CONFERENCE PROCEEDINGS

Digital, environmental, and social transformation: challenges and perspectives

September 28th – 29th, 2023 - University of Messina

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INDICE

INTRODUCTION

In an era marked by rapid and unparalleled transformations that challenge the very aspect of our societies, economies, and natural environments, the UNIME Scientific Quadrilateral Conference 2023 emerges not merely as an academic symposium but as a crucible of interdisciplinary scholarship, innovation, and global collaboration. Themed "Digital, Environmental, and Social Transformation: Challenges and Perspectives," this conference embarked on a mission to understand and discuss solutions to the complexities of the 21st century's most pressing and intertwined transformations.

This proceedings volume serves as a comprehensive archive of the rich discourse, groundbreaking research, and dynamic collaborations that flourished over the course of the conference. At the heart of the conference's agenda was an acknowledgment of the intricate ties that bind the digital, environmental, and social spheres—a triad of forces shaping our present and future. The digital revolution, with its relentless march of progress, has ushered in an age of connectivity, automation, and data-driven decision-making, redefining what is possible in almost every aspect of human endeavor. Concurrently, the environmental imperative, underscored by the urgent threats of climate change, biodiversity loss, and resource depletion, calls for a radical reimagining of how we live, work, and interact with our planet. Meanwhile, the social dimension of transformation reminds us of the critical need for equity, inclusion, and humanity in navigating these changes, ensuring that the future we build is one that cherishes diversity and fosters a sense of belonging for all.

By capturing the essence and outcomes of the UNIME Scientific Quadrilateral Conference 2023, this volume aims to illuminate the path forward through these complex transformations. It highlights the key role of interdisciplinary inquiry and cross-sectoral collaboration in crafting innovative responses to the challenges and opportunities of digital, environmental, and social change. Through a blend of empirical research findings, theoretical insights, and reflective narratives, the contributions within these pages collectively offer a kaleidoscopic view of our transforming world.

NAVIGATING THE DIGITAL WAVE: OPPORTUNITIES AND CHALLENGES

The digital transformation stands as a cornerstone theme of the conference, signifying a pervasive and compelling force of change across the global landscape. This transformation—driven by the swift currents of technological advancement such as artificial intelligence, blockchain, and cloud computing—ushers in an era of unprecedented connectivity, algorithmic precision, and virtual capacity. It embodies the potential to revolutionize industries by fostering enhanced efficiency, cultivating innovation avenues, and promoting the creation of value in ways hitherto unimagined. The narrative of digital transformation is one of democratized access to technology, optimized supply chains, and the advent of digital commerce, which together have the capacity to reshape the contours of the global economy.

However, within the folds of these promising developments lie significant challenges that demand our collective attention and nuanced

understanding. The contributions within this volume cast a discerning eye on the diverse implications of digital transformation, rigorously scrutinizing its potential to both uplift and unsettle the socio-economic order. Chief among these challenges are privacy concerns, as personal data becomes a new currency in the digital marketplace, making its protection paramount. Cybersecurity threats loom large, evolving in sophistication as the stakes of digital assets and infrastructures soar. The relentless march of digital innovation also beckons for ethical governance—a clarion call to ensure that as we chart new territories in the digital domain, we remain anchored to principles of fairness, transparency, and accountability.

In the quest to harness digital technologies as catalysts for economic growth and social equity, the authors within this volume embark on a multifaceted exploration. They investigate how intelligent algorithms serve as agents of social change, potentially narrowing the chasms of inequality through personalized education and healthcare. They unravel the paradoxes of blockchain technologies that promise both an immutable ledger of transparency and a cloak of anonymity. Cloud computing is examined not just as a technological phenomenon but as a strategic imperative that could potentially redistribute the global power dynamics by enabling scalable solutions across borders.

The thoughtful explorations in this volume navigate the spectrum of digital transformation, from the heights of its promise to the depths of its challenges. They contemplate the role of digital infrastructure as the backbone of modern societies and economies, while also probing the societal impacts engendered by digital divides and technological disenfranchisement. Through a balanced discourse that acknowledges the

digital wave's double-edged nature, this collection of works aims to contribute to a more informed and equitable global digital trajectory.

CHARTING THE GREEN TRANSFORMATION: TOWARD SUSTAINABLE FUTURES

The theme of environmental transformation occupies a position of profound importance within the conference's discourse, reflecting an acute global awareness of the perils posed by climate change and the corresponding imperative for urgent action. This theme extends beyond a call for awareness, into a rallying cry for tangible, systemic change through sustainable strategies, green technologies, and the principles of a circular economy. This debate sheds light on the trailblazing paths toward environmental sustainability—paths that weave through the realms of policy, innovation, and corporate responsibility.

This section embodies the intellectual journey of researchers and practitioners who are at the forefront of ecological stewardship, showcasing their pioneering work in renewable energy adoption and its role in mitigating the effects of fossil fuels. It presents the ingenuity of eco-friendly business practices that are redefining corporate success in terms of not just profits, but also ecological impact. Here, green entrepreneurship is not just a concept but a transformative force, characterized by businesses that harmonize economic objectives with the planet's ecological limits, crafting a sustainable economic tapestry for future generations.

The dialogue among scholars and practioners brings to the forefront the pressing need for a paradigm shift in how we conceptualize growth and progress. It examines the adoption of green technologies not as a

burdensome obligation but as an opportunity for innovation and leadership in the emerging green economy. Moreover, the contributions delve into the potential of the circular economy as a model that challenges the traditional take-make-waste linear economy, proposing instead a restorative and regenerative approach that maximizes resource efficiency and minimizes waste.

The authors present case studies and theoretical frameworks that reveal how environmental considerations can be seamlessly integrated into the foundation of technological and economic developments. This integration is not only about reducing harm but also about creating a net positive impact on the environment. The discussions extend into the role of public policy in fostering an enabling environment for green initiatives, the significance of stakeholder engagement in driving the sustainability agenda, and the responsibility of education in cultivating an environmentally conscious and proactive citizenry.

WEAVING THE SOCIAL FABRIC: INCLUSIVITY AND DIVERSITY IN TRANSFORMATION

The exploration of social transformation represents a vital strand in the rich tapestry of the conference's thematic weave, engaging deeply with the societal reverberations of digital and environmental shifts. The proceedings explore the crucial interplay among technology, ecology, and society, emphasizing an imperative that extends beyond the mechanical and into the very heart of human experience—the principles of inclusivity, diversity, and social innovation. As we stand at the crossroads of huge

transformations, the collective insight presented in these papers underlines the significance of constructing social systems that are not only robust in the face of change but are also rooted in the principles of equity and collective well-being.

In this sense, the contributions critically analyze how the seismic waves of digital and green transformations can be harnessed to drive positive social change. The discussion transcends traditional boundaries, probing into how technological advancements and environmental stewardship can be channeled to fortify communities, engender resilience, and bridge divides. Authors dissect the societal impacts of digital proliferation—how it has the potential to democratize access to information and services but also how it may exacerbate socioeconomic disparities. They explore the avenues through which green initiatives can be leveraged for societal benefit, examining the ways in which they can support sustainable community development and provide a foundation for social equity.

The debate on these topics delves into the transformative potential of digital tools in facilitating inclusive education and healthcare, enabling marginalized voices to be heard, and empowering individuals with the capabilities to participate fully in a rapidly evolving economy. Furthermore, it tackles the imperative for diversity and inclusivity within the green transformation, asserting that environmental solutions must be designed with and for a diverse population, ensuring that the benefits of a green economy are accessible to all, irrespective of geography, socio-economic status, or culture.

Moreover, this discourse examines the role of policy and governance in shaping a conducive environment for social transformation. It highlights

the necessity of policy frameworks that actively promote inclusivity, diversity, and social innovation, thus fostering an ecosystem where transformational initiatives can take root and thrive.

As the world grapples with the waves of change brought forth by digitalization and a burgeoning green consciousness, this section of the proceedings stands as a clarion call for a collective reimagining of the social landscape. It is an invitation to weave a new social fabric—one that is resilient in its structure, rich in its diversity, and inclusive in its embrace, ensuring that the transformations of our time lead to a future where all members of society can thrive.

Conclusion: Toward a Sustainable and Inclusive Future

The UNIME Scientific Quadrilateral Conference 2023 has charted a remarkable journey through the labyrinth of modern transformations, illuminating the pathways that could lead humanity to a sustainable and inclusive future. This proceedings volume stands as a beacon of the conference's intellectual rigor and its commitment to pragmatic solutions, encapsulating the essence of a dialogue that is as broad as it is deep, as diverse as it is focused. As a congregation of some of the most insightful minds across disciplines, the conference has not only reflected on the present complexities but has also projected visions for our shared tomorrows.

Through its meticulous examination of the digital, environmental, and social transformations that define our era, this conference has underscored

the interconnectedness of these domains, challenging siloed thinking and advocating for a holistic approach to global issues.

The volume brings this discourse to a wider audience, engaging readers in the tapestry of change that these transformations are weaving across the globe. It presents an array of research, case studies, theoretical reflections, and practical recommendations that collectively call for an integrative strategy in addressing the myriad challenges that confront us.

In charting a course toward a future that values sustainability and inclusivity, this volume recognizes the vital role of innovation—not merely as a driver of economic growth but as a tool for social and environmental betterment. It acknowledges the potential of technological advancements to create new opportunities for progress while also stressing the importance of ethical considerations and governance to ensure that these advancements benefit all segments of society.

As we stand at the crossroads of change, the proceedings invite us to reflect on our responsibilities and our capacities to shape the future. They encourage a reimagining of economic models, a redesign of social structures, and a reevaluation of our relationship with the environment.

The contributions within this volume speak to the necessity of dialogue, the power of collaboration, and the spirit of innovation. As we digest the wealth of knowledge and insight offered, we are reminded that the challenges of the 21st century are not insurmountable. With a shared vision and concerted effort, the opportunities for transformation can be harnessed. We are summoned not only to navigate the present complexities but also to actively participate in the molding of a world that is just, prosperous, and sustainable for all.

Thus, the UNIME Scientific Quadrilateral Conference 2023 concludes with a hopeful gaze toward the horizon, where the confluence of digital prowess, environmental stewardship, and social cohesion holds the key to a future that we can all aspire to. This proceedings volume is an invitation to each reader to be an agent of change in this grand endeavor, to take up the torch of transformation and carry it forward into the unfolding narrative of our time.

DIGITAL TRANSFORMATION:
WHY ORGANIZATIONS OFTEN FAIL?

Valeria Schifilliti and Daniele Schilirò

Table of Contents

Abstract

Many companies struggle to implement genuine and effective Digital Transformation (DT). This paper aims to tackle the fundamental question: What are the factors that contribute to the failure of DT in organizations, especially considering that many organizations seem to struggle in achieving successful DT? DT is a complex and pervasive phenomenon with broad and deep economic and organizational implications. Although specific implications may vary depending on the industry, organization size, and the scope of the transformation effort, the paper aims to demonstrate that clear strategy, redesigning the business model, relying on data-driven decision making, implementing a mindset that accepts change, fostering innovation and agility, and creating a culture that promotes experimentation, continuous learning, and adaptability are key factors in responding to market changes and customer demands. Additionally, ensuring that employees have the necessary skills to leverage digital technologies effectively is crucial. The paper provides a brief review of the literature and presents a conceptual framework to explain the features and drivers of DT. Additionally, by utilizing the software VOSviewer, the paper offers a metadata-based analysis that can help in identifying the factors contributing to the failure of DT. The principal findings highlight that DT serves as a constant catalyst for change and necessitates a holistic approach aligned with the business strategy. Strategy, mindset, skills, and technology emerge as the primary factors contributing to both the failure and success of DT. Being a relatively new topic, the available literature on this subject is limited, and obtaining relevant data can be challenging. It's important to note that the VOSviewer dataset adopted may not be comprehensive enough to offer a complete understanding of failures in DT.

Despite these limitations, this contribution aims to enrich the literature and enhance knowledge regarding this important issue. The study's originality lies in the metadata analysis, providing a deeper insight into the problem at hand.

***Keywords**: Digital Transformations; Failure Factors; Bibliometric Analysis; Strategy; Mindset; Technology*

1. *INTRODUCTION*

Digital transformation (DT) is centered around the use of technology to bring about changes within organizations, introducing new ideas and processes. While digital technologies play a crucial enabling role, they alone are insufficient. People and culture also play vital roles in the successful implementation of the changes brought about by DT. Furthermore, the expectations of consumers and investors, along with the potential for greater economic and social benefits, serve as additional driving forces behind DT.

DT has emerged as a widely discussed topic across various disciplines. More recently, multidisciplinary researchers have also contributed to the discourse. However, the majority of existing literature on DT primarily focuses on the concept of organization-wide changes and how businesses can utilize digital technologies to drive transformation and generate value. In contrast, only a minority of studies delved into the reasons behind the failure of DT in many organizations (e.g., McKinsey & Company, 2022; Akkerman, 2021; Ramesh & Delen, 2021; Saldanha, 2019, Bughin et al., 2018).

In this paper, we aim to address the following research question: Why do organizations frequently encounter failures in DT, as many companies struggle to achieve genuine and effective transformation? Thus, we endeavor to identify the key factors that contribute to the failure of DT within organizations. By analyzing existing literature, the study employs a meta-analysis of the publications on the topic, along with an analysis of survey reports on DT, to identify the crucial factors leading to failures in DT for companies. The primary goal is to gain a better understanding of how organizations can successfully implement DT and why they often fail, the ultimate goal is to contribute to the advancement of research and understanding of this disruptive phenomenon.

2. *THEORETICAL FRAMEWORK*

2.1 DIGITAL TRANSFORMATION: DEFINITION AND FEATURES

Within the existing body of literature, various definitions of DT have been offered by scholars such as Kraus et al., (2022); Hanelt et al., (2021); Warner & Wäger, (2019); Saldanha, (2019), among others. In summary, DT is a multifaceted and multi-level phenomenon that impacts various functions and segments within an organization. It encompasses the adoption of emerging digital technologies, the formulation of a new strategy, the cultivation of dynamic capabilities, the acquisition of new skills, and the implementation of innovative business models, along with organizational changes. Additionally, DT is influenced by evolving consumer expectations.

Regarding its features, DT is primarily characterized by technology, in particular digital technologies that are its important drivers. These technologies and the flow of innovations related to them have not only changed how businesses are conducted but also how people communicate and interact. In addition, the use of digital networks to coordinate economic transactions with algorithms through platforms, leveraging the greater possibilities of artificial intelligence, has become an important factor in DT (Schilirò, 2021). However, Arantes et al. (2021) argued that that DT is still obscure and poorly understood by companies and academics. Their empirical analysis based on VOSviewer showed that DT occurs in many contexts and requires new strategies and behaviors for companies to manage their business. According to the authors, DT is not just about technology but is rather a sociocultural process where knowledge emerges as a unique asset.

Some scholars (e.g., Dąbrowska et al. 2022; Broekhuizen et al. 2021; Hanelt et al. 2021; Verhoef et al. 2021; Lanzolla et al. 2020; Cennamo et al. 2020; Nambisan et al. 2019) recognized that DT is a complex, multidimensional, and multifaceted phenomenon. DT has a strong impact on multiple disciplines and its analysis requires the integration of different theoretical perspectives. Hanelt et al. (2021), in particular, emphasized the dynamic nature of change associated with DT processes underlining the significant role of institutions and institutional design, alongside technology, in facilitating DT.

2.2 DIGITAL TRANSFORMATION AND FIRMS' CRITICAL FAILURE FACTORS

As Dąbrowska et al. (2022) pointed out, DT does not always lead to positive outcomes. Previous literature addressed the critical failure factors of firms in DT focusing not only on the rapid pace of digital technologies but also on people and culture. It is evident that DT projects often fail due to unrealistic expectations regarding employee resources and the lack of involvement from the corporate team, as well as issues related to time and budget constraints. Consequently, the desired outcomes are not achieved.

Empirical research has provided confirmation of the challenges that are commonly encountered when striving for success in the field of DT. Notable obstacles include the requirement to acquire new skill sets and the potential disruption of existing business models. In today's era, particularly during the Fourth Industrial Revolution, DT demands the convergence of technologies such as artificial intelligence, hyper-intelligent automation, blockchain, metaverse, and quantum computing on cloud-native applications. The transition to digital operations requires the formulation of digital strategies. However, it has been observed that these strategies often fail to reflect the changing economic fundamentals and industry dynamics brought about by DT, as well as the evolving nature of competition (Bughin et al. 2018).

In general, high-tech and media industries are particularly favored by DT, exhibiting lower failure rates, because companies harness vast amounts of customer data, leveraging their scale and network advantages.

Yet, Saldanha (2019) pointed out that more than 70% of DTs fail underlining that the primary factor contributing to the high failure rate of DT is the lack of sufficient discipline. However, the author recognized that a new business model and the building of dynamic capabilities are very important, suggesting a disciplined checklist approach – influenced by the same methodology - that has been successfully applied in the airline industry and the medical field. In line with Saldanha, Akkerman (2021) agreed with the high failure rate of 70% in DTs and identified a number of common causes including but not limited to: a lack of clear vision; not integrated digital strategy, failure to sustain initiatives beyond the inception stage, focus on technology while ignoring the human factor, silo approach to data, risk-averse culture; lack of innovation capabilities, legacy, and technology limitations. He suggested three critical success factors for every DT that are: Strategy, Mindset, and Skills and Tech, arguing that DT requires a holistic approach linked to the business strategy. This approach includes integrating DT with strategic business outcomes; develop a mindset of continuous innovation; enable an end-to-end focus on the customer; promote a data-driven culture throughout the organization. Digital skills and tech are also found to be crucial. Finally, eliminating legacy technology should be part of the DT agenda. PECB (2022) included, beyond the absence of an organizational change management strategy and a lack of the necessary skills and knowledge, the internal resistance to change, the challenge of meeting evolving customer needs, security concerns, and budget constraints.

McKinsey (2022) found that the organizations have captured much less of the value than initially expected showing that the critical for DT in

capturing value are: the use of digital technology that is more important than cost efficiency for achieving strategic differentiation in terms of customer engagement and innovation; bolder digital strategies that are more likely to be successful than more incremental ones; developing proprietary assets, such as AI, data, and software, that are more beneficial than relying on off-the-shelf tools; focusing on attracting and developing tech-savvy executives and achieving better overall integration of tech talent into the organization is key. Top-performing companies are foud to be more likely to have invested in several core tech capabilities (e.g., adoption of public cloud, a clear company-wide data strategy, agile practices, use of design thinking to enhance user experience, automated processes for testing and developing tech). They are also more effective than their peers in managing executive talent and more likely to have a tech-savvy C-suite (McKinsey, 2022). Ramesh and Delen (2021) highlighted several attributes that can be easily adopted for DTs including relative advantage over existing technology, simplicity of use, ability to try before buying, easily observable improvements, timing, communication.

3. *METHODOLOGY*

3.1 SEARCH STRATEGY AND SAMPLE IDENTIFICATION

The research design of this study involves a bibliometric analysis with the aim of presenting a comprehensive picture of the state of the art on DT and failure.

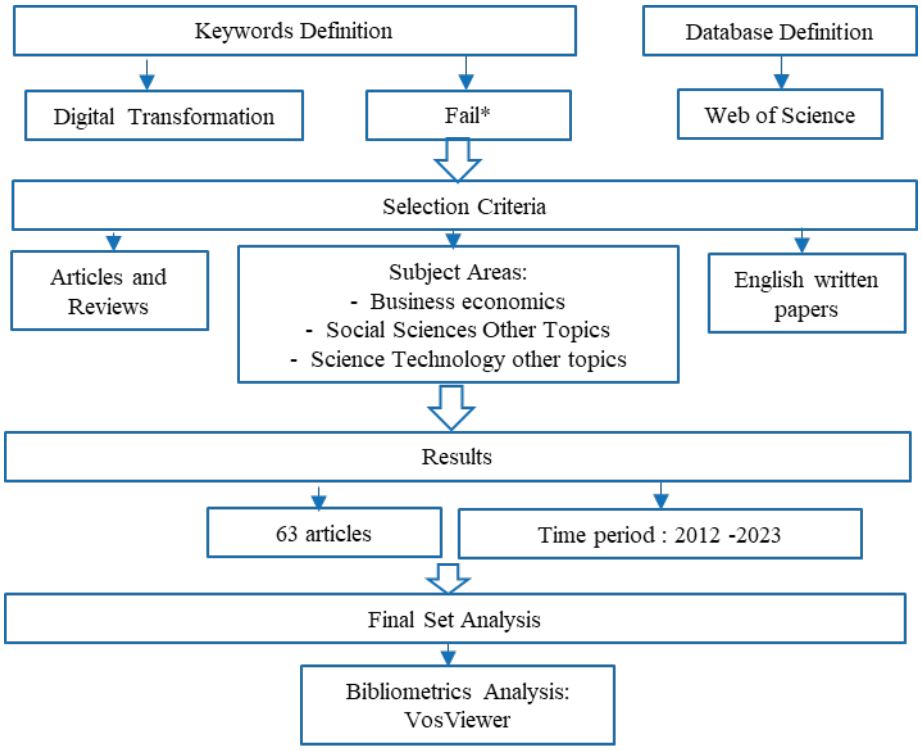
The process was divided into several phases. For the document search and collection, the keywords "Digital Transformation" and "Fail*" have been identified in the title, abstract, and/or keywords. Works published between 2012 and 2023 have been considered. Findings have been restricted to articles and reviews written in the English language, while grey literature and other published materials have been excluded. Additionally, a research area filter has been implemented in accordance with the research objectives, by selecting: Business Economics, Social Sciences Other Topics, Science Technology other topics.

The research results allowed to identify a total number of 63 results. To examine the results, the mapping and clustering technique proposed by Waltman et al. (2010) has been employed for the bibliometric networks. This methodology serves as a means of mitigating the inconsistencies that arise during the construction of maps at various levels of detail, by utilizing mapping and clustering systems that are founded upon analogous measures. The text mining analysis was conducted using a precise selection of the most frequently occurring words in the titles and abstracts of the publications. The objective was to ascertain the frequency of occurrence of the keywords or 'items' as well as the connections between them. The network visualization has facilitated the grouping of items into clusters, which are represented by labels and circles. The size of each circle is determined by the weight of the corresponding item. Furthermore, a chronological analysis of the evolutionary phenomenon has been conducted by using the overlay visualization technique. Therefore, the analyses have been performed by constructing and visualizing bibliometric networks utilizing the VOSviewer software. Finally, the clustering

outcomes, which have been categorized based on thematic domains, have been explicated.

The above defined stages of analysis are graphically represented in Figure 1.

Figure 1:



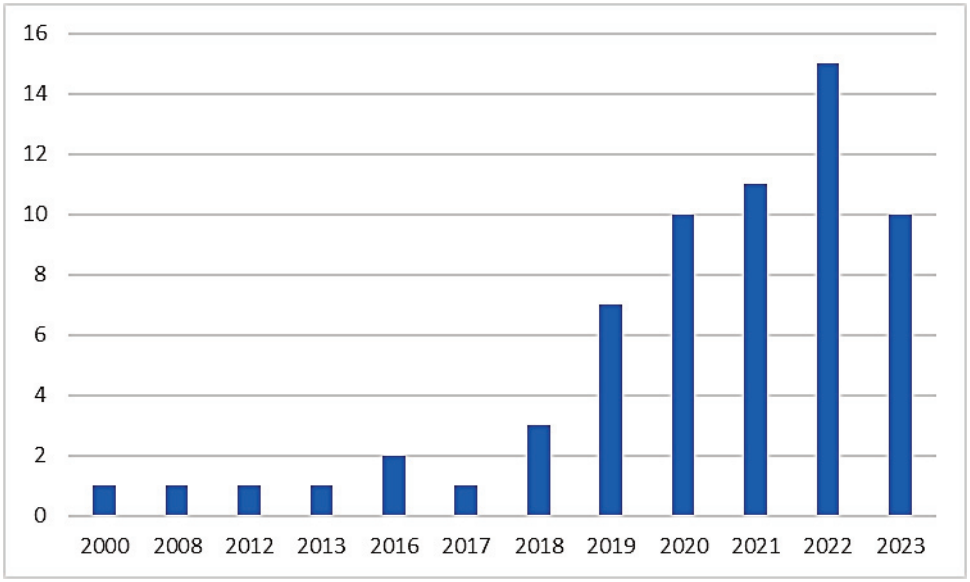
Source: our elaboration

4. *RESULTS*

The examination of the progression of article publication over the selected time frame, as depicted in Figure 2, demonstrating that it was not until the year 2019 that the topic was adequately addressed in academic

journals. During this period, there was a noticeable increase in the production of articles, culminating in the year 2022 when the number of published articles pertaining to DT and failure achieves its maximum, in the amount of 15. Considering that the investigation has been conducted during the third week of July 2023, a further increase in publications is expected for the rest of year.

Figure 2: Total number of publications per year



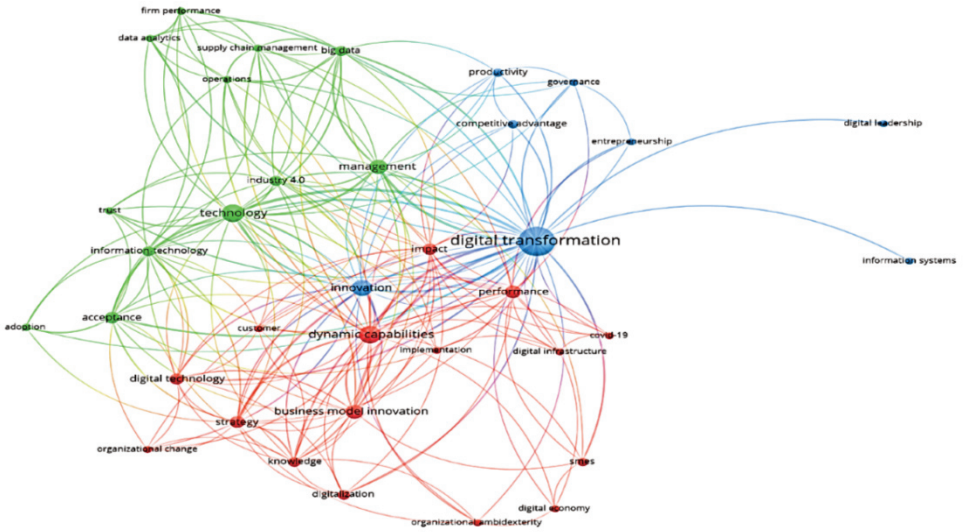
Source: our elaboration

To gain a more comprehensive understanding of the interconnections between the chosen articles, the study employs visualization techniques by using the VOSviewer software. Distinct colors have been allocated to each cluster to visually represent them. This implies that items within the same cluster exhibit greater associations among themselves compared to

entities belonging to distinct clusters and the various items are interconnected by lines, symbolizing the relationships between them.

Figure 3 presents the result of the text mining analysis, revealing a total of 3 distinct clusters. The first cluster, colored in red, comprises 16 items encompassing keywords such as strategy, business model innovation, digital technology, customer, knowledge, organizational change. The second cluster (green colored) comprises 12 items including big data, acceptance, firm performance, data analytics, industry 4.0, management and operations among others; while cluster 3, colored in blue, consists of the 8th items: competitive advantage, digital leadership, digital transformation, governance, entrepreneurship, information systems, innovation, and productivity.

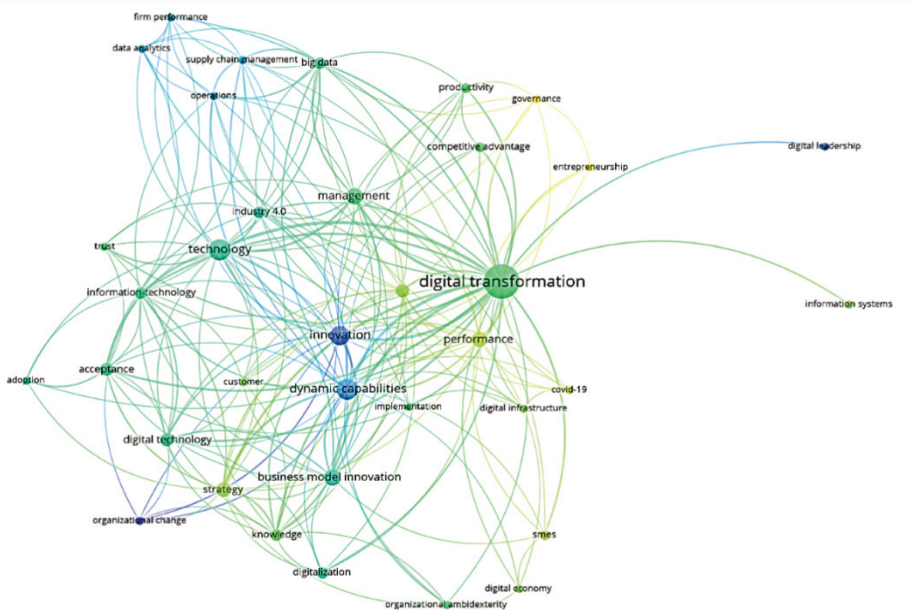
Figure 3: Network visualization of text mining analysis



Source: our elaboration from VOSViewer

Figure 4 presents the outcome of the chronological analysis conducted on the topic over time. In the present study, the overlay visualization map illustrates the temporal evolution of publications comprising the years 20191 - 2023, transitioning from a blue color denoting early publication to a yellow color representing more recent publications. The figure shows the literature evolution from topics related to innovation, dynamic capabilities and organizational change, to more recent topics on strategy, performance, governance and Covid-19.

Figure 4: Overlay visualization of chronological analysis



Source: our elaboration from VOSViewer

[1] 2019 was the year that showed a visible rise in the number of articles published.

5. *Discussion and Conclusions*

The present study has provided a comprehensive analysis pertaining to the relationship between DT and failure. The purpose of this study has been to provide an answer to the question on what factors may contribute to the failure of DT in organizations? According to the results of the text mining analysis (Figure 3) the elements that determine the failure of DT can be various. The red cluster, characterized by a greater number of items, suggests that failure in the DT process may occur due to inadequate implementation of dynamic capabilities, business model innovation, and strategies. Successfully navigating DT requires employees to acquire different capabilities, new competencies, and new skills. Consequently, the absence of essential talents within organizations, as well as a lack of investment in training and upskilling initiatives, can impede the successful integration and acceptance of digital technologies. Furthermore, a well-defined strategy and vision for DT become crucial because, without such a strategy, organizations may struggle to align their efforts and make informed decisions. The green cluster highlights that technology, the implementation of Industry 4.0, the acceptance of change, trust, and good data-driven management, may impact DT. This cluster points out that one of the main reasons for the failure of DT appears to be the resistance to change within organizations. Additionally, organizations that lack a data-driven culture or fail to invest in data management and analytics capabilities, may not leverage data effectively for transformation purposes. Finally, inadequate technology infrastructures can obstacle the implementation and scalability of digital initiatives. The blue cluster

shows that the lack of innovation, entrepreneurship, and governance may lead to failure (Nadkarni & Prügl, 2021).

Figure 4 offers a different reading, as it illustrates the temporal evolution of publications, where the yellow color represents more recent publications. Thus, the focus concerning critical factors for DT has shifted to strategy, governance, entrepreneurship, and customer, but also Covid-19, which represented a breaking point in the adoption of DT.

To conclude, we acknowledge that DT is not an easy task to accomplish, and it is not just about technology; it also involves people, mindset, dynamic capabilities (competences and skills), and business models. The recent stress of the literature on strategy, governance, and entrepreneurship means that organizations should assess the former factors and, at the same time, develop strategies and the right governance to mitigate potential risks and increase the likelihood of successful DT.

However, our paper is not without limitations. In our search strategy, we used the database WoS for the collection of publications; further research could consider employing additional databases (e.g., Scopus, Google Scholar). To examine the articles, we carried out a bibliometric analysis; while a systematic literature review could be considered for further research.

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