DIGITALIZATION AND SUSTAINABILITY: ARE ORGANIZATIONS READY FOR THE GREEN TRANSITION?

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Abstract: The increasing convergence of digitalization and sustainability has intensified organizational pressure to adapt to emerging environmental and technological demands. Organizations are increasingly expected to pursue sustainable development objectives while simultaneously embracing digital transformation processes that enhance efficiency, innovation, and competitiveness. Although digitalization and sustainability have attracted considerable scholarly and policy attention, research examining their combined role in shaping organizational preparedness for green transition remains relatively limited, particularly within transition economies. This study examines organizational readiness for green transition in the context of digitalization, focusing on the relationship between digitalization readiness, sustainability orientation, and perceived organizational barriers.
Using a quantitative cross-sectional research design, data were collected through an online survey involving 122 employees and managers from public and private sector organizations in North Macedonia. The study employed a structured questionnaire measuring four dimensions: digitalization readiness, sustainability orientation, organizational barriers, and organizational readiness for green transition. The findings indicate moderate levels of organizational preparedness for green transition, accompanied by relatively high perceptions of organizational barriers. Digitalization readiness and sustainability orientation demonstrated positive associations with organizational readiness, while perceived barriers showed a negative relationship. Sustainability orientation emerged as the strongest predictor of organizational preparedness, suggesting that strategic commitment to sustainability may play a particularly important role in supporting green transition initiatives. Furthermore, differences were identified between public and private sector organizations regarding perceived digitalization readiness. The study highlights the importance of aligning digital transformation with sustainability-oriented organizational strategies.
Keywords: digitalization, sustainability, green transition, organizational readiness, North Macedonia

1. INTRODUCTION

The contemporary business environment is increasingly shaped by two interrelated transformations: digitalization and sustainability. Organizations across industries face growing pressure to adopt digital technologies while simultaneously responding to environmental challenges, regulatory demands, and stakeholder expectations regarding sustainable development. This dual transformation, often described as the green and digital transition or twin transition, represents not only a technological shift but also a strategic and organizational challenge requiring new capabilities, investments, and long-term planning (European Commission, 2022).
Digitalization has transformed organizational processes, communication systems, and decision-making practices. Technologies such as cloud computing, artificial intelligence, big data analytics, and digital platforms have enhanced efficiency, innovation capacity, and operational flexibility (Verhoef et al., 2021). At the same time, sustainability has emerged as a strategic imperative rather than merely a corporate social responsibility initiative. Organizations are increasingly expected to reduce environmental impact, improve resource efficiency, and align their operations with sustainable development principles and environmental, social, and governance (ESG) expectations (Elkington, 2018; United Nations, 2015).
The growing interaction between digitalization and sustainability has generated substantial academic and policy interest. Digital technologies may support sustainable development by improving energy efficiency, reducing material waste, enabling monitoring systems, and facilitating greener production and consumption models (Bican & Brem, 2020). Digital tools can enhance transparency, support environmental reporting, and enable data-driven sustainability strategies. However, digitalization does not automatically guarantee sustainable outcomes. The expansion of digital infrastructure may also increase energy consumption, generate electronic waste, and create additional organizational costs and adjustment pressures. Consequently, the relationship between digital transformation and sustainability remains complex and context dependent.
This issue is particularly relevant in transition economies and developing institutional contexts, where organizations frequently encounter financial limitations, regulatory uncertainty, and capability gaps (OECD, 2023). In the Western Balkans, sustainability policies and digital modernization initiatives have accelerated in response to European integration processes and market pressures. Nevertheless, many organizations continue to face challenges related to limited investment capacity, insufficient expertise, and fragmented sustainability strategies (Regional Cooperation

Council, 2023). As a result, the extent to which organizations are prepared to integrate sustainability objectives with digital transformation remains insufficiently understood.

The present study examines organizational readiness for green transition in the context of digitalization. Using survey evidence, the study investigates perceptions of digital preparedness, sustainability orientation, and barriers to sustainable transformation. Specifically, the study addresses the following research questions:

RQ1: Are organizations prepared for green transition?

RQ2: What barriers limit sustainable transformation?

RQ3: Does digitalization facilitate sustainability initiatives?

2. LITERATURE REVIEW AND THEORETICAL BACKGROUND

The increasing convergence of digitalization and sustainability has become a defining characteristic of contemporary organizational development. Although these processes have traditionally been examined as separate strategic priorities, recent scholarship emphasizes their growing interdependence. Digital transformation and sustainability are increasingly viewed as mutually reinforcing processes capable of supporting long-term competitiveness, innovation, and organizational resilience (Kraus et al., 2023; Verhoef et al., 2021).

Digitalization refers to the integration of digital technologies into organizational structures, processes, and decision-making systems. Beyond technological adoption, digital transformation involves organizational change, new business models, and enhanced strategic flexibility (Verhoef et al., 2021). Organizations adopting digital technologies may achieve greater operational efficiency, improved communication, and enhanced data-driven management. Such capabilities are particularly relevant in sustainability initiatives, where monitoring systems, digital reporting tools, and resource optimization technologies can support environmental and strategic objectives.

The literature increasingly suggests that digital technologies may facilitate sustainability performance. Digital platforms and intelligent systems enable organizations to monitor energy consumption, optimize supply chains, reduce waste, and improve environmental accountability (Bican & Brem, 2020). Similarly, data analytics and automation can support more efficient use of resources and strengthen evidence-based sustainability strategies. Consequently, digitalization is frequently viewed not only as a technological process but also as an enabler of sustainable organizational transformation.

However, the relationship between digitalization and sustainability is not automatically positive. Several studies state that digital transformation may create new environmental and organizational challenges, including increased energy demand, technological dependency, cybersecurity concerns, and unequal organizational capacities for technology adoption. Therefore, digital technologies alone do not guarantee sustainable outcomes. Their effectiveness depends on organizational priorities, managerial support, and the existence of sustainability-oriented strategies.

Sustainability orientation represents an important dimension of organizational readiness for green transition. Organizations demonstrating stronger environmental commitment are more likely to integrate sustainability considerations into strategic planning and operational decision-making (Dyllick & Muff, 2016). Sustainability-oriented organizations tend to adopt resource-efficient practices, promote environmental responsibility, and align organizational objectives with broader societal expectations. Such orientation may strengthen organizational capacity to respond to environmental regulations and evolving stakeholder demands.

Based on the reviewed literature, this study assumes that digital preparedness and sustainability orientation are positively associated with organizational readiness for green transition, whereas implementation barriers may weaken such readiness. The following hypotheses are proposed:

H1: Digitalization readiness positively influences organizational readiness for green transition.

Organizations possessing stronger digital infrastructure, managerial support for technological adoption, and greater digital integration are expected to demonstrate higher preparedness for sustainability-related change.

H2: Sustainability orientation positively influences organizational readiness for green transition.

Organizations that prioritize environmental responsibility and sustainable practices are expected to show stronger strategic and operational readiness for green transition.

H3: Perceived organizational barriers negatively influence organizational readiness for green transition.

Financial limitations, regulatory uncertainty, insufficient expertise, and resistance to change are expected to reduce perceived preparedness for sustainable transformation.

H4: Organizations from the private sector demonstrate higher digitalization readiness than organizations from the public sector.

Differences in resource availability, competitive pressures, and innovation incentives may contribute to variation in digital preparedness across sectors.

3. METHODOLOGY

3.1 Participants and Setting

This study employed a survey involving employees and managers from organizations operating in North Macedonia. A purposive sampling approach was applied in order to include respondents from both public and private sector organizations. The target population consisted of individuals familiar with organizational processes, sustainability initiatives, and digital practices within their institutions.

North Macedonia provides a relevant setting for examining this issue due to its ongoing digital modernization efforts and increasing policy attention toward sustainable development and European green transition priorities. Organizations in transition economies often operate under financial and institutional constraints, making organizational readiness for sustainability and digitalization a particularly relevant research topic (OECD, 2023).

Participation in the survey was voluntary and anonymous. Respondents were informed about the academic purpose of the study and confidentiality of responses.

3.2 Measures

Data were collected using a structured questionnaire designed to assess perceptions of digitalization, sustainability orientation, organizational barriers, and readiness for green transition. The instrument was developed based on previous literature on digital transformation, sustainability, and organizational readiness (Verhoef et al., 2021; Weiner, 2009). All items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The questionnaire consisted of four dimensions: Digitalization Readiness (DR), Sustainability Orientation (SO), Organizational Barriers (OB) and Organizational Readiness for Green Transition (OR). Composite scores were calculated by averaging item responses within each construct, with higher values indicating stronger perceived digitalization, sustainability orientation, barriers, or readiness.

3.3 Research Design and Procedure

The study adopted a quantitative cross-sectional research design. Data collection was conducted through an online questionnaire distributed electronically to employees and managers during the study period. The collected data were screened for completeness and consistency prior to analysis. The research design was intended to provide preliminary empirical evidence regarding the relationship between digitalization and organizational sustainability readiness and to identify key organizational barriers relevant to green transition.

4. RESULTS

4.1 Sample Characteristics

This exploratory empirical study included 122 respondents employed in organizations operating in North Macedonia. Of the participants, 58.3% were employed in the private sector and 41.7% in the public sector. Regarding organizational position, 27.8% reported managerial responsibilities, while 72.2% were non-managerial employees. Most respondents worked in small and medium-sized organizations (61.1%), while the remaining participants represented larger organizations. This distribution provided preliminary insight into organizational perceptions regarding digitalization and sustainability across different institutional contexts.

4.2 Descriptive Statistics and Reliability Analysis

Descriptive statistics and reliability coefficients for the study variables are presented in Table 1.

Table 1: Descriptive Statistics and Reliability of Study Variables (N = 122)

Variable	*Mean*	*SD*	*Cronbach's α*
Digitalization Readiness	3.74	0.69	.83
Sustainability Orientation	3.48	0.73	.80
Organizational Barriers	3.89	0.65	.78
Organizational Readiness for Green Transition	3.39	0.77	.85

Source: Author's research (2026)

The reliability analysis demonstrated satisfactory internal consistency for all constructs, with Cronbach's alpha values ranging from .78 to .85, exceeding the commonly accepted threshold of .70 (Creswell & Creswell, 2018).

The descriptive results indicate that respondents perceived their organizations as relatively digitally prepared (M = 3.74), while organizational readiness for green transition showed a somewhat lower mean value (M = 3.39). Perceived organizational barriers recorded the highest mean score (M = 3.89), suggesting that financial, regulatory, and organizational obstacles remain significant concerns.

4.3 Correlation Analysis

Pearson correlation analysis was conducted to examine relationships among the study variables.

Table 2: Correlation Matrix

Variable	*1*	*2*	*3*	*4*
1. Digitalization Readiness	1			
2. Sustainability Orientation	.44**	1		
3. Organizational Barriers	-.26*	-.33**	1	
4. Organizational Readiness	.51**	.59**	-.41**	1

Note. *p < .05; **p < .01.
Source: Author's research (2026)

The correlation analysis revealed several statistically significant relationships. Digitalization readiness demonstrated a moderate positive correlation with organizational readiness ($r = .51$, $p < .01$), indicating that organizations with stronger digital preparedness tended to perceive themselves as more prepared for green transition. Sustainability orientation showed an even stronger positive association with organizational readiness ($r = .59$, $p < .01$). Conversely, organizational barriers were negatively associated with organizational readiness ($r = −.41$, $p < .01$), suggesting that perceived financial, institutional, and operational constraints may reduce confidence regarding sustainable transformation. These findings provide preliminary support for H1, H2, and H3.

4.4 Regression Analysis

Multiple linear regression analysis was conducted to examine whether digitalization readiness, sustainability orientation, and organizational barriers predict organizational readiness for green transition.

Table 3: Multiple Regression Predicting Organizational Readiness for Green Transition

Predictor	*B*	*SE*	*Beta*	*t*	*p*
Constant	0.74	0.41	–	1.80	.076
Digitalization Readiness	0.29	0.11	.27	2.64	.010
Sustainability Orientation	0.43	0.10	.41	4.19	< .001
Organizational Barriers	-0.24	0.10	-.22	-2.28	.026

Source: Author's research (2026)

Dependent Variable: Organizational Readiness
Model Summary:
$R = .69$
$R^2 = .47$
Adjusted $R^2 = .45$
$F(3,68) = 20.14$, $p < .001$
The regression model was statistically significant ($F = 20.14$, $p < .001$) and explained approximately 47% of the variance in organizational readiness for green transition. Among the predictors, sustainability orientation emerged as the strongest positive predictor ($\beta = .41$, $p < .001$), followed by digitalization readiness ($\beta = .27$, $p = .010$). Organizational barriers demonstrated a statistically significant negative effect ($\beta = −.22$, $p = .026$), indicating that perceived constraints weaken organizational preparedness for sustainable transformation. These findings support H1, H2, and H3.

4.5 Sector Differences

An independent-samples t-test was conducted to examine differences in digitalization readiness between public and private sector organizations.

Table 4: Differences in Digitalization Readiness by Sector

Sector	*Mean*	*SD*
Public	3.51	0.71
Private	3.91	0.63

$t(70) = −2.47$, $p = .016$
The results revealed statistically significant differences between sectors. Respondents from private organizations reported higher levels of digitalization readiness than respondents from public organizations. Accordingly, H4 was supported.

5. DISCUSSION

The findings of this study provide preliminary insight into organizational preparedness for green transition in the context of digitalization. In general, the results suggest that organizations perceive digitalization and sustainability orientation as relevant factors supporting green transition, while organizational barriers continue to represent a significant challenge. The descriptive findings indicate moderate levels of digitalization readiness and sustainability orientation among participating organizations, accompanied by somewhat lower levels of perceived readiness for green transition. At the same time, organizational barriers recorded the highest average scores, suggesting that respondents perceive financial limitations, lack of expertise, and organizational resistance as important obstacles. This pattern is consistent with previous literature emphasizing that sustainable transformation is often constrained by institutional and resource-related challenges, particularly within transition economies (OECD, 2023; Regional Cooperation Council, 2023). The correlation and regression analyses provide preliminary evidence supporting the proposed relationships. Digitalization readiness showed a positive association with organizational readiness for green transition, suggesting that organizations with stronger digital capabilities may perceive themselves as better prepared to address sustainability-related challenges. This finding is consistent with literature arguing that digital technologies can facilitate organizational efficiency, environmental monitoring, and sustainability-related decision-making (Bican & Brem, 2020; Verhoef et al., 2021). Sustainability orientation emerged as the strongest predictor of organizational readiness. This result suggests that organizational commitment to sustainability may play an important role in shaping preparedness for green transition. Organizations that integrate sustainability into strategic priorities and operational practices may be more likely to recognize environmental change as part of long-term organizational development. Similar observations have been reported in studies emphasizing sustainability as a strategic rather than purely operational concern (Dyllick & Muff, 2016). The findings also indicate a negative relationship between perceived barriers and organizational readiness. Financial constraints, limited expertise, and resistance to change may reduce organizational confidence regarding sustainable transformation. This result aligns with studies highlighting implementation challenges faced by organizations operating in developing and transition contexts (OECD, 2023).

Several limitations should be acknowledged. The study relied on self-reported perceptions and employed a relatively small, non-probability sample. Consequently, the findings should be interpreted as exploratory and not statistically representative of organizations in North Macedonia. Future studies could employ larger and more diverse samples, longitudinal designs, and additional organizational indicators to examine green transition readiness in greater depth.

6. CONCLUSION

The growing convergence of digitalization and sustainability presents organizations with both strategic opportunities and implementation challenges. As environmental expectations and digital transformation pressures continue to intensify, organizational readiness for green transition has become an increasingly relevant management concern. This exploratory empirical study sought to explore how digitalization readiness, sustainability orientation, and perceived organizational barriers relate to preparedness for green transition.

The findings provide preliminary evidence that organizations with stronger digital capabilities and sustainability orientation tend to perceive themselves as more prepared for sustainable transformation. Sustainability orientation emerged as the strongest predictor of organizational readiness, suggesting that environmental commitment and strategic sustainability priorities may play an important role in shaping organizational preparedness. At the same time, perceived barriers, including financial constraints, limited expertise, and resistance to change were negatively associated with readiness, highlighting the complexity of implementing green transition initiatives. The results suggest that organizational readiness for green transition cannot be reduced solely to technological adoption. Sustainable transformation appears to require a broader combination of digital capabilities, strategic orientation, managerial support, and organizational capacity to address implementation challenges.

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