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From Insights to Business Model Innovation and Results: Using the Digital Transformation Canvas

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Abstract

Digital transformation is the process that a company must undertake to connect its operational model with all stakeholders to respond to ongoing market effective changes in technological trends and to create the conditions for anticipating future trends. This article introduces and explains the digital transformation canvas's components and tools, intending to provide a starting point for developing a digital transformation strategy and a plan of action to achieve this.

Introduction

Much growth in productivity and the global economy in general in the last decades can be ascribed to digitalisation and digital transformation of existing modes of business. According to Vial (2019), digital transformation is a process in which digital technologies create disruptions that trigger strategic responses from organisations that seek to alter their value-creation paths while managing the structural changes and organisational barriers that affect this process's positive and negative outcomes (see also Foss, 2023).

Digital transformation is the process that a company must undertake to "connect" its operational model with all stakeholders (customers, suppliers,

partners, and employees) to respond to ongoing market effective changes in technological trends and to create the conditions for anticipating future trends vis-à-vis its competitors. Such a process often requires companies to substantially revise their existing operational models, starting with external stimuli (an outside-in approach). To implement such changes, it is necessary to:

- Instil the outside-in culture in all corporate departments, not limited to the marketing department
- Abandon or mitigate legacy processes and systems that render the company less flexible and adaptable to change

Keywords: Digital transformation, business model innovation, firm performance, business model canvas

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- Equip the organisation with digital infrastructures and platforms that facilitate stakeholder interaction

The starting point is developing a digital transformation strategy, a plan of action to achieve a specific objective. To craft this strategy, the Digital Transformation Canvas comes to our aid. Hence, this article aims to provide a tool managers can use to increase the probability that their digital transformation efforts will result in more resilient businesses and positive financial results. The article offers a conceptual model grounded in empirical probing over five years. It has been denoted the Digital Transformation Canvas because it assists managers in creating an overview, conducting appropriate analyses and drawing relevant conclusions that help them improve their business models.

The literature contains numerous examples of failed digital projects and the reasons for this (Saldanha, 2019). Davenport and Westerman (2018) argue that managers should avoid viewing digitalisation as the sole salvation of the business and be aware that digitalisation is not a plug-in but a very integrated process. Other less apparent factors affecting success and failure might be whether the industry you are operating is calibrated to digitalisation and whether the call of a new business model can become more potent than it should just because things are not going so well in the existing business. Poor governance and leadership are also key reasons for digital transformation failure. Ramesh and Delen (2021) identify five factors as critical influencers of digital transformation success: a) innovation attributes, b) opinion leaders, c) diffusion approach, d) timing, and e) duration.

Another problem often encountered is resource scarcity. Digitalisation projects often fight for a budget in the initial development stages. Still, if they lead to new business models that the firm needs to explore and invest in, they must fight for resources with the old business models. In addition to these organisational and governance aspects, our experiences and prior research into successful business development led us to formulate the following additional criteria:

- Lacking or no definition of the objectives of the digital transformation

- Poor analysis of the expected economic effects and lack of business case
- Lacking notion of how to turn business ideas from digital transformation into business opportunities
- Lacking knowledge of how to translate business opportunities into action
- Lacking a basis from which to measure the often multi-dimensional aspects of digital transformation success

These frustrations have led to the formulation of the digital transformation canvas.

The Relevance of the Digital of Everything

The relevance of the potential value created by the "Digital of Everything" (DoE) and the market potential spending on digital transformation is nothing short of transformative. Cisco's (2013) staggering estimate of over \$14 trillion in value in 2022 underscores the immense impact of this digital revolution. This potential spans various critical areas, such as asset utilisation, employee productivity, supply chain and logistics, customer experience, and innovation, as exemplified by billions of dollars in each category, and companies' positive financial performance is quite well documented: sales growth, cost reduction, improved efficiency (Accenture, 2023). Evidence of business Statista's projections for 2025 suggests that the Internet of Things alone could generate up to \$11.1 trillion in revenue annually. Moreover, with digital transformation spending projected to rise from \$1.6 trillion in 2022 to a forecasted \$3.4 trillion in 2026, businesses worldwide recognise the urgency of investing in digital innovation. McKinsey's (2013, see also 2015) forecast of over \$14 to \$33 trillion in value creation by 2025 across numerous sectors, including mobile internet, IoT, automation, cloud technology, and advanced robotics, attests to the vast opportunities within the DoE. Additionally (Mordor Intelligence 2023), the Manufacturing Digital Transformation Market is projected to exhibit robust growth, with an anticipated increase from USD 307.87 billion in 2023 to USD 733.75 billion by 2028,

reflecting a compound annual growth rate (CAGR) of 18.97% over the forecast period spanning 2023 to 2028. As spending on digital transformation continues to surge, it is evident that the DoE is driving a global revolution with unprecedented economic and societal implications.

Evidence on the effects of digital transformation on firm performance needs to be clarified. Curran (2018) found no direct positive correlation between digital transformation and firm performance, while Guo et al. found that digital transformation hurt firm performance due to higher operational cost rates, reduction in total asset turnover, and increased management expenses. Other studies find positive correlations between digital transformation and firm performance, for example, through cost reductions and the promotion of innovation (Heredia et al., 2022; Peng & Tao, 2022).

What is digital transformation?

Digital transformation is currently one of incumbent firms' most pervasive managerial challenges and is intimately connected to achieving greater sustainability effectiveness (see also Ricart, 2023). According to Nadkarni & Prügl (2020) and Hess et al. (2016), digital transformation concerns all the changes digital technologies can bring about in a company's business model, services, products, and organisational and governance structures. According to Vial (2019), digital transformation is a process in which digital technologies create disruptions that trigger strategic responses from organisations that seek to alter their value-creation paths while managing the structural changes and organisational barriers that affect this process's positive and negative outcomes. Schwertner (2017), quoting Kane et al. (2015), argues for grouping the effects of digital transformation processes into three areas: effects on consumer behaviour, business processes and business models.

Nadkarni and Prügl (2020) identify technology and actors as the two aggregate dimensions of digital transformation and digital transformation processes. Digital transformation is typically connected to concrete technologies and infrastructures. To mention a few: AI (see Haafner and Gassmann, 2023), Cloud computing (DaSilva et al., 2013), HPC,

multi-cloud-as-default, cybersecurity, Blockchain (Schmück, 2023), cryptocurrency, 6G (Ahokangas, 2023), robotics, Web 3.0, digital twins (Rosenstand et al., 2023), mobile technologies, social technologies, big data, analytics, internet of things. Regarding the actors, Bradley et al. (2015) identify troubling findings about the potential for disruption and incumbents' readiness to adapt. While the potential is massive, companies do not seem to take the movement seriously and lack the competencies to embrace digital transformation.

Failure Potential

While digital transformation is crucial for companies to embrace and has the potential to create value for both companies, the planet and society, it takes work to achieve. Everest (2021 and 2019) and McKinsey (2019 and 2022) estimate a massive 66% to 78% failure rate on digital transformation initiatives. Additionally, McKinsey has found that traditional industries such as pharmaceuticals, oil and gas, automotive, and infrastructure face even lower success rates than those indicated above. They found success rates ranging from as low as 4% to 11%. The complexity of these sectors, involving numerous stakeholders with diverse objectives and heavy regulatory frameworks (Nielsen, 2023), contributes to the challenges faced in achieving successful digital transformations. Boston Consulting Group's (BCG) research (2020) highlights that merely 30% of digital transformations can be classified as "winning," meeting or exceeding their target value and resulting in enduring change. Several reasons contribute to this need for more success in implementing digital transformations¹. These reasons can be attributed to four main clusters:

- 1. Strategy and Digital Technology Fit.** There is a lack of alignment between strategies and the concept of the "digital of everything." (see

¹ In this chapter, we do not consider reasons and evidence why digital transformation has yet to be considered or implemented. Lack of resources, adequate digital competencies and knowledge, and timing are recurrent. Here, we focus on failures during implementation. See: Harvard Business Review (HBR) Analytic Services Survey, September 2021 and Magnusson et al., 2022

Everest, BCG, McKinsey 2018). Digital transformation necessitates a holistic and comprehensive approach. Digital transformation or the integration of digital technologies should be part of a clear strategic vision and the business model through which the company aims to position itself in the competitive landscape. It is essential to understand that introducing digital components does not equate to genuine digital transformation.

2. Implementation Pitfalls. Errors during the implementation phase, such as communication and engagement of various actors involved or potentially affected by the project (see Accenture, HBR 2021). Leadership and commitment are essential. A compartmentalised view of the digital journey, known as the “silos effect,” hampers its effectiveness. In addition, a misalignment between the objectives of digital transformation and performance management systems might cause conflicts, ambiguity, confusion, or undesired and opportunistic actions.

3. Poor business case exercise. Inadequate business case analysis and the absence of robust assumptions testing (Bland & Osterwalder, 2020) may lead to underestimating potential threats and overemphasising opportunities and outcomes while ignoring competitive reactions or genuine market interest. Furthermore, little attention is paid to the presence of resources, capabilities, and skills or a supportive ecosystem. Finally, poor quantitative and financial analysis is sometimes due to superficial accounting skills or the effective translation of the digital strategy into a performance model.

4. Governance restraint. Weak governance and inadequate leadership hinder the successful execution of digital transformation initiatives. The governance style and the level of involvement in embodying a digital model or transformation can be critical factors in transmitting the vision and information related to strategies, plans, and programs to various levels of the organisation (Khezri, 2022). Furthermore, the dynamic capabilities of the board are crucial for the success of digital strategies. These capabilities should be more focused on cognition

than operations, and transformation should not rely solely on a transformation-oriented CEO; the board should continuously develop these dynamic capabilities to ensure the right balance between exploitation and exploration, financial and strategic sustainability (Khezri, 2022).

Considering the size of the investments currently going into digital transformation projects, reducing this failure rate even minutely would have significant economic implications. The following section introduces the Digital Transformation Canvas. This framework aims to effectively exploit and explore the potential of digital technologies in a business context and to drive digital strategy deployment.

Driving digital transformation: The Digital Transformation Canvas

Digital transformation is not just about adopting new technologies; it is more about changing people's behaviour and connecting the company's operations with all stakeholders - customers, suppliers, partners, and employees - to adapt to market changes and stay competitive. To do this, the company must reframe its existing business model, starting with external influences. Key steps include fostering an outside-in mindset, eliminating legacy processes, and investing in digital infrastructure. Viewed from a business standpoint, the “Digital of Everything” (DoE) empowers organisations to optimise their business models, enhancing both efficiency and effectiveness (referred to as business refinement). It also provides the opportunity to pioneer innovative approaches for serving existing market categories and user bases (business innovation) or venture into entirely new business sectors and markets (referred to as business expansion).

Given the substantial value potential inherent in digital transformation for businesses and the notable failure rates in digital endeavours, the core challenge is to adeptly leverage competitive advantages offered by the “Digital of Everything” (DoE). In tackling this challenge, the formulation and deployment

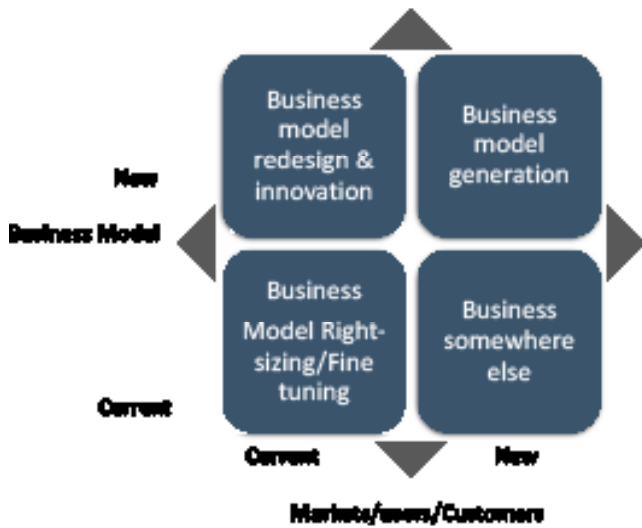


Figure 1: A typology of business model innovation

of a digital strategy requires at least four moments of reflection:

- 1. Comprehension of the business context:** It seeks to identify opportunities and threats of markets, technologies, and the firm's business model
- 2. Assessment of Digital Maturity:** It assesses the digital maturity level of an organisation.
- 3. Impact Identification:** It identifies the potential impact that can be achieved through digital transformation.

- 4. Progress Monitoring:** It controls the advancement of the digital transformation process through successive assessments and feedback management.

From this standpoint, the Digital Transformation Canvas (DTC) serves as a structured framework for facilitating digital transformation, considering the abovementioned reflection. The DTC encompasses four fundamental domains (Figure 2).

- 1. Understanding the Big Picture:** This step involves gaining a comprehensive view of the broader landscape. It encompasses analysing the competitive market environment, identifying threats and opportunities in business and technology realms, understanding business model performance, and recognising key success factors. By doing so, organisations can better position themselves to leverage the advantages of the digital age.
- 2. Digital Assets:** Assessing digital assets' availability, readiness, and needs is crucial. This includes evaluating the presence of **digital talents** within the organisation, the state of **digital infrastructure**, and the potential of the digital ecosystem. Recognising what is already in place and identifying areas where improvements or

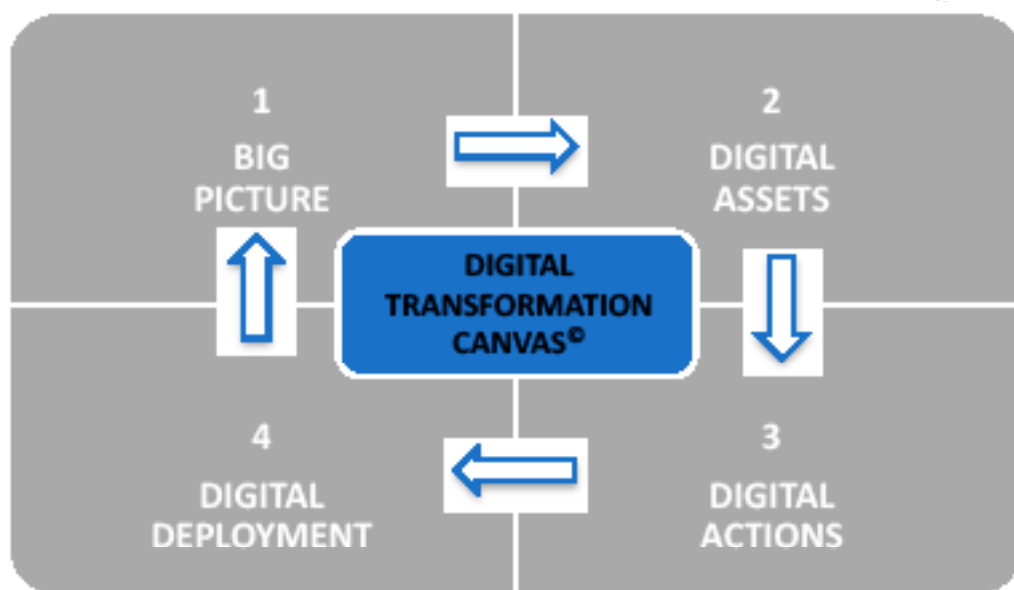


Figure 2: The Digital Transformation Canvas™

investments are needed is central to a successful digital strategy.

3. Digital Actions: This step involves aligning opportunities and threats with potential actions. It may encompass fine-tuning existing business processes, fostering innovation to stay competitive, exploring new avenues for revenue generation, or even considering expansion to new markets. By matching the digital potential with the appropriate action, businesses can adapt and thrive in the digital era.

4. Digital Deployment (of Strategy and Plans): Once the actions are defined, it is essential to translate them into a concrete digital strategy. This entails setting clear goals, targets, and Key Performance Indicators (KPIs) to measure progress. Equally important is the continuous monitoring, control, and management of

feedback. A test-learn-adjust-improve approach ensures that the digital strategy remains flexible and responsive to changes in the dynamic digital landscape.

By following these four steps, organisations can better navigate the “Digital of Everything” complexities and position themselves to extract competitive value from the digital transformation journey.

The Digital Transformation Canvas in detail

While Figure 2 illustrates the overall components of the Digital Transformation Canvas, a detailed breakdown of the areas of investigation and the potential tools associated with each is provided in Figure 3). The numbers in the Figure explain the ideal process flow.

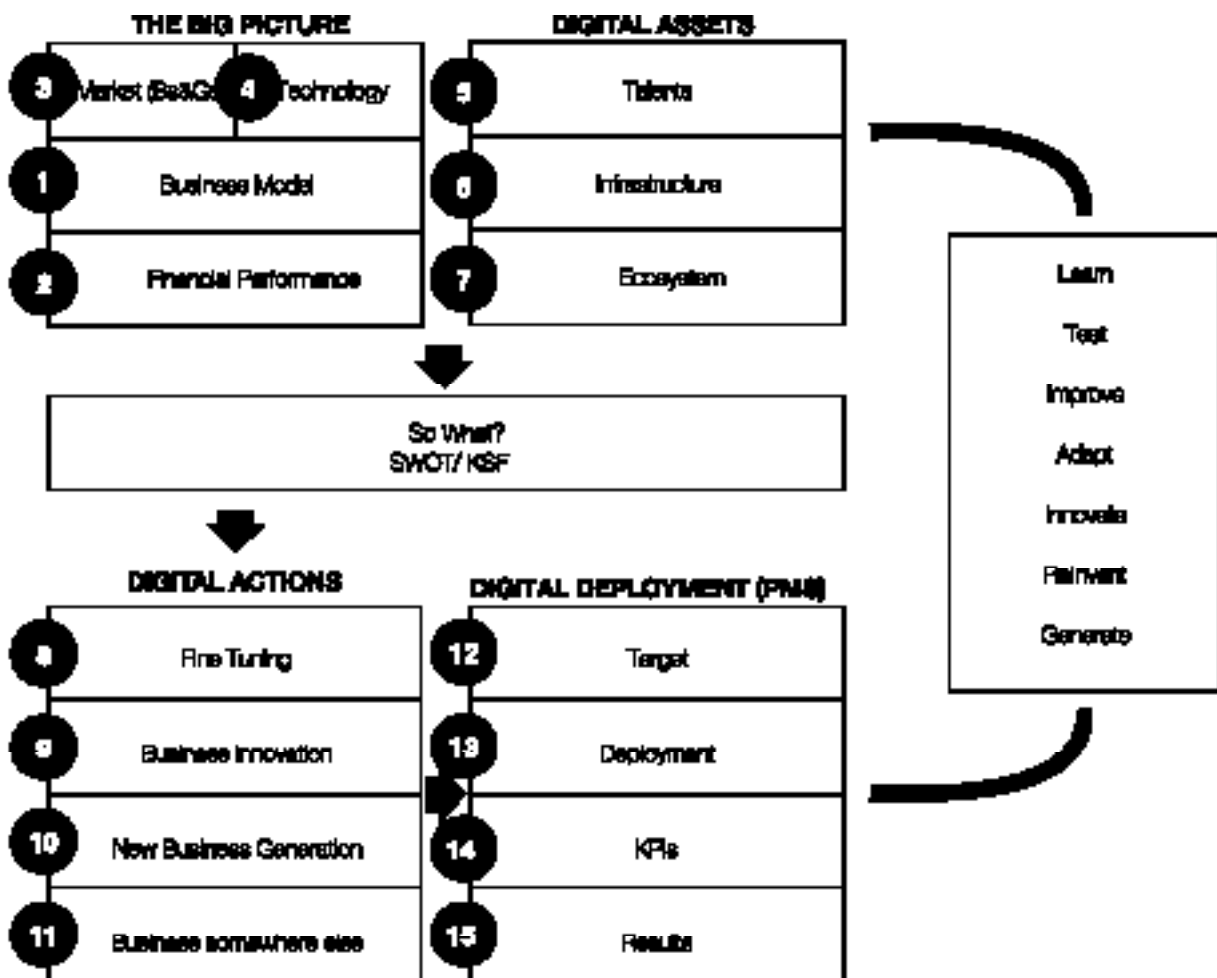


Figure 3. The detailed steps of the Digital Transformation Canvas™

As already mentioned, the Digital Transformation Canvas™ introduces four analytical phases for the performative evaluation of digital transformations. First, you need to establish the big picture. In doing so, you identify the technology and type of transformation, the market potentials and value propositions it promises, the type of business model that is currently applied, and the type of financial improvements and results that can be expected. So far, so good. This phase is what is currently known and a space where companies are well-acquainted in making decisions.

The digital assets needed to implement the potential digital transformation are analysed in the next phase. These assets can be in the form of digital talent, digital infrastructure, or digital ecosystems. In conjunction with phase one, the baseline establishes a call to action, denoted by the “so what” conclusion. In establishing this, strengths, weaknesses, and critical success factors must be identified.

These provide a natural point of departure for the third phase, namely Digital Actions. Digital actions are the actual digital transformations to be made. In depicting the type of transformation and the specific type of technology, the focus in this phase is to depict the potential severity of the transformation in terms of the degree of effect on the business model, as depicted by Johnson (2010). This spans from fine-tuning the existing business model to redesigning a minor or significant proportion of the business model’s value drivers to generating an entirely new

business model.

In the fourth and final phase of the Digital Transformation Canvas™, the deployment of the digital transformation is designed. Constructing a sound performance management system around digital transformation is crucial in bringing resources into effective action and is often a neglected area. This is where the necessary analytical strategies are designed and undertaken. In ensuring that organisations can go from transformation potentials to concrete actions and results, managers need to understand how to analyse and measure status and performance. Below, the four key investigative areas of the Digital Transformation Canvas are explained.

FIRST AREA: BIG PICTURE

The first area, known as the “Big Picture,” encompasses the following aspects:

1. The business model of a company (utilising tools such as the Business Model Canvas or similar frameworks). A company’s business model, as defined by Osterwalder and Pigneur (2010), describes how the company creates, delivers, and captures value. The Business Model Canvas is a key tool for understanding this, with nine building blocks that focus on value creation, delivery, and profitability. In a similar vein, Gassmann introduces a framework called “the business model navigator” (Figure 5) to delineate and understand

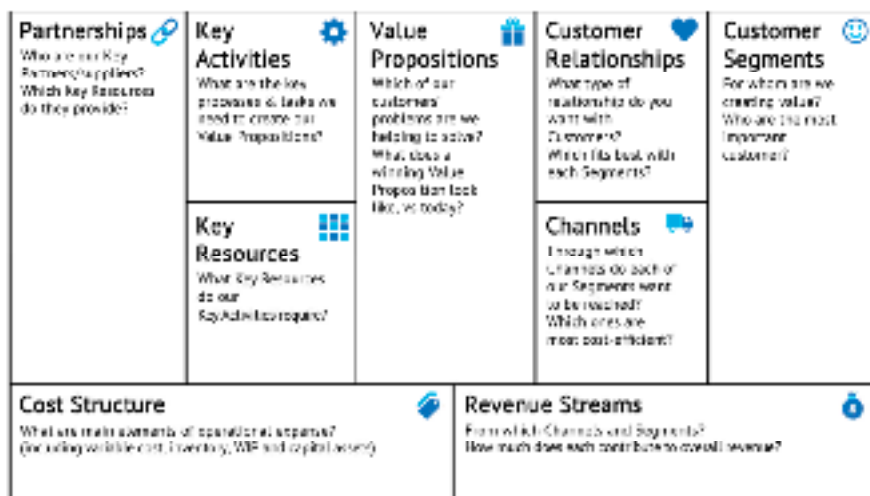


Figure 4. A Business Model Canvas with questions (Osterwalder & Pigneur, 2010)



Figure 5. The Business Model Navigator (Gassmann et al., 2014)

the company's offerings, its target customers, the production process, and the resulting financial outcomes (Gassmann et al., 2014). The business model comprehension exercise is a sound starting point for identifying the most relevant value drivers (Montemari et al., 2019), which are the key to identifying Key Performance Indicators (Nielsen et al., 2017).

2. Critical financial aspects are pertinent to the intended transformation journey. This section deals with comprehending the financial situation underlying the company's business model. In particular, it involves understanding business profitability, its drivers and financial solvency and riskiness (if relevant). Understanding the revenue, cost, and asset models and drivers supports this investigation. In addition, benchmarking with competitors or best practices and using simulation and forecasting tools are employed to understand better how contextual factors and assumptions impact business results.
3. Market analysis encompasses ongoing changes, strengths, weaknesses, opportunities, and threats. This includes market research, trend analysis, and consumer research.

4. The ongoing technological trends, emerging start-ups entering the relevant market or value chain, and potential innovative solutions. Digital technologies enable digital processes (and capture throughout), enabling the digitalisation of customer relationships/partnerships, which requires digital skills. They produce new use value for users, customers, and society (and probably several different use value types). Technologies include Sensors for movement, temperature, location, etc., augmented reality/wearables, 3D printing, mobile units, and Virtual Reality.

SECOND AREA: DIGITAL ASSETS

The "Digital Assets" area pinpoints the organisation's current and target digital resources and readiness state. This analysis, presented in Figure 6, includes (Bartolini et al., 2017; Bartolini & Silvi, 2020):

1. Mapping of digital talents, acquired competencies, existing capabilities, experiences, and training paths (past, present, and future).
2. Mapping of digital technologies existing within the organisation, excluding legacy IT systems from the digital ecosystem.

Digital Assets



Figure 6: Digital Assets overview

3. Identify existing relationships with external entities supporting the digital transformation process, such as research centres, open innovation activities, technological incubators, and strategic partners.

Digital talents

The digital transformation of a business is, in some cases, a matter of vision or necessity. Still, it cannot be separated from the presence of consistent digital knowledge, skills, and competencies. This specifically encompasses technological and IT skills (systems and network experts), data analysis (data science), programming, development, usage, and management of digital platforms that enable communication, sales, production, and overall relationships with customers and suppliers (Davenport, 2001), and cybersecurity. Digital human capital is evident in the knowledge embedded in the workforce, acquired through targeted recruitment, and developed through appropriate training and the involvement of these resources in analysis and decision-making processes. Knowledge, skills, and participatory analytical processes all contribute to forming an organisation's so-called digital intelligence quotient (DIQ) (Geissbauer et al., 2015). Its presence and growth over time help seize digital

opportunities, while its absence becomes an obstacle to digital transformation, progressively widening the gap between competitive and non-competitive companies.

Digital infrastructure

While the presence and development of digital knowledge are critical factors for the success of digital transformation (Catlin et al., 2015; Bi and Cochran, 2014), achieving the latter will be challenging without adequate technological provisions, including hardware, software, networks, and infrastructure. Information and Communication Technology (ICT) systems, in fact, play a fundamental role in addressing the challenges posed by digital ecosystems. These systems enable the collection and management of both internal and external data within a company, even in large quantities (Big Data). In the business context, these provisions could encompass systems like Enterprise Resource Planning (ERP), Business Intelligence (BI) and Data Mining tools, inter-organizational sharing mechanisms, databases, and web-based software. On the other hand, the infrastructure component relates to the presence of technologies that enable Industry 4.0 (Schwab, 2017). ICT infrastructure grants management direct access to a wide range

of operational, financial, and market/customer information, often in real-time. It aids in serving customers better, developing new products, optimising productive and intangible assets (data), performing processes autonomously (artificial intelligence, machine learning), and preventing operational risks stemming from both malfunctions and cybersecurity breaches (Geissbauer et al., 2015).

Digital ecosystem

The importance of ecosystems in the realm of business strategy and sustainability is increasingly emphasised in the literature (Adner 2017, Orlova et al. 2020, Tsujimoto 2018, Lingens 2023, Jacobides et al. 2018), and this perspective also encompasses digital transformation. This approach involves strategies for inter-company collaboration and is completely aligned with the Industry 4.0 paradigm and related phenomena. These trends anticipate higher levels of integration among supply chain partners facilitated by digitalisation, going as far as envisioning industrial digital ecosystems (as described by Moore in 1996 and Nachira in 2002). This category encompasses technology suppliers, research and training centres, industry-specific institutions, customers, and consumer associations.

THIRD AREA: DIGITAL ACTIONS

After analysing the first two areas, hypotheses can be formulated regarding the impact of a digital transformation process within an organisation. While there is no one-size-fits-all solution, appropriate actions can be identified based on the specific context:

- **Fine Tuning:** Suitable when there are opportunities for improving market or financial indicators, a need for short-term results in the absence of significant resources or internal competencies, or challenges in scaling an existing, robust business model.
- **Business Reinvention:** This is applicable when companies aim to maintain their products and services while introducing innovative business models, such as subscription models. This approach is advisable in cases involving a high

market share, increasing revenue and profits without expanding production, capitalising on relationships with existing stakeholders, and enhancing stakeholder loyalty.

- **Business Somewhere Else:** It refers to the opportunity to use digital to serve markets of another geographical area or to address new segments of customers. This digital action might refer to the possibility of decentralised production or activity phases in different locations.
- **New Business Generation:** The most radical form of digital action, suitable for solid companies seeking expansion beyond saturated markets or sensing obsolescence in their existing business models. This approach requires substantial digital resources.

FOURTH AREA: DIGITAL DEPLOYMENT

The fourth and final section of the Digital Transformation Canvas focuses on control and performance analysis tools for assessing the progress and potential impact of the digital transformation process. This phase involves:

- Designing, testing and selecting the business actions
- Setting the deployment of the selected business action. It requires the formulation of new objectives and targets, the alignment of the organisation, and the assessment of its readiness
- Evaluating the organisation's focus and motivation and the degree of readiness for a new operational model
- Engaging stakeholders to drive effective implementation.

Once the entire organisation is moving in the right direction with appropriate focus and strength, financial and market objectives can be established. These objectives are directly influenced by the type of digital action identified.

In conjunction with activity planning, the roadmap for transformation associates the anticipated impacts, both qualitatively and quantitatively. Effective

control necessitates the identification of specific Key Performance Indicators (KPIs).

The performance management system remains incomplete without the interpretation of KPIs as feedback for:

- Identifying unforeseen barriers or challenges
- Acquiring new information and data in new contexts
- Refining and updating the digital transformation plan to optimise objective achievement

At the end of the assessment phase, one or more digital actions are defined and prioritised based on impact assessment and required time for realisation. Typically, actions that maximise impact in the shortest time are considered first.

Conclusions, Recommendations, and Future Research

Spending projections for digital transformation in the future indicate massive investments. At the same time, digital transformation projects seem to have horrific failure rates, so focusing on supporting analyses, business cases, processes, project management, and governance structures that increase the likelihood of positive outcomes is a sensible endeavour. Given these considerations of the value potential of digital in business transformation and high failure rates, the challenge is to extract competitive value from the digital of everything.

The Digital Transformation Canvas is useful for clarifying and providing input to businesses' strategies and results. It identifies four relevant steps: First is understanding the big picture, including the

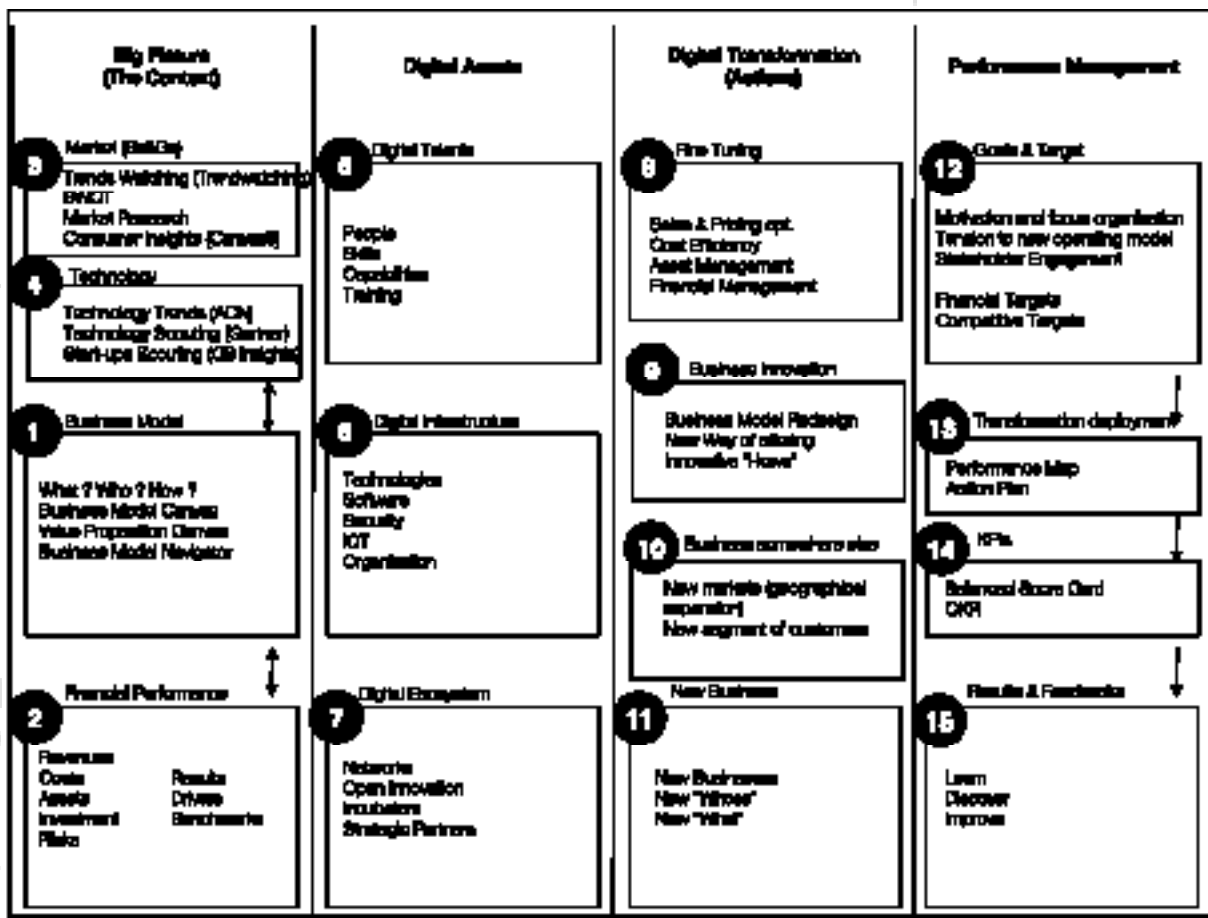


Figure 7: The expanded Digital Transformation CanvasTM

competitive landscape, threats and opportunities in business and technology, business model performance and key success factors. The second is to create an overview of the company's digital assets, including digital talents, digital infrastructure, and the digital ecosystem, as well as the needs and availability in the future. Third, regarding digital actions, companies must match opportunities and threats with digital potentials and potential action strategies such as business fine-tuning, business innovation, business generation, and doing business somewhere else. Fourth, the digital strategy and deployment plans are set, including goals, targets, and KPIs), so that management control and feedback are made possible through testing, learning, adjusting, and improving mechanisms.

In addition to these practical implications, the research implications of the Digital Transformation Canvas are as a research tool for studying the successes and failures of digital transformation. First, the Digital Transformation Canvas can be a model for linking digital transformation actions to financial firm performance. Second, it depicts various characteristics that could serve as latent variables for further quantitative empirical testing.



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