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A DIGITAL MATURITY OF INSTITUTIONS IN POLAND – AN ATTEMPT AT IDENTIFICATION

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Purpose: The purpose of this article is to identify and assess the level of digital maturity among institutions in Poland, with a focus on distinguishing patterns between public and private sector organizations.
Design/methodology/approach: The study combines a systematic literature review with an empirical survey conducted among representatives of Polish institutions. The survey, based on a 7-point Likert scale, examined eight dimensions of digital maturity.
Findings: The results indicate a moderate level of digital maturity across both public and private institutions, with notable differences in specific areas. While public institutions demonstrate higher maturity in regulated areas such as data management and infrastructure, private institutions score higher in digital leadership and cultural readiness. However, both sectors exhibit insufficient levels of innovation and agility, confirming that technological development alone does not ensure comprehensive digital transformation.
Research limitations/implications: This study is limited to the Polish context and uses self-reported data, which may be subject to bias. Future research could incorporate comparative studies across different countries or sectors, and expand with qualitative methods to explore internal organizational factors that support or hinder digital maturity.
Practical implications: The findings offer practical insights for decision-makers and policymakers aiming to develop strategies for digital transformation. They highlight the need to support leadership development, cultural change, and integrated digital strategies beyond infrastructure upgrades. The results may inform the design of targeted support programs, especially for public institutions lagging in cultural and strategic areas.
Social implications: Digital maturity has a significant impact on access to services, transparency, and responsiveness of institutions. A higher level of digital readiness in public institutions can enhance citizen trust, inclusivity, and democratic participation. Moreover, aligning digital efforts with sustainability goals can contribute to responsible innovation.
Originality/value: This paper provides a rare empirical insight into the state of digital maturity in Polish institutions, bridging theoretical models with real-world application. It delivers a comparative analysis between public and private sectors and highlights the multidimensional nature of digital maturity. The article is relevant for scholars, practitioners, and public administrators engaged in digital policy and transformation.
Keywords: Digital maturity, public institutions, private sector, digital transformation, Poland.
Category of the paper: Research paper.

1. Introduction

Modern organizations, both public and private, face the necessity of adapting to a dynamic technological environment. Digital transformation has become a key driver of competitive advantage, determining an organization's capacity for adaptation, innovation, and value creation for stakeholders (Kane et al., 2015; Westerman et al., 2012)

One of the fundamental issues accompanying this process is digital maturity—understood as the organization's ability to strategically, organizationally, and technologically manage the digitalization process (Schumacher et al., 2016). This maturity encompasses not only the degree of technological implementation (so-called digital intensity) but also the capacity to manage change, develop an organizational culture, engage employees, and integrate digital solutions across various operational areas (Westerman et al., 2012; Yılmaz, 2023).

The literature offers multiple conceptualizations of digital maturity. Kane et al. (2015) argue that the success of digital transformation is determined not merely by technological investment but by a coherent strategy and the ability to reshape organizational structures. Similarly, Berghaus and Back (2016) distinguish stages of digital maturity in the context of business transformation, emphasizing the importance of innovation, leadership, and customer orientation. De Carolis et al. (2017) also highlight the need for a systemic approach to digital readiness, pointing out that organizations should develop integrated competencies in data, automation, and process management.

In the Polish context, research by Kucharska and Rostek (2021) reveals significant disparities in digital advancement among higher education institutions. Their findings show that while most universities have implemented elements of digital infrastructure, many continue to face cultural, competency-related, and organizational barriers that hinder full transformation.

It is also worth noting that, according to Yılmaz (2023), digital maturity should be understood holistically—not as a collection of isolated initiatives, but as an organization's ability to synchronize strategy, technology, and workplace culture in pursuit of sustainable development and long-term adaptability.

The aim of this article is to identify the level of digital maturity among institutions operating in Poland—both public and private—taking into account their ability to implement, integrate, and further develop digital solutions. The article adopts an empirical approach based on the analysis of quantitative data collected using a 7-point Likert scale and refers to key dimensions of digital maturity identified in the literature.

2. Digital maturity – definitions and conceptual background

The concept of digital maturity has gained prominence in the context of organizational digital transformation, becoming a key element of development strategies in both the private and public sectors. Despite the growing number of empirical studies and theoretical models, there is no single, universally accepted definition of digital maturity. Instead, the term is interpreted through various lenses—strategic, technological, cultural, and organizational (Kane et al., 2015; Berghaus, Back, 2016; Schumacher et al., 2016; Thordsen, Bick, 2023; Vavura, Matei, 2024; Alexandrov et al., 2019).

In recent years, there has been a noticeable increase in scholarly interest in this subject. The bibliometric analysis by Vavura and Matei (2024) shows that digital maturity has become one of the key research areas within digital transformation management. At the same time, an increasingly emphasized perspective highlights the need for a holistic approach that integrates technological, organizational, and cultural dimensions—a position supported by studies conducted in Central and Eastern Europe (Adamczewski, 2018).

From a strategic perspective, digital maturity refers to an organization's capacity to integrate digital technologies with the achievement of strategic objectives. Kane et al. (2017) describe it as "a systematic preparation to adapt to the conditions of continuous digital change," while Westerman et al. (2014) emphasize the integration of operations and human capital within digital processes.

The technological perspective focuses on the degree of digital solution implementation. Schumacher et al. (2016) define digital maturity as the extent to which Industry 4.0 technologies are implemented within organizational structures and processes. Models from this perspective often rely on metrics related to IT infrastructure, process automation, and data analytics tools.

The cultural-organizational approach recognizes the significance of internal norms, values, and behaviors as factors supporting digital transformation (Berghaus, Back, 2016; Aslanova, Kulichkina, 2020). In this view, maturity is not solely about technology but also about changes in thinking and organizational behavior. Aslanova and Kulichkina (2020) define digital maturity as an organization's ability to integrate digital and managerial resources in a way that enables effective transformation while maintaining cultural and organizational coherence.

Holistic approaches perceive digital maturity as a complex capability of organizations to synchronize strategy, technology, people, and processes (Yılmaz, 2023; Chanias, Hess, 2016). It is seen as an organizational competence that allows not only adaptation but also the proactive use of digital transformation for value creation. Yılmaz (2023) emphasizes that digital maturity represents a level of competence that enables an integrated response to the challenges of digital transformation. Berghaus and Back (2016) present a seven-dimensional model that includes culture, strategy, structure, and competencies.

Similarly, de Carolis et al. (2017) argue that digital maturity results from the coordinated development of technological and managerial resources, which enables coherent and sustainable organizational transformation.

Below is a review of selected definitions of digital maturity. For the purposes of further analysis, the definitions have been organized according to their dominant approach: strategic, technological, cultural-organizational, and holistic.

Table 1.
Selected definitions of the concept of Digital Maturity

Author	Definition	Dominants
Kane et al. (2017)	„Digital maturity – how organizations systematically prepare to adapt consistently to ongoing digital change. Digital maturity draws on a psychological definition of 'maturity' that is based upon a learned ability to respond to the environment in an appropriate manner"	Strategic
Westerman et al. (2014)	„Digital maturity is about integrating your organization's operations and human capital in digital processes and vice versa"	Strategic
Chanias, Hess (2016)	„Digital maturity describes what a company has already achieved in terms of performing transformation efforts and how a company systematically prepares to adapt to an increasingly digital environment in order to stay competitive"	Holistic
Shahiduzzaman et al. (2017)	„Organizations reach the highest level of maturity when they have both a strong digital foundation and a good understanding of how to leverage this foundation for a strategic business advantage"	Holistic
Berghaus, Back (2016)	„Digital maturity models consist of dimensions and criteria which describe areas of action and measures in various levels which indicate the evolution path towards maturity"	Cultural-organizational
Schumacher et al. (2016)	„The maturity model proposed defines digital maturity as the level of implementation and integration of Industry 4.0 technologies within the company's processes, systems, and organizational structure"	Technological
Yılmaz (2023)	„Digital maturity is not a technological state only but an integrated competence level in which organizations can effectively synchronize technology, strategy, people, and processes to respond to digital transformation challenges"	Holistic

Source: Own compilation.

In response to the need for a measurable approach to managing digital transformation, the past decade has witnessed the emergence of numerous Digital Maturity Models (DMMs). These models are designed to assess the current level of an organization's digital maturity and to indicate potential directions for further development (Berghaus, Back, 2016; Gökşen, Gökşen, 2021).

The architecture of DMMs is typically multidimensional—covering areas such as digital strategy, leadership, organizational culture, IT infrastructure, innovation, process automation, and data management (Fernandez-Perez et al., 2024). Organizations are evaluated according to defined stages of maturity—from the nascent phase, through defined and integrated levels, up to the stage of advanced innovation (digital innovator) (Thordsen, Bick, 2023).

It is worth noting that despite the growing popularity of DMMs in managerial practice, their academic value has been questioned. Researchers point to the lack of standardized evaluation criteria and insufficient empirical evidence supporting the link between declared maturity levels and actual organizational performance (Teichert, 2019).

Alternative approaches have also emerged in the literature, focusing not on organizations, but on individuals. Hofmans et al. (2023) proposed the Digital Maturity Inventory (DIMI)—a tool designed to assess an individual's capacity for responsible, conscious, and adaptive use of digital technologies. DIMI encompasses ten domains, including digital autonomy, competencies, emotions, digital citizenship, and impulse regulation. The analysis is based on network modeling and reveals internal interdependencies among dimensions of maturity.

Digital maturity is also gaining significance in the education sector and public administration. Fernandez-Perez et al. (2024) emphasize that well-designed models can support institutions in strategic planning and service quality improvement. Đurek et al. (2018) highlight the importance of digital education and civic competencies in fostering sustainable digital development.

3. Institutions in Poland

The contemporary institutional landscape of Poland is characterized by significant diversity in terms of ownership forms, organizational objectives, and the degree of openness to technological change. Broadly speaking, institutions are classified as either public or private. Each of these groups plays a distinct role in socio-economic processes and operates under different legal and market conditions.

Public institutions are organizations established by the state or local government to perform public functions—they operate in the public interest rather than for profit, which constitutes their most distinguishing feature compared to private entities (Heffner, 2015). They are primarily funded through the state budget, although they may also obtain supplementary funds from off-budget sources. From a legal standpoint, public institutions correspond to the broader concept of public administration entities, including governmental and local government bodies, state legal persons (e.g., public organizational units such as administrative establishments), and certain private-law entities that carry out public tasks (e.g., municipal or state-owned companies) (Zaborowski, 2015).

Private institutions include both sole proprietorships and commercial law companies (e.g., limited liability companies and joint-stock companies) owned by private individuals or shareholders. Private institutions do not benefit from state authority privileges or public funding—they are maintained through revenue from operations or private donations. Their primary goal is typically profit generation or the pursuit of private interests, in contrast to the public mission typical of the public sector.

In economic literature, private enterprises are often classified according to the type of business activity they conduct. Most generally, three main categories are distinguished: manufacturing enterprises, trading enterprises, and service enterprises.

- A manufacturing enterprise is involved in the production of tangible goods. This may include operations in the agricultural, industrial, or construction sectors—the core of such activity lies in transforming raw materials, energy, and other production factors into finished products. Examples include a furniture factory, an industrial plant, or a farming enterprise (Lichtarski, 2005).
- A trading enterprise focuses on the exchange of goods—purchasing and selling products (or in some cases, services) on the market. Trading companies act as intermediaries between producers and consumers. Examples include a food wholesaler or a chain of retail stores (Kożuch et al., 2004).
- A service enterprise provides various types of services to clients. These services may be intangible (e.g., financial, consulting, or educational services) or tangible (e.g., repairs, transport). Examples of service enterprises include an IT company providing software services, an accounting office, a transportation firm, or a travel agency (Kożuch et al., 2004).

It should be noted that many companies today operate mixed business models and cannot be clearly classified into a single category—for instance, an electronics manufacturer may also offer repair services, while a trading company may provide purchase financing options (Herman, 2006). Nonetheless, the division into manufacturing, trade, and services remains analytically useful and is frequently applied in statistics and literature, as it reflects fundamental differences in the nature of economic activities.

Private institutions tend to demonstrate greater flexibility in implementing new digital solutions and are generally more inclined to collaborate with external partners (Polyanska, 2022; Viryala, 2023).

As emphasized in the literature, the institutional environment has a significant impact on the pace and quality of digital transformation (Schumacher et al., 2016). Public institutions often operate under more formal and legal constraints, but they also have the potential to shape standards for digital accessibility, data protection, and transparency. In contrast, private institutions—driven by goals of efficiency and competitiveness—tend to adopt modern technologies and business models more rapidly.

In the context of sustainable development, the ability of institutions—regardless of sector—to integrate environmental, social, and ethical considerations into digital processes is becoming increasingly important. De Carolis et al. (2017) argue that digital maturity requires the coordinated development of technological and managerial competencies, which enables the responsible implementation of innovation. In Poland, there is still a lack of comprehensive strategies that link digitalization with climate and social goals, posing a challenge for both the public and private sectors.

4. Research approach

While the literature review presents various conceptual models of digital maturity—ranging from strategic and technological to holistic and cultural-organizational perspectives—the empirical part of this study is based primarily on the frameworks proposed by Rossmann (2018) and Petzolt et al. (2022). These models were selected due to their multidimensional structure, empirical validation in institutional settings, and adaptability to both public and private sector organizations. Unlike narrowly focused models that emphasize either infrastructure or culture, the adopted frameworks allow for a balanced assessment of digital strategy, leadership, competencies, innovation, and governance. Their application also reflects the need for a comprehensive yet practical tool capable of capturing the complexity of digital transformation in a diverse institutional environment. Nonetheless, future studies may explore alternative or hybrid models to further test the robustness and cross-sectoral applicability of digital maturity constructs.

The empirical part of the article is based on a quantitative study aimed at assessing the level of digital maturity of institutions in Poland. The research employed a survey method using a structured questionnaire that included 73 diagnostic statements related to various dimensions of digital maturity, evaluated on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree).

The structure and content of the questionnaire were developed based on established maturity models and validated instruments from previous studies. The conceptual foundation was drawn from Rossmann's (2018) model, as adapted in Salume et al. (2021), and from the maturity framework for SMEs proposed by Petzolt et al. (2022). These models emphasize the multidimensional nature of digital maturity and are widely applied in institutional and enterprise-level assessments of digital transformation.

The survey items were grouped thematically into areas reflecting key aspects of digital transformation, including:

- strategic orientation,
- digital leadership and organizational culture,
- digital competencies,
- customer data and analytics,
- IT infrastructure and systems,
- innovation and agile product development,
- internal and partner-driven process automation,
- data governance and privacy.

In addition, the questionnaire included demographic and organizational descriptors such as gender, age, education level, job position, employment tenure, type of organization, ownership structure, sector of activity, company size, and founding year.

A total of 308 complete questionnaires were collected in 2025. The respondents represented a wide range of institutions operating in Poland, including public and private entities from sectors such as education, culture, administration, and services.

The quantitative research on digital maturity revealed a moderate level of advancement in digital transformation among Polish institutions. Comparative analysis showed significant differences between public and private sectors as well as across specific areas of institutional functioning.

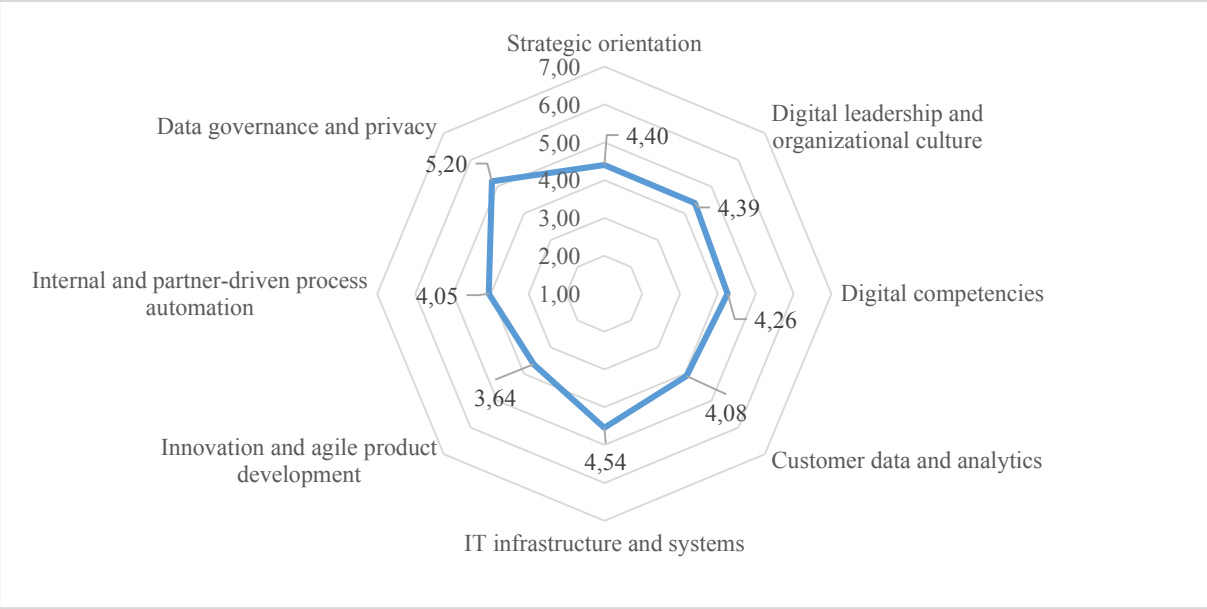

Figure 1. Digital maturity in public institutions.

Source: Own compilation.

In public institutions, the highest levels of digital maturity were observed in the areas of data management and privacy (5.20) as well as IT infrastructure (4.54). These results suggest that public institutions are effectively adapting to regulatory requirements regarding personal data protection and are investing in modern technological infrastructure—likely as a result of targeted government support and EU funding for the digitalization of public administration.

Slightly lower values were recorded in strategic orientation (4.40) and in digital leadership and organizational culture (4.39), indicating the presence of barriers stemming from conservative management structures and limited decision-making flexibility. The lowest level of maturity was observed in the area of innovation and agile product development (3.64), pointing to significant procedural constraints and insufficient support for innovation-related activities within public sector structures.

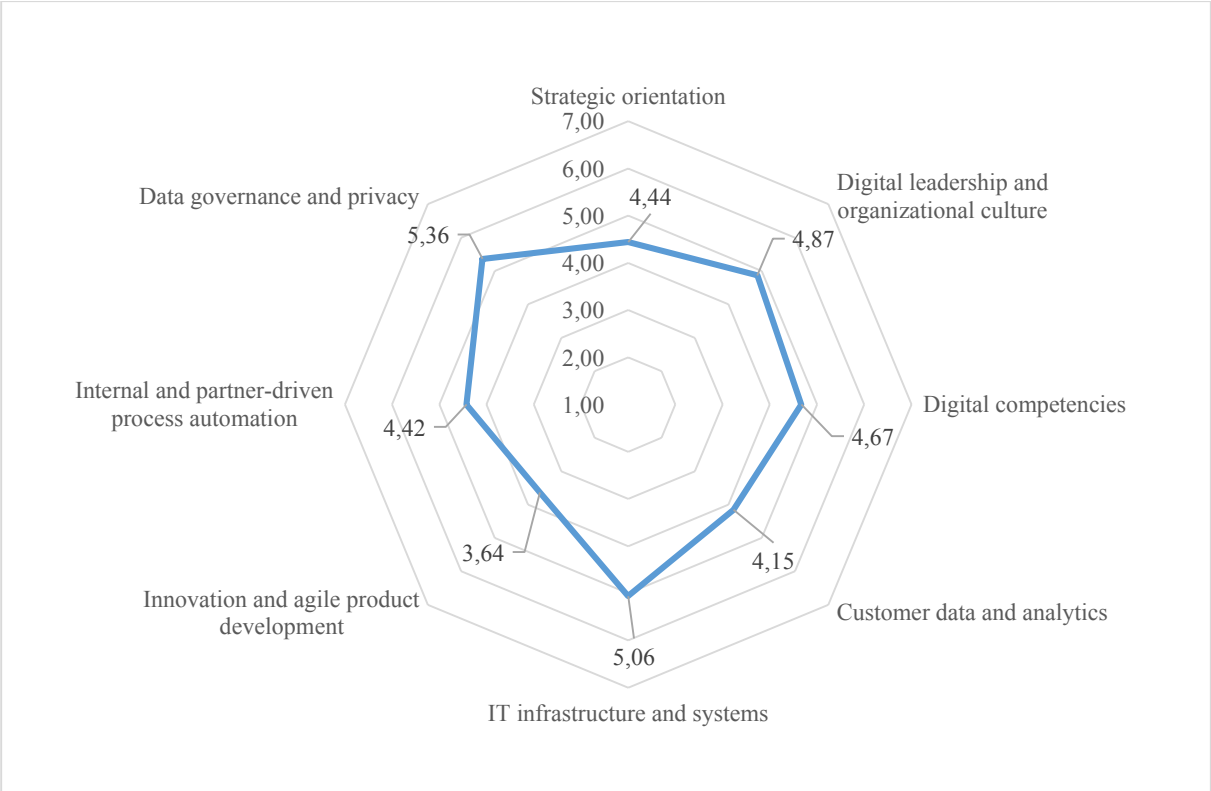

Figure 1. Digital maturity in private institutions.

Source: Own compilation.

Private institutions exhibit higher levels of digital maturity, particularly in the areas of data management and privacy (5.36), IT infrastructure (5.06), and digital leadership and organizational culture (4.87). These elevated scores reflect the private sector's greater adaptability to rapidly evolving technologies, as well as its higher organizational and cultural flexibility in managing digital change. Digital competencies in this sector are also rated higher (4.67), which can be linked to active investment in workforce development and better access to specialized training.

However, similar to public institutions, the private sector also demonstrates the lowest level of maturity in the area of innovation and agile product development (3.64). This points to a general deficit in experimentation culture and limited practical application of agile approaches in business environments.

The findings indicate a need for the implementation of comprehensive digitalization strategies that go beyond technological investments. Such strategies should also emphasize the development of digital competencies, the promotion of an innovation-friendly organizational culture, and the strategic integration of digital initiatives with established sustainable development goals. Particularly important is the continued advancement of qualitative research to better understand specific barriers and identify best practices that could accelerate the digital transformation of Polish institutions.

5. Discussion

The conducted empirical study enabled a comprehensive analysis of the level of digital maturity among institutions in Poland and confirmed that digitalization does not progress uniformly. The results reveal a moderate level of maturity in both public and private sectors, with noticeable differences across specific dimensions.

In line with earlier literature reviews (Schumacher et al., 2016; de Carolis et al., 2017), the implementation of technology alone does not guarantee digital maturity unless it is accompanied by the development of managerial and cultural competencies. This thesis is confirmed in the study—the highest scores in both sectors were observed in the areas of IT infrastructure and data management and privacy. In the public sector, this may stem from regulatory pressure, while in the private sector it may reflect the need for market analytics. These findings align with the conclusions of Kane et al. (2015), who argue that organizations investing in technology without reshaping their operational culture fail to achieve full transformation.

A key area of divergence was found in organizational culture and digital leadership—private institutions scored higher, indicating greater flexibility in decision-making and stronger managerial engagement in the transformation process (Polyanska, 2022; Viryala, 2023). In contrast, the low results in innovation and agility in public institutions point to procedural constraints, limited autonomy, and weaker experimentation mechanisms—an observation also supported by Andersen et al. (2023) in their study of public administration.

Despite these differences, the private sector likewise did not exhibit high maturity in innovation and agile product development, suggesting that agile approaches and a culture of experimentation are not yet deeply embedded in Polish organizations. A similar conclusion is drawn by Berghaus and Back (2016), who emphasize that digital maturity requires the parallel development of organizational processes, culture, and leadership—not just technical infrastructure.

Digital transformation should be embedded within the logic of sustainable development—taking into account environmental responsibility, transparency, service accessibility, and social participation (de Carolis et al., 2017). Only such an approach enables the creation of digitally mature institutions capable of sustained adaptation in conditions of uncertainty and constant change.

Although the survey instrument did not explicitly capture structural or contextual obstacles, the observed differences in maturity levels may be partially explained by factors such as institutional size, geographic location, or access to external funding sources. Smaller organizations, particularly those operating in less urbanized regions, may face disproportionate challenges in attracting digitally competent personnel, modernizing infrastructure, or accessing innovation networks. Moreover, institutional inertia, limited change management capacity,

and a lack of leadership continuity may further inhibit digital progress. Future research would benefit from incorporating these variables explicitly into the analytical framework, allowing for a more granular understanding of the mechanisms that enable or constrain the digital development of Polish institutions.

The findings of this study may serve as a foundation for designing public strategies to support digitalization—such as educational initiatives, the development of leadership competencies, flexible financing mechanisms, and the creation of cross-sector cooperation networks. There is also a need for more in-depth qualitative research to identify internal factors that either hinder or support digital maturity in specific types of institutions.

Although sustainable development was not directly operationalized within the survey instrument, its presence in the discussion reflects its growing significance as a normative framework in the context of digital transformation. Environmental, social, and ethical considerations increasingly shape the strategic orientation of institutions undergoing digital change. Within the scope and design of the present study, this dimension was treated as a broader contextual factor rather than a directly measurable variable. Further research should consider the integration of sustainability indicators into digital maturity assessment tools to allow for a more embedded and evidence-based analysis.

6. Conclusion

The pursuit of high digital maturity is currently one of the key processes shaping the operational model of modern institutions. The results of the conducted study confirm that the level of digital maturity among Polish institutions—both public and private—is moderate, with significant disparities across functional areas.

Public institutions demonstrate a relatively high level of maturity in regulated domains such as data management, privacy, and IT infrastructure. This may be attributed to legal requirements and digitalization support programs. However, their limited structural flexibility, low experimentation culture, and weaker leadership competencies hinder full transformation. In contrast, private institutions show greater adaptability in managing change and fostering digital culture. Nonetheless, like the public sector, they also exhibit low levels of innovation development and adoption of agile management practices.

Both the empirical data and the literature review indicate that digital maturity should be understood as an integrated organizational capability—combining technology, strategy, organizational culture, and the ability to learn and respond to change. A fragmented approach, focused solely on technological implementation, does not lead to sustainable transformation and may further deepen disparities between sectors.

From a practical perspective, this study provides a foundation for designing support programs for digital transformation in both public and private institutions, taking into account sector-specific barriers and potentials. It also highlights the importance of investing in digital skills development, promoting a culture of innovation, and integrating digital initiatives with the goals of sustainable development.

Future research should deepen our understanding of the factors that facilitate or hinder the advancement of digital maturity—particularly through qualitative approaches, comparative analyses, and case studies. Only such a multifaceted perspective will make it possible to design effective strategies supporting institutional adaptation to the challenges of the digital age.

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