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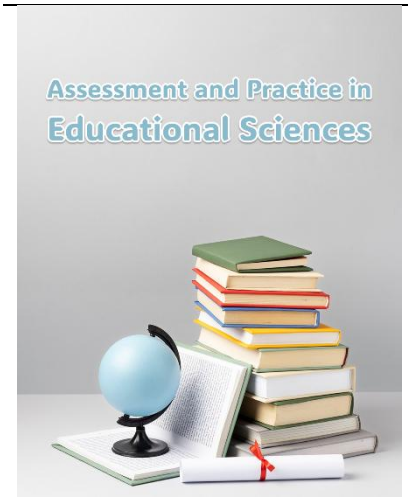

Constituent Factors of Intelligence-Based Academic Governance: Developing a Qualitative Framework (Case Study: Comprehensive Universities of Tehran)

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ABSTRACT

The present study was conducted with the aim of identifying the constituent factors of intelligence-based academic governance in the comprehensive universities of Tehran and developing a qualitative framework for it. From the perspective of purpose, the study is applied; in terms of data, it is qualitative based on a systematic grounded theory approach; and in terms of implementation, it is exploratory with an inductive orientation. The statistical population consisted of university faculty members in the fields of governance and management, considering scientific criteria (research experience). Using a purposive and snowball sampling method, 14 interviews were conducted until theoretical saturation was reached. For data collection, both library methods (document analysis) and field methods (semi-structured interviews) were employed. To ensure the validity of the findings, triangulation was applied, including reliability, credibility, confirmability, and transferability, which indicated that the data possessed the required validity. Data were analyzed using theoretical coding in three stages: open coding, axial coding, and selective coding (based on the systematic grounded theory method of Strauss and Corbin). The results revealed that the constituent factors of intelligence-based academic governance in universities include 22 components and 121 indicators within the six dimensions of the paradigm model, as follows: Central phenomenon of the model with 2 components (self-management and knowledge governance) and 13 indicators. Causal factors of the model with 4 components (rule of law, national and international developments, institutional independence, competence of governing bodies) and 21 indicators. Contextual factors of the model with 4 components (intelligent university communications, intelligent administrative management, intelligent scientific services, financial resource management) and 24 indicators. Intervening factors of the model with 3 components (organizational culture, structural factors, technological factors) and 16 indicators. Strategies of the model with 5 components (quality assessment and improvement, scientific independence, stakeholder participation in decision-making, redesign of structures and processes, intelligent qualitative academic programs) and 25 indicators. Consequences of the model with 4 components (enhancing the university's brand, educational innovation, improving the quality of teaching and research, and training efficient and entrepreneurial human resources) and 22 indicators. Based on the identified factors, a qualitative framework was developed and validated by experts. Utilizing the findings of scientific research on intelligence-based academic governance can help universities leverage the scientific and executive capacities of faculty members and act in ways that not only enhance and develop the university itself but also make significant contributions to national development.

Keywords: Governance, Academic Governance, Intelligence, Comprehensive Universities of Tehran.

Introduction

In recent decades, the transformation of higher education has placed academic governance at the center of debates about quality, accountability, and strategic adaptability. Universities worldwide are no longer isolated institutions; instead, they operate within complex national and global networks influenced by political, economic, technological, and cultural dynamics (1, 2). The rise of knowledge-based economies, the acceleration of digital transformation, and the expansion of cross-border education have made effective governance frameworks crucial for ensuring universities remain responsive and resilient (3, 4). Against this backdrop, academic governance has evolved from traditional collegial models into more sophisticated, multi-stakeholder systems that emphasize transparency, accountability, and strategic intelligence (5, 6).

At the global level, the need to align higher education governance with sustainable development and competitiveness has been increasingly emphasized. Universities are expected not only to produce scientific knowledge but also to contribute to economic growth, social equity, and innovation (7, 8). This evolution has prompted international organizations such as the OECD to call for sustainable and future-oriented reforms in higher education governance structures (9). In countries experiencing rapid demographic, political, or economic changes, governance models must address the dual challenge of maintaining academic autonomy while ensuring alignment with national priorities (10, 11).

In the context of Iran and other Middle Eastern countries, the modernization of academic governance frameworks has gained urgency. Policymakers have increasingly sought to develop governance models capable of balancing state authority, institutional independence, and societal needs (12, 13). Grounded theory and policy analyses reveal that Iranian universities must transition from state-centered management toward models inspired by "good governance" principles that emphasize participation, accountability, and responsiveness (14, 15). Similarly, comparative studies of European and North American experiences underscore that embracing global best practices in governance can provide valuable lessons for countries with centralized higher education systems (16, 17).

Recent scholarship highlights that the effectiveness of academic governance depends on multiple dimensions, including strategic leadership, resource allocation, stakeholder engagement, and the adoption of intelligent technologies (18, 19). With the rapid integration of digital systems, governance must increasingly be redefined in terms of "smart governance," which relies on data-driven decision-making, transparent processes, and real-time communication (20, 21). The emergence of smart governance aligns closely with broader initiatives to develop smart cities and societies, where technology enhances accountability and efficiency (22, 23). Thus, universities are not only knowledge producers but also pioneers of intelligent governance mechanisms that can inform broader societal reforms (24, 25).

The academic literature on governance demonstrates that different regions adopt diverse models, each shaped by unique cultural, political, and historical contexts. For instance, European universities tend to emphasize autonomy and decentralization, with increasing attention to performance-based accountability (26, 27). In contrast, East Asian countries such as Japan and China illustrate how governance reforms are often embedded in state-led modernization projects (10, 28). In the Middle East and North Africa, governance benchmarking studies reveal the ongoing tension between state oversight and institutional autonomy (11, 29). These international variations highlight the importance of contextualizing governance reforms while ensuring adherence to global standards of quality and transparency (30, 31).

The challenge of developing appropriate governance models has been further complicated by rapid technological change. Digital transformation, artificial intelligence (AI), and big data are now integral to higher education governance (8, 32). The deployment of intelligent systems not only enables transparency and accountability but also allows institutions to anticipate and adapt to societal demands in real time (20, 33). As Gil-Garcia and colleagues argue, being "smart" in governance is not

limited to adopting technology but involves leveraging innovation to redesign decision-making processes (21). In this regard, universities function as laboratories of governance reform, demonstrating how smart governance principles can transform public institutions (34, 35).

Within Iran, the call for intelligent academic governance has emerged from both internal and external pressures. Internally, there is growing demand for improved quality assurance, accountability, and academic independence (36, 37). Externally, globalization, knowledge economies, and international rankings push universities to adopt transparent, competitive, and innovative governance models (38, 39). Studies suggest that Iranian universities must prioritize stakeholder participation, digital transparency, and strategic autonomy to meet global standards (14, 15). Furthermore, attention to sustainability and social responsibility has reinforced the notion that governance is not only about internal management but also about broader societal impact (7, 40).

The literature also highlights the risks of poorly designed governance models. Excessive centralization, lack of transparency, and limited stakeholder participation can hinder innovation and responsiveness (2, 41). Conversely, well-designed governance structures promote institutional trust, improve academic performance, and enhance societal legitimacy (18, 19). Comparative evidence from Taiwan, Australia, and the United States shows that governance reforms emphasizing participatory decision-making, autonomy, and accountability lead to greater academic performance and public trust (5, 6, 42). In addition, the sustainability dimension of governance underscores that universities must embed environmental, social, and governance (ESG) principles into their operations to remain globally competitive (7, 43).

In this context, Iranian universities face the dual challenge of maintaining cultural and national relevance while integrating global best practices. Studies confirm that the country's five-year development plans have increasingly incorporated governance reforms, but practical implementation often lags behind policy objectives (12, 13). Moreover, governance maturity requires not only policy frameworks but also organizational culture shifts that recognize expertise, promote transparency, and support digitalization (25, 33). Without cultural alignment, even well-designed governance structures may fail to achieve their objectives (14, 15).

The pursuit of intelligent academic governance, therefore, is both a necessity and an opportunity. It requires integrating global trends with local realities, leveraging digital transformation, and balancing autonomy with accountability (20, 22, 23). Importantly, smart governance frameworks offer universities the capacity to respond dynamically to stakeholder needs while preserving their academic mission (24, 35). By embedding quality assurance, independence, stakeholder participation, and strategic innovation into their governance models, universities can ensure long-term sustainability and societal impact (26, 27).

Finally, a significant body of scholarship emphasizes that academic governance must be conceived as a dynamic and evolving framework rather than a static structure (3, 4). Universities must anticipate changes in global education systems, embrace technological transformation, and engage with multiple stakeholders to remain effective and legitimate (30, 31). The Iranian case illustrates the importance of integrating international best practices with localized governance innovations to achieve both academic excellence and national development goals (36, 38). This study, therefore, contributes to the ongoing discourse by identifying the constituent factors of intelligence-based academic governance and proposing a qualitative framework tailored to comprehensive universities in Tehran.

Methods and Materials

This study is applied in terms of purpose; qualitative in terms of data, based on a systematic grounded theory approach; and exploratory in terms of execution, based on an inductive orientation.

The participants of the study included all university faculty members (holding a PhD in Educational Management or Higher Education, with a minimum of 5 years of faculty membership, and at least two scientific-research works, including articles, books, or research projects, in the field of governance and leadership in higher education). The comprehensive universities of Tehran referred to in this study are the University of Tehran, Shahid Beheshti University, and Islamic Azad University.

Sampling of participants was conducted purposively and by the snowball method. Based on the snowball method, two experts in the field of governance and leadership in higher education were initially selected, and after the interviews, they were asked to introduce other specialists in this field. In this way, subsequent participants were identified until theoretical saturation was achieved. Interviews with experts were conducted in person, lasting 30–60 minutes. After every two interviews, the transcriptions were prepared and entered into MAXQDA software. In total, 14 interviews were conducted, and since no new codes were extracted from later interviews, the analysis was based on those 14 interviews. Semi-structured interviews were used for data collection.

To validate the findings, the triangulation method of Lincoln and Guba, including reliability, credibility, confirmability, and transferability, was employed. After collecting the required information, using grounded theory through the coding of concepts and categories, the constituent factors of intelligence-based academic governance in comprehensive universities of Tehran were identified, and a suitable qualitative framework was developed. In the coding stage, the Strauss and Corbin method was employed, which suggests a systematic approach. The most important part of the analysis of the research data was coding (open, axial, and selective), which was carried out as follows:

- **Open coding:** Interviews were transcribed, data were standardized, and scientific terminology consistent with the theoretical literature was selected. A list of concepts was obtained, which were then categorized.
- **Axial coding:** The resulting categories were connected within the framework of the six paradigm elements of Strauss and Corbin's model. This established relationships among the codes generated in the open coding stage.
- **Selective coding:** In this stage, which is the core phase of theory-building, the central category was systematically related to the other categories. Relationships were expressed clearly within the framework of a narrative and storyline, and categories requiring further refinement were revised. In other words, in the selective coding stage, the process of integrating, improving, and refining the categories was carried out. The researcher arranged the categories in a structured flow to shape and present a theory, which was made possible by identifying the central category.

Findings and Results

Considering the research questions posed in the present study, the researcher, through systematic grounded theory, conducted coding and provided answers to the questions as follows:

Open coding: The interviews were read twice thoroughly by the researcher, key sections of the interview texts were highlighted, and an initial list of key points in the data was prepared. To convert textual data into usable and understandable data, "paragraphs," "phrases," and "words" were employed. The interview texts were transferred to the software, and open codes were identified. In the first stage, 276 initial codes were obtained, which, after merging similar codes and standardizing phrases, were reduced to 121 codes.

Table 1. Open and axial codes related to causal conditions

Axial Codes	Open Codes
Rule of Law	Transparency of decision-making processes under the rule of law – approval of policies and procedures for decision-making and control over leadership and management processes – establishing a fair legal framework for transparency through an intelligent organizational system – decision-making based on laws and regulations in higher education – free access to information for faculty members and students – creating a transparent platform for public access to information in a simple format

National and International Developments	Considering rapid changes in global businesses – revising policies and macro-goals of higher education – being influenced by central governments through social transformations – entering competitive business environments – aligning higher education policies with changes and transformations
Decentralization/Institutional Independence	Pressure from external actors and policymakers on university administration – granting more authority to universities by the government based on missions and subjects – increasing university autonomy – granting internal legislative rights to universities – aligning financial resources with governance policies to address environmental changes
Competence of Governing Bodies	Professional authority of faculty members in universities – cooperation with domestic universities for knowledge exchange and integrated management – playing an appropriate role in internal and external university developments – effective communication with foreign universities for knowledge and technology transfer – obtaining cooperation from governance and management specialists in the development of smart universities

Generally, the realization of any action requires a suitable context for implementation. In this study, the contextual conditions enabling the realization of intelligence-based academic governance in comprehensive universities of Tehran were identified, including 4 axial codes and 24 open codes: intelligent university communications (5 open codes), intelligent administrative management (5 open codes), intelligent scientific services (8 open codes), and financial resource management (6 open codes).

Table 2. Open and axial codes related to contextual conditions

Axial Codes	Open Codes
Intelligent University Communications	Constructive interaction between students and university administrators – interaction between the university and the government, especially through new technologies – strengthening connections between the university and other domestic and international universities to provide growth opportunities for students and faculty – improving governance and administration processes through comparative studies – creating alignment and harmony among key actors in higher education development
Intelligent Administrative Management	Transparency in managerial actions at the university level – availability of the status of actions taken and in progress through intelligent systems – enhancing the capacity for resource mobilization and academic innovations for commercialization – full implementation of administrative automation and elimination of in-person processes – transparency of university actions and managers' performance across different areas via performance dashboards
Intelligent Scientific Services	Facilitating and accelerating innovation processes in society – planning and establishing networks for identifying and commercializing innovation – cooperation and provision of services to industry and society through intelligent systems – implementation, execution, and updating of e-learning systems – holding conferences and academic events via videoconferencing and online platforms – eliminating repetitive and time-consuming university service processes for stakeholders – collecting scientific needs of society, presenting research priorities, and signing contracts through intelligent platforms, with timely and appropriate feedback to society – presenting research, educational, and scientific achievements of universities to the public for practical use instead of general and non-transparent reports
Financial Resource Management	Ability to attract resources for the university – intelligent internal control over financial performance – use of intelligent technologies for financial integrity in universities – resource attraction and financial sustainability – consideration of changes in resource provision – diversification of financial resources required by universities

The occurrence of any event involves factors that can act either as obstacles or as facilitators in the realization of the main phenomenon. These factors play a dual role, depending on how they are managed. In this study, three intervening factors with 16 open codes were identified: organizational culture (5 open codes), structural factors (7 open codes), and technological factors (4 open codes).

Table 3. Open and Axial Codes Related to Intervening Conditions

Axial Codes	Open Codes
Organizational Culture	Belief in faculty members as specialists with executive managerial capability – valuing expertise alongside experience as an organizational asset – belief in the scientific capacities within the university system – prioritization of knowledge and expertise over other factors affecting university management and administration – organizational resistance to eliminating or reforming processes and structures due to digitalization
Structural Factors	Guiding universities through structural and procedural transparency – reforming structures to improve performance under smart dissemination – recognizing the new roles of universities in knowledge production and application – external pressures on universities – reduction of certain organizational units due to digitalization of activities and services – faculty-driven departmental parochialism in relation to their own activities – technical knowledge of faculty members in managerial domains such as finance, human resources, and marketing
Technological Factors	Possibility of providing the technical equipment required for intelligent university management despite political and economic constraints – national technical and technological infrastructure for implementing intelligent systems such as fiber optics, bandwidth, and servers – managerial belief and attitude toward intelligent service delivery platforms – public access to the hardware and software necessary for receiving intelligent services

The results regarding the central phenomenon of the qualitative framework of intelligence-based academic governance in comprehensive universities of Tehran indicate that the very concept of intelligence-based academic governance is positioned as the core element of the model. This central factor consists of two axial codes and 13 open codes: self-management (6 open codes) and knowledge governance (7 open codes).

Table 4. Open and Axial Codes Related to the Central Phenomenon

Axial Codes	Open Codes
Self-Management	Decision-making and self-management within the university by faculty and specialists – serving all stakeholders within a reasonable timeframe – university autonomy in producing and determining educational content – creating equal educational opportunities for students and faculty – universal access to quality education – acceptance of the consequences and results of university actions, programs, and outputs
Knowledge Governance	Continuous development of staff knowledge with a focus on the university's unique areas of expertise – academic leadership by specialists instead of administrative domination – enhancing the quality of university outputs in solving societal problems – generating foundational knowledge for innovation in industry – developing revenue-generating activities for the university – managing knowledge mobility through actor coordination – establishing a knowledge community to support marketing and economic revitalization

The results regarding the strategies category show that intelligence-based academic governance must be pursued through five systematic strategies. In this study, five strategies with 25 open codes were identified: quality assessment and improvement (5 open codes), scientific independence (5 open codes), stakeholder participation in decision-making (5 open codes), redesign of structures and processes (5 open codes), and intelligent qualitative academic programming (5 open codes). If implemented, these strategies could significantly support intelligence-based academic governance in comprehensive universities of Tehran.

Table 5. Open and Axial Codes Related to Strategies

Axial Codes	Open Codes
Quality Assessment and Improvement	Proper utilization of available resources to achieve desirable outcomes – enhancing responsiveness to societal needs through higher education quality – developing, implementing, and executing quality assurance policies and processes – designing quality evaluation indicators based on scientific principles – creating intelligent, transparent, and accountable structures in university management
Scientific Independence	Researchers' freedom to conduct studies, teach, and publish findings – recognizing faculty knowledge and expertise for defining research fields – faculty independence in preparing and producing up-to-date, practical educational content relevant to students – granting economic and administrative authority for university management based on internal specialists – safeguarding intellectual property rights of knowledge produced by faculty and students
Stakeholder Participation in Decision-Making	Creating collective identity – collaboration and consultation between university officials and stakeholders – considering all stakeholders' interests and reaching consensus on public benefit – decision-making through scientific approaches with comprehensive impact analysis – achieving consensus to ensure the majority's interests are considered
Redesign of Structures and Processes	Strengthening the university's status as a prestigious institution – creating mechanisms for multiple higher education stakeholders to influence decisions – replacing human resources with intelligent systems to reduce errors and ensure fast feedback – reforming and eliminating redundant processes based on input from scientific service recipients – reducing individual biases of staff and managers by systematizing activities
Intelligent Qualitative Academic Programming	Enhancing faculty capacity in knowledge production and management to meet societal needs – revising and improving curricula based on student and societal needs – providing educational programs electronically and intelligently – removing non-practical courses and replacing them with entrepreneurial programs – engaging industries in revising curricula

The findings from data analysis indicate that the implementation of intelligence-based academic governance in comprehensive universities of Tehran leads to desirable outcomes: university branding enhancement (8 open codes), educational innovation (3 open codes), improvement of teaching and research quality (5 open codes), and training of efficient and entrepreneurial human capital (6 open codes). These results demonstrate that intelligence-based academic governance can generate positive and influential impacts on the comprehensive development of universities, graduates, and the services provided by universities.

Table 6. Open and Axial Codes Related to Consequences

Axial Codes	Open Codes
University Brand Enhancement	Enhancing university reputation through faculty involvement in higher-level management – creating academic competitive advantage for the university – optimal use of university resources for producing, transferring, and applying knowledge – producing practical knowledge for society and other organizations – improving universities' competitiveness nationally and internationally – reducing organizational reputation risks – increasing public trust – achieving sustainable development goals and economic growth
Educational Innovation	Applying knowledge in industry and services – utilizing industry services for practical training of students – employing industry specialists as instructors in practical and internship-based programs
Improvement of Teaching and Research Quality	Increasing student satisfaction from participation in programs and decisions – improving university performance across domains through intelligent technologies – increasing stakeholder satisfaction with university services – continuous development of intelligent services and processes via education and research – providing effective, real-time responses to societal needs and expectations
Training of Efficient and Entrepreneurial Human Capital	Highlighting the university's role in knowledge-based development – enhancing capacity to deliver technical knowledge to society – motivating capable human resources to understand complex societal realities – contributing to scientific and economic development of universities and the country – producing graduates who are innovative, updated, productive, and entrepreneurial – preparing responsible, inquisitive, and accountable citizens for society

What is the Qualitative Framework of Intelligence-Based Academic Governance in Comprehensive Universities of Tehran?

The findings of this study indicate that the qualitative framework of intelligence-based academic governance in comprehensive universities of Tehran consists of 121 concepts (open codes) and 22 axial codes (main categories), schematically illustrated in Figure 5-1. The framework was derived through a qualitative study using the systematic grounded theory approach of Strauss and Corbin, supported by expert interviews.

This framework shows that intelligence-based academic governance in comprehensive universities of Tehran requires a holistic perspective, considering the entire model. Universities, as the primary institutions for producing, distributing, and transferring knowledge, as well as for preparing individuals to take on various social, political, economic, cultural, and familial responsibilities, play a vital role. Therefore, their management holds greater significance compared to other institutions.

Universities need experts and skilled individuals at their helm, who, by applying their knowledge, involving specialists from other domains, and utilizing modern technology to facilitate operations, increase transparency, and enhance speed and accuracy, can fulfill their primary mission. This requires complete autonomy to establish policies and objectives, plan, implement, supervise, reform structures and processes, and respond effectively to societal needs.

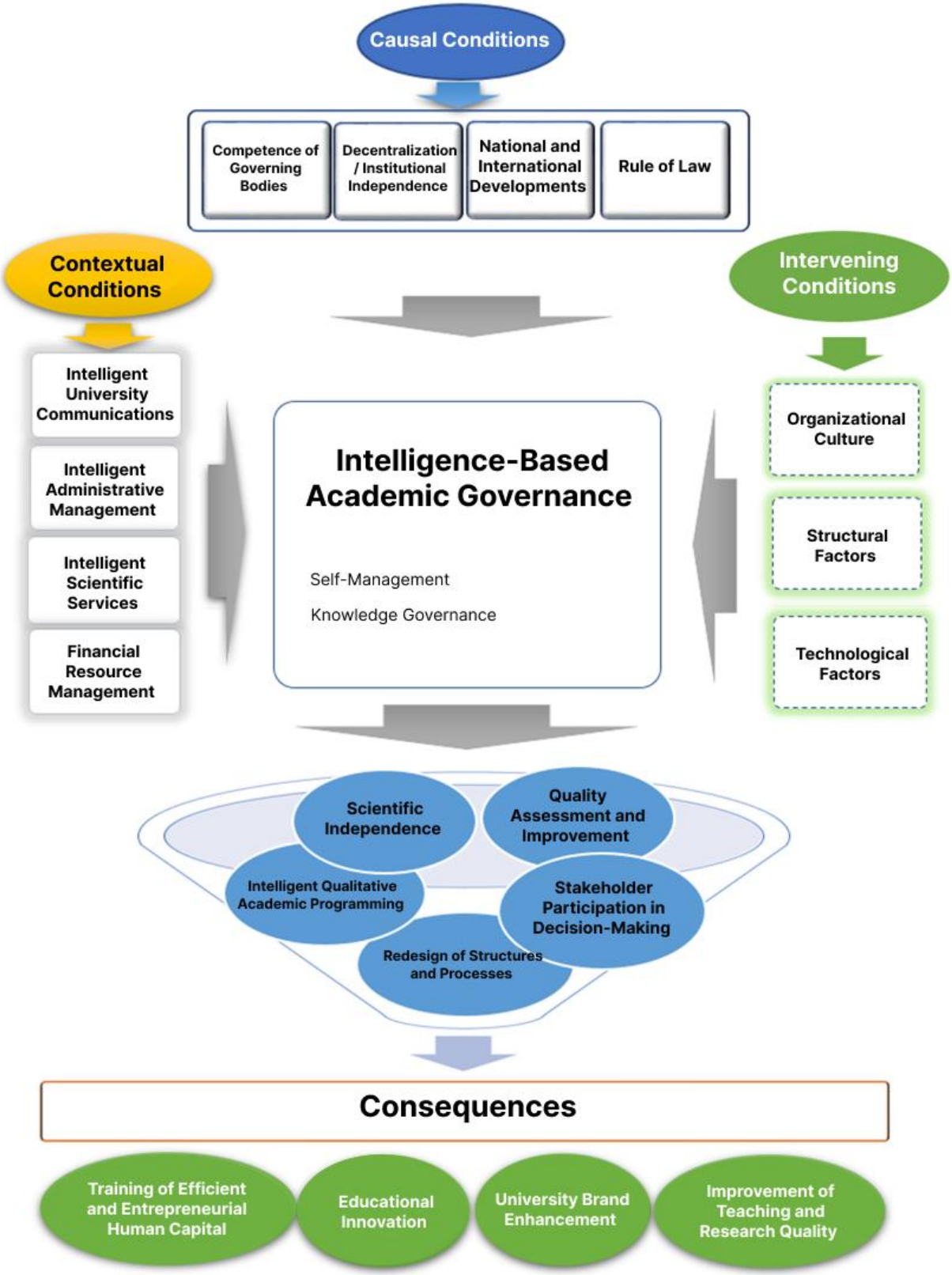

Figure 1. Qualitative Framework of Intelligence-Based Academic Governance in Comprehensive Universities of Tehran

Discussion and Conclusion

The purpose of this study was to identify and develop a qualitative framework for intelligence-based academic governance in comprehensive universities of Tehran. The findings revealed six core dimensions and twenty-two axial codes encompassing causal conditions, contextual conditions, intervening conditions, central phenomenon, strategies, and consequences. Together, these components illustrate a paradigm model for governance that emphasizes digital intelligence, self-management, stakeholder participation, and outcome-oriented academic leadership. The results provide an evidence-based framework that situates academic governance not as a static system, but as an evolving, intelligent, and adaptive process.

The causal conditions were found to include rule of law, national and international developments, institutional independence, and the competence of governing bodies. These elements highlight the importance of regulatory frameworks, external pressures, autonomy, and expertise as foundations for governance. Contextual conditions emphasized intelligent communications, administrative management, scientific services, and financial resource management, underscoring the need for enabling infrastructure. Intervening conditions included organizational culture, structural factors, and technological factors, each acting as both barriers and facilitators depending on managerial responses. The central phenomenon of intelligence-based governance was distilled into self-management and knowledge governance, which together reflect the heart of modern governance models. Strategies included quality assessment and improvement, scientific independence, stakeholder participation, redesign of structures, and intelligent academic programming. Finally, consequences were identified as enhancing university branding, educational innovation, quality improvement in teaching and research, and the training of efficient and entrepreneurial human capital. This multidimensional model integrates structural, cultural, and technological elements to produce a comprehensive approach to governance.

The prominence of rule of law as a causal factor aligns with prior research showing that governance in higher education requires transparent regulatory mechanisms to ensure accountability and stability (18, 19). Similar to our findings, studies in Latin America and the Middle East have highlighted that regulatory asymmetries and weak policy frameworks are major obstacles to effective university governance (11, 29). Thus, the centrality of legal frameworks in this study confirms the global evidence that without clearly defined rules, governance systems are prone to inefficiency and mistrust.

The importance of national and international developments resonates with the literature on globalization and world-class universities. Marginson emphasized that governance must adjust to political and cultural variations in the quest for excellence (3). Our findings that universities are influenced by global competitiveness and national policy shifts support similar evidence from East Asia, where higher education institutions adjust their governance in response to state-driven modernization (10, 28). In Iran, such developments have been captured in five-year development plans and ongoing reforms (12, 13). These findings reinforce that governance models cannot be static; they must be continuously recalibrated to align with broader socio-political and global dynamics.

Institutional independence and decentralization emerged as another critical causal dimension. This reflects the ongoing shift from state-centered to good governance models in higher education (14, 15). Comparative studies in Europe and North America show that autonomy in decision-making correlates with higher institutional performance (16, 17). Our findings align with Rabbani Khah's research, which emphasized the need for decentralization and faculty empowerment in Iranian universities (38). The current results confirm that autonomy is not only a desirable condition but also a functional requirement for intelligent governance.

The competence of governing bodies, as identified in this study, highlights the professional authority and expertise of faculty and leaders. This finding is supported by international literature that stresses the importance of leadership capacity in

governance (5, 6). Clapham's work on governance maturity theory similarly underscores that leadership must evolve beyond compliance to a stage where expertise and strategic insight are institutionalized (33). In the Iranian context, this confirms earlier studies stressing the need for professional and knowledge-based leadership (36, 37).

The contextual conditions identified—intelligent communications, intelligent administrative management, intelligent scientific services, and financial management—reveal that infrastructure is essential for implementing governance reforms. This is consistent with findings that digitalization and intelligent technologies improve transparency, accountability, and performance (20, 21, 23). Universities worldwide are increasingly deploying data-driven platforms to optimize decision-making and enhance responsiveness (32, 42). Moreover, OECD reports have stressed that sustainable higher education requires robust financial management and digital transformation (9). The study's identification of financial resource management as a contextual condition aligns with international recognition of the fiscal pressures facing universities (7, 24).

Intervening factors in this study—organizational culture, structural barriers, and technological constraints—were found to play a dual role, either facilitating or hindering governance. Prior research similarly highlights that governance reforms often fail without cultural alignment (14, 25). In addition, structural rigidities in hierarchical systems can obstruct agility, echoing Parker's critique of university change management (41). Technological challenges, such as lack of infrastructure or managerial skepticism, have also been reported in studies on digital governance (8, 40). The dual nature of these factors in our study confirms that reforming culture and investing in technology are prerequisites for successful governance transformation.

At the heart of the model lies the central phenomenon of intelligence-based governance, which this study conceptualized as self-management and knowledge governance. Self-management, involving faculty and institutional autonomy, echoes the literature emphasizing the shift from bureaucratic control to participatory governance (1, 2). Knowledge governance, on the other hand, aligns with global discussions about universities as central actors in knowledge production and transfer (19, 39). This reflects the argument of Marginson that universities are not merely teaching institutions but global knowledge enterprises (3).

The strategies identified—quality improvement, independence, participation, redesign, and intelligent programming—mirror global trends in higher education reforms. Quality assurance mechanisms are widely recognized as key drivers of accountability (18, 31). Independence and academic freedom are central to effective research and innovation (26, 27). Stakeholder participation reflects the shift to collaborative governance models (25, 38). Redesign of structures and intelligent programming are aligned with smart governance and the digital transformation of universities (20, 22). These strategies provide a roadmap for universities navigating the challenges of modernization.

Finally, the consequences of intelligence-based governance identified in this study—university branding, innovation, quality improvement, and human capital development—highlight the outcomes that effective governance can generate. Previous studies confirm that robust governance systems contribute to reputation and competitiveness (7, 30), foster innovation (5, 6), enhance teaching and research (16, 17), and ensure universities play a pivotal role in national development (24, 35). These parallels confirm that the framework developed in this study not only resonates with international literature but also addresses the unique needs of Iranian universities.

Despite the comprehensiveness of this study, several limitations should be acknowledged. First, the study was conducted only within comprehensive universities in Tehran, which may not fully represent the diversity of higher education institutions across Iran. Smaller universities, regional institutions, and private entities may experience different governance challenges. Second, the study relied on qualitative interviews with a limited number of experts. While theoretical saturation was achieved, the findings may not capture all perspectives. Third, the focus on academic governance through the lens of intelligence-based

systems may overlook other dimensions such as political interference, financial crises, or cultural constraints that also affect governance.

Future research should extend the scope of analysis to include a broader range of universities across different provinces and institutional types. Comparative studies between public, private, and international branch campuses in Iran could yield insights into diverse governance models. Quantitative research could complement the qualitative findings by measuring the impact of specific governance dimensions on performance outcomes. In addition, longitudinal studies could track how intelligence-based governance evolves over time, especially in response to technological advancements and policy reforms. Finally, comparative international research could situate Iran's experiences within broader regional and global governance trends.

For practitioners, the study underscores the need for universities to invest in intelligent systems, digital infrastructure, and cultural reforms to ensure successful governance. University leaders should prioritize stakeholder participation, transparency, and quality assurance while safeguarding academic independence. Policymakers must create supportive frameworks that enable autonomy while holding institutions accountable for outcomes. At the institutional level, leaders should focus on integrating knowledge governance, fostering innovation, and building capacity for human capital development. Ultimately, the adoption of intelligence-based academic governance can enhance both institutional performance and national competitiveness.

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Authors' Contributions

Not applicable.

Declaration of Interest

The author of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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