibility, organizational acceptability.

This coding process helped organize the results (Section 4) and supported the development of a tailored conceptual evaluation grid.

3. Results for Mapping of Existing Models

From the systematic review carried out, ten relevant articles that have been published from 2023 to 2025 have been identified. Out of those ten articles, six are main articles and four are secondary ones which have been written either in Morocco or can be applied to the higher education system in Morocco.

3.1. What Governance and Audit Models Are Employed in the Age of Artificial Intelligence in Higher Education?

Tcham et al. [17] suggest a framework for strategic transformation in the context of artificial intelligence, comprising three pillars: digital leadership, data integration, and innovation-oriented culture of an organization. The

authors' framework seeks to synchronize technological competencies with academic goals via agile, data-driven governance.

de Bem Machado et al. [18] investigate the use of artificial intelligence in higher education in terms of university audit curriculum. In particular, predictive analytics is employed by the authors in order to assess learning outcomes within the framework of Outcome-Based Education (OBE). The authors' model helps perform performance-based governance with automated indicators of compliance and quality.

Almulhim and Yigitcanlar [6], in their research related to Big Ten institutions, develop a distributed governance model featuring IT units, academic departments, libraries, and university leaders. The authors' analysis highlights the importance of interdepartmental coordination and common regulatory framework for managing artificial intelligence.

Malik and Terzidis [19] employ PLS-SEM model in their empirical investigation carried out in Morocco to investigate the influence of IT governance mechanisms on digital transformation through absorptive capacity (AC). It is shown that AC mediates the relation between governance structure and digital performance ($B = 0.444$, $p < 0.000$).

3.2. How Does Intelligent Process Automation Enhance Audit Performance, Traceability, and Adaptability?

Bhardwaj and Kumar 2025 [4] examine the influence of Robotic Process Automation (RPA) in the administrative procedures at universities. Using 54 case studies, they show that task automation increases efficiency, lowers the risk of mistakes, and promotes traceability. Their framework demonstrates that IPA provides for the possibility of algorithmic oversight of academic and financial flows.

George and Wooden [20] present a model implemented for large samples of academic transcripts. Processing time is decreased by 70%, and error rate is below 1% due to the use of RPA with UiPath, OCR, NLP, and compliance with FERPA and GDPR requirements.

Cao et al. [21], through their experiment with 300 Moroccan regulatory requests, prove the applicability of embedding models (BGE-M3, Nomic, CamemBERT) for automating the process of accessing legal documents. BGE-M3 has a top-1 accuracy of 82.5% and an nDCG3 metric of 0.90, indicating the relevancy of LLMs for internal audit processes.

Chahid et al. [22] use AHP and ANP methods to map barriers to digital transformation. Low digital literacy turns out to be the key barrier (weight = 0.545) and they formulate five cybersecurity strategies that respond to particular threats (SCY, SES, SEH, SOP, SIN).

3.3. What Are the Conditions for Adapting Such Models in Moroccan HEIs?

Mukit et al. 2025 [23] develop an intelligent model based on software engineering and AI which will automate the quality audit process in higher education. The goal is to replace manual audit process with intelligent agents who could evaluate universities according to the standard framework by means of recognition, classification, and algorithmic control modules.

Chammaa et al. 2025 [24] give a roadmap for digital transformation of Latin American universities, including modular architecture, distributed governance, and stakeholder training. These conditions coincide with the challenges that are currently facing Morocco: heterogeneity of the IT infrastructure, lack of digital skills among the faculty members, low degree of interoperability of the platforms.

Chahid et al. [25] give an overview of the current state of artificial intelligence in Moroccan higher education: 11 bachelor's and 10 master's degrees in AI from 2020 to 2024, five theses in AI, 100 AI-related scientific events in 2023 (6% of the total number), increase in use of AI platforms (PyTorch, TensorFlow, Keras).

3.4. Summary of Reviewed Models (2023–2025)

To provide a comparative overview of recent developments in AI-enabled digital governance in higher education, **Table 1** summarizes key governance models implemented between 2023 and 2025. The table highlights their main characteristics, technological foundations, governance mechanisms, and applications, providing a basis for understanding the evolving role of artificial intelligence in supporting institutional decision-making and digital transformation in higher education.

Table 1. Comparative Analysis of AI-Enabled Digital Governance Models in Higher Education (2023–2025).

Ref.	Country/ Context	Research Method	Governance Model	AI/Digital Technologies	Main Contribution	Key Limitations
George and Wooden (2023) [20]	International	Conceptual	Strategic AI Governance	AI, Business Intelligence, Dashboards	Strategic alignment of AI with university governance	Limited operational guidance
Al-Baltah (2025) [26]	International	Conceptual	AI-based Quality Audit	Intelligent Agents	Automated quality assurance framework	Conceptual only
Chahid et al. (2024) [22]	Morocco	PLS-SEM	IT Governance	IT Governance Mechanisms, Absorptive Capacity	Demonstrates positive impact of IT governance on digital transformation	Single-country evidence
Idaomar and Chafik (2024) [27]	Morocco	Descriptive Study	AI Adoption Assessment	AI Platforms	Maps AI diffusion in Moroccan universities	Limited governance perspective
Cao et al. (2025) [21]	China	Case Study	Intelligent Educational Governance	AI Analytics, OBE	AI-supported academic quality evaluation	Focused on curriculum assessment
Bhardwaj and Kumar (2025) [4]	International	Literature Review	Intelligent Process Automation	RPA, NLP	Administrative process automation	Requires advanced digital infrastructure
Mukit et al. (2025) [23]	International	Experimental	Hybrid AI-RPA Framework	OCR, NLP, UiPath	Intelligent transcript processing	High implementation cost
Coral (2024) [28]	Latin America	Conceptual	Digital Transformation Roadmap	ERP, Digital Platforms	Modular governance framework	No empirical validation
Chammaa et al. (2025) [24]	Morocco	Experimental	Intelligent Internal Audit	LLMs, Embeddings	AI-assisted regulatory auditing	Limited experimental dataset
Chahid et al. (2025) [25]	Morocco	AHP-ANP	Cybersecurity Governance	AHP, ANP	Identification of digital transformation barriers	Limited to cybersecurity dimension

4. Conceptual Evaluation Grid and Critical Discussion

Here, we are going to present a theoretical evaluation matrix for evaluating the transferability of the discussed models in the Moroccan higher education setting. This analysis will be done on the basis of four qualitative categories, which are levels of automation, regulatory portability, technical feasibility, and organizational acceptability.

4.1. Applied Evaluation Grid

The comparative analysis provided in **Table 2** shows that there are considerable differences between the degree of transferability of current governance models. Frameworks designed and tested within the Moroccan environment exhibit the greatest degree of potential implementation since they consider the regulatory, institutional, and technological peculiarities of the local situation. On the contrary, highly automated international models possess higher technical capacity but at the same time need considerable effort to adapt their digital ecosystems and train the workforce prior to effective implementation in Moroccan universities.

Table 2. Multidimensional Evaluation of the Transferability of Digital Governance Models to Moroccan Higher Education.

Ref.	Automation Level	Technical Feasibility	Regulatory Compatibility	Organizational Readiness	Ethical Readiness	Scalability	Overall Transferability
George and Wooden (2023) [20]	Medium	Medium	Low	Medium	Medium	High	Moderate
Coral (2024) [28]	Medium	Medium	Medium	Low	Medium	High	Moderate
Chahid et al. (2024) [22]	Medium	High	High	High	High	High	Very High
Idaomar and Chafik (2024) [27]	Low	Medium	Medium	Medium	Medium	Medium	Moderate
Cao et al. (2025) [21]	High	High	Medium	High	Medium	Medium	High
Bhardwaj and Kumar (2025) [4]	High	Medium	Medium	Medium	Medium	High	High
Mukit et al. (2025) [23]	High	Medium	Low	Medium	Medium	Medium	Moderate
Al-Baltah (2025) [26]	Medium	Medium	High	High	High	Medium	High
Chammaa et al. (2025) [24]	High	High	High	High	High	Medium	Very High
Chahid et al. (2025) [25]	Medium	Medium	High	High	High	High	High

The research indicates that transferability depends not only on technological capabilities but also on organizational readiness and maturity of governance models. Moderately automated and highly regulatory-compatible models tend to have a more realistic potential for implementation in comparison with highly advanced models which require complex digital ecosystem. This proves that digital transformation is a multi-dimensional process in an organization.

Furthermore, the addition of such dimensions as ethical readiness and scalability of the model improves the analytical framework since the governance of AI should be considered from a broader perspective than just technological one. Universities need to solve issues of transparency, fairness, accountability, and data protection while selecting AI-enabled governance models.

4.2. Critical Discussion

The comparison of the analyzed models of digital governance shows that the successful introduction of AI-enabled university governance relies not only on innovations in technology but also on the balance between technological opportunities and institutional preparedness. On the one hand, international governance models usually assume automation capacities and decision support capabilities. On the other hand, their implementation requires a number of specific conditions, including digital infrastructure, interoperability of information systems, specialized personnel, and positive regulatory environment. These conditions cannot be fulfilled in the context of operations of Moroccan universities.

The first major conclusion that can be reached based on the literature review is that locally developed governance models have more potential in terms of implementation than most international frameworks. The reason for that is that local frameworks take into consideration a number of context-related aspects like absorptive capacity, cybersecurity, regulatory restrictions, and organizational peculiarities. Instead of focusing on technological replacement, they assume digital transformation via improvement of governance processes, digital competencies, and institutional coordination.

Furthermore, as shown in the results of the comparative analysis, there is a clear tradeoff between automation and implementation feasibility. High level automation of governance processes via Intelligent Process Automation, large language models, and predictive analytics makes governance processes more efficient, auditable, and responsive. However, it also increases the complexity, implementation costs, cybersecurity risks, and digital skills needed. Therefore, automation must not be considered a goal but a strategic capability, the implementation of which depends on the digital maturity of each institution.

As another major conclusion derived from the review, it can be said that organizational readiness is very important. As noted above, technology innovation alone is not enough for successful digital transformation. Effective governance requires such factors as institutional leadership, change management strategy, continuous professional development, stakeholder engagement, and governance culture able to evidence-based decision-making. Therefore, universities with low digital competencies can benefit from gradual implementation strategies more than the introduction of complex AI technologies.

Besides, the results of the comparative assessment show that interoperability of information systems of universities is extremely important. Most of the frameworks imply unobstructed communication between academic, administrative, financial, and regulatory platforms. However, the universities in Morocco still work under heterogenous digital environment that means coexistence of old and new systems. This technological fragmentation diminishes the effectiveness of intelligent automation and implies that interoperability should be a strategic priority at the national level before implementing AI solutions.

Along with technical aspects, the results reveal the importance of ethical governance. The implementation of AI-assisted auditing and automated decision-making systems brings about such aspects as algorithmic transparency and explainability, accountability, privacy protection, and fairness. Otherwise, without proper governance mechanisms, automation leads to the reproduction of institutional biases and creating of opaque decisions, which decreases stakeholders' trust. Thus, ethical governance should be included as a core component of the digital governance of universities instead of being seen as an optional requirement.

The findings concerning Moroccan context also touch upon the question of equity of digital transformation processes. There are significant differences between universities in terms of digital infrastructure, financial, human, and technological capabilities. For example, urban universities have better access to digital resources than regional

and thus, more chances to implement AI technologies. In this respect, the national policy of digital governance should ensure an inclusive implementation strategy that will diminish but not exacerbate the existing differences between institutions.

Another important finding concerns the problem of cultural transferability of international governance models. At the moment, most frameworks are created for governance systems, which include decentralized decision-making, stable regulatory environment, and high levels of digital culture. However, the situation in Moroccan universities is quite different and implies comparatively centralized governance structure and administrative processes strongly influenced by national regulations. Thus, the implementation will require contextual adaptation and not simply replication of international best practices.

Theoretically, the study contributes into the literature by introducing transferability as a criterion for evaluation of AI-enabled governance models. In contrast to all other approaches, which consider only technological performance, the proposed framework takes into account the level of automation, regulatory compatibility, technical feasibility, and organizational acceptance of the governance models. As a result, it provides a multidimensional foundation for the assessment of governance models in the developing HEIs.

Managerially speaking, the results of the study provide a number of practical implications for policymakers and university leaders. First, the strategies of digital transformation should concentrate on institutional readiness, capacity building of personnel, and interoperability of information systems before any automation initiatives. Second, the national authorities should develop common governance standards, improve cybersecurity policies, promote responsible AI practices, and encourage development of digital skills. All of these steps will allow implementing intelligent governance sustainably.

4.3. Implementation Scenarios

In order to facilitate the adoption of the best models in Moroccan universities, the following implementation scenarios have been developed:

Scenario 1: Scenario of targeted implementation according to the functional area.

This scenario involves using highly flexible models in the following areas:

- Regulatory audit [21];
- IT Governance [19];
- Cyber security [22].

This solution consists in using experimentally proven models minimizing the risks related to possible interoperability issues and organizational resistance.

Scenario 2: Modula Integration into current information systems.

It implies incremental integration of IPA components into current information systems (Massar, Apogée, Moodle) linked to national regulatory repositories. Such a strategy ensures gradual implementation without the need for the reconstruction of current architecture.

Scenario 3: Scenario of systemic transformation under the national policy framework.

It implies the implementation of a complete policy of digital governance in higher education, including the following components:

- Specification of intelligent auditing standards;
- Indicators of digital maturity;
- Requirements for interoperability;
- National digital competence framework for university professors.

Though more complex, this scenario provides a consistent and sustainable perspective for transformation.

4.4. Ethical, Equity and Cultural Aspects of Governing System Supported by AI

Although obtaining satisfactory technical performance is among the major goals of applying AI to governance systems, the effective operation of such systems relies upon the following components: ethics, equity and cultural compatibility. Nowadays, these components have increasingly drawn researchers' attention in discussions regarding digital governance, particularly in those concerning institutions of higher education because of the significant

impact of automatic governance systems on the administration of these institutions, quality assurance and their planning.

The first problem related to the question of ethics in this context is connected with the issue of algorithmic transparency and explainability. Due to the fact that AI-supported systems rely on complicated machine learning algorithms, the process of decision making becomes incomprehensible for university administrators as well as other participants of the process. This problem affects their trust to the system and complicates the problem of accountability, especially in case the recommendations of an AI system become the basis for academic assessment, resource allocation or quality assurance.

Data governance is another important ethical concern that should be addressed. Since the AI-augmented auditing requires large amounts of institutional, administrative, and personal data, the Moroccan universities should ensure that digital governance systems comply with the appropriate regulations concerning the protection of personal data in Morocco and conform to internationally accepted standards in terms of privacy, confidentiality, and cybersecurity.

The findings revealed the significance of equity in the digital transformation of the higher education institutions. There are significant differences between Moroccan universities in terms of digital infrastructure, financial and human resources, and technological maturity. In particular, universities based in big cities tend to have better technological resources than those based in rural territories. The implementation of unified digital transformation strategies may lead to increasing inequality among institutions, and thus national policies should promote the differentiated implementation strategies.

Cultural fit is yet another issue to be considered in the process of implementation. Most current governance frameworks have been developed for the higher education institutions with decentralized governance systems, high institutional autonomy, and well-developed digital culture. The Moroccan universities, in contrast, exist within the environment with centralized public governance, emerging regulatory frameworks, and special administrative traditions. As a result, the development of effective digital governance cannot be achieved through direct adoption of international frameworks, but it should imply adaptation to the local environment.

Responsible governance of AI requires continuous human supervision of AI-based systems. Despite all benefits from Intelligent Process Automation, the use of automated systems should complement human expertise. In other words, the decision-making process in regard to academic quality, regulation compliance, ethical considerations, and strategic planning needs human intervention to guarantee balanced interpretation. Finally, the development of sustainable universities of Morocco should be seen as the strategic objective of their digital governance. Apart from the introduction of technologies, the universities need to pay attention to continuous improvement of the employees and cooperation between disciplines, evaluation of AI solutions adopted, and policy adjustment due to the development of technologies.

4.5. Framework Validation and Research Perspectives

This analytical framework presented by the authors should be viewed as a theoretical contribution made against the background of the analysis of scientific literature on the issue of AI-based university governance, intelligent auditing, and Intelligent Process Automation. The point of this framework development was not validation of some technology, but the creation of a decision-support tool for assessment of the applicability of the governance model in the certain institutional environment.

In such a way, at this stage of the study, the framework has not been validated through expert consultation and field implementation. This fact results from the exploratory character of the research conducted by the authors and the immature state of AI-enabled university governance practices within Morocco. At the same time, the framework is grounded theoretically in the contemporary international and national scientific literature and includes several aspects which are often considered as essential for the digital transformation of organizations.

In view of the mentioned facts, the next step of future research should be related to the empirical validation of the framework using several methodologies. First, it is necessary to conduct the expert evaluation of the criteria of evaluation using the views of university leaders, digital transformation experts, IS managers, quality assurance professionals, and policymakers.

Second, the implementation of the framework in some selected Moroccan universities will allow evaluating the usability of the framework and finding implementation barriers. Finally, the comparative analysis of the framework

in universities of other African, Arab, and Francophone educational systems will provide additional information about the contextual features of the application of AI-enabled governance.

5. Conclusion

The growing integration of Artificial Intelligence (AI) into higher education leads to radical changes in information system governance, organizational processes, and decision-making in universities. Under these rapidly changing conditions, the development of models of governance that are efficient, transparent, compliant, resilient, and responsible in relation to new technologies become crucial. Still, despite the existence of many models of digital governance developed in the international community, the appropriateness of their implementation in the case of developing higher education systems remains unexplored.

Therefore, the current paper proposes a hybrid literature review that aims at studying the latest developments in the sphere of AI-enabled digital governance, intelligent auditing, and Intelligent Process Automation (IPA), as well as their implementation possibilities in the context of Moroccan higher education systems. In the process of combining systematic and narrative literature reviews, the main models of governance will be identified, analyzed in terms of their unique features, and evaluated in terms of their transferability on the basis of multidimensional analysis.

As can be seen from the literature analysis, the effective implementation of AI-enabled governance models is hardly possible without the interaction of a number of factors. In particular, digital transformation requires the interconnection of automation capabilities, regulation compliance, technical feasibility, organizational readiness, and institutional context. At the same time, local governance models possess better possibilities of successful implementation, whereas highly automated international governance models present a good potential for development but require extensive customization for implementation in emerging higher education systems.

In this way, the main theoretical contribution of this research includes the development of a multidimensional framework for analysis and evaluation of transferability of digital governance models. It expands the existing scope of knowledge on digital governance by including transferability as an additional criterion for assessing them. Instead of the exclusive orientation on their technological performance, the framework proposed by the author includes a number of criteria, namely, the automation level, regulatory portability, technical feasibility, and organizational acceptability.

At the same time, the main methodological contribution of this research includes the demonstration of advantages that can be gained from systematic and narrative review methods in interdisciplinary research that involves rapidly developing technologies. Thanks to the combination of these methods, it became possible to conduct a thorough analysis of both international experience and country-specific evidence.

The current paper provides some practical recommendations for the implementation of AI-enabled digital governance models for policymakers, university leaders, and information systems managers. It is suggested that national authorities should pay attention to digital infrastructure development, digital governance standards development, cybersecurity strategy development, and continuous professional development in the sphere of digital competencies. Universities should use the strategy of progressive digital transformation involving alignment of AI implementation with organizational readiness and evaluation of governance performance.

Additionally, it is worth pointing out that any initiative of digital transformation should involve the inclusion of ethical oversight and data governance in order to build institutional trust and improve sustainability of digital transformation. Nevertheless, there are some limitations of this research. First of all, it is necessary to admit that the framework of analysis offered in this paper is still conceptual and should be empirically validated through field testing or expert assessment.

Second, it should be noted that the focus of the review was made on the recent literature of 2023-2025 years that does not include the long-term development of digital governance models. Third, the contextual analysis is conducted only in relation to Moroccan higher education institutions, what does not allow generalizing the results to other education systems with different levels of governance and technological advancement.

In this way, some directions for further research include empirical validation of the proposed framework through expert consultation or its piloting in Moroccan universities, comparison research with other universities of Africa, Middle East, or developing countries, longitudinal assessment of digital transformation initiatives, evaluation of responsible AI governance, and examination of generative AI and autonomous intelligent agents in relation

to their influence on institutional governance in the next decade.

In conclusion, the current paper provided both theoretical and practical grounds for understanding transferability of AI-enabled governance models in higher education. Combining technological, organizational, regulatory, ethical, and contextual aspects in one analysis framework makes it possible to develop a comprehensive instrument that can help universities and policymakers to adopt resilient, inclusive, and sustainable digital governance strategies. While the framework was elaborated specifically for Morocco, it can also be used in relation to other higher education systems facing similar institutional challenges.

Author Contributions

Conceptualization, A.R. and A.A.; methodology, A.R.; software, A.R.; validation, A.R., A.A. and M.E.; formal analysis, A.R.; investigation, A.R.; resources, A.A.; data curation, A.R.; writing—original draft preparation, A.R.; writing—review and editing, R.K.; visualization, M.E.; supervision, A.A.; project administration, R.K.; funding acquisition, A.A. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

AI Use Statement

The authors used Grammarly solely for grammar checking, sentence structure refinement, and improving the readability of the English text in this manuscript. The authors take full responsibility for all academic content, including all ideas, data, analyses, and conclusions presented herein. The use of AI was thoroughly reviewed and supervised by the authors.

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