Blockchain For Higher Education Reform: A Strategic Model For Formalizing Knowledge, Advancement, And Governance Systems

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Abstract

Universities across post-transition and semi-formal education systems face a persistent paradox: while knowledge production lies at the heart of their mission, the structures guiding staff advancement, knowledge use, and internal governance remain informal, politicized, and resistant to change. This paper presents a strategic reform model that uses blockchain not as a digital overhaul, but as a trust-enabling backbone to support cultural and institutional formalization. Grounded in prior field research and lived insight into Eastern European academic environments, the model integrates blockchain infrastructure with knowledge management formalization and performance accountability. It offers a layered blueprint to address deep-rooted challenges such as misaligned strategic plans, opaque staff progression, fragmented budgeting, and siloed information systems. Each layer maps onto essential university functions—rectorate governance, HR, finance, research, international relations, and IT—while allowing phased, modular implementation rooted in organizational realism. Rather than replacing the culture, the design respects it, while offering scalable tools for traceable decisions, transparent recognition, and shared institutional memory. By linking strategy, governance, and knowledge in practical and culturally aware ways, this model offers a path toward universities that are not only better managed—but more transparent, future-ready, and self-aware.

Keywords: Blockchain in higher education, knowledge management, institutional governance, university reform, academic career systems, strategic planning in education, digital trust infrastructure, academic performance accountability, administrative innovation.

1. **Introduction**

In many post-Soviet and transitional higher education systems—particularly in Georgia—universities face a paradox. On the one hand, they are called upon to modernize, globalize, and commercialize their knowledge outputs in line with 21st-century innovation imperatives. On the other hand, the internal governance systems that shape how knowledge is created, evaluated, and rewarded remain deeply entangled in informal networks, hierarchical social structures, and opaque decision-making cultures. Despite the increasing discourse on digital transformation and institutional innovation, the operational reality in these academic environments still reflects a culture of personalism over process, and loyalty over merit.

While digital technologies such as blockchain are increasingly being promoted as tools for transparency and accountability in public systems, their integration into higher education administration—particularly in regions like the Caucasus and Eastern Europe—requires a more nuanced and culturally grounded approach. This study does not propose blockchain as a universal solution. Rather, it explores whether and how blockchain-based systems can be adapted to formalize merit, trace knowledge flows, and break cycles of exclusion rooted in invisible governance norms.

This research proposes a conceptual framework—tentatively titled B-FORM **(**Blockchain-based Formalization for Organizational Restructuring and Meritocracy**)**—to reimagine internal university governance through the lens of blockchain technology. Unlike technocratic models that assume institutional maturity, B-FORM is designed for environments where informality, hierarchy, and relational politics dominate. The framework emphasizes practical entry points for change: transparent knowledge contribution tracking, merit-based career progression systems, and smart contract–enabled budgeting mechanisms. Each component of the model addresses a specific dysfunction in how post-Soviet academic institutions currently organize and value work.

1-1. Background and Problem Context

As documented in Moghimi and Monemizadeh (2025), effective institutional reform in transitional contexts depends not only on the technical viability of digital systems but also on their ability to align with and gradually transform deeply embedded socio-cultural practices. Their work in the Georgian healthcare sector highlights how patients and practitioners navigate "personalized trust loops" that often override systemic protocols. Similar dynamics are observed within academic institutions, where knowledge production, resource access, and staff advancement often occur within parallel informal structures that remain undocumented and unaccountable.

At the same time, the urgency for modernization is undeniable. Knowledge-intensive growth, international accreditation, and the push for research commercialization demand governance models that are not only efficient but also fair and auditable. As Moghimi and Dastouri (2023) argue in their case study on Georgian universities, attempts at commercialization and knowledge management fail when they are detached from structural reforms that embed transparency and long-term institutional memory.

Yet, most of the digitalization initiatives in the region either imitate Western frameworks or remain superficial — lacking the cultural sensitivity to address the invisible rules of the game. This mismatch has created a growing sense of stagnation in administrative reform and a widening gap between institutional rhetoric and operational reality.

1-2. Purpose and Significance

This paper addresses a critical gap in the digital transformation literature: the failure to adapt governance models to environments where informalism is the rule, not the exception. By grounding blockchain adoption in the cultural, structural, and relational specificities of Georgian and Eastern European universities, this study contributes:

- A context-sensitive use case for blockchain that does not center credentialing, but rather institutional justice.
- A structural theory of change for universities operating in politically sensitive, low-transparency environments.
- A practical, replicable framework that can be piloted and gradually scaled—starting with the least politically volatile processes like academic contribution tracking and internal budgeting.

The significance of this research lies not in its technological novelty, but in its institutional realism. It offers a blueprint for how to formalize what has long remained informal—not to suppress relational networks, but to make them visible, accountable, and equitable.

1-3. Research Question

The study is guided by the following research questions

1. How do informal networks and cultural hierarchies shape knowledge management, budgeting, and career advancement in Georgian and Eastern European universities?

2. What features of blockchain technology can be realistically used to increase transparency and accountability in these systems?
3. How can blockchain help formalize merit-based decision-making without triggering resistance from embedded social and political cultures?
4. What would a culturally sensitive, practically applicable blockchain governance framework look like for mid-tier universities in transition economies?

2. Literature Review

The intersection of blockchain technology and higher education has attracted increasing scholarly interest in recent years, though the majority of existing literature tends to concentrate on narrow functional domains—such as digital credentials, degree verification, and plagiarism detection. These studies offer important contributions to the digitalization of academic services but largely overlook the deeper organizational and governance challenges that persist inside universities—particularly in culturally complex, politically transitional systems.

A systematic review of blockchain use in higher education by Alammary et al. (2019) identified transparency and security as the two most cited benefits. However, their analysis also noted a consistent lack of consideration for socio-political structures and institutional maturity, especially in low-governance or relationally dominated academic cultures. Similarly, Grech and Camilleri (2017) warned against "technological determinism" in blockchain discourse, cautioning that the success of such systems depends on more than technical efficiency—it relies on cultural trust, policy alignment, and user motivation. This insight is especially relevant in contexts like Georgia, where informal relationships often override formal rules in shaping career trajectories, access to resources, and recognition of academic contributions.

Within the field of knowledge management (KM), the literature strongly supports the idea that effective commercialization of university knowledge depends on coherent and strategically applied KM systems. As Moghimi and Dastouri (2023) demonstrated in their case study of Georgian universities, knowledge assets are often underutilized or fragmented due to the absence of systematized capture, classification, and reward structures. These findings align with Nonaka and Takeuchi's (1995) foundational work on tacit and explicit knowledge, emphasizing that without institutional processes to formalize and transfer tacit knowledge, universities risk stagnation even when rich in intellectual capital.

Additional regional studies, such as those by Kwiatkowski and Żemigała (2021), point to the lack of knowledge valorization pathways in Eastern European universities as a major bottleneck for innovation. These challenges are compounded by political inertia, inadequate reward systems, and a mismatch between policy rhetoric and administrative infrastructure. As a result, attempts to implement modern KM or commercialization policies often remain technocratic in design but performative in practice.

A particularly underexplored area of research is the potential of blockchain to function not just as a technical tool for record-keeping, but as a governance mechanism that can reframe relationships of power, responsibility, and merit inside university systems. Recent theoretical advances in blockchain-enabled governance, such as those by Ølnes, Ubacht, and Janssen (2017), suggest that smart contracts and decentralized consensus models can shift institutional dynamics by removing discretion from decision nodes and enforcing rules through code. However, most of these models have been applied to national governments or corporations, not to academic institutions in semi-formal, post-authoritarian systems.

Moreover, existing blockchain integration proposals for universities rarely address the emotional, relational, and psychological layers of institutional behavior. This is a critical omission. As Moghimi and Monemizadeh (2025) illustrated in their research on patient relationship management in the Georgian healthcare sector, successful digital interventions depend on the alignment between system logic and social logic. People do not respond to software; they respond to power, recognition, and cultural cues. If blockchain is to succeed in higher education governance, it must be embedded into processes that stakeholders already perceive as meaningful—such as career advancement, fair budgeting, and acknowledgment of academic work.

In short, the existing literature provides valuable technical foundations but offers little insight into how blockchain can address informalism, hierarchy, and opacity—the very features that define decision-making in many Eastern European university environments. This study responds to that gap by proposing a blockchain-enabled framework that is not only operationally coherent, but culturally compatible, socially realistic, and transformation-oriented.

a. Conceptual Framework and Theoretical Grounding

This study builds upon three interconnected bodies of theory: (1) the sociology of informal institutions, (2) knowledge management (KM) as a strategic tool in higher education, and (3) blockchain-enabled governance mechanisms. Each of these perspectives provides a necessary lens through which the structure and intent of the proposed B-FORM model can be understood.

i. Informality as an Institutional Logic

In many post-socialist university systems, formal structures exist largely as symbolic scaffolding, while real power and decision-making are embedded in informal networks of loyalty, hierarchy, and personal trust. This distinction, rooted in Helmke and Levitsky's (2004) theory of informal institutions, is not merely a side effect of weak governance—it is often the primary operating system of the institution. As documented in Moghimi and Dastouri (2023), efforts to commercialize knowledge or improve strategic planning in Georgian universities frequently fail not due to policy weakness, but because such policies fail to acknowledge or challenge the dominance of internal social networks that operate off-record.

From this view, any intervention that seeks to promote merit, transparency, or innovation must first grapple with the relational logic of the institution—not just the technical logic of reform. Informality is not a defect to be erased; it is a force that must be redirected, documented, and eventually structured into systems that support inclusion and performance.

ii. Knowledge Management and Organizational Learning

Knowledge management has traditionally been viewed as a tool to improve organizational efficiency and innovation. But in higher education—especially in emerging systems—KM becomes a political practice. Decisions about what knowledge is valued, who gets credit, and how learning is circulated are not neutral. They shape who advances and who is excluded.

Moghimi and Monemizadeh (2025) point to this dynamic in their model of patient-centric relationship management, where informal knowledge about patients was central to care but rarely formalized. A similar problem exists in universities: much of the most valuable academic labor—mentorship, institutional memory, informal coordination—remains invisible. Unless codified and rewarded, this labor stays outside the formal performance and budgeting metrics.

The proposed B-FORM framework adopts a knowledge-as-infrastructure view: knowledge is not just a product, but a foundation upon which budgeting, promotion, and evaluation processes are built. Formalizing this knowledge through traceable systems is a prerequisite to enabling fair and accountable institutional growth.

iii. Blockchain as a Governance Layer

Blockchain is often discussed in education as a tool for issuing tamper-proof certificates or managing digital identities. However, its core innovation lies in its ability to reconfigure governance—to embed rules into technology and remove discretion from decision-making. Smart contracts, distributed consensus, and immutable records are not just technical features; they are instruments for redesigning how trust is mediated in organizations.

Ølnes et al. (2017) conceptualize blockchain as a "trust machine" for public institutions, especially those facing legitimacy deficits. In the context of higher education, this study extends that view by positioning blockchain as a formalization mechanism—a way to replace opaque practices with auditable, decentralized protocols that align with institutional goals.

The B-FORM framework does not advocate for full decentralization. Rather, it proposes selective blockchain integration in three areas:

1. Knowledge contribution tracking
2. Budget allocation
3. Career advancement

Each of these nodes serves as an entry point for transparent, criteria-based decision-making—allowing institutions to begin reform where resistance is lowest and impact most visible.

iv. Integration Logic: From Social Logic to System Logic

At its core, the conceptual contribution of this paper lies in its shift from a technological adoption logic to a governance alignment logic. Rather than asking whether blockchain works, the B-FORM framework asks:

Where are the critical gaps between formal systems and lived institutional behavior—and how can blockchain selectively help close those gaps without cultural rupture?

In this regard, B-FORM is not a technological innovation. It is a strategic governance prototype: a blueprint for how transitional universities can begin to restructure themselves around merit, transparency, and value creation using blockchain as a supportive layer—not a controlling one.

2.1.5. Blockchain in Higher Education Administration

Blockchain technologies are increasingly positioned as enablers of transparency, accountability, and process automation in higher education governance (Turkanović et al., 2018; Grech & Camilleri, 2017). By decentralizing authority and embedding trust through cryptographic ledgers, blockchain offers potential solutions for credential verification, research record management, funding traceability, and administrative integrity. In environments where discretionary decision-making undermines institutional equity, smart contracts can standardize approvals, enforce policy logic, and create immutable audit trails (Sharples & Domingue, 2016). However, its successful application in universities depends not solely on technological readiness, but also on the capacity of higher education institutions to realign governance processes and develop compliance-aware data frameworks (Chen et al., 2020).

2.1.6. Knowledge Management Models in Higher Education

Knowledge Management (KM) is a core component of institutional performance, yet remains underdeveloped in many higher education contexts. Classical models such as Nonaka and Takeuchi's (1995)

SECI model (Socialization, Externalization, Combination, Internalization) offer a lens for understanding how tacit knowledge can be systematized. In higher education, however, this process is complicated by the siloed nature of departments, the absence of incentive structures for sharing, and a cultural resistance to standardization (Rowley, 2000; Ramachandran et al., 2009). To succeed, KM must be more than a documentation initiative—it must be embedded in HR systems, performance reviews, institutional budgeting, and strategic planning (Mládková, 2012). The integration of knowledge value chains into staff progression models, research funding systems, and internal governance can catalyze a shift from passive knowledge holding to active knowledge governance (Dalkir, 2017).

2.1.7 Governance Reform in Post-Soviet and Eastern European Higher Education

The governance structures of post-Soviet and Eastern European universities are shaped by path dependency, informalism, and weak process legitimacy (Tomusk, 2000; Silova et al., 2017). Despite policy-level reforms across the region, institutional cultures remain hierarchical, resistant to transparency, and characterized by decision-making rooted in personal networks rather than formal procedures. Attempts at reform often fail not due to lack of policy but because of insufficient strategic implementation mechanisms (Kwiek, 2016). Effective governance reform requires the alignment of new administrative tools—such as digital ledgers, ABC costing, and performance dashboards—with local political economies and organizational cultures. Moreover, efforts to formalize decision-making must be phased, contextualized, and politically aware to avoid institutional backlash (Deem et al., 2007). Models such as B-FORM are particularly relevant in this regard, offering a layered and adaptable approach to governance transformation tailored to institutional inertia and operational fragmentation.

3. Model Development

This study proposes a conceptual framework for institutional transformation in transitional university environments, built around the formalization potential of blockchain technologies and knowledge management systems. The framework is structured into six interdependent layers, each targeting a specific dimension of dysfunction common in post-Soviet and Eastern European academic contexts.

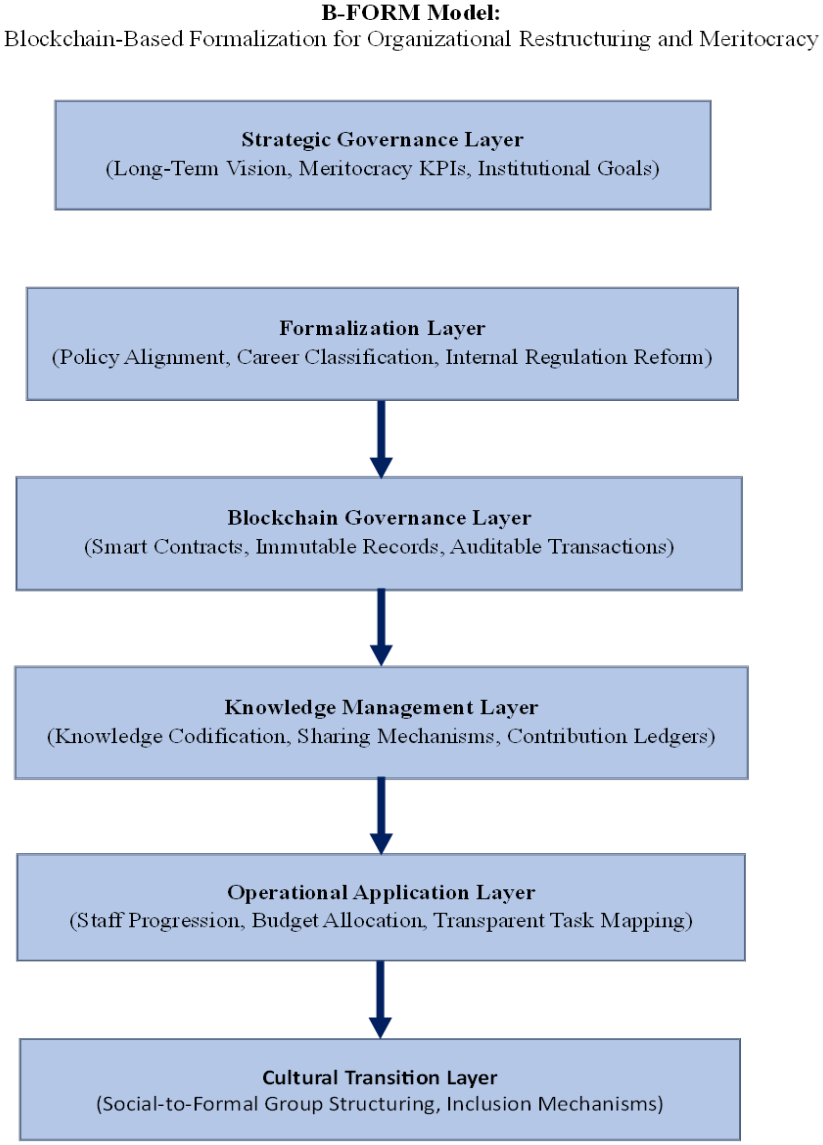

Figure 1: Conceptual Model of Blockchain-Enabled Formalization in University Governance

As illustrated in Figure 1, the model proceeds from a high-level strategic vision and gradually integrates blockchain functionality, knowledge systems, and cultural transition mechanisms. It does not assume institutional readiness for decentralization but offers incremental entry points where reform can realistically begin without triggering systemic resistance.

a. Strategic Governance Layer

At the top of the framework lies the Strategic Governance Layer, which serves as the foundation for any long-term digital or cultural transformation. This layer is responsible for articulating clear institutional goals, designing merit-based KPIs, and embedding reform priorities into official planning documents and budgeting cycles.

Without this layer, blockchain systems and KM tools risk becoming isolated IT initiatives. The strategic layer ensures that new technologies are aligned with career progression models, performance reviews, and institutional ranking goals. It also anchors the reform process within a broader discourse of organizational legitimacy, enabling university leadership to communicate change as both vision-driven and structurally necessary.

b. Formalization Layer

Below the strategic layer lies the Formalization Layer, where institutional norms and procedures are codified and aligned with the values articulated above. This includes:

- Redesigning career classification systems to reflect contribution rather than connections
- Reforming internal regulations to limit discretion and enhance procedural transparency
- Aligning role expectations across departments and avoiding informal workarounds

This layer is crucial for setting the rules that blockchain systems will enforce. As Moghimi and Dastouri (2023) observed in their study of Georgian university commercialization, technical systems alone cannot remedy structural incoherence unless policies, practices, and expectations are harmonized.

c. Blockchain Governance Layer

The Blockchain Governance Layer introduces distributed ledger technology as a mechanism for enforcing transparency, recording decisions, and limiting informal interference in administrative processes. Rather than proposing full decentralization, this model advocates for targeted integration in three domains:

- Smart contracts for internal budgeting approvals
- Immutable academic contribution records tied to promotions and internal awards
- Transparent audit trails for committee-based decisions (e.g., funding, travel, hiring)

These features allow universities to create lightweight digital accountability systems that reinforce fairness without demanding massive cultural shifts upfront. As Ølnes et al. (2017) and Alammary et al. (2019) suggest, the governance potential of blockchain lies in its ability to encode rules into action—not to replace policy, but to make policy enforceable through trustless systems.

d. Knowledge Management Layer

At the heart of the framework sits the Knowledge Management (KM) Layer, where blockchain's traceability converges with institutional learning. This layer focuses on:

- Codifying contributions that are often overlooked (mentorship, internal reports, peer reviews)

- Creating open yet protected knowledge-sharing ecosystems
- Building contribution ledgers that feed into annual evaluations and grant opportunities

This approach draws from Moghimi and Monemizadeh 's (2025) healthcare study, which emphasized how relational knowledge, when formalized, becomes both operationally useful and politically neutral. Similarly, knowledge systems in universities must extend beyond published research to account for everyday intellectual labor—making it visible, traceable, and rewardable.

e. Operational Application Layer

The Operational Application Layer is where reform meets the day-to-day reality of academic life. It includes blockchain-supported systems for:

- Transparent staff progression mapping based on traceable milestones
- Budget allocation logs that tie spending to strategic priorities
- Task assignment systems that reduce favoritism and hidden labor

Unlike high-level dashboards often used in university digitalization, this layer is meant to create bottom-up accountability. It provides staff with clear visual pathways for career growth, allows administrators to track performance by contribution—not affiliation—and gives internal auditors the tools to identify process bottlenecks or deviations from policy.

f. Cultural Transition Layer

Finally, at the base of the model lies the Cultural Transition Layer. Reform in transitional university environments must grapple with entrenched informal networks and the power they exert. Rather than attempting to eliminate these outright, this model proposes gradual transformation of social relations into structured formal interactions, including:

- Integrating diverse voices (e.g., gender, ethnic, disciplinary) into governance systems
- Formalizing informal groups into recognized working groups or taskforces
- Creating inclusive advancement opportunities tied to documented contributions

This layer is essential not just for ethical reasons but for institutional stability. Reform is only sustainable if it reflects the human dynamics of the system. Cultural transition must therefore be treated not as a soft domain but as a structural component of institutional architecture.

3-7. Positioning of the Model

Unlike existing blockchain education frameworks focused on degree validation or student identity, this model targets the internal institutional mechanics of governance, budgeting, and staff development. It assumes:

- Low digital maturity, but high urgency for reform
- Resistance to top-down change, but openness to performance-linked fairness
- Widespread informalism, which must be documented and redirected, not denied

In short, this model views blockchain not as a disruptive force, but as a formalization enabler—a means of embedding logic and accountability into academic systems where those have long been personalized or opaque.

4. Methodological Path and Implementation Strategy

This research is conceptual in structure, but deeply grounded in institutional analysis, contextual knowledge, and authorial experience within post-Soviet and European academic systems. The methodological orientation is thus design-based, emphasizing systemic realism over positivist generalization, and committed to building a solution-oriented framework that could be adapted, critiqued, and eventually piloted in diverse higher education institutions.

The section below outlines how the B-FORM framework was developed, how it can be ethically engaged, and how its potential implementation could be structured within a university system like Georgia's or similar Eastern European contexts.

a. Methodological Approach

The study adopts a constructivist and design-oriented methodology, where knowledge is generated not through experimentation, but through the structured conceptualization of systemic problems and theoretically grounded interventions. The approach is informed by reflective institutional inquiry, organizational logic, and a synthesis of literature across blockchain governance, knowledge management, and educational reform.

Rather than separating literature and design, this study integrates the literature review into the modeling process. Relevant theoretical perspectives and comparative experiences in higher education were used not only to ground the design but also to inform the feasibility, sequence, and institutional logic of the proposed model—ensuring that it reflects regional realities and avoids abstract idealism.

The B-FORM model draws directly from the author's prior field-based research on topics including:

- Cryptic knowledge cultures in Georgian academic and clinical settings (Moghimi, 2025),
- Informal institutional hierarchies and their impact on commercial innovation (Moghimi & Dastouri, 2023),
- Adaptive barriers in workforce preparedness in Georgian universities (Moghimi & Gegeshidze, 2024),
- And cross-border HR accountability systems in public and private education (Moghimi & Monemizadeh, 2025).

These insights form the empirical and narrative foundation upon which the conceptual design has been iteratively built.

b. Model Design Logic and Framework Construction

The B-FORM framework was developed through a layered abstraction process, combining institutional logic with operational necessity. The design unfolded in four iterative phases:

1. Problem Mapping**:** Synthesizing empirical insights and relevant literature to identify root dysfunctions in university governance—specifically, informal power structures, limited career visibility, and the absence of transparent, merit-based systems.

2. Functional Alignment**:** Mapping blockchain capabilities (e.g., smart contracts, immutable ledgers) onto critical institutional vulnerabilities such as favoritism in budgeting and opaque staff evaluation practices.

3. Cultural Interfacing**:** Adapting the model to sociocultural realities—including resistance to change and entrenched informalism—by emphasizing phased integration rather than radical decentralization.

4. Component Structuring**:** Defining six interlinked layers as modular reform levers: strategic governance, formalization, blockchain integration, knowledge management, operational systems, and cultural transition.

The framework balances the practical realism of institutional practitioners with the analytic discipline of systems thinking, while remaining sensitive to the political, emotional, and relational dimensions of organizational reform.

c. Ethical Considerations and Reflexive Integrity

This study does not involve active human subjects and thus does not require IRB approval at this stage. However, the author has made a deliberate ethical decision to avoid simulated or fictionalized interviews, acknowledging that any attempt to fabricate field data in such sensitive institutional contexts would undermine the model's validity and violate academic transparency.

Instead, the author draws upon candid reflections and firsthand field research conducted over several years in various university systems. The model is thus informed by authentic systemic diagnosis and grounded practitioner insight—without overstepping epistemic bounds.

Future applications of this model involving interviews, system testing, or staff feedback would require formal ethical clearance through university ethical committees and alignment with GDPR or local data protection standards, particularly if piloted in the EU or Türkiye.

d. Implementation Pathway and Pilot Proposal

While conceptual, the B-FORM model is designed to be implementable in modular form. A realistic pilot could be carried out at faculty or department level, especially in universities undergoing internationalization or accreditation processes where merit-based governance is a recognized challenge.

Strategic Implementation Milestones:

- Begin with the Knowledge Management Layer: Deploy blockchain-supported contribution registries to document internal reports, mentoring activities, and committee participation—making informal work visible and institutionally acknowledged.
- Expand to Budgeting and Task Formalization: Introduce smart contracts for approving micro-grants, research incentives, and departmental budgeting, ensuring traceability and reducing discretionary conflict.
- Embed in Career Advancement Systems: Integrate verified contribution records into HR evaluation frameworks, replacing subjective promotion decisions with transparent, merit-based progression paths.

This phased approach enables institutions to introduce reform in manageable stages, testing changes within specific departments or functions before broader rollout. It avoids the risks of a full systemic overhaul while still promoting meaningful transformation. The model's layered structure allows it to adapt to different institutional sizes, legal frameworks, and cultural dynamics without compromising its integrity.

Evaluation Metrics Aligned with Model Objectives:

- Improvement in staff satisfaction related to fairness, recognition, and promotion
- Decrease in informal conflicts over budget allocation and task assignment
- Greater visibility and accountability in documenting internal knowledge contributions
- Increased adoption of task-mapping systems and contribution-based recognition platforms

4. Methodological Path and Implementation Strategy

This study, while conceptual in structure, is informed by a deep and realistic engagement with the lived realities of institutional dysfunction in Eastern European and Georgian universities. Rather than aiming to generalize or simulate empirical data, it draws upon prior published field research, organizational analysis, and direct administrative experience to propose a layered model of reform. The purpose of this section is to demonstrate how the proposed B-FORM model can move beyond theory and become a scalable, phased, and strategically manageable intervention across diverse institutional functions.

4.1 Methodological Orientation: Design Thinking with Institutional Logic

The methodological orientation of this research is rooted in **design science**, particularly within the traditions of higher education reform, knowledge management systems, and institutional innovation. The research follows a logic of "constructive contextualization," in which a conceptual model is derived from problem identification, organizational mapping, and the tactical application of technological affordances. In this regard, B-FORM functions both as a theoretical framework and a reform design architecture that can be adapted in real-world settings without necessitating a system-wide digital revolution.

This approach is especially relevant in contexts where full digital transformation is neither politically feasible nor culturally tolerated. Institutions where power flows through informal networks, discretionary influence, and hidden labor must be treated not as anomalies but as normative realities that technology must navigate, not erase. In this context, the layered composition of B-FORM is not aesthetic but strategic: it reflects a sequencing of reform entry points based on institutional receptivity and strategic priority.

The conceptual architecture was developed using triangulated insights from the author's earlier empirical works involving cryptic knowledge cultures, commercialization inefficiencies, workforce adaptability gaps, leadership development, and digital PRM integration in healthcare systems. These insights form the narrative foundation upon which the conceptual design has been iteratively built.

4.2 Institutional Logic Behind the Model

The design logic of the model begins by acknowledging a central flaw in many university systems across the region: the disjuncture between strategic vision and operational logic. Strategic plans often exist, but are weakly institutionalized. Career advancement is often politically influenced or seniority-driven. Knowledge is often disconnected from practice, and technological investments are often disjointed from both governance and incentives.

B-FORM responds to these failures by introducing a model that binds knowledge flows to strategic outcomes via blockchain-anchored trust mechanisms and KM-based formalization. It also aligns with the governance structure of most universities where authority is divided across rector’s offices, deanships, schools, financial departments, HR departments, study offices, research centers, and international affairs units. Each of these structures suffers from vertical and horizontal misalignment, which B-FORM addresses by creating a common formalization spine.

4.3 Application Architecture Across Functional Units

As institutions strive for modernization under constrained resources, structural reform must be tailored not only to strategic aspirations but also to the lived realities and internal politics of academic environments. In the Eastern European and Georgian context, each university unit operates with distinct logics, informal networks, and inherited inefficiencies. Therefore, the application of B-FORM must not be formulaic—it must be deeply contextual and institutionally dialogic. Below is a department-wise roadmap designed with administrative realism and strategic foresight in mind.

The following is a detailed proposal for how B-FORM can be deployed across key university functions:

Rector's Office:

- Use the Strategic Governance Layer to align B-FORM KPIs with the university's multi-year strategic plan and accreditation priorities.
- Implement performance dashboards showing traceable metrics of staff progression and research contributions using blockchain-based ledgers.
- Anchor the model legally within rector-issued bylaws and institutional regulations.

Schools and Deanships:

- Redesign career advancement rubrics using formalized classification systems integrated with smart contracts, considering long-standing issues of favoritism and unclear promotion criteria.
- Implement knowledge contribution points systems tied to departmental reports, student mentoring, and internal committee work—shifting the focus from mere publication count to meaningful engagement in academic life.
- Enable transparent task and workload mapping across teaching, research, and service, so that informal task-sharing arrangements are replaced with traceable, equitable role definitions.
- Encourage faculty-led governance innovations through data-backed proposals, allowing department heads and deans to pilot reforms with measurable feedback loops.

Study Office:

- Deploy blockchain-supported audit trails for student appeals, examination processing, and grading fairness.
- Track instructor workloads and curricular compliance based on verified engagement logs.

Financial and Budgeting Offices:

- Utilize smart contracts for approving and disbursing internal funding (e.g., travel grants, research incentives).
- Record budgeting decisions and committee justifications on tamper-proof ledgers to reduce discretionary conflict.
- Introduce **Ac**tivity-Based Costing (ABC) systems integrated with blockchain to more accurately allocate resources to teaching, research, and service activities, and to inform evidence-based budgeting and strategy alignment.

Human Resources (HR) Department:

- Centralize career progression systems through blockchain-enabled talent profiles that track mentorship, internal leadership roles, and professional development contributions—ensuring consistent evaluation across faculties.
- Link HR evaluations to verified outputs stored within the KM framework, creating a direct line between real contributions and institutional reward mechanisms.
- Promote transparency in promotions and reward mechanisms, reducing dependency on informal influence, particularly important in environments where personal networks often supersede documented achievement.

- Support long-term institutional stability by implementing succession planning tools and career pathway analytics, integrated into the strategic foresight efforts of the Rector's Office.
- Coordinate closely with the study and research offices to map academic roles to institutional strategy, using HR not as an administrative back-office, but as a catalyst for organizational alignment.

IT Department:

- Serve as the technical integration and coordination core, tasked with harmonizing the university's fragmented digital ecosystem. This includes linking operational data systems such as attendance tracking, examination results, internal reports, and student lifecycle databases with analytical platforms designed to generate actionable insights for strategic use by decision-makers.
- Replace disjointed departmental tools with a unified institutional data warehouse, ensuring that datasets from HR, Study Office, Financial Planning, and Research Administration are stored in standardized formats, indexed with blockchain-backed timestamps, and available through tiered access based on administrative role.
- Develop and deploy real-time institutional dashboards for deans and rectors, offering policy-relevant insights such as teaching loads, faculty knowledge contributions, project progression, and strategic budgeting alignment.
- Ensure synchronization between operational and analytical systems, enabling seamless data flow from faculty-level activity to institutional-level strategy mapping. This minimizes redundancy and supports longitudinal tracking of academic and administrative performance.
- Lead the design of interoperable blockchain APIs, allowing secure interactions between legacy university platforms (such as financial, HR, and learning systems) and the new blockchain-anchored registry. This reduces the need for full migration while enhancing traceability and data verification.
- Collaborate with internal audit units and legal offices to maintain compliance with national regulations and EU data privacy laws (e.g., GDPR). Emphasis should be placed on role-based access control, encryption, and responsible data retention protocols.
- Act as the internal incubator for future digital transformation projects, including AI-driven scheduling, adaptive learning technologies, and algorithmic analysis of knowledge flows across institutional hierarchies.

Research Offices and Scientific Councils:

- Record and verify research outputs, project deliverables, and external partnership contracts using blockchain, thereby minimizing disputes over authorship, project ownership, or fund disbursement.
- Establish a transparent research funding chain, where internal calls and results are codified, timestamped, and open for audit. This reduces perceptions of favoritism and protects against political maneuvering in grant allocation.
- Align research goals with institutional knowledge priorities by identifying clusters of excellence within the university and connecting them to the strategic roadmap managed by the Rector's Office.
- Encourage data-driven project management by giving research managers access to performance dashboards that align faculty research with resource investment and expected deliverables.

PR and International Relations Departments:

- Integrate B-FORM indicators into international visibility tools, allowing verified institutional metrics to be externally shared.
- Use a transparent model for scoring agents and international student recruiting system and evaluation process and documentation of brand knowledge and students loyalty programs.
- Use the model to support trustworthy reporting in international rankings and cross-border grants.

4.4 Strategic Implementation Phases

The model is best implemented in three phases:

1. Formalization Pilots**:** Begin by introducing career classification structures and knowledge contribution codification in selected faculties.
2. Blockchain Integration**:** Launch smart contract-based micro-transactions for research support, internal grant disbursement, or peer-review tracking.
3. Institutional Scaling**:** Scale toward full knowledge governance through B-FORM dashboards, staff progression engines, and budgeting alignment protocols.

This staged approach allows cultural alignment while producing immediate accountability benefits, such as traceable decisions, fairer task distribution, and transparent contribution logs.

4.5 Evaluation and Feedback Loops

The model's success would be evaluated not by full digital transformation, but by institutional behavior change, such as:

- Uptake of knowledge contribution systems
- Staff perception of fairness in recognition
- Reduced informal conflict around budgeting
- Measurable link between strategy and staff progression

These KPIs can be monitored by Rector's offices in collaboration with IT, HR, study offices, and finance units, using visual and anonymized analytics dashboards generated via B-FORM's blockchain back-end.

In conclusion, the B-FORM model is not just a blockchain adoption roadmap—it is a meritocratic knowledge governance architecture, designed for practical institutional transformation. It offers not only diagnostic accuracy but a multi-entry platform for structural and cultural change, grounded in realism and optimized for strategic evolution across education systems in transition.

4.6 Ethical Compliance and Research Integrity

This research is fully conceptual and did not involve interviews, surveys, or direct data collection from individuals. All institutional insights and challenges described in the study are based on the author's previous empirical work, administrative experience, and documented academic literature. No data was invented or simulated.

The goal of this project is to offer a strategic model rooted in observed realities, not to report new empirical findings. Any future application of the model involving human participants will, of course, require formal ethical review. At this stage, however, the work stands as an honest design proposal—guided by professional responsibility, not artificial claims.

5. Discussion and Implications

This section reflects on the deeper academic and institutional meaning of the B-FORM model, drawing together its architectural elements, its layered approach, and the strategic responses it offers to endemic governance challenges in Eastern European and Georgian higher education contexts. It also revisits the original research questions to assess the model's contribution in a direct, applicable, and reflective manner.

5.1 Reflecting on Institutional Transformation

The B-FORM model proposes more than a technical intervention—it envisions a cultural reset in how universities think about knowledge, trust, and advancement. At its core, it aims to transition institutions from people-dependent systems (vulnerable to informalism and favoritism) to process-driven cultures, anchored in traceable contribution, career transparency, and strategic coherence. By mapping knowledge flows and career dynamics into formal systems, the model transforms institutional memory from anecdotal and political to verifiable and merit-based.

5.2 Practical Contributions to University Governance

For university administrators, B-FORM delivers a cross-functional logic. It offers not just a reform model, but a toolkit for accountability—a way to reengineer advancement, budgeting, and recognition without disrupting the institution's identity or overloading its resources. Deans can use it to balance task distribution; HR officers to rationalize promotion; and rectors to align budgets with outcomes. Blockchain is not promoted here as a buzzword but as a trust ledger—a minimalist, verifiable back-end that enables decentralized fairness without full digital overreach.

5.3 Cultural and Strategic Implications

Strategically, B-FORM aligns with growing expectations in European higher education for performance transparency, responsible budgeting, and sustainable reform. Culturally, however, it acknowledges resistance. In systems where informal relations are power structures, formalization may be seen as intrusive or performative. That is why B-FORM is designed as modular and phased, allowing institutions to gradually build legitimacy, gain internal champions, and demonstrate incremental value without triggering organizational fear or backlash.

5.4 Revisiting the Research Questions

The following reflections directly address the research questions outlined earlier:

1. What structural and cultural barriers prevent effective adoption of knowledge management systems in Georgian universities?
   → The model demonstrates that informalism, role ambiguity, and strategic fragmentation are key barriers. These were confirmed and operationalized in the design of B-FORM's layered structure, especially in how KM is tied to career architecture and budgeting.

2. How can blockchain technology realistically support the formalization of knowledge and performance systems in higher education administration?
   → Blockchain is used not for disruption, but for minimal guarantees of transparency—applied selectively to task tracking, funding decisions, and contribution records. This approach reduces human discretion without eliminating human agency.

3. What governance, HR, and budgeting mechanisms must be restructured to enable such systems to thrive?
   → B-FORM addresses these in Section 4.3, particularly through career progression maps, ABC-based financial modeling, and the recalibration of HR from evaluator to enabler.

4. How might such reforms be sequenced and localized without overwhelming institutions already under administrative strain?
   → The model's implementation plan—pilot, integrate, scale—responds precisely to this challenge, offering realistic entry points rather than utopian overhaul.

5.5 Toward a New Institutional Mindset

The final implication is perhaps the most profound: the reform is not only structural—it is epistemological. It challenges universities to reimagine how they define legitimacy, how they reward contribution, and how they preserve institutional memory. By anchoring recognition and decision-making in knowledge rather than power networks, B-FORM invites universities to become not only better managed, but more just.

In this way, the research does not only propose a model—it advocates for a new governance consciousness.

5.6 Human and Organizational Outcomes: Toward a High-Trust Academic Culture

Beyond governance reform, the implementation of B-FORM offers deeply human-centered outcomes that are critical to institutional renewal and fairness. One of the most immediate shifts is expected in staff satisfaction, as promotion, workload, and reward systems become transparent and traceable—reducing frustration caused by informalism, favoritism, and opaque hierarchies.

Importantly, the system is designed to explicitly preserve and strengthen diversity and inclusion. Blockchain-led traceability and knowledge management formalization ensure that institutional recognition is no longer dependent on proximity to power, personal networks, or seniority, but on verified contributions. HR departments, in this model, are repositioned not merely as administrative processors but as guardians of equity, using structured data to guarantee that opportunities for advancement are distributed fairly across all demographics, including underrepresented staff, international faculty, and emerging scholars.

Students also benefit from this shift. More responsive and consistent service—across exam processing, appeals, academic advising, and support systems—becomes possible through blockchain-anchored records and interoperable systems. As departments synchronize their workflows, student-facing services become faster, fairer, and more aligned with educational goals, improving both satisfaction and trust.

Institutional synergy improves as well. When knowledge flows are connected across departments like HR, finance, IT, academic units, and research centers, the result is a shared operational logic. This reduces duplication, enhances interdepartmental understanding, and fosters a culture where strategic coordination is a norm, not an exception.

From a resource standpoint, blockchain-backed accountability mechanisms also reduce internal friction. With traceable decisions and formalized task logging, institutions save considerable time and cost by avoiding informal conflicts, rework, and miscommunication. These savings can then be redirected to support innovation, student services, inclusion initiatives, and internationalization.

Finally, the model expands the potential for research, innovation, and external collaboration. By offering trustworthy documentation of intellectual contributions and research funding flows, it helps institutions build credibility with international partners and funding agencies. It supports diverse knowledge systems, making space for interdisciplinary work, early-career researchers, and institutional learning partnerships across sectors.

In sum, B-FORM does not merely streamline operations—it helps reframe institutional culture around merit, equity, and shared purpose. It encourages universities to become not only better managed but more just, inclusive, and prepared for the complexity of global academic engagement.

5.7 Ethical Design and Governance Integrity

Any meaningful reform in higher education must be guided not only by functional improvements but also by ethical clarity. The B-FORM model is designed with an underlying commitment to fairness, inclusion, and institutional integrity—ensuring that technological tools serve justice rather than reinforcing existing hierarchies. In academic environments where informal power structures often shape recognition and advancement, the formalization of knowledge, contribution, and career progression systems presents both an ethical opportunity and responsibility.

By using blockchain to support traceable and tamper-resistant records of task allocation, research contributions, and budgeting decisions, the model reinforces procedural fairness and transparency. It also emphasizes ethical decision-making in the disbursement of internal funds, the appointment of staff to leadership roles, and the evaluation of academic labor. Rather than replacing human judgment, the system supports it through verifiable data, consistent criteria, and role-based access controls. Ethical safeguards are embedded through institutional bylaws, cross-departmental feedback loops, and privacy-respecting data governance aligned with EU standards. In this way, B-FORM aims not just to improve how universities operate—but to elevate the ethical quality of how decisions are made, how contributions are valued, and how academic communities evolve.

6. Conclusion

6.1 Summary of Contributions

This paper has presented B-FORM: a conceptual, context-sensitive architecture for integrating knowledge management and blockchain systems into the governance of universities, particularly within Georgian and Eastern European settings. The model emerged from the real institutional failures observed in multiple studies—where informalism, fragmented authority, and weak accountability undermine institutional growth, fairness, and academic quality.

By dissecting these dysfunctions and offering a layered design rooted in strategic logic, human-centered design, and administrative realism, the study proposes a new path toward traceable meritocracy, fair budgeting, and cross-functional coordination. The model's value lies not in replacing legacy systems, but in formalizing what is already informally functioning—thereby making progress visible, contributions countable, and governance verifiable.

6.2 Unique Value of the B-FORM Approach

Unlike purely technical proposals or top-down governance models, B-FORM bridges the sociopolitical culture of universities with the enabling logic of technology. Its strength lies in its modularity, gradualism, and respect for institutional identity. It does not treat blockchain as a solution in search of a problem; rather, it applies it surgically—where human discretion must be minimized, and where traceability is crucial to fairness.

Similarly, knowledge management is not presented as an administrative add-on, but as a foundation for strategic budgeting, staff development, and academic innovation. Through these integrations, B-FORM speaks to both operational needs and ethical aspirations of higher education.

6.3 Final Reflections on Change, Trust, and Reform Readiness

The core insight of this research is that reform must be navigable, not imposed. In settings where informal power drives outcomes, change cannot rely solely on regulation or digitalization. It must build trust—first by clarifying rules, then by respecting contribution, and finally by reinforcing fairness through formal design.

B-FORM proposes that blockchain and knowledge management are not just technical tools, but ethical infrastructures—when embedded properly. They help universities protect what matters: credibility, people, memory, and direction.

In this spirit, the paper invites not immediate adoption, but institutional dialogue: to pilot, adapt, and test what is possible when reform grows from within.

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Appendix A. Departmental Implementation Checklist: Operationalizing the B-FORM Model

University Unit	Strategic Entry Point	Knowledge Management Mechanism	Blockchain Role	Short-Term KPIs	Long-Term KPIs
Rector's Office	Aligning strategy with measurable outputs	KM-aligned institutional strategy dashboards	Immutable KPI recording and audit trail of strategic goals	Strategy-KPI alignment; Staff feedback dashboards	Annual performance traceability; Trust-based decision audits
Schools / Deanships	Career advancement and workload formalization	Knowledge contribution scoring; Equitable workload mapping	Smart contracts for promotions; Contribution ledgers	Participation in contribution metrics; Role clarity	Transparent career paths; Data-driven faculty engagement
Study Office	Grading and academic record traceability	Instructor feedback logs; Student lifecycle documentation	Blockchain-secured audit trail for assessments and appeals	Reduced complaint volume; Instructor workload logs	Audit compliance rates; Timely grading and progression tracking
Financial Department	Transparent budgeting and internal grant disbursement	ABC models integrated with research/service data	Smart contracts for micro-funding; Tamper-proof budget ledger	Response time to funding requests; Budget audit reports	KPI-aligned budget allocation; Reduction in discretionary gaps
Human Resources (HR)	Staff evaluation and progression	Integrated knowledge-talent profiles; Succession mapping	Transparent promotion records; Role-secured data access	Staff satisfaction; Role-to-performance mapping	Institutional stability; Reduction in favoritism-based decisions
IT Department	Data governance and system interoperability	Data lake standardization; KM/IS coordination	Blockchain timestamps for data entries; Access-level permissioning	System uptime; Integration compliance reports	Real-time dashboards; Cross-departmental data access flow
Research Office	Research fund distribution and impact alignment	Research deliverables mapping; Contribution analytics	Immutable registry of research activities and project deliverables	Time to fund release; Project milestone compliance	Alignment of research with strategy; Fair fund allocation
PR & International Relations	Institutional visibility and recruitment integrity	Reporting on verifiable KM outputs; transparent agent and loyalty scoring; documentation of	Public blockchain references to recruitment, agent scoring, and trust-based indicators	Quality of recruitment documentation; Brand recall feedback; Agent evaluation compliance	Transparent recruiting chain; Brand equity metrics; Institutional trust growth in global networks

University Unit	Strategic Entry Point	Knowledge Management Mechanism	Blockchain Role	Short-Term KPIs	Long-Term KPIs
		brand-related knowledge			

Appendix B. Strategic Implementation Roadmap for B-FORM Model

Phase	Key Actions	Challenges Addressed	Success Indicators	Timeline
Phase 1: Formalization Pilots	- Identify pilot faculties for KM contribution indexing- Design career classification schemes- Initiate basic performance dashboards	Informalism, Role ambiguity, Favoritism	Staff participation; Role clarity; Contribution visibility	Months 1–6
Phase 2: Blockchain Integration	- Implement smart contracts for promotions and internal funding- Secure grading, budgeting, and research records via blockchain- Establish tiered access to institutional data	Discretionary decisions, Record tampering, Lack of transparency	Immutable ledgers; Shortened decision cycles; Enhanced trust	Months 7–12
Phase 3: Institutional Scaling	- Develop real-time dashboards for deans and rectors- Connect financial, HR, research, and study systems to a unified data core- Monitor knowledge-flow KPIs institution-wide	Siloed systems, Cultural resistance, Strategic misalignment	Integrated systems; Policy-linked analytics; Staff and student satisfaction	Months 13–24
Phase 4: Quality Control and External Integration	- Set up monitoring unit for ongoing model evaluation- Launch external benchmarking and knowledge-sharing mechanisms- Introduce AI and feedback loops for system correction	Stagnation, Policy drift, Institutional isolation	Verified institutional KPIs; External collaboration; Adaptability over time	Months 25–36+