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DIGITAL TRANSFORMATION AND SUSTAINABLE ENVIRONMENTAL MANAGEMENT

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Abstract

Recently, several studies have examined sustainable environmental management and digitalization, focusing on how digital transformation within companies influences their sustainable ecological practices. To monitor the development of environmental management and the digital transformation of society, a conceptual framework for collecting data on information society and as a framework for comparative analysis is essential. Therefore, fundamental indicators on the extent of ICT use in society at different levels of business and organization and following the EFQM business excellence model are crucial. That is mainly because of the logical design of the business excellence model and the meaningful, established business organizational units in the model. Business Environmental Excellence transcends traditional corporate responsibility; it has become a critical priority that global businesses must embed within their sustainable, green policies and strategic frameworks. The research done in this paper focuses on the extent of Slovenian micro and small companies' digital transformation and which areas of the business system are most often the subject of digital transformation with impacts on sustainable environmental protection. This paper explores whether the companies analyzed prioritize creating new value for customers through digital transformation and investigates which dimensions of this transformation are most commonly associated with the concept.

Keywords: *Digital Transformation, Environmental Management, Business and Organization, Micro and Small Companies in Slovenia.*

1 INTRODUCTION

Changes in the socio-economic environment require increasing awareness of tightening competitive conditions and a further push to improve operations. One of the results of this tendency is the continuous improvements in the quality of operations and handling of the environment, and the market position. Due to increasingly unpredictable changes in the market and the rapid development of science and technology, even the world's largest companies, even the most successful ones, must adopt the principles of flexible business and organization if they want to avoid being overshadowed by those companies that are ready to do so. Management of the business process should be flexible and easy, due to the possibility of adapting to market

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requirements, but at the same time, it is complex and comprehensive. Due to the complexity of operating within the competitive dynamics of the global market, businesses will prioritize product excellence and customer satisfaction. Companies should recognize environmental management firstly as human virtue and then as part of business competitiveness.

The company recognizes its mission in developing the core business by incorporating the latest knowledge and technology in digitization, the quality of which comes from a focus on excellence in all areas. To achieve the mission and contribute to a society based on knowledge of the modern digitalization ecosystem and innovation, we want to introduce the principles of digital culture quality and excellence into everyday business practice. Therefore, the management and management system of the company are based on:

- Customer focus (customer experience),
- Orientation towards results (data strategy),
- Leadership and stability of purpose (digital business models, products and services),
- Management based on processes and facts (processes and digital solutions for business support),
- Development and inclusion of employees (development of digital personnel and digital jobs),
- Constant learning, innovation, and improvement,
- Developing partnerships,
- Digital culture,
- Social responsibilities of the company (cyber security).

When designing the company's digitization strategy, we proceed with the following assumptions:

- Education, creativity, innovation, and the ability to cooperate represent a combination of values and skills of employees, which is an essential factor in the successful development and establishment of a company in the global market.
- The successful operation and organization of a modern company in a digitized eco-system rely on a close connection between the stakeholders involved. This connection includes the mutual exchange of knowledge and good practices and engagement with a broader environment of fundamental character.
- The company should provide customers with a wide range of options, opportunities, and initiatives to actively engage in shaping the company's business models, contributing to its development, and co-designing its digital products and services.
- The development priorities focus on exploring contemporary trends and dynamics in business and organizational practices within the digital society. It originates from the interaction of the ever-changing environment and human interaction with the environment.
- The reference framework of key digital competencies proposed by the European Commission within the framework of the concept of lifelong learning, and approved by the European Parliament and the European Council, is represented by the following:
    - Communicating in a mother tongue,
    - Communicating in foreign languages,
    - Mathematical competencies and foundational competencies in the field of science and technology,
    - Digital literacy,
    - Learning competencies,
    - Social and civic competencies,
    - Self-initiative and entrepreneurship,
    - Cultural awareness and expression.

Management plays a pivotal role in this process. Through its example, expertise, experience, and skills, it should guide the planning of the company's digital transformation, paving the way for successful organizational development. Continuous updating and expanding knowledge remain among the most significant challenges faced by modern management.

It has been recognized that with existing business process characteristics often linked with efficiency, new features are necessary, among them knowledge, environmental awareness, encouraging human relationships, excellence, supportive contact with natural and other environment, humanization, ethnic functioning, and credibility. Scholars interested in ecological management discuss it from different perspectives. Most companies are trying to implement environmental management from a theoretical point of view in everyday situations. It

is significant to underscore that environmental management is a concept used every bit as a theory in practice in different aspects from different points of view. Similar cases exist in concepts of management, organization, and quality. The theoretical foundations of environmental management remain insufficiently examined. Consequently, its interpretation and application in business practice lack systematicity and consistency (Kralj, 2011).

At the dawn of the twenty-first century, sustainable business development (SBD) and digitalization are coming of age. Leading global corporations are adopting SBD and digital transformation (DT) as a strategic framework for integrating their business enterprises. That means creating innovative solutions to the complex needs and requirements of the business environment and thinking strategically about leading change. SBD and digital transformation take a comprehensive perspective of the corporation and its business environment. That includes direct relationships with suppliers, distributors, customers, partners, employees, and shareholders and indirect linkages with stakeholders, competitors, related industries, and the natural environment (the eco-systems) (Kralj, 2013).

2 THE INCREASING DIGITALIZATION OF ECONOMIES

The increasing digitalization of economies has highlighted the importance of digital transformation and how it can help businesses stay competitive in the market. However, disruptive changes do not only occur at the company level. They also have environmental, societal, and institutional implications. That is why the research on digital transformation has received growing attention, with a wide range of topics investigated in the literature in the last two decades.

Disruptive changes, understood as changes in a company and its operating environment caused by digitalization, possibly leading to the current business becoming obsolete (Kralj, 2011) trigger DT in different environments due to rapid or disruptive innovations in digital technologies. These changes create high levels of uncertainty. Industries and companies try to adapt to these new environments through different options. For example, when banks implement e-banking to gain competitive advantages.

DT is similarly linked with digital strategy, supply chain management, leadership, value creation, or entrepreneurship. This could suggest that an approach focused only on DT is insufficient, even while it remains crucial to consider other aspects of this process, including the company's overall strategic structure.

More than 440 answers from 55 countries and 20 different industry sections were received in 2 years and 5 months (29 months), from June 2020 to the end of October 2022. The great majority of 34% of participants originate from the manufacturing sector, 13% came from the information and communication sector, and 10% from the education sector. The results show that the survey is representative of all sizes of companies, as both large companies and SMEs are covered – the great majority, about 55%, being SMEs (<250 employees)(KIdschun, 2024).

Although digitalization is a key component of corporate strategy for more than half of the companies, around 15% lack clearly defined measurable goals. Another major impediment is the inadequate monitoring of activities to reach company targets in digital transformation.

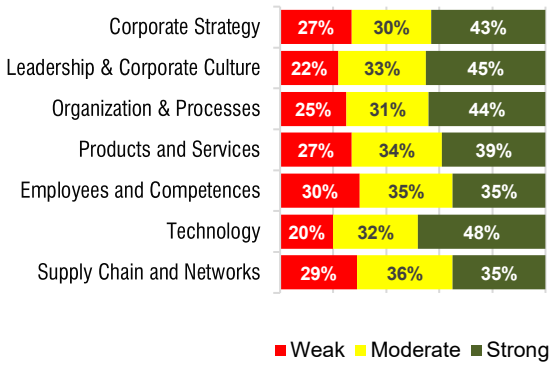

Fig. 1 The Digital Transformation Assessment Source: (Kidschun, 2024)

When analyzing the importance of leadership & corporate culture, more than 60% of the companies reported that their top management is actively driving the digital transformation forward (Kidschun, 2024).

3 THEORY AND AIM OF THE STUDY

The research focuses on digital transformation and sustainable ecological management within

the company's operations. It covers the definitions of digitization, digital transformation, and sustainable environmental management. Additionally, it explores various approaches to environmental management across different periods. Finally, it examines the relationship between ecological management and digital transformation within the context of global competitiveness.

The narrower subject of the research is the company's comprehensive business process, digital transformation, and sustainable management. Many authors have published papers on sustainable environmental management as a basis for continuous improvement and/or business excellence. Very few authors have concretely examined the role and importance of the digital transformation of the company and sustainable management of the environment. Therefore, companies should check the importance of the company's digital transformation and ecological management in their perception, the perception of the client, and the broader social community. The proposed model for digital transformation and ecological management indicators aims to enhance both digital transformation and environmental management. Its focus is improving business administration related to the environment and sustainability within real business sectors.

Additionally, the model serves as a tool for evaluating environmental and sustainability factors in specific companies. The model is designed for use in various corporations (companies) and allows further development dependent on a single company. The central section of the paper presents a model of digital transformation and environmental management indicators in companies based on the theoretical findings and the author's practical experience.

Managing sustainability and quality to achieve excellence means managing an organization, business, or unit so that every job and every process is performed correctly, the first time, every time. To be successful, this must be viewed as a holistic approach that affects and involves, everyone – employees, customers, suppliers, shareholders, and society. It must be driven from within the organization, as it cannot be imposed from outside and is not simply a cost-cutting or productivity-improvement exercise (Kralj, 2013). The EFQM Excellence Model was introduced in early 1992 as the framework for assessing organizations for the European Quality Award. It is now the most widely used organizational framework in Europe. It has become the basis for most national and regional Quality Awards (Pentapalli, 2020). The EFQM Excellence Model is a practical tool that can be used in several different ways:

- As a tool for Self-Assessment
- As a way to Benchmark with other organizations
- As a guide to identifying areas for Improvement
- As the basis for a common vocabulary and a way of thinking
- As a structure for the organization's management system (Pentapalli, 2020)

Fig. 2 EFQM Model 2020
Source: (Al Balushi, 2025)

The EFQM Model is a globally recognized framework that supports organizations in managing change and improving performance. Over the years, it has undergone several improvement cycles to ensure its continued relevance. These updates allow it to remain a leading guide for organizations aiming for a long-term, sustainable future.

The specific content and visual identity of the EFQM Model may have changed over time. What has not changed are the underlying principles on which it is based regardless of the organization's

size or whether it is public, private, or third sector. These principles remain as important today as ever, and this latest edition of the EFQM Model continues to emphasize the significance of:

- The primacy of the customer.
- Taking a long-term, stakeholder-centric perspective.
- Understanding the cause-and-effect relationships between why an organization acts, how it performs those actions, and the outcomes it achieves (EFQM, 2020).

Using the EFQM Model provides the opportunity to see the whole, take a holistic perspective, and appreciate that an organization is a complex but, at the same time, an organized system. Like the wider world, an organization should not be viewed as linear, mechanical, or predictable. It is better understood as a complex adaptive system composed of interdependent humans within a dynamic, living world. Any organization using the EFQM Model:

- Recognizes that it does not operate in isolation but is part of a larger, complex ecosystem. Within this network, known and unknown players can support or obstruct its progress. Therefore, it actively seeks to engage, learn, and grow by maximizing opportunities to collaborate with others in its ecosystem.
- Accepts the opportunity to act as a Leader in its sphere of influence, behaving as an inspiration to others and demonstrating what can be achieved for the benefit of others as well as itself.
- Recognizes that it will encounter ever-increasing speeds and volumes of change. To succeed, it must be ready to anticipate, address, and respond appropriately to these challenges. At the same time, organizations must embrace the dual responsibility of managing the present while forecasting the future and ensuring they are prepared for it (EFQM, 2025).

Digital transformation is a significant component of business excellence.

EFQM Diagnostic Tool, RADAR is the acronym that EFQM uses to describe the logic behind the diagnostic tool it has developed to help any organization:

- Better manage its current way of working.
- Diagnose its current strengths and opportunities for improvement. At its highest level, the RADAR logic emphasizes that an organization should:
  - Define the Results it aims to achieve as part of its strategy.
  - Establish appropriate approaches to ensure the delivery of these results, in the present and future.
  - Deploy these approaches appropriately.

Assess and Refine the deployed approaches to learn and improve. The RADAR elements are divided into several attributes for a more comprehensive analysis. Each attribute is accompanied by a detailed description that clarifies its meaning and outlines what the organization should demonstrate (EFQM, 2025).

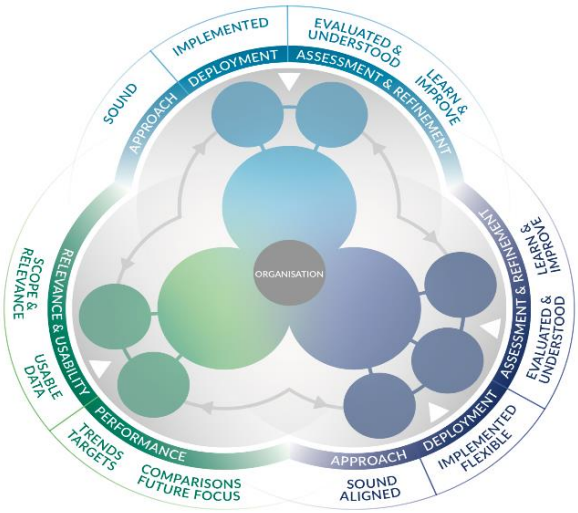

Fig. 3: EFQM Diagnostic Tool: RADAR
Source: (EFQM, 2025)

An individual or a team can use the RADAR logic at the Attribute level, in conjunction with the EFQM Model:

- To identify an organization's current strengths and opportunities for improvement.
- To define an organization's future by outlining desired outcomes and the necessary actions to achieve them (EFQM, 2025).

One of the most widely used voluntary environmental initiatives is the ISO 14001:2015 ecological management standard. ISO 14001:2015 is a global standard for environmental management that provides a structured framework for ensuring compliance and driving

continuous improvement. Its flexibility makes it widely applicable to diverse organizations, including manufacturers, service providers, and government agencies (ISO, 2015). ISO 1400:2015 was developed by the International Organization for Standardization to provide a template for environmental management systems. For facilities to obtain ISO Certification they must:

- Develop a policy statement on the organization's commitment to the environment.
- Identify the environmental impacts of products, activities, and services.
- Commit to compliance with applicable laws and regulations.
- Set environmental goals for the organization and develop the means to achieve them.
- Establish roles and environmental Responsibilities within the organization.
- Maintain documents about the EMS and related procedures.
- Monitor key activities and track EMS performance to correct problems and prevent reoccurrences.
- Audit the EMS to ensure its effectiveness in meeting objectives and targets, verifying that it remains suitable and appropriate.
- Commit to continual improvement of the EMS (ISO, 2015).

An EMS is an organizational structure with associated responsibilities and procedures to integrate environmental considerations and objectives into the ongoing management decision-making processes and operations of an organization. According to an EPA summary, an EMS is a continual cycle of planning, implementing, reviewing, and improving the processes and actions that an organization undertakes to meet its business and environmental goals. Most EMSs are built on the "Plan, Do, Check, Act" model. This model leads to continual improvement based on:

- Planning, including identifying environmental aspects and establishing goals [Plan];
- Implementing, including training and operational controls [Do];
- Checking, including monitoring and corrective action [Check]; and
- Reviewing, including progress reviews and acting to make needed changes to the EMS [Act] (Pentapalli, 2020).

Organizations must integrate Environmental Business Excellence based on EFQM, Environmental Management ISO 14001:2015, and digital transformation if they are curious about the Fourth Industrial Revolution (4IR) and its role in building a greener future. In this new era, online technology is more than just gadgets and apps. It's a key player in embracing more eco-friendly behaviors, creating a strong correlation between digital transformation and sustainability. Digitization, or the digital transformation of society, is a trend that has started to be talked about more seriously in the last few years, even though the digitization process has been going on for more than a decade (Homopolitikus). Societies or countries where citizens are very digitally literate, have a well-developed (digital) infrastructure, and digital solutions are generally used at all levels have significantly fewer problems adapting to the new situation. Such companies are called digitally mature companies.

With issues like climate change, global warming, and biodiversity loss threatening the world, using digital solutions to power sustainable initiatives is no longer optional. Digital transformation leverages the internet and online resources, providing green alternatives to traditional methods and introducing technology for a more sustainable future.

The transformation benefits all parts of your business, from predictive maintenance reducing environmental burdens to cloud computing and teleconferencing tools diminishing carbon output with virtual exchanges. Every byte transmitted and every online transaction executed can contribute to a clean, green, digital, and sustainable landscape.

Yet, as we navigate this journey, encountering challenges like cybersecurity risks, digital literacy gaps, initial investment costs, and resistance to change is inevitable. But the prize, a green future, carbon footprint reduction, optimized resource use, and a healthy planet, is unequivocally worth it.

Buckle up as we delve into the emerging world of digital transformation and sustainability. It's time to discover how digital solutions conserve our environment and pave the way to a better future (Digital Transformation, 2024).

Digital technologies foster innovative sustainability solutions. For example, Artificial Intelligence and machine learning analyze data for sustainable strategies, while IoT tools optimize energy usage. Blockchain promotes eco-friendly supply chain transparency, and emerging technologies facilitate carbon capture. These digital innovations help businesses meet ESG targets, create greener products and services, and contribute to global environmental goals (Homopolitikus, 2022).

Many organizations are now several years into their digital transformation journeys, and they look to measure progress, gauge maturity, and benchmark against peers in their industry. Measuring maturity helps them determine where they are in their transformation journey, create goals and plans, both short and longer-term, and make impactful transformation project investments. The crucial questions remain how to assess this maturity, the key pillars and factors of maturity, and which capabilities are new and different compared to business as usual.

Companies must improve capabilities in stages to develop and scale digital businesses rapidly. If the company doesn't have the right qualifications to execute its acceleration strategy, it won't go far. Before leaders launch their initiatives, they should take three steps to determine whether their organization has all the capabilities it needs:

1. Evaluate the maturity of the organization's digital business.
2. Determine what digital business acceleration looks like for the enterprise.
3. Identify the new capabilities the organization will need (Dawson, 2021)

4 METHODOLOGY

Empiric research in its main chapter addresses the importance of environmental business excellence and digital transformation indicators in Slovenian small business practice. The chapter also contains the research methodology; from the plan of collecting the data, plan implementation, research instrument, and analyzing method to answers interpretation. The following is a detailed analysis of the answers. The content of the research has been original. The fundamental point is the answer to questions; how are environmental business excellence management and digital transformation integrated into the management and administration of companies; which indicators have a crucial role when dealing with successfulness and efficiency of companies? Our research indicates that a sizeable number of previous hypotheses relating to environmental business excellence management and digital transformation would appear to be correct and are logically justified.

Digital business involves six business and technology dimensions. Together, they create a certain level of digital maturity across the organization (see Figure 4). Various initiatives require different levels of maturity across these dimensions. Examples include optimizing the current business model and transforming the business model to adapt to new challenges.

The research topic is a comprehensive business organization process inside an enterprise in a modern, competitive economy, with particular emphasis on environmental business excellence management and the implication of the EFQM Model and ISO 14000 Standards with indicators of digital transformation. The research strives to underscore the importance of ecological business excellence management and digital transformation in how an enterprise, its customers, and the broader community perceive these aspects. It also strives to identify environmental and digital indicators within enterprises that reflect the current state of ecological attributes, environmental business excellence management, and transformation progress. An example of an application was based on a random sample of 110 Slovenian enterprises (AJPES, 2024). The results include questionnaire replies from 110 received questionnaires.

The purpose of this paper is to study and define the most significant indicators influencing environmental business excellence management and digital transformation effectiveness and efficiency in enterprises, focusing on Slovenian enterprises. The focus is on environmental and digital indicators as the result of excellent ecological business management, environmental/digital policy, and a strategic direction toward achieving environmental/digital

goals as well as constant and continuous training and awareness-raising in stakeholders, employees, customers, suppliers, and the broader social community.

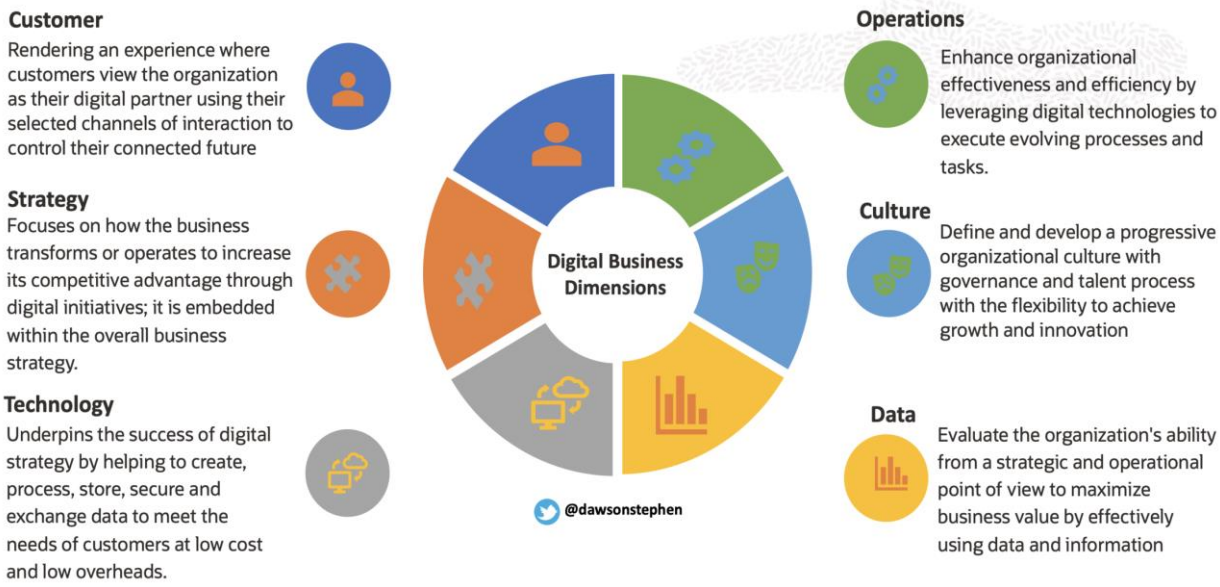

Fig. 4 Digital Business Dimensions / Capabilities

(Dawson, 2021)

The research objective was to set or determine and prove the role and significance of environmental/digital management indicators in an enterprise's operations. The reflection included interdisciplinary thinking which enables us to understand and manage the process of ecological business excellence and digital management in terms of sustainable development. Based on the assumption that an enterprise respects and complies with environmental legislation, it was analyzed to see what types of environmental and digital indicators and measures contribute to constant and continuous improvement in terms of sustainable development.

In the research, the following assumptions were tested:

- Assessing environmental care (protection) and digital transformation in enterprises are practiced on a declarative level (rather than being practiced).
- Enterprises holding a certificate of environmental management perform better in environmental and digital indicators and are more effective than those without such a certificate.

The research was designed as a qualitative case study. It was conducted in 2023 and 2024.

The basic information on the sample unit (the organization studied) and the respondent (the person who completed the questionnaire), was acquired based on the responses from the first (8 questions) and second cluster or set of questions (the first 5 questions).

The research included 110 enterprises performing various activities. Among them, the highest number goes to limited liability companies (52.5%), joint-stock companies (14.7%), or institutes (11.9%). In contrast, the lowest number is to sole proprietors, unlimited liability companies, investment companies, and companies of other legal forms (altogether 14.8%). Over half of enterprises (57.8%) are involved in servicing activities while 28% are engaged in manufacturing. Other enterprises are either predominantly servicing or predominantly manufacturing. In the recent period, in Slovenia and the EU, a slowdown in the spread of ISO 14001 and EMAS environmental certificates has been observed. The number of ISO 14001 certificates awarded per million inhabitants in Slovenia increased by 4.8 percent in 2020 despite the epidemic, which, however, meant a 2.8

percentage point lower growth than in the previous year. Growth declined in the EU, from 5 percent in 2019 to almost zero in 2020. The situation with EMAS certificates is even less favorable. The number of certificates per million inhabitants in Slovenia has stagnated for the third year. A 3.8% growth was recorded in the EU in 2020, but the prevalence of this certificate in 2021 remained at the level of the previous year. According to the spread of ISO 14001 environmental certificates, in 2020, Slovenia still lagged most of the new EU members, but it still ranked above the EU average. The opposite is the case with EMAS certificates, where Slovenia also lagged the EU average in 2021, but only Cyprus, Estonia, and Slovakia surpassed it among the new EU members (Zelena Slovenija, 2023). 41.9% of the enterprises have established an environmental management system in compliance with ISO 14001:2015 Standard, 32.6% of the enterprises have established such a system in compliance with the legislation in force in the Republic of Slovenia, 4.1% of the enterprises have established other systems. (data for the year 2022).

A qualitative case study was conducted to acquire information and research results from the complete questionnaires. However, only part of the research results is presented in this paper. The findings from the research results cannot be generalized to all forms or types of environmental business excellence and digital management.

5 RESEARCH RESULTS

Only part of the results of the analysis are here. They were conducted to find the most suitable environmental business excellence and digital indicators and indicate devices in different areas of an organization. The focus of this paper is leadership. By way of factor analysis, the most suitable indicators were selected. Based on the indicators, the indicating devices were set. They represent the average value of the selected indicators.

The new digital leader can learn, adapt to changes in their environment, and seek out new skills and experiences at work. They are also champions of collaboration and demonstrate a drive to lead. They know how to empower, support, experiment, and learn — and when to switch between these behaviors. They are humble enough to seek out those with the right skills to support them when needed. They demonstrate business acumen, the ability to handle and examine data, and mental endurance.

Aon's Digital Leader Model unites these elements by combining the three tenets of an agile mindset, leading change, and driving the business forward (MacKay, 2024). See Figure 5.

Fig. 5: Aon's Digital Leader Model
Source: (MacKay, 2021).

In the continuation, an example of leadership and a set of questions concerning the leadership characteristics in an organization - measured on a scale from 1 (I do not agree at all) to 5 (I agree entirely) - are presented. The focus is on two key aspects of leadership: a general perspective on enterprise management and the role of leadership in achieving environmental business excellence and sustainable management, emphasizing the interconnection between these two dimensions. By way of factor analysis using the Principal Axis Factoring method, followed by Varimax Rotation, the most suitable indicators to assess the mentioned dimensions aspects of leadership (3 for a general view on management of an enterprise and 5 for environmental and digital management) were selected among 25. (See Table 1.)

Table 1 Leadership – Factor Loadings After an Orthogonal Rotation

	Leadership in the area of environmental and digital management	Leadership in general
Environmental and digital management measures are planned, executed, controlled, and enhanced incessantly.	0.84	0.13
Leaders assess the efficiency and effectiveness of environmental and digital management business processes.	0.83	0.14
Leaders encourage launching initiatives and searching for new opportunities and solutions to address environmental and digital problems.	0.78	0.19
Leaders efficiently inform their employees about environmental and digital issues.	0.76	0.23
The management has a clear vision, strategy, and objectives concerning environmental and digital management.	0.68	0.18
Leaders encourage and promote autonomy at work.	0.18	0.94
Leaders identify the need for organizational changes and are the first to opt for changes.	0.12	0.92
Leaders encourage and enable their employees to cooperate in decision-making.	0.31	0.65

In Table 1 factor loadings after an orthogonal VARIMAX rotation are presented. The factor structure is distinct as each indicator has high factor loadings only with one factor. The highest indicators of leadership quality indicating devices in terms of environmental and digital management are:

- Clear vision, strategy, and goals.
- Careful planning, executing, and enhancing measures.
- Efficiency and effectiveness assessment.
- Promoting initiative and searching for new opportunities and solutions for tackling environmental and digital problems
- Providing information about business excellence and environmental and digital issues.

The dimension is most prominently marked by the indicator *Environmental and digital management measures are planned, executed, controlled, and enhanced incessantly*, in which the highest factor loading is obtained. The Cronbach reliability coefficient (alpha) value, which measures the reliability of a measuring instrument, is 0.9, suggesting the appropriateness of the choice of indicators.

The indicator Leadership quality in general was determined by the following indicating devices:

- Encouraging and promoting autonomy at work.
- Encouraging and promoting employee cooperation in decision-making and identifying the needs for organizational changes.

The indicator, Leaders encourage and enable their employees to co-operate in decision making, has a lower factor loading and thus a lower contribution to this dimension. Based on the reliability coefficients, the selected indicators can be used for computing indicators, namely the average value of each indicator, about a specific dimension as shown in Table 2.

Table 2: Descriptive Statistics of Leadership Indicators and Dimensions

	N	Min	Max	Arithmetic mean	Standard deviation
Environmental and digital management measures are planned, executed, controlled, and enhanced incessantly.	107	1	5	3.35	1.21
Leaders assess the efficiency and effectiveness of environmental and digital management business processes.	107	1	5	3.16	1.12
Leaders encourage launching initiatives and searching for new opportunities and solutions to address environmental and digital problems.	107	1	5	3.22	1.14
Leaders efficiently inform their employees about environmental and digital issues.	110	1	5	3.18	1.11
The management has a clear vision, strategy, and objectives concerning environmental and digital management.	110	1	5	3.71	1.13
Leadership in the area of environmental and digital management	110	1	5	3.33	0.98
Leaders encourage and promote autonomy at work.	100	1	5	3.89	0.88
Leaders identify the need for organizational changes and are the first to opt for changes.	108	1	5	3.91	0.86
Leaders encourage and enable their employees to cooperate in decision-making.	105	1	7	3.65	1.01
Leadership in general	109	1	5	3.81	0.83

The enterprises that positively or favorably assess Leadership in general typically positively assess Leadership in terms of environmental management.

Organizations plan, implement, and control processes to meet their customers and other participants' expectations and requirements and generate higher value for them. Managing the functioning of a digital management system is part of business processes in an organization that is concerned with sustainable development. We were interested in the processes related to environmental management, which were tested through the following indicators.

Three-quarters of enterprises do not have a specific Digital Management Department, 16% have such a department inside another department/function, and 7.6% have an independent Digital Management Department, as shown in Table 3. The data obtained show the leadership's attitude towards the organization of the Digital Management Department. In some enterprises, environmental management is an outsourced service.

Table 3: Survey Results on the Presence of a Digital Management Department in Enterprises

	Percentage
There is no Digital Management Department.	76.4
The Digital Management Department is inside another department/function.	16.0
There is an independent Digital Management Department.	7.6
Total	100

Table 4: Responsibility for Business Process Analysis and Environmental Management in Enterprises with or without a Digital Management Department

		Is there a Digital Management Department in your enterprise?		Total
		Yes	No	
Who oversees the analysis of business processes and digital management in your enterprise?	No answer	7.1%	31.4%	25.4%
	Nobody	-	12.8%	9.6%
	Executives	25.0%	33.7%	31.6%
	Other departments	25.0%	12.8%	15.8%
	Digital Management Department	35.7%	2.3%	10.5%
	Other	7.1%	7.0%	7.0%
Total [%]		100.0%	100.0%	100.0%
Total N		18	82	100

Table 5: How frequently do you monitor the efficiency of digital management?

	Percentage
Not at all.	20.9
Annually.	27.0
Semi-annually.	16.5
Every three months.	9.6
Monthly.	19.1
At least weekly.	7.0
Total	100.0

A clearer picture of the situation and entity in charge of the analysis of business processes and digital management (whether an enterprise has a Digital Management Department or not) is shown in Table 5. One-fourth of the enterprises were reluctant to/did not know how to answer the question about who oversees such an analysis; most of them belong to a group that does not have a specific Digital Management Department. Interestingly, among enterprises with a special department dealing with digital management, the analysis of business processes and digital/environmental management is undertaken by the same department only in 35.7% of the enterprises. In one-third of the enterprises that do not have such a department, the analysis is undertaken by the executives. It is a fact that familiarity with the processes from the digital/environmental management perspective does not depend only on the Digital Management Department but also on accountability and competence as well as working methods in a particular enterprise. Analyses of processes are undertaken by those in charge of processes; a digital professional may be a member of such a team.

6 CONCLUSIONS

The shift towards the fourth industrial revolution and sustainability implies promoting digital literacy among your workforce and customers. Disparities in digital skills can compromise operational efficiency, employee morale, market reach, and customer satisfaction. Promoting digital literacy and inclusion is crucial to prevent global inequalities. It makes language easy to understand, uses simple words, and organizes information logically (Digital Transformation). The shift towards the fourth industrial revolution and sustainability implies promoting digital literacy among your workforce and customers. Disparities in digital skills can compromise operational efficiency, employee morale, market reach, and customer satisfaction. Promoting digital literacy and inclusion is crucial to prevent global inequalities. It makes language easy to understand, uses simple words, and organizes information logically (Digital Transformation, 2024).

The most important thing in digital transformation is the role of leadership. Digital transformation is taking over the business and corporate world now. Companies and their front-runners have recognized the influence that it has. Therefore, they have and will continue to transition to it. Although culture clashes are the leading barrier to digital transformation, they can be controlled and turned into a tool for growth. It is worth reiterating that digital culture is not all about technology, but also the products, services, mindset, and means of achieving set goals. In such an organization, a high level of trust and honesty in communication between the management and other employees,

within the management, between teams, and even between the organization and its customers and other companies is achieved. Employees can ask questions and get honest and helpful answers. Information exchange is effective when the system and communication network enable management and employees to access relevant information at the necessary time. It should also allow them to share their perspectives and personal goals during discussions about the company's objectives. Additionally, it facilitates verifying ideas and learning from one another (Kralj, 1994). Good managers help people find out what is important about their work and in what way the work of each employee contributes to achieving the company vision. Employees are interested in learning whether their work, and in what way, influences common goals. Employees ask themselves why changes are required for themselves and why for the company.

Managers, who speak in favor of changes, must act in compliance with their words, spoken in public, formally or non-formally. Their actions must support the "story of the company", they also must be good communicators, and they must know how to present their "story of the company" in a convincing way (Rao, 2000). In the early stages of introducing a learning organization in the company, such credibility is of great significance. The development of Environmental and Digital Management Systems is constantly improving. New environmental issues dictate the redefining of the interest of customers, users, developers, and others in the environmental aspects and impacts of products (Kralj, 2010). The development of indicators is an evolving process, continuously refined and enhanced. The long-term orientation of the organization depends on:

- Organizational culture,
- Management philosophy,
- long-term and enduring choice of resources (capital, work, knowledge).

The shift towards the fourth industrial revolution and sustainability implies promoting digital literacy among your workforce and customers. Disparities in digital skills can compromise operational efficiency, employee morale, market reach, and customer satisfaction. Promoting digital literacy and inclusion is crucial to prevent global inequalities. It makes language easy to understand, uses simple words, and organizes information logically (Digital transformation). Our initial research has proved that sustainable excellence in business with digital transformation can bring about increased short-term, especially financial gains. Adopting sustainable business practices and embracing digital transformation can pose significant risks if not strategically implemented. The more a company engages with environmental initiatives and digitalization, the stronger its connection becomes with its stakeholders, with whom it shares a common vision. The research findings can serve as a valuable starting point for an in-depth analysis of the benefits of temporary sustainable business excellence and digital transformation.

WORKS CITED

AJPES. (2024). *Poslovni register Slovenije.* Retrieved October 3, 2024, from https://www.ajpes.si/registri/poslovni_register/splosno

Al Balushi, S. (2025). *EFQM Model 2025.* ITQM - Institute for Total Quality Management. Retrieved March 16, 2025, from https://efqm.org/the-efqm-model/

Davson, S. (2021). *Digital Maturity Model - Where does your organization stand?* LinkedIn. Retrieved October 3, 2024, from https://www.linkedin.com/pulse/digital-maturity-model-where-does-your-organization-stand-dawson/

Deskbird. (2024, September 27). *Digital transformation and sustainability: Shaping a green future.* Retrieved October 3, 2024, from https://www.deskbird.com/blog/digital-transformation-and-sustainability/

International Organization for Standardization. (2015). *ISO 14001:2015 Environmental management systems — Requirements with guidance for use.* Retrieved from https://www.iso.org/standard/60857.html

Kidschun, F. (2024). *Digital transformation assessment.* ENRICH. Retrieved from https://lac.enrichcentres.eu/digital-transformation-assessment/

Kos, K. (2022). *Digitalizacija Evropske Unije – aktualno stanje in prihodnost.* Homopolitikus. Retrieved June 1, 2024, from https://homopolitikus.si/digitalizacija-evropske-unije-aktualno-stanje-in-prihodnost/

Kralj, D. (1994). *The meaning of systematical consideration in enforcement of managing innovation in the process of TQM.* In M. Rebernik & M. Mulej (Eds.), STIQE '94: Proceedings of the 2nd International Conference on Linking Systems Thinking, Innovation, Quality and Entrepreneurship (pp. 113–124). Maribor, Slovenia: Faculty of Business Economics.

Kralj, D. (2010). *Modern green trends require systems thinking. Proceedings of the 5th IASME/WSEAS international conference on Energy & Environment,* Cambridge, UK: Cambridge University Press.

Kralj, D. (2011). Innovative systemic approach for promoting sustainable innovation for zero construction waste. *Kybernetes, 40*(1/2), 275–289.

Kralj, D. (2013). *Environmental excellence* (1st ed.). Maribor: Pivec.

MacKay, K. (2021, September 16). *How do you identify your future leaders?* Aon. Retrieved October 6, 2024, from https://humancapital.aon.com/insights/articles/2021/how-do-you-identify-your-future-leaders/

Pentapalli, S. R. (2020). *EFQM.* Retrieved October 3, 2024, from https://www.itqm.ch/en/efqm-model-2020-trainings/

Rao, P. K. (2000). *Sustainable development – Economics and policy.* Blackwell.

Zelena Slovenija. (2023, April 20). *V Sloveniji upočasnjena rast okoljskih certifikatov.* Retrieved from https://www.zelenaslovenija.si/novice/v-sloveniji-upocasnjena-rast-okoljskih-certifikatov/

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