

FROM DIGITAL MATURITY ASSESSMENT TO DEVELOPMENT PRIORITIZATION: AN INTEGRATED SCORING FRAMEWORK FOR SMES – EMPIRICAL EVIDENCE FROM HUNGARIAN SMALL AND MEDIUM-SIZED ENTERPRISES

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Abstract

Digital transformation has become a key driver of competitiveness, innovation, and long-term sustainability for small and medium-sized enterprises (SMEs) as well. Although numerous digital maturity models have been developed to assess organizational readiness for digital transformation, most existing frameworks focus primarily on measuring technological and organizational maturity while providing limited support for development prioritization and managerial decision-making. This study develops and empirically validates a Digital Maturity Scoring and Development Prioritization Framework that integrates digital maturity, digital capabilities, strategic alignment, and market presence into a unified assessment system. The empirical analysis is based on survey data collected from 74 Hungarian SMEs operating across various sectors of the economy. The results reveal considerable variation in both digital maturity and business impact, while also demonstrating that technological development does not automatically translate into business value. The proposed framework extends traditional maturity assessment approaches by linking measurement with development prioritization and managerial decision support. In addition to its practical applicability, the framework provides a potential foundation for future AI-assisted diagnostic systems capable of generating automated assessments and development recommendations for resource-constrained SMEs.

Keywords: digital transformation, digital maturity, SMEs, scoring model, development prioritization, business impact, strategic alignment, AI-assisted diagnostics

1. Introduction

Digital transformation has emerged as one of the most significant strategic challenges and opportunities facing contemporary organizations. Advances in cloud computing, artificial intelligence, data analytics, digital platforms, and automation technologies have fundamentally reshaped how firms create value, interact with customers, and compete in increasingly dynamic business environments. Consequently, digital transformation is no longer viewed merely as a technological phenomenon but rather as a multidimensional organizational process affecting strategy, structures, capabilities, and business models.

The importance of digital transformation is particularly evident among small and medium-sized enterprises (SMEs). As SMEs constitute most firms worldwide and play a central role in employment, innovation, and economic growth, their ability to adopt and utilize digital technologies has become an important determinant of competitiveness and long-term sustainability. However, unlike large corporations, SMEs often face substantial financial, organizational, and human resource constraints that

limit their ability to undertake complex transformation programs (Mittal et al., 2018). As a result, managers must make development decisions under conditions of limited resources and considerable uncertainty.

In response to these challenges, numerous Digital Maturity Models (DMMs) have been developed to assess organizational readiness for digital transformation and to identify areas requiring improvement (Kane et al., 2015; Schumacher et al., 2016). These frameworks typically evaluate technological infrastructure, digital processes, leadership commitment, organizational culture, and strategic orientation.

Despite their growing popularity of maturity assessment, existing maturity models exhibit important limitations. Most frameworks are designed to measure the level of digital development rather than the business value generated by digitalization. Consequently, organizations often receive detailed assessments of their technological maturity but obtain limited guidance regarding which development initiatives should be prioritized and how digital investments contribute to organizational performance (Gökalp et al., 2017; Wendler, 2012). In practice, firms may achieve relatively high levels of digital maturity without realizing comparable business benefits, while others may generate favorable business outcomes despite more limited technological development. This observation suggests that digital maturity and business impact should not be regarded as identical concepts. While digital maturity reflects the extent to which technologies and digital practices are adopted, business impact refers to the organizational outcomes generated through their utilization. Understanding the relationship between these dimensions has become increasingly important for both researchers and practitioners seeking to evaluate the effectiveness of digital transformation initiatives.

The challenge is particularly relevant for SMEs. Many small firms lack access to expensive consulting services, digital transformation specialists, and comprehensive assessment programs. Consequently, there is a growing need for practical diagnostic approaches capable of transforming maturity assessment results into actionable managerial recommendations. Rather than simply measuring digital development, such approaches should support decision-making by identifying development priorities and highlighting those organizational areas where intervention is likely to generate the greatest business value.

To address this challenge, the present study develops and empirically validates a Digital Maturity Scoring and Development Prioritization Framework. The proposed framework integrates digital maturity assessment, digital capabilities, strategic alignment, and market-related outcomes into a unified scoring system. In contrast to traditional maturity models, the framework incorporates a Development Prioritization Matrix that enables organizations to be classified according to both digital maturity and business impact, thereby supporting managerial decision-making and development planning.

The empirical validation of the framework is based on survey data collected from 74 small and medium-sized enterprises. By combining maturity assessment with business impact evaluation, the study seeks to provide a more comprehensive understanding of organizational digital transformation and to demonstrate how digital maturity assessment can be transformed into a practical diagnostic and decision-support tool.

Accordingly, the study addresses the following research questions:

- RQ1:** How can digital maturity and business impact be integrated into a unified scoring framework for SMEs?
- RQ2:** What types of SME development profiles can be identified through the proposed Development Prioritisation Matrix?
- RQ3:** To what extent can the proposed framework support managerial decision-making and development prioritisation?

The study contributes to the literature in three ways. First, it introduces an integrated scoring methodology that combines technological, organizational, strategic, and market-related dimensions of

digital transformation. Second, it develops a Development Prioritisation Matrix capable of transforming maturity assessment results into actionable development priorities. Third, it demonstrates how standardized assessment procedures can provide the foundation for future AI-assisted diagnostic and decision-support systems capable of generating automated recommendations for SMEs.

The remainder of the paper is organized as follows. Section 2 presents the theoretical background and methodological foundations of the proposed framework. Section 3 reports the empirical findings and matrix classification results. Section 4 discusses the implications of the findings, while Section 5 summarizes the main conclusions and future research directions.

2. Theoretical background and methodology

The growing importance of digital transformation has stimulated the development of numerous conceptual and practical frameworks designed to assess organizational digital development. Among these approaches, Digital Maturity Models (DMMs) have become one of the most widely applied instruments for evaluating the readiness of organizations to adopt and utilise digital technologies (Schumacher et al., 2016). Digital maturity is generally understood as the degree to which digital technologies, processes, and organizational practices are embedded within a firm's operations and strategic activities.

Although existing maturity models differ in structure and scope, most evaluate similar dimensions (Kane et al., 2015). Their primary purpose is to provide a structured assessment of an organization's current level of digital development and to identify areas requiring improvement. However, the literature increasingly suggests that technological development alone does not guarantee superior organizational performance. From the perspective of Dynamic Capabilities Theory, competitive advantage emerges not only from technological resources but also from the ability of organizations to integrate, adapt, and exploit these resources effectively (Teece, 2007). Consequently, firms possessing similar technological capabilities may achieve substantially different business outcomes.

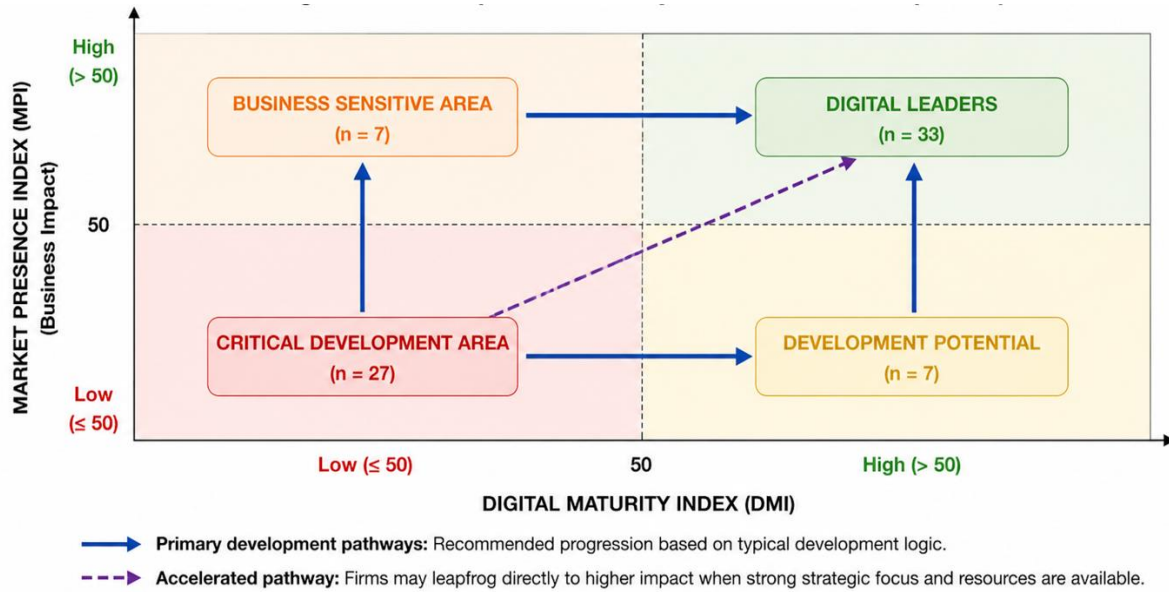
A similar conclusion can be derived from Strategic Alignment Theory (Henderson & Venkatraman, 1993), which argues that digital technologies generate value only when they are aligned with organizational objectives and strategic priorities. This implies that digital transformation should be viewed as a multidimensional process involving technological, organizational, strategic, and market-related dimensions.

Building on these theoretical foundations, the present study proposes a Digital Maturity Scoring and Development Prioritisation Framework. The framework was designed to extend traditional maturity assessment approaches by integrating digital development indicators with business impact evaluation and managerial decision-support mechanisms.

The framework incorporates four core dimensions:

- **Digital Maturity Index (DMI)** – technological readiness and digital development.
- **Digital Capability Index (DCI)** – organizational competencies and digital capabilities.
- **Strategic Alignment Index (SAI)** – alignment between digital initiatives and business objectives.
- **Market Presence Index (MPI)** – market-related outcomes and business impact.

The relationship between these dimensions forms the basis of the integrated scoring system and the subsequent prioritisation process.



Note: The dashed lines represent the overall sample means (DMI = 63.7; MPI = 60.5).

Figure 1. Integrated diagnostic and decision-support framework

As illustrated in Figure 1, the framework combines diagnostic assessment, scoring procedures, prioritisation logic, and development recommendations within a unified architecture. The scoring system transforms questionnaire responses into standardized indices ranging from 0 to 100, thereby enabling comparison across firms and dimensions. The resulting scores are subsequently used to position organizations within a Development Prioritisation Matrix, which serves as the primary decision-support component of the framework.

An important characteristic of the proposed model is its potential applicability within future AI-assisted diagnostic systems. Because the framework relies on standardized indicators, transparent scoring procedures, and predefined development pathways, the generation of automated diagnostic reports and development recommendations becomes technically feasible. This feature is particularly relevant for SMEs, which frequently lack access to extensive consulting resources and specialized digital transformation expertise.

The empirical validation of the framework was conducted using a structured questionnaire survey targeting Hungarian SMEs. The questionnaire was developed based on the theoretical constructs identified in the literature and contained measurement items related to digital maturity, digital capabilities, strategic alignment, and market presence.

Data collection was carried out through an online survey. Following data cleaning and validation procedures, 74 usable responses were retained for analysis. The sample included micro, small, and medium-sized enterprises representing multiple sectors of the economy.

The analytical procedure consisted of four stages. First, composite scores were calculated for each dimension. Second, the scores were transformed into standardized indices ranging from 0 to 100. Third, firms were positioned within the Development Prioritisation Matrix according to their digital maturity and

business impact scores. Finally, organizations were classified into development categories to evaluate the practical applicability of the proposed framework and to identify distinct SME development profiles.

The following section presents the empirical findings of the study, including the characteristics of the sample, the distribution of diagnostic indices, and the classification of firms within the Development Prioritisation Matrix.

3. Results

The empirical analysis was based on data collected from 74 Hungarian SMEs representing different organizational sizes and economic sectors. The characteristics of the surveyed firms are presented in Figure 2.

Micro-enterprises represented the largest segment of the sample (51.4%), followed by small enterprises (28.4%) and medium-sized enterprises (20.3%). Regarding sectoral distribution, service firms constituted the largest group, while manufacturing, trade, construction, and agriculture were also represented. The sample further included both exporting and non-exporting firms, thereby providing a heterogeneous basis for evaluating the applicability of the proposed framework.

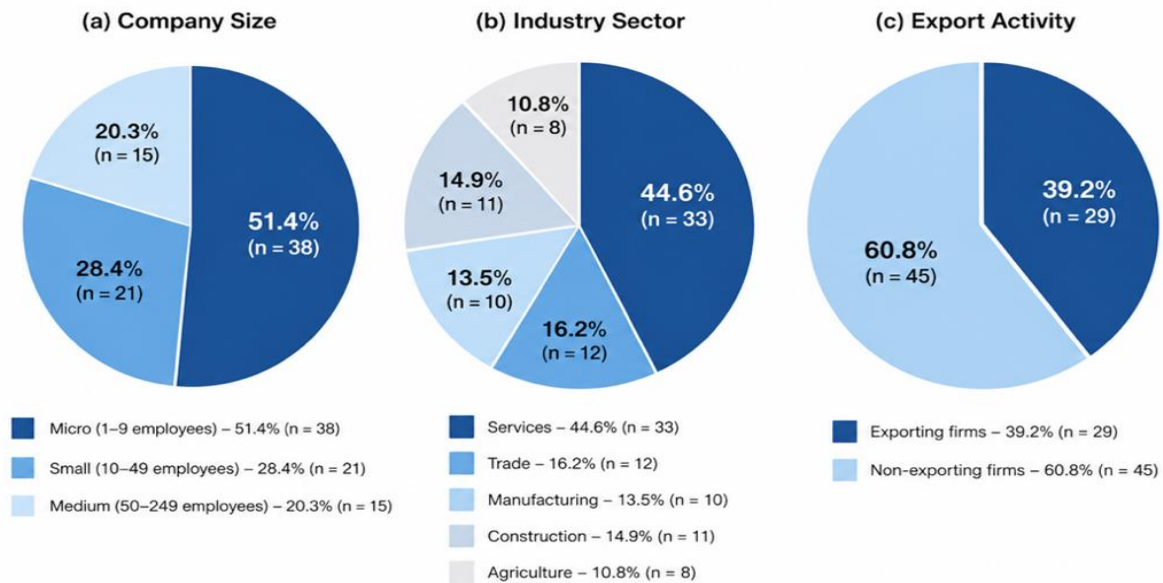


Figure 2. Sample characteristics of the surveyed SMEs (N = 74)

The composition of the sample reflects the diversity typically observed within the SME sector and supports the examination of digital transformation patterns across different organizational contexts.

3.1. Diagnostic indices

To evaluate organizational digital transformation, four diagnostic indices were calculated: the Digital Maturity Index (DMI), Digital Capability Index (DCI), Strategic Alignment Index (SAI), and Market Presence Index (MPI). The descriptive statistics of the indices are presented in Table 1.

Table 1. Descriptive statistics of the diagnostic indices

Index	Mean Score (0–100)
Digital Maturity Index (DMI)	63.7
Digital Capability Index (DCI)	68.5
Strategic Alignment Index (SAI)	66.2
Market Presence Index (MPI)	60.5

The results indicate moderate-to-high levels of digital development among the surveyed firms. The highest average value was observed for the Digital Capability Index (68.5), followed by the Strategic Alignment Index (66.2) and the Digital Maturity Index (63.7). The Market Presence Index recorded the lowest average value (60.5).

These findings suggest that the surveyed SMEs generally possess stronger internal digital capabilities than externally observable business outcomes. In other words, technological and organizational development appear to progress more rapidly than the realization of market-related benefits. This observation provides preliminary evidence that digital maturity and business impact should be evaluated as distinct but interconnected dimensions.

3.2. Development Prioritisation Matrix

Following the calculation of the diagnostic indices, firms were positioned within the Development Prioritisation Matrix according to their levels of digital maturity and business impact. The distribution of organizations across the matrix categories is presented in Table 2.

Table 2. Distribution of firms across the Development Prioritisation Matrix

Quadrant	Number of firms	Percentage
Critical Development Area	27	36.5%
Development Potential	7	9.5%
Business Sensitive Area	7	9.5%
Digital Leaders	33	44.6%

The largest group of firms (44.6%) was classified as Digital Leaders, indicating above-average performance in both digital maturity and business impact. In contrast, 36.5% of organizations were positioned within the Critical Development Area category, reflecting below-average performance in both dimensions.

The Development Potential and Business Sensitive categories each represented 9.5% of the sample. Together, these categories account for 18.9% of all surveyed firms and represent organizations where digital maturity and business impact are not aligned.

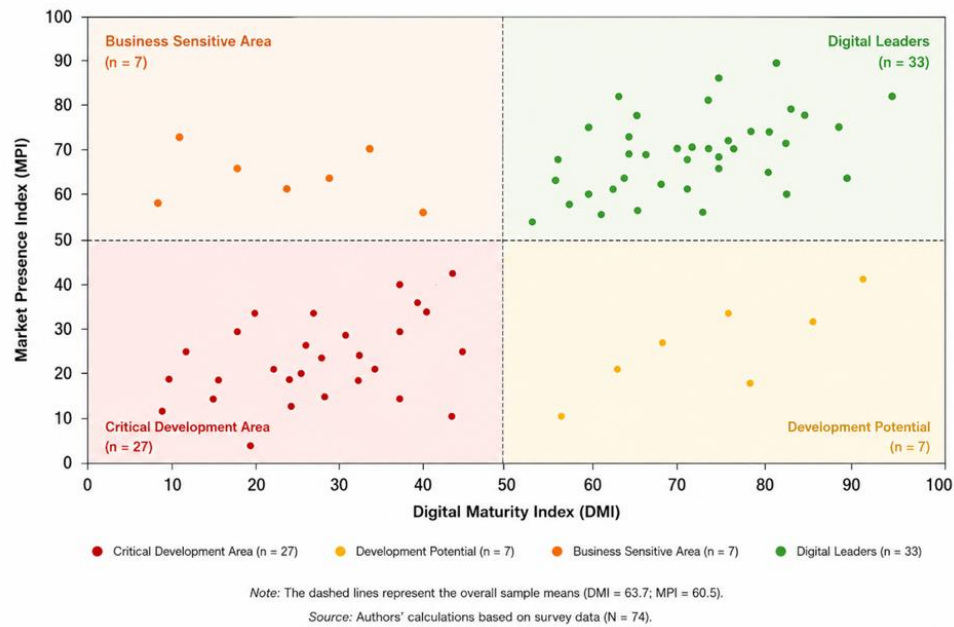


Figure 3. Development Prioritisation Matrix of the surveyed SMEs (N = 74)

The graphical representation of the matrix is presented in Figure 3. As shown firms are distributed across all four quadrants of the matrix. The existence of organizations within the Development Potential category indicates that relatively advanced digital maturity does not necessarily generate corresponding business outcomes.

Conversely, firms classified within the Business Sensitive category demonstrate that favourable market performance may be achieved despite comparatively lower levels of digital development.

3.3. SME Development Profiles

The matrix classification enabled the identification of four distinct SME development profiles.

Digital Leaders combine high levels of digital maturity with strong business impact. These firms can be regarded as benchmark organizations within the sample and demonstrate the successful transformation of digital investments into measurable business value.

Development Potential firms exhibit relatively advanced digital maturity but below-average business impact. For these organizations, future improvements should focus on the utilization and commercialization of existing digital capabilities rather than additional technology adoption alone.

Business Sensitive firms achieve favourable business outcomes despite comparatively lower levels of digital maturity. These organizations may possess strong customer relationships, managerial capabilities, or market positions that compensate for technological limitations. Nevertheless, additional digital investments may strengthen their long-term competitiveness.

Critical Development firms display below-average performance in both dimensions and therefore require the most comprehensive development interventions. For these organizations, improvements in technology adoption, organizational capabilities, and strategic alignment should be pursued simultaneously.

Overall, the matrix classification demonstrates that SMEs differ not only in their level of digital maturity but also in the extent to which digital transformation generates business value. Consequently, the proposed framework provides a more nuanced assessment than traditional maturity models and offers a practical basis for development prioritisation and managerial decision-making.

4. Discussion

The primary objective of this study was to develop and empirically validate a Digital Maturity Scoring and Development Prioritisation Framework capable of integrating digital maturity assessment with business impact evaluation. The findings demonstrate that the proposed framework can effectively distinguish between different SME development profiles and provide a more nuanced assessment than traditional digital maturity models.

One of the most important findings of the study is that digital maturity and business impact do not necessarily evolve simultaneously. While organizations with higher levels of digital maturity generally exhibited stronger business outcomes, the relationship was not uniform across the sample. Nearly one-fifth of the surveyed SMEs (18.9%) were classified into categories where digital maturity and business impact were not aligned. This result suggests that technological development alone is not sufficient to generate business value and supports the argument that digital transformation should be viewed as a multidimensional organizational phenomenon.

This finding is consistent with previous studies emphasizing that digital technologies do not automatically create competitive advantage (Brynjolfsson & McAfee, 2014; Warner & Wäger, 2019). Instead, business value emerges through the effective integration and utilization of technological resources. Organizations classified within the Development Potential category provide a particularly illustrative example. Although these firms achieved relatively high levels of digital maturity, they failed to realize comparable business outcomes. This suggests that technology adoption alone cannot guarantee successful digital transformation if organizations lack the capabilities or strategic mechanisms required to exploit digital resources effectively.

The results can also be interpreted through the lens of Dynamic Capabilities Theory (Teece, 2007). According to this perspective, sustainable competitive advantage depends on an organization's ability to integrate, reconfigure, and deploy resources in response to changing environmental conditions. The relatively high average value of the Digital Capability Index compared to the Market Presence Index indicates that many SMEs have already developed internal digital competencies, yet their ability to transform these competencies into market-related outcomes remains limited. This observation highlights the importance of organizational capabilities as an intermediary mechanism between technological development and business performance.

The findings also reinforce the relevance of Strategic Alignment Theory (Henderson & Venkatraman, 1993). Digital transformation initiatives are more likely to generate business value when they are aligned with organizational objectives and strategic priorities. The existence of firms within the Development Potential category suggests that technological investments may remain underutilized when digital initiatives are not sufficiently connected to broader business goals. Consequently, digital transformation should be understood not merely as a technological process but as a strategic organizational change process.

From a methodological perspective, the study contributes to the literature by extending traditional digital maturity assessment approaches. Existing maturity models primarily focus on benchmarking and measurement, whereas the proposed framework incorporates business impact evaluation and development

prioritisation. As a result, the framework does not simply indicate how digitally mature an organization is; it also identifies where managerial attention and future investments should be concentrated.

The practical implications of the framework are particularly important for SMEs. Many small firms lack the financial resources required to engage consulting companies or implement comprehensive digital transformation programmes. The proposed framework offers a relatively simple and transparent alternative that can support managerial decision-making through standardized assessment procedures and clearly defined development pathways. By identifying specific development profiles, the framework enables organizations to allocate scarce resources more effectively and prioritize interventions with the greatest potential business impact.

A further contribution of the study relates to the growing role of artificial intelligence in organizational diagnostics. The framework was intentionally designed around standardized indicators, transparent scoring procedures, and predefined development pathways. Consequently, the generation of automated diagnostic reports and development recommendations becomes technically feasible. In practice, this means that SMEs may be able to obtain structured digital transformation assessments without relying exclusively on expensive consulting services. Future AI-assisted diagnostic systems could therefore significantly expand access to digital transformation expertise and contribute to more inclusive digital development.

Overall, the findings suggest that the future evolution of digital maturity assessment may lie in the integration of measurement, prioritisation, and decision support. Rather than focusing exclusively on technological readiness, future assessment frameworks should incorporate organizational capabilities, strategic alignment, and business outcomes. The proposed Digital Maturity Scoring and Development Prioritisation Framework represents a step in this direction by transforming maturity assessment into a practical development-oriented management tool.

5. Conclusion

The increasing importance of digital transformation has created a growing demand for assessment approaches that extend beyond the measurement of technological development. While existing digital maturity models provide valuable insights into organizational readiness, they often offer limited support for development planning and managerial decision-making.

This study proposed and empirically validated a Digital Maturity Scoring and Development Prioritisation Framework that combines digital maturity assessment with business impact evaluation. The results demonstrate that organizations with similar levels of digital development may achieve substantially different business outcomes, highlighting the importance of evaluating digital transformation from a broader organizational perspective.

The main contribution of the study lies in shifting the focus from measurement to action. Rather than treating digital maturity as an end in itself, the proposed framework translates assessment results into development priorities and organizational profiles that can support managerial decision-making. In this sense, the framework serves not only as an evaluation tool but also as a practical decision-support instrument.

The findings further suggest that future digital transformation assessment systems should place greater emphasis on business utilisation and value creation. Measuring technology adoption alone provides only a partial picture of organizational digital development. A more comprehensive understanding emerges when technological, organizational, strategic, and market-related dimensions are evaluated simultaneously.

Beyond its academic contribution, the framework was designed with practical applicability in mind. Its standardized structure and transparent scoring logic make it suitable for implementation within digital self-assessment platforms and future AI-assisted diagnostic systems. Such solutions may significantly improve access to digital transformation expertise, particularly for SMEs that lack the resources required for extensive consulting support.

Although the framework was validated using a sample of Hungarian SMEs, its underlying logic is not country-specific and may be applicable in a broader international context. Future research should therefore focus on testing the model in different countries, industries, and organizational environments, while also exploring the integration of artificial intelligence and automated recommendation mechanisms into digital transformation diagnostics.

Ultimately, the study argues that the next generation of digital maturity models should not merely assess where organizations currently stand but should also help determine where they should go next. The proposed framework represents an initial step toward this objective by connecting digital maturity assessment with development prioritisation and decision support.

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