

BARRIERS AND ENABLING CONDITIONS FOR DIGITAL TRANSFORMATION IN UNIVERSITY ADMINISTRATION: EVIDENCE AND POLICY IMPLICATIONS FOR UZBEKISTAN

Oslonov Jasurbek Rustam o'g'li

University of Digital Economics and Agrotechnologies, Academic affairs department manager

jasurbekoslonov@gmail.com

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Abstract.

This paper examines the barriers and enabling conditions that shape digital transformation in the administration of higher education institutions (HEIs) in Uzbekistan. Unlike studies that treat digitalization primarily as the introduction of new platforms, the analysis focuses on the organizational conditions required for digital systems to change administrative practice. A targeted review of international research is combined with Uzbek policy documents, official information on the Higher Education Management Information System (HEMIS), and country-specific academic and development evidence. Four diagnostic domains are identified: staff capability and technology adoption; system integration and data governance; strategy and process redesign; and institutional capacity, resources, and decision rights. The analysis shows that Uzbekistan has created substantial digital infrastructure, including a national HEMIS platform, but the value of this infrastructure depends on whether institutions can integrate systems, develop users' capabilities, redesign administrative processes, and convert digital information into managerial action. The paper proposes a matched barrier-response framework that can guide future empirical research and institutional digital-transformation plans.

Keywords:

digital transformation, university administration, HEMIS, digital governance, organizational barriers, enabling conditions, Uzbekistan.

Introduction.

Digital transformation in higher education is increasingly understood as an organizational change process rather than a simple technology-acquisition exercise. Vial (1) describes digital transformation as a process through which digital technologies trigger significant changes in organizational structures, processes, and value creation. In universities, this distinction matters because digitizing an existing paper procedure may improve convenience while leaving the underlying administrative logic, responsibilities, and decision practices largely unchanged. A stronger form of transformation occurs when digital systems alter how information moves through the institution, how administrative work is coordinated, and how managers use evidence to make decisions.

Uzbekistan has created an important policy and technological foundation for this transition. Presidential Decree No. PF-6079 approved the "Digital Uzbekistan - 2030" Strategy and established a national framework for digital transformation across public administration and social sectors (2). In higher education, HEMIS has become a central administrative platform. According to the Ministry of Higher Education, Science and Innovations, HEMIS digitizes 35 types of statistical information and

stores academic records, schedules, diploma and academic data, and information on students and academic staff within a unified platform (3). Earlier, the World Bank's Modernizing Higher Education Project explicitly supported HEMIS as an instrument for strengthening the management capability of the ministry and HEIs and for improving information used in targeting and resource allocation (11).

The presence of such infrastructure, however, does not eliminate organizational barriers. International evidence shows that HEIs frequently implement isolated digital initiatives without an integrated strategy, while systematic reviews identify recurring barriers related to leadership, digital skills, organizational culture, infrastructure, funding, and fragmented systems (4), (5), (7). In the Uzbekistan-specific sources reviewed for this paper, evidence is relatively strong regarding the introduction and intended functions of digital systems, but more limited regarding institution-level measurement of why implementation succeeds in some administrative settings and remains procedural in others. This creates a useful research problem: not whether digitalization exists, but which barriers prevent digital infrastructure from producing deeper administrative transformation and which enabling conditions can address them.

Accordingly, the paper addresses two research questions: (RQ1) which organizational barriers are most relevant to the digital transformation of university administration in Uzbekistan; and (RQ2) which enabling conditions and policy responses are logically matched to those barriers? The aim is to develop a diagnostic framework that complements outcome-oriented research by explaining what institutions must manage before digital systems can reliably improve administrative practice.

Materials and methods. The paper uses a targeted conceptual and policy review. Three source groups were examined. First, peer-reviewed international studies were selected that classify digital-transformation initiatives, barriers, technology-adoption factors, and organizational conditions in higher education and public administration (1), (4)-(9). Second, official Uzbek policy and implementation sources were reviewed to identify the objectives and operational scope of higher-education digitalization, particularly the "Digital Uzbekistan - 2030" Strategy, official information on HEMIS, and reforms concerning institutional financial independence (2), (3), (13). Third, Uzbekistan-specific academic work and World Bank material were used to compare international barrier categories with evidence relevant to the national higher-education system (10)-(12).

The analysis does not claim to be a systematic review of all publications on Uzbekistan. Instead, the selected sources were coded thematically and grouped into four diagnostic domains: (1) staff capability and technology adoption; (2) system integration and data governance; (3) strategy and process redesign; and (4) institutional capacity, resources, and decision rights. A factor was treated as a barrier when it could impede meaningful organizational use of digital systems, and as an enabling condition when it could reduce or manage that barrier. This barrier-enabler pairing is the principal organizing contribution of the paper.

Results and discussion. The review indicates that the main challenge is not a single technological deficiency but the interaction of human, organizational, and institutional constraints.

First, staff capability and technology adoption are critical. The Unified Theory of Acceptance and Use of Technology identifies performance expectancy, effort expectancy, social influence, and facilitating conditions as major determinants of whether individuals adopt information systems (8). Recent higher-education research likewise identifies digital literacy, resistance to change, and insufficient support as persistent barriers (5)-(7). Uzbekistan-specific research on digital governance also points to digital competence as an important issue for university management (10). The relevant enabling condition is therefore not generic one-time training, but role-based capability development: administrators need skills linked to the tasks they actually perform, continuing technical support, and visible managerial use of digital information. Training should be evaluated through changes in system use, error rates, processing time, and independent task completion rather than simply through attendance at training sessions.

Second, system integration and data governance determine whether digitalization reduces or reproduces administrative fragmentation. Fernández et al. found that only about one quarter of the universities in their multivocal review had a digital strategy and that many initiatives were isolated rather than integrated (4). Fragmented platforms can create duplicate data entry, inconsistent definitions, parallel records, and uncertainty about which system is authoritative. HEMIS provides Uzbekistan with a strong platform-level foundation because major academic and administrative datasets are consolidated

nationally (3). Yet future research should examine interoperability between HEMIS and other institutional systems, including financial, human-resource, document-management, and internal analytics tools. The corresponding enabling conditions are common data definitions, assigned data ownership, interoperability rules, and clear responsibilities for data quality. Without these governance arrangements, adding more platforms may increase administrative burden instead of reducing it.

Third, digital strategy must be connected to process redesign. A university may convert forms and approvals into electronic format while retaining every historical approval step, duplicated responsibility, and reporting requirement. This is digitization of bureaucracy rather than transformation of administration. Vial (1) and the higher-education literature (4), (5) emphasize that transformation requires organizational change alongside technology. The enabling response is therefore to map and simplify processes before or during digital implementation: institutions should identify which steps create value, which controls are legally necessary, which approvals are duplicated, and which data can be reused instead of repeatedly requested. Digital projects should then be governed through institution-level priorities and measurable administrative outcomes rather than through the number of systems launched.

Fourth, institutional capacity, resources, and decision rights affect how far digital information can be translated into action. It would be inaccurate to describe all Uzbek public universities as uniformly lacking autonomy because reforms have granted financial independence to designated state HEIs under Presidential Resolution No. PQ-61 (13). A more defensible interpretation is that institutions may differ in the resources and decision rights available to them. The World Bank's regional analysis also identifies structural and capacity constraints affecting higher-education reform across Central Asia (12). This implies a differentiated enabling approach: institutions with greater autonomy can be held more directly accountable for digital investment choices and process redesign, while institutions with narrower decision rights may require centralized standards, shared services, and targeted support. Empirical research should therefore measure autonomy and institutional capacity rather than treating them as fixed characteristics of the entire sector.

Table 1.

Diagnostic barrier-response framework for university administration in Uzbekistan.

Diagnostic domain	Typical barrier	Matched enabling response
Staff capability and adoption	Low digital confidence; resistance; weak support	Role-based training; help-desk support; management use of digital evidence; usage-based evaluation
System integration and data governance	Duplicate entry; inconsistent data; isolated platforms	Interoperability standards; common data definitions; data ownership; quality controls
Strategy and process redesign	Digitized but unchanged bureaucracy; isolated projects	Process mapping and simplification; institution-wide digital roadmap; outcome-based KPIs
Institutional capacity and decision rights	Uneven resources, autonomy, and implementation capacity	Differentiated governance; shared services; targeted investment; accountability matched to decision rights

This framework makes Thesis 2 distinct from a study that asks whether digital transformation improves management effectiveness. Its focus is diagnostic: it identifies the conditions that must be managed for transformation to occur. The framework also produces testable propositions. For example, the negative effect of platform fragmentation on administrative efficiency should decline as interoperability and data-governance maturity increase; the relationship between digital-system availability and effective use should strengthen as staff capability and facilitating conditions improve; and the effect of digital information on managerial action should depend partly on the decision rights available to institutional managers. These propositions can be examined through surveys, administrator interviews, process-time data, system logs, or comparative case studies across Uzbek HEIs.

Conclusion. Uzbekistan has established substantial digital infrastructure for higher-education administration, and HEMIS provides a significant national foundation for consolidated information management. The next research and management question is therefore not simply how many processes have been digitalized, but whether institutions possess the human, organizational, data-governance, and decision-making conditions needed to use those systems effectively. This paper identifies four

diagnostic domains: staff capability and adoption; system integration and data governance; strategy and process redesign; and institutional capacity, resources, and decision rights. For each domain, the study links a barrier to a corresponding enabling response.

The practical implication is that digital-transformation policy should move from system deployment toward measurable organizational capability. Training should be tied to actual administrative tasks; integration should be supported by data-governance rules; digital projects should simplify processes rather than reproduce paper routines; and implementation expectations should reflect institutional capacity and decision rights. Future empirical research should test the relative importance of these four domains across a representative sample of Uzbek HEIs and determine which combinations of enabling conditions are most strongly associated with successful administrative transformation. Such evidence would support more differentiated and effective digital-governance policy in the national higher-education system.

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