Smart governance through data governance: barriers and emerging trends in Moldova's banking sector

TURCAN Aurelia,
PhD in Economics, Associate Professor,
Academy of Economic Studies of Moldova
E-mail address: cce.turcan@gmail.com,

GUJUMAN Lucia,
PhD in Economics, Associate Professor,
Academy of Economic Studies of Moldova
E-mail address: gujuman.lucia@ase.md,

COLESNICOVA Tatiana,
PhD in Economics, Associate Professor,
Academy of Economic Studies of Moldova
E-mail address: ctania@gmail.com

Abstract
In the context of accelerated digital transformation, the banking sector of the Republic of Moldova is confronted with increasingly complex challenges regarding the effective implementation of a data governance framework. Data governance has become a priority issue, supported by the sustained efforts of both the National Bank of Moldova and European partners as they work together to enhance corporate governance practices, ensure data compliance and security, and introduce better risk management practices among financial institutions. Good data governance not only strengthens confidence in the banking system but has also become a cornerstone for further financial reforms. This research paper pinpoints and analyzes certain obstacles impeding the implementation of data governance policies, standards, and procedures in the local banking sector, such as resistance to change, limited technical resources, legislative gaps, and difficulties related to the integration of legacy systems. The article also discusses the latest trends to enable the positive development of data governance, including the adoption of intelligent technologies-Smart Governance-promoting transparency and opening data, and continuous development of information technology and e-governance, ICT & E-gov. The paper also puts forward practical recommendations for banking institutions and public decision-makers, based on the analysis of obstacles and opportunities, with a view to promoting consolidation in the data ecosystem, enhancing resilience and innovation in the financial sector of Moldova, while sustainably aligning with European standards.

Keywords: data governance, banking sector, smart governance, digital transformation, Republic of Moldova.

Introduction
We live in times of accelerated digital transformation, wherein data has turned out to be the cardinal strategic resource. Data isn't just a by-product of operational activities; it is a crucial link to innovation, compliance, and building trust with customers. In this environment, data governance has become a core discipline. It offers the framework that ensures data is managed as a valuable asset—that it is secure, high-quality, and used ethically and effectively to support business objectives. Smart governance through data governance: The approach is being worked out within a strategic context of digital transformation for the banking sector, merging emerging technologies with advanced

governance frameworks towards the creation of secure, transparent, and efficient data ecosystems. Data governance is a pressing issue in view of exponential growth in data volumes and increasing regulatory requirements, above all within the banking sector. While the United States and the European Union have already achieved great successes with such frameworks, for states like the Republic of Moldova, this path to a solution is full of unique challenges but also remarkable opportunities to adopt best practices and emerging technologies from the outset. In the Republic of Moldova, commercial banks process quite a significant volume of information with regard to customers, financial operations, and banking products every day. This determines the expediency of implementing an efficient data management and protection system. The relevance of this topic is given by the concurrence of several factors: on the one hand, national and international regulations impose on financial institutions an assurance of the quality, integrity, and traceability of data used both in decision-making processes and in reports to supervisory authorities; on the other hand, rapid technological development and increasingly sophisticated customer requirements are forcing banks to adopt modern and transparent data management practices, making data governance a true strategic pillar for the sustainable digital development and modernization of the sector beyond the simple obligation of compliance. The relevance of this study lies in explaining how a coherent strategic data governance framework may become a key source of competitive advantage for banks in the Republic of Moldova, contributing to meeting compliance standards and optimizing operational efficiency by enhancing the quality of decision making and strengthening trust from customers and regulators.

1. The strategic importance of data governance

The digital transition is a fundamental strategic priority of the European Union, with direct implications for economic development and digital sovereignty. The EU has developed, in the context of exponential growth in data volumes and the emergence of advanced technologies, an all-encompassing policy framework to support the digital transformation of the European economy.

The COVID-19 pandemic accelerated the digitization process noticeably, underscoring how digital technologies are important not only for economic recovery but also for enhanced sectoral resilience. Additional impetus has come from this context for the adoption of innovative technologies such as cloud computing, artificial intelligence, and high-performance computing in the financial and banking sector. [1]

Against this backdrop, the EU has scaled up its efforts to develop a secure and accessible digital space, ensuring the protection of citizens' rights, European values, and digital sovereignty. "Path to the Digital Decade" is an EU strategic program for coordinating this digital transformation at the European level.

The explosion in data volume has created a need for an appropriate regulatory framework.

Data governance in the modern world means setting up rules, policies, and standards for effective data management, utilization, and security in support of the digital economy.

Notably, the European Data Act promotes a fair and innovative digital environment by putting citizens in control of the data produced by their connected devices and boosting a data-driven economy in accordance with the principles of privacy and trade secrets protection.

Data governance is the backbone of digital transformation in the banking sector, ensuring the following:

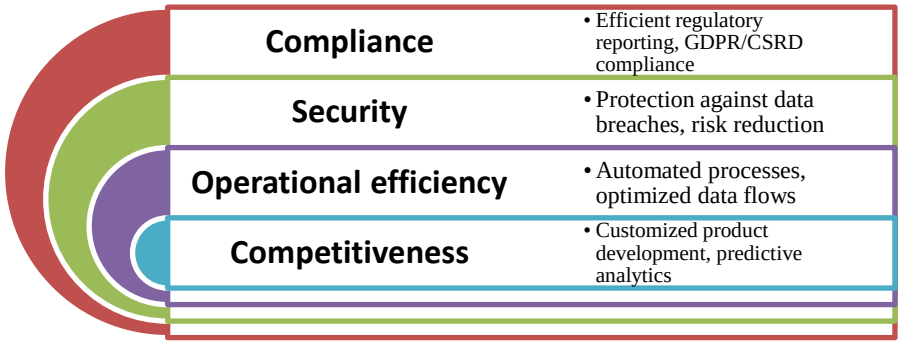


Fig. 1. The Benefits of Data Governance in Banking .

Source: Adapted from [1]

The World Bank and the IMF, among other organizations, underscore that data governance is central to financial stability and financial inclusion. In this period of accelerated digital transformation, data governance has thus become a fundamental strategic building block for the global financial and banking sector. Its growing importance is also reflected in the evolution of data governance frameworks, which have undergone a profound transformation, as shall be shown below in the table:

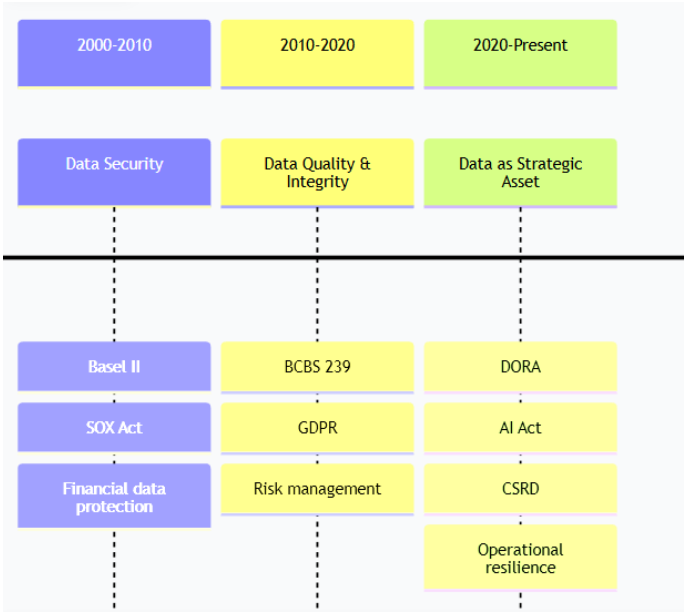


Fig. 2. The evolution of data governance in the international banking sector
Source: Adapted from BCBS (2021) and EU (2022) [2,3]

This evolution reflects a shift from a reactive approach, centered on security and compliance, to a strategic and proactive one, in which data is seen as an integral enabler of innovation and sustainable growth.

The European Commission has adopted a wide-ranging strategy in the area of data governance, of which the Data Governance Regulation is a key component. It provides a regulatory framework necessary to ensure that effective mechanisms are established to:

- Growing confidence in data intermediation services
- Encouraging responsible data sharing among entities
- Facilitate the development of common and interoperable data spaces at European level
- Make data usage transparent and controllable.
- Stimulating innovation by harnessing the potential of data

In May 2022, the Council adopted the Data Governance Act and in June 2023, a provisional agreement was reached between the Council and the European Parliament on the Data Act. [1]

These regulations create harmonized rules on fair access to data and its proper use, directly affecting both EU Member States and candidate and associated countries, of which the Republic of Moldova is a part.

It does so by focusing on a strategic approach that moves away from reactive compliance to proactive compliance, placing data governance at the core of digital transformation in the banking sector.

This paradigm shift from a defensive to a strategic view of data management reflects a deep understanding of the transformative role that data plays in the digital economy.

The development of RRPD for the banking sector in the Republic of Moldova is an obligation of compliance but also a strategic opportunity to reposition itself within the European financial landscape, transforming data from a regulatory risk issue into a strategic resource for innovation and sustainable growth.

II. Harmonization and applicability of international data governance standards in the banking sector of the Republic of Moldova

Over the past decade, the banking sector of the Republic of Moldova has been undergoing continuous transformation, actively supported by reforms initiated by the National Bank of Moldova with the purpose of increasing the stability of the financial system, the transparency of reporting, and consumer protection.

Events like the 2014 banking fraud accelerated these measures of supervision and control, such as harmonization of the local regulations with the directives and regulations of the European Union.

The Republic of Moldova's banking sector has undergone wide reforms with a view to harmonizing national legislation with European standards and regulations. The two basic laws that govern banking activity are Law No. 202/2017 on Banking Activity, dated October 6, 2017, and Law No. 548/1995 on the National Bank of Moldova, dated July 21, 1995. They are completed by secondary regulations and regulations issued by the NBM in the implementation process of EU directives such as Directive 2013/36/EU and Regulation (EU) No. 575/2013 on prudential requirements for credit institutions and investment firms. [4]

In view of effectively implementing Directive 2013/36/EU and Regulation (EU) No. 575/2013, in the period 2015 - 2017, the NBM benefited from the assistance provided by the central banks of Romania and the Netherlands within the Twinning project for enhancing the NBM capacity in the field of banking regulation and supervision - the so-called CRD IV package. [5]

This harmonization is pursued to align the Moldovan banking system with the best international practices, on the one hand, and to increase the attractiveness of the sector for investors while reducing the risks of banking activities, on the other hand. In this respect, an important part will fall to the implementation of international norms of data governance, which provide direct guidance on the aggregation, protection, and security of banking data.

The commercial banks are increasingly confronted, within the actual context of globalization, with regulatory requirements driven by the need for adequate and responsible data management. Considering the changes that have taken place within the banking sector of the Republic of Moldova and the tendency of the country to join the European Union, it will be more than natural and necessary from several points of view to comply with relevant international regulations and standards in the banking field:

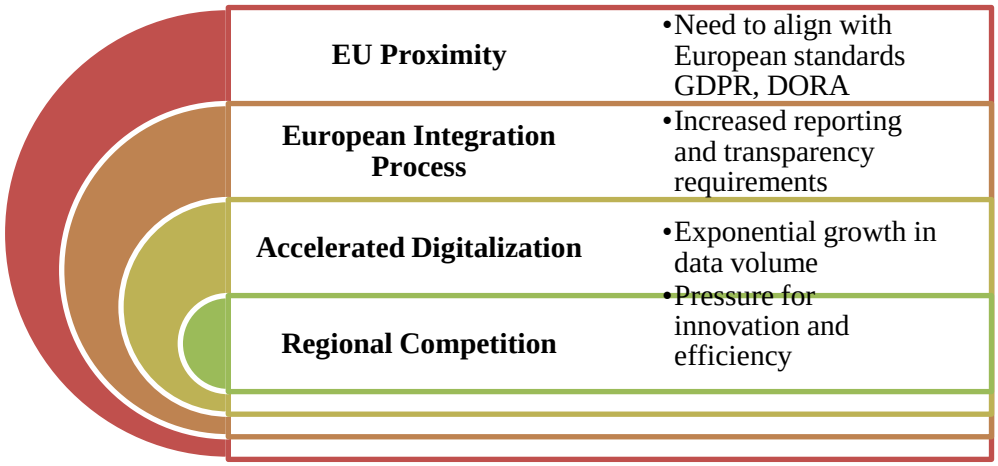


Fig. 3. Factors Driving Data Governance in the Republic of Moldova
Source: Adapted from the National Bank of Moldova (2023) [6]

These structural factors define a particular operational context of the banking sector in the Republic of Moldova, where specific features make the following challenges salient:

Operational challenges for the Moldovan banking sector:

- Fragmented data ecosystem between financial institutions
- Need for convergence with European regulations
- Pressure to modernize technological infrastructure
- Growing cybersecurity requirements

This configuration puts the Republic of Moldova in a specific place within the regional landscape, as evidenced from the comparative analysis below:

Table 1. Positioning of the Republic of Moldova in the Regional Context

Country	**Data Governance implementation level**	**Main Challenges**
Romania	Tertiary	Integration of complex systems
Republic of Moldova	Emerging	Limited resources, legacy systems
Ukraine	Medium	Consequences of regional conflict

Source: Own analysis based on World Bank (2023) [7]

In this context, data governance for the Republic of Moldova is not just a technical requirement, but also a strategic opportunity to:

• Accelerating integration into the European financial space
• Consolidating the stability of the financial system
• Supporting the national digital transformation process
• Attracting foreign investments [8]

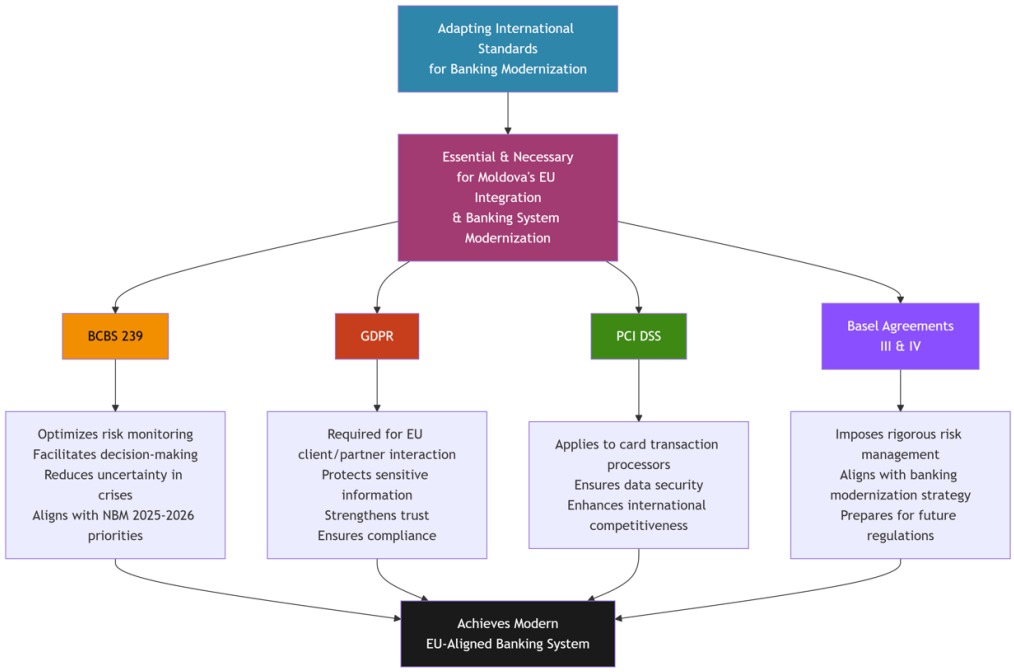


Fig. 4. Adaptation of international standards to the banking system in the Republic of Moldova:
Source: adapted from the Digital Transformation Strategy 2024-2030. Ministry of Digital Development of the Republic of Moldova [8]. Figure generated by AI [accessed on 29.11.2025]

This diagram presents the adaptation of key international standards, which is not only desirable but also highly necessary for the modernization of the Moldovan banking sector and its integration into Europe. Every standard pertains to particular aspects that are very important, from risk monitoring (BCBS 239) and data protection (GDPR) to transaction security (PCI DSS) and full risk management (Basel III/IV-all) working to establish a modern competitive banking system to meet European standards and priorities of the National Bank of Moldova.

By implementing BCBS 239 (officially known as "Principles for the Effective Aggregation of Risk Data and Risk Reporting," introduced by the Basel Committee on Banking Supervision, BCBS, in 2013 in response to the deficiencies revealed during the global financial crisis of 2007-2008 [9]), financial institutions in Moldova are enhancing their risk monitoring capabilities, which allow management to make decisions with less

uncertainty in crisis situations-the main directions of the NBM banking supervision for the period 2025-2026. [10]

Although the GDPR or General Data Protection Regulation is a European Union legislative framework, adopted in 2016 and applicable since 2018, it is designated to protect personal data and standardize data protection legislation; financial institutions in the Republic of Moldova often operate with European customers or partners, necessitating adherence to these regulations. In this way, implementing a GDPR-compliant data governance system significantly enhances sensitive information protection and helps build up better trust from their customers. Noncompliance with GDPR could have significant penalties-some as high as 4% of global annual turnover-potentially causing severe damage to the institution's reputation.

The PCI DSS standard means the Payment Card Industry Data Security Standard, already at version 4 in 2023, which is a global standard that defines obligatory requirements for the safe management of payment card data for all institutions processing this kind of data. It is directly applied only to institutions processing card transactions-a sector of relevance when it comes to banks in the Republic of Moldova. Banks that comply with PCI DSS actively protect not only their critical information but also conform to international requirements, which increase their international competitiveness.

The BASEL agreements obliged banks under Basel III and, soon to be initiated, Basel IV, to have stringent risk management based on detailed reporting and orderly internal processes.

In the Republic of Moldova, the application of these agreements corresponds to the strategy of banking modernization, which contributes to the establishment of systems of data governance that support the accurate evaluation of risks. The failure to comply with the BASEL agreements results in higher capital requirements, restrictions on banking activities, and interventions by the regulating authorities, which may involve serious sanctions. [11]

Given the European context and the need for international alignment of standards, this analysis will be focused on current barriers and trends related to data governance in the Moldovan banking sector. Therefore, the analytical framework developed will enable the creation of effective strategies in terms of the digital transformation of this area, so important for the country's economic development.

Therefore, any comprehensive study of the opportunities regarding data governance in the Moldovan banking sector would remain incomplete without its parallel analysis of barriers and trends. An integrated approach to these three dimensions—opportunities, barriers, and trends—is indispensable for developing a coherent national strategy in this area, which is crucial for the country's economic development.

III. Current barriers and trends in data governance

Even though a banking organization realizes the importance of good data governance, there are particular barriers to effectively implementing associated policies, standards, and processes. The following represent the specific barriers to the banking market in the Republic of Moldova, along with recent trends that might have a positive influence on the evolution of data governance within the local banking sector.

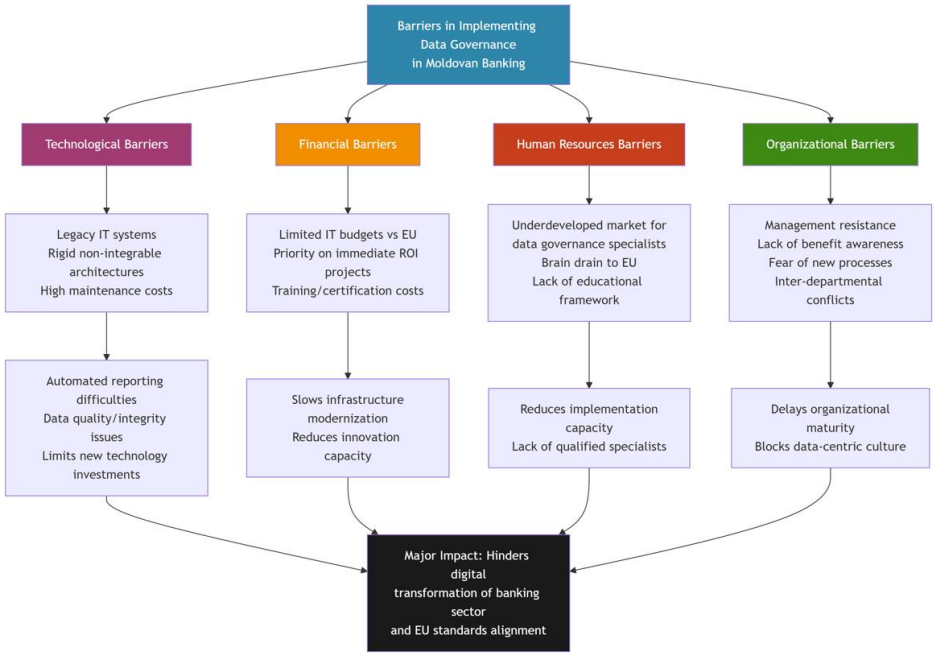


Fig. 5. Barriers in Implementing Data Governance in Moldova's Banking Sector

Source: Own analysis based on NBM data and sector reports 2023 [12]

Figure generated by AI [accessed on 29.11.2025]

Let's take a closer look at the barriers to implementing data governance in the banking sector [13].

1. Outdated, or "legacy," technological systems

In the Republic of Moldova, many banks still operate with old systems developed in the technological contexts of the past.

These are legacy systems, often based on technologies and architectures that do not integrate easily with modern data management platforms. Many times, they are rigid, hard to update, and unable to integrate efficiently large volumes of data from multiple sources. This has been well documented in literature, such as studies by consulting firms like Gartner and McKinsey, who frequently raise the difficulties related to out-of-date technology systems within the banking sector. Thus, banks face the following challenges:

• Difficulties with automating reporting and efficiently aggregating data;

• Issues with ensuring the integrity and quality of data;
• High maintenance costs that impede investments in new technologies.

2. Limitations of financial and human resources

Data governance is a process that requires substantial investment in both technological infrastructure and human capital. For a commercial bank in the Republic of Moldova, it may be hard to sustain this investment in relation to several factors:

Limited IT budgets: Banks in the Republic of Moldova operate in a constrained economic environment compared to EU banking institutions. Therefore, budgets for IT system development and data governance implementation are often below the optimal level that would be needed.

Prioritization of other projects: Without regulatory pressure, which exists because of BCBS 239 in the EU, many banks in Moldova would divert resources to projects that have immediate return on investment, like digital banking or credit products, and would not prioritize projects without such clear and immediate returns, like data governance.

Some of the key reasons involve: Lack of qualified specialists due to the underdevelopment of the labor market concerning data governance, data quality, or metadata management. The local skills shortage is influenced by the missing formal educational framework and professional exodus to EU countries.

Training Costs: For internal training of specialists, banks should invest in training and international certifications, such as DCAM or DAMA-DMBOK; this may be quite costly for a medium-sized or even small banking institution.

3. Organizational resistance to change

The implementation of an effective framework of data governance requires significant changes in the internal process and organizational culture. In Moldovan banks, as well as in the majority of companies in the Republic of Moldova, significant resistance to such changes is still present, either due to the senior management's conservative thinking, or lack of awareness regarding concrete benefits that data governance can bring, or the staff's fear of new processes perceived as complex and time-consuming.

Organizational culture can be a critical factor: if employees do not understand the relevance of data governance or if management does not provide sufficient support, the implementation of initiatives will face internal resistance. Conflicts in defining responsibilities and workflows are generated by differences in mindset between departments, IT vs. business, risk vs. marketing, etc.

Counterbalancing such a perception may be done through awareness and training campaigns; data governance is perceived as yet another bureaucratic burden and should instead be communicated as a strategic competitiveness factor. Internal specialist training requires investment in training and international certifications-e.g., DCAM, DAMA-

DMBOK-which for a medium or small banking institution may represent a remarkable cost. [13]

Emerging trends in banking Data Governance

Data governance is rapidly changing in the wake of accelerated digitization and rising regulatory pressures, embracing a whole series of new technologies, roles, and approaches. These studies also point to a number of major trends that are currently shaping how banking and financial institutions manage and utilize data.

Artificial Intelligence and process automation The integration of Artificial Intelligence and process automation-Robotic Process Automation-is a radical change in how organizations govern data. These technologies facilitate the automatic identification and correction of data errors, the classification of digital content, and the application of governance policies on a large scale. AI systems learn from historical data to identify anomalies, duplicates, or non-conformities in data flows. Automation reduces manual effort and increases the operational efficiency of the data governance teams.

The relevance of this trend is that it significantly reduces human error, improves data quality and integrity, and simplifies reporting and decision-making processes by automating internal data flows.

Several factors are driving the rapid evolution of data governance in the banking sector, grounded in technological and regulatory trends that are changing the way financial institutions manage and use their data assets.

Table 2. Characteristics of current trends in banking Data Governance

Artificial Intelligence & Process Automation	The use of AI and Robotic Process Automation has been fundamentally changing Data Governance practices. These technologies make it possible to automatically detect and correct errors, classify digital content, and apply policy on a large scale. An AI system can be taught from historical data to recognize anomalies, duplicates, and issues in data flows regarding compliance concerns, thereby broadly minimizing manual effort in improving operational efficiency. As predicted by Gartner [14], in 2025, more than 80% of data governance strategies will include AI components in their classifying remediation and continuous monitoring of data.
Cloud Computing Migration	The use of cloud infrastructures, be it public, private, or hybrid, is one of the big trends in the banking industry. Cloud platforms provide scalability, flexibility, and fast data access. However, they create huge challenges for governance around access control, data localization, confidentiality, and regulatory compliance. Because of this, financial organizations are under an obligation to adopt very strict policies concerning cloud data governance while observing the relevant international standards like GDPR and ISO/IEC 27018, among others, as well as the requirements of the supervisory authorities. [16] Cloud transition in financial organizations is significantly related to having a robust data governance framework that ensures control, visibility, and compliance throughout the process of digital transformation.

Big Data & Advanced Analytics	The volume and complexity of data from banking systems and customer interactions are increasing exponentially. Big Data and advanced analytics have just become critical tools that underpin informed decision-making, risk management, and personalization of financial services. In practice, effective utilization of such data sources calls for robust governance that assures data quality, consistency, and integrity. Big Data can enable banks to analyze large volumes of data from varied sources rapidly and efficiently for better understanding customers and optimizing strategic decisions.
ESG Data Governance Requirements	ESG information reporting requirements have increased significantly during the last couple of years. Data for ESG reporting needs to be traceable, transparent, and aligned with compliance, while its integration into data governance constitutes a part of bank sustainability strategies. The European Union's Corporate Sustainability Reporting Directive, CSRD [17], puts concrete demands on the quality and control of ESG data, which forces banks to adopt rigorous data governance practices. [18] The European Banking Authority recommends integrating controls on data governance into the process of managing ESG risks from the early stages of the data life cycle.
Data Democratization & Self-Service Analytics	Data democratization-a representation of extending data access to non-technical users with support from self-service analytics platforms-is one of the notable trends that have emerged in 2024. This is a reflection of a deep shift in data governance models where the emphasis is not on centralized control but rather on balancing access with responsibility. This, in turn, helps get rid of data silos and accelerates decision-making while setting up an organizational culture of being data-oriented. However, this extended access brings new challenges in governance: ensuring data quality, traceability, and usage compliance.

Source: Adapted from [14,16-19]

The convergence of these trends is transforming banking data governance from a compliance-focused function to a strategic enabler of digital transformation. Although each trend has substantial benefits, there are particular challenges associated with its implementation, and successful strategies will need to be tailored to institution size, technological maturity, and the regulatory environment. The best implementations often involve phased approaches that focus on quick wins while laying the foundations for longer-term strategic ambitions.

Conclusions

Data governance as a means for transitioning to a Smart Governance model is not an option but a necessity for the sustainability of the banking sector in Moldova.

The role of data governance has been put front and center in the digital transformation in the banking sector in Moldova. Significant barriers to effective implementation of data governance frameworks, together with emerging global trends offering opportunities for modernization, have been identified. These barriers can be overcome through a strategic approach that combines emerging technologies with appropriate cultural transformation.

Smart data governance is not just a compliance requirement but also a strategic opportunity for the Moldovan banking sector. Accordingly, banks aligning with international standards and following emerging trends will further enhance their resilience, competitiveness, and positioning within the European financial landscape.

The successful implementation of Data Governance will contribute considerably to:

• Accelerating integration into the European financial space
• Enhancing risk management and financial stability
• Increasing the confidence of customers and international partners
• Developing a competitive and sustainable digital economy

Based on the above, some strategic recommendations can be made for the banking system and policy makers.

For commercial banks:

• Modernize legacy systems in steps or phases
• Invest in training and retention programs for specialists
• Institute governance policies and procedures that are appropriate for the institution's size
• Foster an organizational culture of data-driven insights and innovation

Policy makers,

• Strengthen the regulatory framework that supports governance standards.
• Provide permanent harmonization of national regulations with European standards
• Develop educational partnerships for skills training
• Create incentives for investment in modern technologies

Therefore, investment in data governance is not only a key but also a catalyst for the digital transformation and sustainable economic development of the Republic of Moldova. The Moldovan banking sector may finally emerge stronger in the European financial landscape by moving to adopt smart data governance strategically, becoming a pillar of the future digital economy.

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