Integrating environmental sustainability and change management into responsible digital transformation by means of a qualitative expert interview study

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INTEGRATING ENVIRONMENTAL SUSTAINABILITY AND CHANGE MANAGEMENT INTO RESPONSIBLE DIGITAL TRANSFORMATION BY MEANS OF A QUALITATIVE EXPERT INTERVIEW STUDY

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AI:	Artificial Intelligence
CM:	Change Management
CSRD:	Corporate Sustainability Reporting Directive
DT:	Digital Transformation
ESG:	Environmental, Social and Governance
ESR-DT:	Environmentally and Socially Responsible Digital Transformation
Green IS:	Green Information System
Green IT:	Green Information Technology
ICT:	Information and Communication Technology
IoT:	Internet of Things

Abbreviations are written out in full in main and subchapter titles. From the third level of headings onwards, the defined abbreviations are used.

1 Introduction

In recent years, digital transformation (DT) has become a key priority for companies seeking to remain competitive in an increasingly complex, volatile and interconnected world (Xu et al., 2022; Zhang et al., 2023). Digitalisation is no longer viewed as merely a technological upgrade or an operational efficiency measure. Instead, it is recognised as a driver of profound organisational change, influencing structures, processes and the logic of value creation within companies (Vial, 2019). While the economic and technical advantages of DT—such as increased productivity, reduced costs and greater adaptability—are widely recognised, attention is increasingly shifting towards its broader societal and environmental consequences.

Digital technologies have the potential to accelerate innovation, enhance organisational flexibility and contribute to decarbonisation efforts. Yet these same technologies also generate significant challenges: they increase electricity demand, expand the footprint of digital infrastructures and contribute to the growing problem of electronic waste. On the social side, they reshape job profiles, introduce new forms of monitoring and stress and create uncertainty among employees regarding their roles and future within the organisation (Meinhold et al., 2025; Péréa et al., 2023).

Such tensions are redefining expectations of corporate responsibility. Under frameworks such as the EU Green Deal and the Corporate Sustainability Reporting Directive (CSRD), stakeholders are demanding digital strategies that support environmental sustainability and social well-being as well as delivering efficiency. The EU's "twin transition" agenda embodies this dual imperative by linking technological advancement with environmental and social progress (Lynn et al., 2024; Schmelzle & Hielscher, 2025). This coupling emphasises the importance of integrating environmental considerations into the earliest stages of decision-making and of addressing social implications such as fairness, inclusion and participation through explicit governance structures and deliberate change management (CM) approaches (Ardiansyah & Alnoor, 2024).

Despite increasing political and managerial focus, incorporating environmental and social goals into DT remains challenging in practice. While academic literature has extensively explored the technological and economic aspects of digitalisation, research on systematically embedding environmental sustainability and social responsibility into transformation processes remains comparatively underdeveloped and lags behind other dimensions. This limits organisations' ability to operationalise responsibility in a comprehensive and practical way.

In this context, this thesis uses the term "environmentally and socially responsible digital transformation" (ESR-DT) to describe processes of transformation in which environmental sustainability and social responsibility are integral design principles, not secondary considerations. Throughout this work, the term "responsible digital transformation" is used interchangeably with "ESR-DT". This analytical perspective provides a normative orientation, defining what responsible transformation should achieve, and a practical framework for identifying organisational conditions that facilitate these outcomes.

The aim of this research is to move beyond abstract principles and examine the concrete organisational strategies, structures and governance mechanisms that make ESR-DT possible. The central research question guiding this study is therefore: ***How can companies digitalise in an environmentally and socially responsible way?***

To address this question, the research employs a qualitative design comprising 15 semi-structured interviews with professionals from sectors including digital strategy, sustainability consultancy, public institutions and academia. This approach enables an in-depth exploration of the challenges, enablers and tensions encountered in different organisational contexts, while remaining firmly rooted in real-world experience.

The thesis is structured as follows: Chapters 2 to 4 present the literature review, which provides the conceptual basis for the empirical analysis. Chapter 2 introduces the concept of DT, examining its strategic importance to organisations and the interplay between technological and organisational change. Chapter 3 explores the environmental dimension by analysing the ecological impacts of digitalisation and solution-oriented approaches. Chapter 4 focuses on the social dimension, applying CM theory to examine how participation, leadership and cultural anchoring can foster responsible transformation. Chapter 5 outlines the research methodology, describing the qualitative design and the processes of data collection and coding. It also explains how artificial intelligence (AI) is used throughout the thesis. Chapter 6 presents the empirical findings, structured along the three dimensions of responsible DT. Chapter 7 discusses these findings in relation to the research question, integrating the dimensions into a comprehensive framework and reflecting on their theoretical and managerial implications. The thesis concludes by summarising key insights, acknowledging its limitations and identifying promising avenues for future research.

2 Digital transformation as a strategic and multidimensional process

DT is a defining force in today's organisational landscape. Although it is often associated with technological progress, its implications extend far beyond the implementation of digital tools. It reshapes value creation, strategic orientation, organisational structures, leadership styles, employee roles and workplace culture, representing an organisational and societal transformation.

This chapter establishes the conceptual and analytical basis for the thesis. First, it clarifies the distinctions between the frequently conflated terms digitisation, digitalisation and DT, before examining the drivers and disruptive forces that prompt organisations to embark on digital change. It then considers how companies adapt their strategies, structures and processes in response, and discusses the organisational conditions for success, including leadership, culture and employee competencies, as well as the barriers posed by inertia and resistance.

By outlining these dimensions, the chapter establishes the basis for the subsequent analysis of aligning DT with principles of environmental and social responsibility.

2.1 Clarifying the concepts of digitisation, digitalisation and digital transformation

Before turning to the literature review, the terminology surrounding DT must first be clarified. The terms digitisation, digitalisation and DT are frequently used interchangeably, which can lead to confusion (Elia et al., 2024; Kherrazi & Roquilly, 2025; Van Veldhoven & Vanthienen, 2021). A clear understanding of these concepts is crucial, as they represent distinct processes within the broader context of DT.

Digitisation refers to the conversion of analogue information into digital formats, such as documents or photographs. Its primary goal is to facilitate access, storage and transfer through digital tools (Feroz et al., 2021; Song et al., 2025; Trenerry et al., 2021). Digitisation usually focuses on transforming documentation processes inside and outside the organisation, without significantly altering core value creation activities (Verhoef et al., 2021). This process serves as the foundational step for subsequent advancements in digital development.

Digitalisation builds upon digitisation by integrating digital technologies into business processes. It aims to optimise operations such as communication, production and procurement, while enabling new forms of internal and external collaboration (Elia et al., 2024; Trenerry et al., 2021). This stage reflects a socio-technical transformation, as it reshapes how organisations utilise technology and interact with their environments (Van Veldhoven & Vanthienen, 2021).

By contrast, DT represents a more profound and comprehensive change. It involves organisation-wide shifts that extend beyond technology to encompass changes in business models, organisational structures and broader societal dynamics (Elia et al., 2024; Van Veldhoven & Vanthienen, 2021). As an overarching process, DT seeks to improve organisational performance and strengthen the value proposition by systematically embedding digital technologies into core business activities (Feroz et al., 2021; Kherrazi & Roquilly, 2025).

Furthermore, DT acts as a catalyst for socio-technical innovation. This includes task automation, organisational structure redesign and the promotion of environmental and social objectives (Elia et al., 2024). Employees are expected to develop new competencies, adopt evolving leadership styles and interact with intelligent technologies, leading to new roles and responsibilities (Ly, 2023; Verhoef et al., 2021; Vial, 2019).

In summary, digitisation and digitalisation form the building blocks of DT, extending the impact of technology into organisational and societal domains.

2.1.1 Navigating the overlap between digitalisation and digital transformation

While these three concepts can be analytically distinguished, the distinction between digitalisation and DT often becomes blurred in practice. Many organisations have pursued digital initiatives for several years, during which time incremental digitalisation has triggered deeper structural changes. Consequently, what initially begins as a technological upgrade can evolve into a broader transformation process (Bellantuono et al., 2021; Kherrazi & Roquilly, 2025). Business model changes can occur as part of digitalisation, though they are more typically linked to comprehensive DT (Kherrazi & Roquilly, 2025).

Due to the conceptual overlap between the terms, a strict distinction is of limited relevance in applied contexts. In this thesis, they are treated as part of a continuum. Depending on the context, certain initiatives may align more closely with the logic of digitalisation, while others can reflect the characteristics of a large-scale transformation.

Against this background, the first part of the literature review adopts a transformation-oriented perspective. Taking this broader view of digital change makes it possible to capture not only technological developments, but also their organisational, social and human implications. This conceptual foundation helps frame the research question and provides analytical grounding for subsequent chapters.

2.2 Digital transformation process

After defining and explaining the concept of DT, it is crucial to understand the driving forces and underlying processes that enable its implementation. To this end, this section of the literature review draws on the framework developed by Vial (2019). This framework is based on a systematic analysis of 282 scholarly articles, offering a structured, academically grounded model of the DT process.

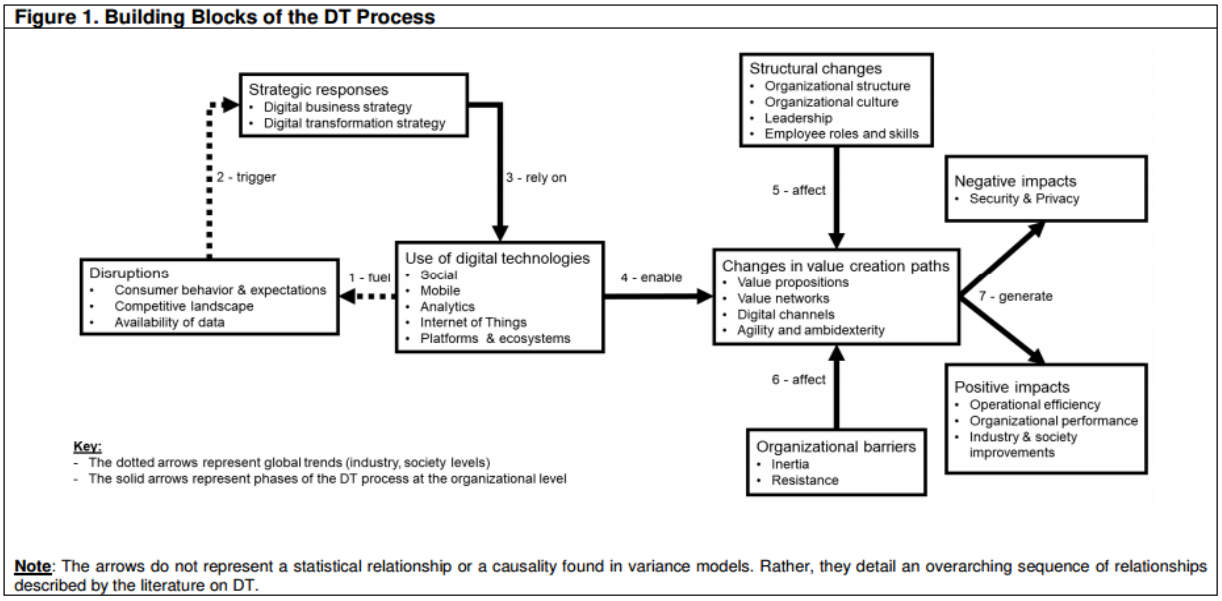

Figure 1: Building Blocks of the DT Process (Vial, 2019).

A key strength of this framework is its dual perspective. It captures not only the technological drivers of DT but also the structural and organisational changes that it entails. This comprehensive approach is particularly relevant to this thesis, which examines the implementation of DT in a socially and environmentally responsible manner.

The model is divided into seven interconnected blocks, each representing a core component of the DT responses and internal organisational transformation.

The first four blocks (Use of digital technologies, Disruptions, Strategic responses and Changes in value creation paths) address the technological imperatives and strategic motivations behind DT.

The final two blocks (Structural changes and Organisational barriers) reflect the internal dynamics and challenges that stem from the preceding stages. These elements are particularly central to this thesis as they touch upon issues such as leadership, resistance, cultural change and employee involvement.

Unlike many other models, Vial's framework explicitly incorporates these organisational dimensions, creating a conceptual bridge to CM. It enables a coherent progression from the technological foundations of transformation to the broader organisational, social and cultural dimensions it entails. Building on a unifying model, this thesis maintains a coherent analytical thread and focuses on the internal conditions necessary for a responsible transformation process.

Although the framework is relatively broad and does not provide detailed insights into specific industries, its robust academic foundation and ongoing relevance in contemporary literature justify its application. To address any potential limitations, additional concepts and updated scholarly perspectives have been incorporated where necessary.

This thesis places particular emphasis on how the later stages of the transformation process, namely structural and organisational change, can be shaped in a socially and environmentally responsible manner.

In this context, the following sections examine each block of the framework in greater depth, beginning with the role of digital technologies. As the primary drivers of DT, they form the starting point for understanding how technological capabilities initiate and shape the transformation process.

2.2.1 Use of digital technology

Digital technologies are the key drivers of DT and are often categorised under the acronyms SMACIT (Social, Mobile, Analytics, Cloud and Internet of things [IoT]) (Vial, 2019) and BRAICQ (Blockchain, Robotics, AI, Cognitive Computing and Quantum Computing) (Van Veldhoven & Vanthienen, 2021). Their impact is particularly striking when applied in combination, enabling innovation and efficiency gains. Their integration opens new opportunities to re-imagine existing business models, drive innovation and ensure sustainable competitiveness (Péréa et al., 2023; Van Veldhoven & Vanthienen, 2021; Verhoef et al., 2021).

2.2.2 Disruptions

Vial identifies three main categories of disruptions in his framework: Consumer behaviour & expectations, Competitive landscape and the Availability of data. These disruptions highlight how digital technologies are fundamentally reshaping industries and market dynamics and are outlined in the following.

The first disruption concerns the transformation of consumer behaviour. Today's consumers have instant access to information, communication and services, which has significantly altered their expectations. No longer passive recipients, they have become active participants who demand personalised and innovative experiences (Vial, 2019). To remain competitive, businesses must continually anticipate, adapt and provide digital services that meet these evolving expectations (Van Veldhoven & Vanthienen, 2021; Verhoef et al., 2021; Vial, 2019).

A second disruption lies in the competitive environment. Digital technologies have lowered traditional barriers to entry, enabling new players to enter markets that were once dominated by a few large incumbents. As a result, competition is no longer limited to products and services but extends to the quality of digital experiences (Verhoef et al., 2021).

The third disruptive force is the massive availability of data. Digital technologies generate vast data streams, often from users' digital traces on mobile devices. Companies increasingly rely on this data to optimise services, support algorithmic decision-making and maintain a competitive edge, or to monetise it via third-party sales (Feroz et al., 2021; Yang, 2024). Real-time analysis of customer sentiment allows for a more responsive adaptation to consumer needs (Verhoef et al., 2021).

Taken together, these disruptions demonstrate the transformative potential of digital technologies, prompting businesses to adapt and innovate to survive and thrive.

2.2.3 Strategic responses

In response to disruption caused by digital technologies, companies must develop new strategies to remain competitive. While DT presents major opportunities, it also poses fundamental challenges.

Vial distinguishes between two strategic concepts: Digital Business Strategy, which integrates digital technologies into a company's long-term vision and DT Strategy, which focuses on the practical implementation of these technologies in daily operations.

While both approaches offer valuable guidance, this thesis takes a different approach: How can digital technologies be embedded into business models in ways that are economically, socially and environmentally viable?

2.2.4 Changes in value creation paths

The interplay between the first three blocks — “Use of digital technologies”, “Disruptions”, and “Strategic responses” — creates a cycle of continual technological innovation and disruption. This compels organisations to adapt and refine their digital strategies.

These strategic adjustments lead to shifts in value creation paths. Within this framework, Vial identifies four key dimensions of this transformation: value propositions, value networks, digital channels and agility and ambidexterity.

Value proposition

A value proposition describes the specific benefits that a company seeks to deliver to its customers. In the context of digitalisation, this often involves shifting from physical products to digital services. This allows firms to expand their business models, attract new customer segments and generate additional demand (Vial, 2019; Yang, 2024). Such digital offerings also facilitate the collection of customer data, enabling personalised services and stronger customer relationships.

Value networks

Value networks illustrate the ways in which digital technologies are transforming the manner in which companies interact with their customers and stakeholders (Pirro, 2024). Traditional linear value chains are evolving into dynamic, interconnected systems that facilitate closer and more collaborative relationships between all stakeholders (Pirro, 2024; Verhoef et al., 2021).

Digitalisation enables companies to bypass intermediaries, fostering transparent and efficient collaboration and supporting more customer-centric value creation. These changes result in shorter production cycles, greater flexibility and more personalised products and services (Schneider et al., 2020; Verhoef et al., 2021; Vial, 2019).

Digital channels

Digital channels refer to the technology-based tools that companies use for communication, content distribution and customer relationship management. Examples include websites, social media, email marketing and algorithm-driven platforms. They facilitate more personalised and emotionally engaging customer experiences, playing a pivotal role in contemporary sales strategies. The omnichannel approach is a prime example of this, integrating online and offline channels to create a seamless, customer-centric experience (Pires et al., 2022; Vial, 2019).

Agility and ambidexterity

Agility is defined as the "capability to respond to changing needs and external factors quickly and cost-effectively without sacrificing product or service quality” (Ly, 2024, p. 4412). In the context of DT, this means swiftly adopting technological advances to identify innovation opportunities and gain a competitive advantage. This requires an organisational approach that is flexible enough to mobilise the right resources, expertise and networks under optimal conditions (Ly, 2023; Verhoef et al., 2021; Vial, 2019).

Companies that lack agility often find it difficult to keep up with technological change, since DT requires the capacity to adapt quickly and effectively (Ciampi et al., 2022; Zangana et al., 2025).

However, responding to DT effectively requires more than agility alone. Companies must also cultivate ambidexterity, a concept that describes a “company's ability to continuously develop its core business while simultaneously establishing new approaches and ways of thinking. This ensures that changes in the surrounding environment are recognized in time, allowing the company to seize opportunities for the future” (Schneeberger & Habegger, 2020, p. 105, own translation).

In this sense, agility and ambidexterity complement each other. Companies need to use digital technologies to engage in a kind of strategic multitasking. On the one hand, they must use these

technologies to improve their core business and maintain their competitiveness. On the other hand, they need to embrace new digital innovations to unlock business opportunities and expand their horizons (Schneeberger & Habegger, 2020; Vial, 2019).

Until now, the focus has been on the technological changes that drive and shape DT, such as the adoption of digital tools and the resulting disruptions and shifts in value creation.

While Vial's framework provides a strong conceptual foundation for understanding these dynamics, it does not explicitly address their broader sustainability implications. Chapter 2 therefore examines how digital developments can be aligned with environmental sustainability, while Chapter 3 explores how these processes can be implemented in a socially responsible manner.

2.2.5 Structural changes

Structural changes are one of the key internal dimensions of DT, influencing how organisations coordinate activities, distribute responsibilities and drive transformation. The following subsections examine these aspects in detail, beginning with organisational structure.

2.2.5.1 Organisational structure

DT involves not only technological developments, but also profound internal shifts. These structural changes affect how organisations operate, how responsibilities are distributed and how existing processes are redefined (Mokkapati et al., 2024; Vial, 2019).

In this context, organisations must reconfigure their structures to allow faster, more decentralised decision-making and adaptive coordination across functions. While Vial identifies here ambidexterity and agility as key principles, his framework provides limited guidance on how to govern these structural shifts. To address this, the present analysis builds on the work of Hanelt et al. (2021) and Markovits (2022), who emphasise that DT necessitates novel governance models that balance strategic direction with operational flexibility.

Hanelt et al. (2021) emphasise the role of top management teams in initiating and steering transformation. As digital initiatives increasingly cut across traditional business units, governance mechanisms must enable decentralised decision-making, continuous learning and iterative development. This implies a shift from rigid control structures towards dynamic, participatory forms of leadership.

While Markovits (2022) does not explicitly refer to governance, he emphasises the strategic importance of DT and the leadership's responsibility to ensure coherence between digital initiatives and broader organisational objectives. In both cases, governance emerges as a central enabler of structural adaptation, ensuring that DT is embedded in the way organisations function and evolve, not just implemented.

The next section addresses how such structural changes are closely linked to transformations in organisational culture — an equally critical dimension of successful digitalisation.

2.2.5.2 Organisational culture

Organisational culture plays a central role in shaping how companies approach and experience DT. It is commonly defined as a pattern of shared assumptions, beliefs, values and norms that are learned by organisational members and transmitted to new employees (Trenerry et al., 2021).

Research highlights that transformation processes are most successful when supported by a cultural environment that fosters adaptability, tolerance to failure, experimentation and ongoing learning. These cultural qualities reinforce structural adaptations by ensuring that newly implemented technologies are actually used, understood and developed further through employee engagement (Ghafoori et al., 2024; Hanelt et al., 2021; Markovits, 2022).

Organisational climate is closely linked to culture and is described as employees' perceptions of internal practices and the behaviours they see being supported (Trenerry et al., 2021). A constructive climate, fostered by inclusive leadership and bottom-up participation, encourages ownership and adaptability.

Culture and climate therefore constitute the social infrastructure of transformation. Without conscious shaping, even advanced digital strategies risk falling short. To succeed, organisations must cultivate digitally mature cultures that empower employees and ensure that digital tools are aligned with purpose-driven value creation (Ghafoori et al., 2024; Hanelt et al., 2021; Trenerry et al., 2021).

2.2.5.3 Leadership

Another crucial factor in the DT process is the leadership demonstrated by those spearheading the project. Business leaders must foster a culture that embraces digital innovation while ensuring their organisations remain adaptable to the challenges and rapid changes brought by emerging technologies (Ly, 2024; Rialti & Filieri, 2024; Vial, 2019). This redefinition of leadership is important given that leadership and technological innovation influence each other throughout the process of transformation (Trenerry et al., 2021).

This interdependence between leadership and technology has also transformed academic discourse. Although the term "digital leadership" is absent from Vial's framework, it features prominently in recent literature. The following section highlights the most important aspects to ensure clarity and relevance.

Digital leadership is defined as "doing the right things for the strategic success of digitalisation for the enterprise and its business ecosystem" (Elia et al., 2024, p. 382). In essence, it shares many principles with traditional leadership but is specifically applied within the context of DT.

Within this framework, digital leadership is primarily defined as the ability to guide and manage organisational transformation. At the same time, a second perspective emphasises the individual dimension, namely the personal skills and technical expertise that leaders must develop to operate effectively in digital environments (El Yaagoubi & El Baz, 2023; Rialti & Filieri, 2024; Trenerry et al., 2021).

2.2.5.4 Employee roles and skills

DT not only reshapes business models and processes but also has a profound impact on employee roles and required skill sets within organisations (Vial, 2019). Traditional job structures are gradually dissolving, requiring employees to take on increasingly cross-functional responsibilities beyond their original roles (Ridoini et al., 2024; Trenerry et al., 2021).

An important driver of this shift is the growing adoption of digital systems that automate workflows. Tasks that were once performed manually are now supported or even replaced by data-driven processes and algorithms. As a result, employees need to develop stronger analytical thinking skills and the ability to make data-driven decisions (Ridoini et al., 2024; Vial, 2019). Therefore, DT requires not only technological adaptation, but also the continuous development of workforce competencies (Trenerry et al., 2021).

To keep pace with these changes, companies must invest strategically in employee training. The ongoing development of new skills is crucial to closing existing and future competency gaps and preparing the workforce for the demands of a digitalised work environment (Ly, 2023; Rialti & Filieri, 2024; Trenerry et al., 2021).

Taken together, the structural elements discussed above constitute some of the most critical determinants of success or failure in DT initiatives. Numerous studies suggest that failing to address these internal transformation requirements is one of the main reasons why digital projects do not achieve their goals (Hanelt et al., 2021; Oludapo et al., 2024). For this reason, they must be considered core components of any strategic transformation effort, rather than peripheral concerns.

Failure to adequately integrate these structural aspects inevitably leads to organisational barriers, which are the subject of the following section.

2.2.6 Organisational barriers

Vial identifies two primary obstacles—inertia and resistance—which are widely recognized in the literature as key challenges that organisations must overcome to successfully implement DT.

2.2.6.1 Inertia

Inertia, in the context of DT, refers to an organisation's reluctance to embrace necessary change. This hesitancy stems from deeply embedded structures, processes, mindsets and technologies and is a significant barrier to the successful implementation of DT initiatives (Ciampi et al., 2022; Marx et al., 2021; Oludapo et al., 2024; Vial, 2019).

A key reason for the emergence of inertia is the strong entrenchment of existing routines and organisational structures, which make change difficult or even obstruct it altogether (Marx et al., 2021; Vial, 2019). Marx et al. (2021) aptly describe this issue by stating: “Structures of organizations have high inertia when the speed of reorganization is much lower than the rate at which environmental conditions change” (Marx et al., 2021, p. 3).

In their study on inertia in DT, they identified five main forms of organizational inertia, which are directly or indirectly reinforced by Vial’s (2019) research:

- **Structural Inertia**: Companies with complex hierarchies and highly standardized processes struggle to quickly adapt to digital changes.
- **Cultural Inertia**: Established corporate cultures, particularly employees’ and leaders’ ingrained habits and workflows, can create resistance to new technologies and methods.
- **Technological Inertia**: Outdated IT systems and rigid technological infrastructures hinder the integration of new digital solutions and innovation processes.
- **Economic Inertia**: Companies hesitate to invest in digital technologies due to concerns over high costs and uncertainties, thereby delaying necessary innovations.
- **Psychological Inertia**: Individual fears and reluctance toward change result in uncertainty and resistance among employees, obstructing the implementation of digital projects.

Minimising inertia is critical for organisations, as it is often a key reason why DT initiatives fail (Oludapo et al., 2024). Holding on to outdated business models, production methods or organisational structures for too long can lead to a loss of competitiveness, allowing more agile and innovative competitors to gain an advantage. Therefore, it is in a company's interest to develop a targeted strategy to overcome organisational inertia and successfully drive DT (Marx et al., 2021; Vial, 2019).

2.2.6.2 Resistance

In addition to organisational inertia, employee resistance poses a significant challenge to the successful implementation of DT. This resistance usually arises when employees develop negative perceptions of the change, often due to a lack of the necessary skills to understand or operate new technologies (Cieslak & Valor, 2024; Sahay & Goldthwaite, 2024). The main sources of this resistance are a fear of being replaced by digital technologies and an inability to see the immediate benefits of these changes to daily tasks (Ciampi et al., 2022; Vial, 2019). However, resistance may also arise from misalignment between new technologies and existing skills or routines, or from perceived threats to professional identity and social connectedness (Cieslak & Valor, 2024).

This scepticism is not confined to low-skilled workers; highly skilled professionals also have concerns about the impact of digitalisation on their roles. This resistance can manifest as passive withdrawal and disengagement, or active behaviours such as sabotage or cyberloafing. It can also take the form of

collective actions, such as social media campaigns, strikes or virtual unions (Cieslak & Valor, 2024; Sahay & Goldthwaite, 2024).

Beyond individual fears and discomfort, structural and psychological factors also play a role (Sahay & Goldthwaite, 2024). Technologies may be perceived as not only tools, but also instruments of control, surveillance and isolation. This threatens both material resources (e.g. income and job security) and immaterial resources (e.g. identity, status and social belonging) (Cieslak & Valor, 2024).

Successfully navigating DT in this context requires a clear vision and a well-structured strategy, as well as strong digital leadership that actively integrates technological advances with cultural and organisational change (Ciampi et al., 2022; Cieslak & Valor, 2024).

In summary, inertia and resistance differ in terms of their causes and how they manifest. Inertia stems from structural, cultural or technological rigidity, which passively blocks change and is often rooted in routines, legacy systems or hierarchy. By contrast, resistance is active opposition from employees, driven by fear, uncertainty or a perceived lack of benefit.

The structural and organisational challenges outlined above are introduced to demonstrate their importance for achieving a successful DT. Rather than providing exhaustive solutions, this chapter aims to frame the key issues and explain why they matter. Chapter 3 will then build on this foundation by examining how companies can address these challenges in practice, through socially responsible and inclusive transformation processes that engage employees, address resistance and encourage long-term acceptance via effective CM.

Summary: DT as a strategic and multidimensional process

To conclude, DT is becoming an increasingly important strategic consideration for companies in all sectors. As markets, technologies and stakeholder expectations evolve, businesses must adapt their structures, processes and mindsets to remain competitive (Bellantuono et al., 2021; Elia et al., 2024). Those who fail to do so risk being left behind — a phenomenon often referred to as “digital Darwinism” (Elia et al., 2024).

However, technological adaptation alone is no longer enough. For DT to achieve its full potential, it must be embedded within a broader strategic vision that encompasses environmental and social responsibility. This chapter has clarified the scope and complexity of DT by exploring the structural, cultural and organisational dynamics that influence its implementation.

To ensure long-term resilience and legitimacy, companies must also reconsider the purpose of their digital strategies. The following chapters explore how DT can be aligned with environmental and social responsibility. This involves integrating ecological awareness into digital practices and designing change processes that respect employee needs and voices. By doing so, they address the dual transition from two complementary angles.

3 From digital change to environmental sustainability

In line with the research question, “environmentally responsible” is used here to qualify practices and governance choices, whereas “environmental sustainability” denotes the outcome dimension (goals, targets and impacts) that these practices aim to achieve.

DT drives innovation, efficiency and competitiveness, yet its environmental implications are frequently overlooked in both academic and corporate discussions. From the extraction of critical raw materials to the increasing energy requirements of data infrastructure, digital technologies put significant pressure on the planet's resources and can exacerbate existing environmental issues.

This chapter examines the environmental impacts of DT, covering material and immaterial aspects, as well as systemic effects such as rebound and induction. Although digital tools have the potential to support sustainability goals, this is often undermined by the increase in environmental footprint caused by unintended consequences.

To move from diagnosis to action, the chapter presents strategic frameworks for implementing DT in an environmentally responsible way. These approaches help companies reassess the environmental cost of their digital operations and align their strategies with environmental sustainability, thereby addressing the environmental dimension of the research question.

3.1 Material dimension

The environmental footprint of DT begins long before a device is switched on. Manufacturing processes, from raw material extraction to component assembly, already cause significant emissions and resource depletion (Rosário & Dias, 2022; UNCTAD, 2024). These upstream impacts are central to the overall sustainability of digital technologies.

Manufacturing is recognised as the most environmentally intensive phase in the lifecycle of digital devices, accounting for a significant portion of the global digital footprint (Bordage, 2019). For example, the production of digital devices continues to account for a significant proportion of the sector's greenhouse gas emissions (UNCTAD, 2024).

A major cause of this impact is the extraction and transformation of raw materials into complex electronic components, which causes resource depletion, pollution and significant emissions (Bordage, 2019). A two-kilogram computer, for example, requires approximately 800 kilograms of raw materials (UNCTAD, 2024).

Some technological devices incorporate a vast mix of materials, including plastics, ceramics, glass and up to 63 different elements from the periodic table, such as gold, cobalt, lithium and rare earth elements (UNCTAD, 2024). These figures collectively highlight the environmental burden of device manufacturing and the importance of reducing production volumes while extending product lifespans.

3.1.1 Electronic waste

Electronic waste – also known as “waste electrical and electronic equipment” (WEEE) or E-waste – is one of the most visible and fastest-growing challenges of the DT era. It refers to discarded electrical and electronic devices which often contain valuable components or hazardous substances. E-waste represents the end of the material life of digital products, which highlights the conflict between rapid technological innovation and environmental sustainability. Many digital devices are replaced long before the end of their functional life due to short innovation cycles, limited repairability and planned obsolescence (Forti et al., 2020; UNCTAD, 2024).

The volume of e-waste continues to increase. In 2022, 62 million metric tonnes were generated, which is an 82% rise since 2010. Despite its growing value, however, formal collection and recycling rates

remain low, with only 22.3% of global e-waste being properly documented. This represents a missed opportunity for the circular economy (Forti et al., 2020).

3.2 Intangible dimension – Data infrastructure

In addition to the tangible environmental impacts of hardware production, digitalisation has a considerable intangible environmental footprint, particularly with regard to data infrastructure (Péréa et al., 2023). Data centres, mobile networks and cloud platforms consume a lot of energy and resources, and their environmental impact is growing as digital demand increases (Bordage, 2019; Ferreboeuf et al., 2020; United Nations Conference on Trade and Development [UNCTAD], 2024).

Data centres currently account for 1–1.5% of global electricity consumption, a figure which is expected to increase. Their environmental impact is exacerbated by their reliance on large-scale electricity consumption and water-intensive cooling systems, which puts further strain on local resources (UNCTAD, 2024). Furthermore, the construction and maintenance of data infrastructure requires significant material resources, highlighting the interconnectedness of tangible and intangible environmental impacts (Ferreboeuf et al., 2020; Meinhold et al., 2025).

While the material and intangible dimensions illustrate the environmental burdens embedded in DT, they also highlight areas where innovation can be leveraged for positive change. Building on this understanding, the following section examines how emerging technologies can create ecological benefits, while acknowledging the risks of unintended effects.

3.3 Ecological potentials and unintended effects

New digital technologies offer promising opportunities to reduce environmental impact. Continuously evolving tools such as AI, IoT and big data analytics enable companies to optimise internal processes, such as production and transportation, making them more sustainable and energy-efficient and thus reducing emissions (Feroz et al., 2021; Meinhold et al., 2025; Rosário & Dias, 2022).

Importantly, this potential is not limited to efficiency gains in existing operations. They also facilitate the development of new products and services that can encourage more sustainable consumer behaviour (Feroz et al., 2021).

Furthermore, Industry 4.0 technologies can play a pivotal role in external environmental processes such as pollution or waste management. For the latter, these technologies support improved handling, separation and reuse of various waste streams, thereby increasing operational efficiency and enabling more effective recycling (Feroz et al., 2021). Consequently, they contribute to the development of a robust circular economy (Meinhold et al., 2025; Rosário & Dias, 2022).

In summary, these emerging technological capabilities are important means of addressing the environmental impacts of DT for companies, both material and intangible. However, these positive impacts do not always translate smoothly into practice, as explained in the following section.

3.3.1 Rebound and induction effects

Although digital technologies offer environmental benefits, their actual impact is often limited by rebound and induction effects. These mechanisms help to explain why improvements in efficiency do not always lead to reduced resource use.

Rebound effects occur when increased efficiency lowers costs and stimulates additional consumption, thereby offsetting ecological gains (Gossart, 2015; Lange et al., 2023). In digital contexts, rebound effects can be direct (e.g. increased data usage due to cheaper storage), indirect (e.g. reinvestment in new, energy-intensive applications) or economy-wide (e.g. structural shifts caused by platformisation and automation) (Meinhold et al., 2025).

Induction effects, by contrast, stem not from efficiency, but from new digital possibilities that generate entirely new behaviours or markets. They demonstrate how innovation itself can create additional demand, a factor often overlooked in sustainability assessments (Lange et al., 2020, 2023; Santarius et al., 2022).

Together, these effects show that technological improvements alone are insufficient. Without broader strategies to address demand and usage patterns, digitalisation risks reinforcing unsustainable consumption dynamics.

An understanding of these systemic effects highlights that the environmental impact of digitalisation cannot be mitigated through technical optimisation alone. Instead, integrated strategies are required that consider the efficiency, scale, purpose and organisational embedding of technologies. The following section outlines these approaches.

3.4 Towards solutions: strategies for sustainable digitalisation

As mentioned in the previous section, the environmental costs of digitalisation are often underestimated or overlooked. Without careful design, governance and behavioural change, these impacts could intensify, which would undermine the pursuit of a sustainable future.

This section addresses the core of the research question directly: How can companies digitalise in an environmentally and socially responsible way? Having established why sustainable digitalisation is crucial in mitigating the ecological footprint of technological advancement, this section introduces practical solutions to help companies achieve a more environmentally responsible DT.

A variety of strategies are presented, ranging from efficiency-driven innovations to fundamental shifts in digital practices. While these approaches differ in scope and ambition, they all share the same goal: to strengthen business competitiveness through digital innovation while supporting long-term environmental sustainability. The following sections do not aim to provide an exhaustive list. Instead, they highlight two complementary categories of strategy: green technology innovations and value-based approaches. Both contribute to the overarching aim of sustainable digitalisation.

3.4.1 Digital sustainability

The concept of digital sustainability, understood as the intersection of DT and sustainable development, is becoming increasingly relevant. This “twin transformation” means the simultaneous and mutually dependent development of the digital and ecological-social aspects of organisations (Lynn et al., 2024; Schmelzle & Hielscher, 2025). The aim is to use digital technologies to increase economic value creation and achieve environmentally and socially sustainable development objectives (Lynn et al., 2024; Rosário & Dias, 2022; Schmelzle & Hielscher, 2025).

Therefore, digital sustainability not only seeks to reduce the negative environmental impacts of digitalisation (e.g. energy consumption and e-waste), but also aims to strategically deploy digital technologies to actively promote sustainable practices (Feroz et al., 2021). This requires technical solutions as well as new ethical, organisational and societal perspectives.

The following sections explore these strategies in greater depth. Each approach represents a distinct yet complementary aspect of digital sustainability. Together, they facilitate the twin transformation, ensuring that digital development aligns with environmental sustainability and long-term value creation.

3.4.2 Green technology innovation

Academic literature on digital sustainability shows a wide range of environmentally oriented concepts, such as Green Information Technology (Green IT), Green Information System (Green IS), sustainable Information and Communication Technology (ICT), Green DT and Digital Green (Guthrie, 2024).

Depending on the context and discipline, the boundaries between these terms can overlap and remain fluid. While this diversity is not necessarily problematic, as these concepts are not intended to be strictly separate, they should be understood as interconnected approaches that collectively contribute to reducing the environmental impact of digital technologies (Lynn et al., 2024; Yang et al., 2017).

The term “green innovation” (Yang et al., 2017) along with related expressions such as “green technology” (Xu et al., 2022), are often used as an umbrella concept in both academic and institutional discourse to summarise these various approaches under a common strategic vision. In some cases, these concepts are discussed together under the label “green technology innovation” (Zhang et al., 2023), reflecting both the technical and organisational aspects of environmentally oriented DT. Considering its inclusiveness and strategic relevance, this thesis adopts “green technology innovation” as an overarching concept. This allows for the broad integration of ICT-based sustainability efforts, aligning with current academic and corporate practice.

Despite terminological nuances, there is broad consensus that such innovations can substantially reduce the environmental burden of digitalisation (Hankel et al., 2018). Within this framework, the thesis specifically focuses on Green IT and Green IS. These two well-established concepts provide companies with a structured and practical way to implement sustainability in their digital operations and improve their environmental performance at infrastructural and organisational levels.

3.4.2.1 Green IT

A first conceptual pillar of digital sustainability is Green IT, what can be defined as “the study and practice of designing, manufacturing, using and disposing of computers, associated subsystems – monitors, printers, storage devices, and networking and communication systems – efficiently and effectively with minimal or no impact on the environment” (Guthrie, 2024, p. 2).

In practical terms, Green IT refers to a set of measures designed to minimise the environmental impact of information technology throughout its entire lifecycle. These include the procurement of energy-efficient hardware, the design of resource-conscious data centre infrastructure and the use of technologies that lower energy consumption (Loeser, 2013; Péréa et al., 2023), such as server virtualisation or automated shutdown systems (Loeser, 2013). Additionally, Green IT involves the extension of product lifespans, the reduction of raw material consumption and the responsible disposal or recycling of obsolete devices to mitigate electronic waste (Lynn et al., 2024; Robinet, 2022).

Through this approach, Green IT responds to key material challenges previously outlined, notably the resource-intensive nature of device manufacturing and the rise in electronic waste. Green IT therefore primarily addresses the internal ecological footprint of digital technologies, focusing on the sustainability of IT infrastructure (Loeser, 2013; Lynn et al., 2024; Robinet, 2022).

However, it does not address how digital technologies can promote sustainability beyond IT infrastructure. The following section discusses Green IS, which focuses on this broader, enabling role.

3.4.2.2 Green IS

Green IS, often referred to as “IT for Green”, describes the use of information systems to support and promote environmental sustainability within organisations (Guthrie, 2024; Robinet, 2022). Unlike Green IT, Green IS seeks to leverage digital tools to improve the ecological performance of business processes, products and services. The aim is to apply technology strategically, using data, automation and analysis to enable sustainability across various organisational functions (Lynn et al., 2024; Radu & Popescul, 2024).

Green IS can take different forms depending on the industry and business model. It includes digital solutions that help monitor and manage emissions, tools that enhance the energy efficiency of operations, or systems that guide decision-makers in choosing low-impact alternatives (Loeser, 2013; Lynn et al., 2024; Radu & Popescul, 2024). Green IS plays a crucial role in redesigning production and service processes to make them more resource efficient. It integrates environmental management into

information systems and supports the development of sustainable innovations (Loeser, 2013; Lynn et al., 2024).

In summary, Green IS particularly well suited to address indirect drivers of digital environmental impact, such as organisational routines that lead to unnecessary data processing. By embedding sustainability into organisational routines and decision-making, it helps steer digital innovation towards ecologically desirable outcomes.

3.4.2.3 Distinguishing Green IT and Green IS

Although Green IT and Green IS are closely related and often applied in conjunction, they refer to two distinct levels of environmental intervention through digital technologies.

Green IT is the primary level of intervention, focusing on reducing the environmental footprint of ICT itself, including hardware, infrastructure and operational processes. In this case, the technology itself is the focus of sustainability efforts (Hankel et al., 2018; Loeser, 2013; Xu et al., 2022).

In contrast, Green IS addresses the second-order level: it explores how information systems can be used as tools to support sustainability across organisational functions. In this view, ICT becomes an enabler of change rather than the target of optimisation (Hankel et al., 2018; Loeser, 2013; Xu et al., 2022).

While both approaches offer valuable instruments for corporate sustainability, their impact remains largely tied to technological and process-based optimisation. However, as seen in the previous discussion, ecological pressures often stem from structural and behavioural drivers of digitalisation. This calls for a complementary perspective – one that questions the volume, necessity and purpose of digital technologies themselves.

3.5 Rethinking digital sustainability: From efficiency to sufficiency

In the context of accelerating DT, much of the discourse focuses on efficiency, innovation and competitiveness. While these are important topics, the discourse neglects a fundamental ethical question: Do all digital technologies serve a meaningful and justifiable purpose? This gap in the discussion highlights the need for a broader, more critical perspective that challenges the necessity and intrinsic value of digital technologies, as well as their scale.

This section shifts the focus towards ethical considerations, advocating sufficiency over mere expansion. It challenges the idea that greater digitalisation always equates to progress and introduces ethical frameworks that aim to balance technological advancement with societal well-being. The intention is to move the conversation away from efficiency-driven objectives and towards more sustainable and responsible DT practices.

3.5.1 Efficiency, consistency and sufficiency

Three overarching strategies have emerged in sustainability research to address ecological challenges from different angles: efficiency, consistency and sufficiency. Each of these strategies represents a distinct approach to reducing environmental impact (Rudolf & Schmidt, 2025; Santarius et al., 2022).

- **Efficiency** aims to minimise resource and energy use per unit of output, mainly through technological improvements and process optimisation.
- **Consistency** seeks to harmonise production with natural cycles, for example by using renewable resources or enabling circular material flows.
- **Sufficiency**, by contrast, targets the absolute scale of consumption. It advocates reducing demand, questioning needs and keeping resource use within planetary boundaries.

While efficiency and consistency optimise or redesign existing systems, sufficiency challenges the necessity of certain activities altogether (Rudolf & Schmidt, 2025).

In both academia and corporate practice, efficiency and consistency are given more attention, partly due to their technological and economic appeal. Sufficiency, on the other hand, often requires behavioural and systemic changes (Rudolf & Schmidt, 2025; Santarius et al., 2022). Nonetheless, sufficiency remains essential, particularly considering the structural drivers of digital overuse.

This imbalance is particularly evident in the context of DT. While most corporate strategies prioritise efficiency and green technologies, the question of how much digital activity is genuinely necessary is largely ignored. As digitalisation accelerates the consumption of resources and emissions, the concept of sufficiency becomes increasingly important (Santarius et al., 2022). This is where more value-based approaches, like digital sufficiency and digital sobriety come into play, to offer a framework to rethink the scale, purpose and societal value of digitalisation.

3.5.2 Digital sufficiency

The concept of digital sufficiency challenges the idea that sustainability can be achieved solely through optimisation and it is becoming increasingly recognised as a fundamental aspect of digital sustainability. It emphasises the importance of restraint and critical evaluation in digital practices. (Schmelzle & Hielscher, 2025).

In concrete terms, digital sufficiency means “switching from an instinctive or compulsive use of digital systems to a more controlled use of technologies, constructed by measuring both associated risks and opportunities” (Ferreboeuf et al., 2020).

Fundamentally, digital sufficiency encourages a more considered and restrained approach to digitalisation. Rather than expanding digital infrastructure or maximising technological usage, it encourages organisations to consider what level of digital activity is genuinely necessary from technical, social and ecological perspectives. While not rejecting innovation, this perspective calls for a critical evaluation of digital needs and the systemic reduction of resource-intensive practices.

Digital sufficiency is based on four interconnected dimensions:

1. **Hardware sufficiency** aims to minimise the number of devices used and extend their lifespan through repair, reuse and sharing, thereby reducing the demand for materials and energy.
2. **Software sufficiency** promotes lean, resource-efficient applications with longer update cycles and minimal feature overload.
3. **User sufficiency** encourages more mindful digital habits by limiting screen time, promoting offline periods and slowing usage routines.
4. **Economic sufficiency** involves structural conditions, such as business models, incentives and infrastructures, that support reduced digital consumption (Santarius et al., 2022; Schmelzle & Hielscher, 2025).

In essence, digital sufficiency shifts the focus from how efficiently or consistently digital technologies operate to how much digitalisation is needed. It thus complements existing strategies by introducing a normative, scale-sensitive perspective into sustainability thinking.

3.5.3 Digital sobriety

Digital sobriety is a related concept to digital sufficiency, but it focuses more explicitly on reducing digital consumption by encouraging the conscious and purposeful use of digital technologies. Rather than opposing digitalisation per se, it advocates a “low-carbon and reasonable” digital transition that aligns technological development with planetary boundaries (Ferreboeuf et al., 2020).

At its core, digital sobriety involves designing, selecting and using digital tools and services in ways that prioritise essential functions and minimise resource intensity. It also seeks to avoid superfluous features or unnecessary data flows (Péréa et al., 2023). Closely aligned with the logic of user sufficiency, it encourages organisations and individuals to reassess their digital behaviours, infrastructures and innovation priorities by asking: Is this technology necessary? Can it be done more simply?

These questions do not imply a rejection of digital innovation but rather serve as a lens to critically evaluate its purpose and necessity. They form a conceptual basis that will be revisited in the empirical analysis to assess how such principles are reflected in practice.

3.5.4 Distinguishing digital sobriety and digital sufficiency

Although both digital sufficiency and digital sobriety seek to minimise the environmental impact of digital technologies, they have different focuses and applications.

- **Digital Sufficiency** is rooted in sustainability theory and questions the necessity and scale of digitalisation. It addresses the systemic drivers of over-consumption and promotes long-term reductions through societal change (Santarius et al., 2022; Schmelzle & Hielscher, 2025).
- **Digital Sobriety** is more pragmatic and action-oriented. It focuses on specific design and usage choices that promote moderation within existing digital systems. (Ferreboeuf et al., 2020; Péréa et al., 2023).

Together, these two approaches offer complementary solutions. Digital sufficiency focuses on determining the necessary level of digitalisation, while digital sobriety demonstrates how to achieve more with less within existing constraints.

3.5.5 Comparing strategic approaches to digital sustainability

The table below compares the two main strategic approaches discussed above. It highlights their different leverage points, focus areas and implementation logics, showing how they can complement each other in shaping a more holistic digital sustainability strategy.

Dimension	**Green Technology Innovations (Green IT / IS)**	**Value-Based Strategies (Digital Sufficiency / Sobriety)**
Focus	Efficiency, consistency, optimisation, enablement	Sufficiency, reduction, moderation, critical reflection
Main question	How can we digitalise more sustainably?	How much digitalisation is truly necessary?
Leverage point	Infrastructure, processes	Behaviour, norms, culture
Examples	Energy-efficient servers, life-cycle extension of hardware	Promote screen-free meetings, regular data clean-ups
Risk addressed	Direct emissions and resource use	Indirect growth, rebound and induction effects
Implementation focus	IT systems and infrastructure	Employee behaviour and company culture

Table 1: Comparing strategic approaches to digital sustainability.

Note: Own Illustration.

As the table shows, value-based strategies help to address structural drivers that green technology innovations alone cannot reach, particularly the rebound and induction effects.

To round off the chapter, the following section briefly highlights the strategic and organisational benefits of adopting digital sustainability in corporate contexts.

3.5.6 Strategic and organisational benefits of digital sustainability

While the primary aim of digital sustainability is to reduce environmental harm, it can also generate tangible benefits for companies. By integrating environmental sustainability into their digital strategies, firms can contribute to the preservation of natural resources, strengthen their legitimacy, respond to growing stakeholder expectations and secure a long-term competitive advantage (Xu et al., 2022; Zhang et al., 2023). In contrast, organisations that continue to consume more resources than ecosystems can regenerate increasingly face reputational, regulatory and operational risks (Xu et al., 2022).

In response, green technology innovation has become a strategic priority for many industries. External factors such as environmental regulations, financial incentives, customer demand and government support encourage companies to adopt more sustainable digital practices. At the same time, internal factors such as green-oriented leadership, organisational capabilities and flexible governance structures are equally important for enabling meaningful change (Zhang et al., 2023). To conclude, these dynamics show that ecological transformation is not merely a cost factor, but an opportunity for strategic renewal and resilient value creation.

Summary: From digital change to environmental sustainability

While DT is often seen as a driver of efficiency and innovation, this chapter has shown that there are significant environmental costs, from raw material extraction and e-waste to rising energy use and systemic side effects. These impacts challenge the assumption that DT is inherently sustainable, highlighting the need for a more critical approach.

To address this issue, the chapter outlined two categories of strategy. Green technology innovations, such as Green IT and Green IS, aim to enhance the environmental performance of digital infrastructures and operations. These approaches are rooted in efficiency and consistency and reduce resource intensity or align systems with natural cycles (Lynn et al., 2024; Péréa et al., 2023).

In contrast, value-based strategies, such as digital sufficiency and digital sobriety, build on the principle of sufficiency (Péréa et al., 2023; Santarius et al., 2022). They advocate a more restrained, purpose-driven use of digital technologies by questioning the necessity of digital activity.

Rather than viewing these strategies as mutually exclusive, recent literature and practice increasingly support integrated approaches that combine technological optimisation with organisational and behavioural change (Rudolf & Schmidt, 2025; Santarius et al., 2022). Such synergies are essential for aligning DT with environmental objectives and for fully realising the ambition of the twin transformation. (Lynn et al., 2024; Schmelzle & Hielscher, 2025).

This chapter has addressed the environmental aspect of the research question by demonstrating how companies can approach DT in a more environmentally responsible way. It has shown that achieving environmental sustainability requires more than just technical improvements. It necessitates a radical change in digital practices, values and priorities. In order to align DT with planetary boundaries, businesses must combine green innovations with sufficiency thinking.

The following chapter turns to the social dimension of responsible digitalisation. It addresses how organisations can navigate transformation in ways that respect employee needs, reflect internal values, and support socially responsible change processes.

4 From structural change to human-centred transformation

This chapter turns to a frequently overlooked aspect of DT: its social responsibility towards employees. As discussed in Chapter 1, organisational culture, leadership and employee involvement are all vital for the success of DT. While these aspects were previously discussed in the context of structural and strategic change, they now take centre stage.

As digital and environmental transformations converge, companies face the challenge of managing change efficiently in a socially responsible way. Strategies such as Green IT and digital sufficiency require technical adaptation as well as behavioural changes, new skill sets and shifts in values, which puts additional pressure on employees. Their support is therefore essential.

Structured change processes are essential for turning ambition into reality. Change management (CM) ensures that technological and environmental goals are aligned with human factors, preventing transformation efforts from failing due to resistance, a lack of coordination or cultural mismatches. CM is therefore the social infrastructure of transformation.

This chapter explores how companies can embrace DT in a fair and inclusive way. It addresses risks such as stress and disengagement, while promoting participation, trust and commitment. In doing so, it engages directly with the core research question: How can companies digitalise in an environmentally and socially responsible way?

4.1 Change management theory

CM is the discipline that guides how organisations prepare, equip and support individuals to successfully adopt change, thereby ensuring the effectiveness of transformation efforts. Tim Creasey, Chief Innovation Officer at Prosci, defines it as “the application of a structured process and set of tools for leading the people side of change to achieve a desired outcome” (Creasey, 2025, para. 2). At its core, CM addresses the human dynamics of change, enabling individuals and teams to transition from the current state to the desired future state (Al-Hinaai, 2023; Bellantuono et al., 2021).

In an environment marked by accelerating technological, environmental and societal shifts, the ability to manage change has become a critical organisational competence. It is critical for innovation, long-term competitiveness and sustainable development (Irimiás & Mitev, 2020). Effective CM helps organisations to mobilise resources, align structures and processes and support employees through transitions, ensuring that new behaviours and mindsets take root (Bellantuono et al., 2021).

CM is a strategic capability embedded in organisational culture. It provides a structured pathway for achieving transformation goals while maintaining employee engagement and operational stability. In doing so, it enables the alignment of technological ambition with social and environmental responsibility (Diaz-Iglesias et al., 2021).

4.2 Change management in the context of digital transformation

Change processes in the context of DT are triggered primarily by new, rapidly evolving technologies. These changes affect organisational structures and strategies and require the adoption of new tools, systems and mindsets. Consequently, managing DT requires greater precision, adaptability and technical proficiency than conventional change initiatives (Al-Moaid & Almarhdi, 2024; Bellantuono et al., 2021; Kherrazi & Roquilly, 2025).

A key challenge lies in the inherent dynamism of the digital world. Technological advancements are continuous and fast-paced, resulting in permanent disruption. In consequence, organisations must develop the capacity to manage repeated and flexible change (Bellantuono et al., 2021; Zangana et al., 2025). This ongoing need for adaptation is consistent with the concept of organisational agility and

ambidexterity, as discussed in Chapter 1. Successful DT requires a balance between exploring new possibilities and exploiting existing capabilities (Al-Moaid & Almarhdi, 2024; Bellantuono et al., 2021; Kherrazi & Roquilly, 2025).

It is widely acknowledged that most DT efforts fail not due to technological shortcomings, but because of employee resistance and misalignment with organisational culture. Therefore, successful DT requires organisations to address the technical implementation of new systems, as well as the social and cultural aspects of the changes (Al-Hinaai, 2023; Al-Moaid & Almarhdi, 2024; Bellantuono et al., 2021; Hanelt et al., 2021; Kherrazi & Roquilly, 2025).

In order to navigate this complexity, organisations require frameworks that guide the implementation of technology and support behavioural, cultural and structural adaptation (Galli, 2018). CM provides the tools needed to align innovation with the human side of transformation, ensuring that the adoption of technology is embedded within a broader organisational context (Hanelt et al., 2021).

The next section explores the suitability of classical CM models in this context and considers what alternatives or adaptations may be required to support digital change effectively.

4.2.1 Classical change management models and their relevance in the digital age

Over the past few decades, a wide variety of CM models have been developed to help organisations navigate transformation. These models differ in terms of their focus, scope and underlying assumptions. Some emphasise individual transitions, while others target organisational systems or cultural adaptation. However, there is no universally applicable solution (Al-Moaid & Almarhdi, 2024; Galli, 2018). Whether a given model is appropriate and effective largely depends on contextual factors such as the type of change, organisational structure, leadership dynamics and external pressures (Al-Hinaai, 2023; Bellantuono et al., 2021).

Despite these differences, classical models share several key features. Most follow a linear, phased structure and aim to promote clarity, acceptance and stability during periods of change. They emphasise transparent communication, strong leadership, stakeholder engagement and psychological safety to reduce resistance (Galli, 2018; Kherrazi & Roquilly, 2025).

The most commonly referenced frameworks include Lewin's Three-Step Model, which outlines the basic process of "unfreezing", "changing" and "refreezing"; Kotter's Eight-Step Model, which provides a detailed, top-down plan for leading large-scale change (Galli, 2018); and the ADKAR model, which guides individuals through change by focusing on awareness, desire, knowledge, ability and reinforcement (Al-Hinaai, 2023; Bellantuono et al., 2021). While each model offers a distinct perspective, they all share the ambition of translating complex change into a manageable and often sequential process (Al-Hinaai, 2023; Bellantuono et al., 2021; Galli, 2018).

4.2.2 Reassessing classical frameworks in the light of digital change

Although models such as those of Lewin (1951) and Kotter (1996) are well-established, their relevance is increasingly being questioned in today's digital environment (Galli, 2018). Originally designed for stable, linear change, they largely overlook the technological dimension. This raises a key issue: Are they still useful in volatile, tech-driven contexts (Bellantuono et al., 2021; Kherrazi & Roquilly, 2025)?

Attention from the academic community on this topic remains limited. However, two studies — by Kherrazi and Roquilly (2025) and Bellantuono et al. (2021) — offer valuable insights into the performance of these models in DT scenarios. Both examine the effectiveness of classical change approaches in the digital age, and how their core principles can be adapted to meet the evolving demands of the ever-advancing digital world and human-centred transformation strategies.

Kherrazi and Roquilly contend that, while classical frameworks offer valuable principles such as leadership and reinforcement, they are too rigid for DT. Designed for single, one-off changes, they are not suited to the continuous, multi-layered nature of digital projects. Crucially, they focus almost exclusively on the social system, ignoring its interdependency with the technical system. Nevertheless,

the authors do not dismiss classical models entirely. Instead, they suggest combining several models to create flexible hybrid approaches that can be tailored to specific contexts — an approach that supports innovation, resilience and learning.

Bellantuono et al. examine DT models and find that many lack integration with CM theory. Most DT models emphasise strategy and vision, yet neglect implementation and consolidation. Even more importantly, classical CM concepts such as resistance management, structured communication, training and participative leadership are rarely incorporated. The authors argue that this weakens the impact of DT models initiatives. They emphasise that the principles of Kotter, Lewin, etc. remain valuable if they are adapted and integrated, not as step-by-step templates, but as modular elements that support human-centric change.

Taken together, the studies point to a similar conclusion: classical models are not obsolete but must be used more flexibly. Kherrazi and Roquilly advocate contextual model mixing, while Bellantuono et al. advocate embedding CM fundamentals into DT strategies. Both agree that successful transformation depends not only on technological adoption, but also on robust people-centred change strategies.

These findings highlight the need for more participatory and human-centred approaches. Such methods better address the social complexities of DT and promote responsible, inclusive outcomes. Building on this foundation, the following section examines the core elements of participatory change and highlights its critical role in shaping socially responsible DT.

4.2.3 Participatory change management

Participatory CM involves the active participation of employees in decision-making and design processes related to organisational change. Rather than viewing employees as passive recipients of change, this approach seeks to empower them as co-creators by systematically incorporating their ideas, perspectives and feedback throughout the process (Haqq et al., 2023; Ullrich et al., 2023; Zhou et al., 2019). The level of participation can range from basic information sharing to true co-determination, the latter of which has been shown to have particularly positive and long-lasting effects (Sahay & Goldthwaite, 2024; Ullrich et al., 2023; Zhou et al., 2019).

This approach promotes democratic and humanistic values within organisations, fostering more inclusive, transparent and higher-quality decision-making. By involving employees in the process, they are not only informed about change but also empowered to assess, reflect and influence the direction of transformation (Fuchs & Prouska, 2014; Sahay & Goldthwaite, 2024; Shin et al., 2022). Consequently, participatory processes facilitate organisational sense-making, helping employees align their attitudes and beliefs with the behavioural changes intended by transformation initiatives (Haqq et al., 2023; Yang, 2024).

However, for successful participation to be realised, it is crucial to establish a culture of trust and openness within the organisation (Shin et al., 2022; Zhou et al., 2019). Such a culture cannot be established ad hoc during a single change event, but must evolve over time through values such as transparency, reciprocity, fairness and integrity (Fuchs & Prouska, 2014; Sahay & Goldthwaite, 2024).

Participatory CM operates on multiple levels. It strengthens individual motivation and agency, fosters collective identity through shared goals and promotes adaptive, resilient organisational cultures (Shin et al., 2022; Trenerry et al., 2021; Yang, 2024). These elements are particularly important in the context of DT, where the success of initiatives depends on technological adaptation and accompanying cultural and behavioural changes. Without meaningful employee involvement from the outset, such transformations are unlikely to succeed (Trenerry et al., 2021; Ullrich et al., 2023; Yang, 2024)

4.2.4 The role of participation in driving sustainability

Participatory approaches can play a crucial role in embedding sustainability into organisational routines and values beyond DT. Achieving sustainability often requires significant behavioural changes, such as altering consumption patterns, adopting a long-term mindset and embracing resource-efficient

practices. These shifts challenge existing habits, roles and incentives, so broad-based support and internal alignment through employee involvement are essential (Ullrich et al., 2023; Zhou et al., 2019).

Resistance to sustainability initiatives often stems from institutional inertia, limited expertise, or conflicting departmental priorities. These barriers can be mitigated by participatory processes, which foster ownership, dialogue and collective problem-solving (Kiesnere & Baumgartner, 2019). Participatory practices link sustainability objectives to personal significance and organisational identity, demonstrating to employees how environmental changes are connected to their daily work and professional values (Haqq et al., 2023; Yang, 2024). This connection fosters commitment, critical reflection and a shared sense of responsibility, all of which are crucial for turning abstract sustainability ambitions into tangible outcomes (Kiesnere & Baumgartner, 2019).

Moreover, when employees are actively involved in designing sustainability strategies, the implementation of these measures becomes more legitimate and feasible, particularly when these strategies affect work processes or job content (Klein et al., 2022). A culture of shared learning and a willingness to experiment are equally important for challenging established routines and fostering readiness for change (Hanelt et al., 2021; Klein et al., 2022; Trenerry et al., 2021).

Participatory approaches offer a human-centred way of embedding sustainability throughout the organisation. Rather than treating it as an add-on, they frame it as a shared responsibility rooted in culture and daily practice. This mindset facilitates cross-departmental collaboration, fosters internal integration and makes organisational transformation both possible and meaningful (Kiesnere & Baumgartner, 2019).

Although such inclusive practices provide promising pathways to embed digital and environmental transformation in a meaningful and collaborative manner, their implementation is rarely straightforward. To better understand the conditions for success, it is crucial to examine the organisational and psychological challenges that typically arise in the context of DT. The following section outlines these challenges as well as the enabling factors that support responsible and sustainable digital change.

4.2.5 Challenges of responsible transformation

Building on the insights established in Chapter 1, this section identifies the core organisational and psychological challenges that hinder responsible DT. These challenges are not isolated or trivial; they are interconnected and require a comprehensive response that combines both technical solutions and an awareness of the human dynamics involved. This section does not aim to provide an exhaustive list but focuses on the most significant challenges that organisations must overcome to enable responsible DT.

4.2.5.1 Resistance & inertia

Resistance and inertia continue to hinder DT efforts by obstructing change from within. A key starting point is to understand that resistance and inertia are not isolated reactions or personal shortcomings. Instead, they gradually emerge over time as a systemic response to ongoing uncertainty, disruption and misalignment during the transformation process (Sahay & Goldthwaite, 2024). Rather than pushing harder against these forces, companies should focus on lowering the psychological and structural barriers to change (Marx et al., 2021). This involves engaging employees from the outset, clarifying the purpose and benefits of the transformation and fostering a culture in which learning, experimentation and adaptation are encouraged (Cieslak & Valor, 2024; Trenerry et al., 2021; Ullrich et al., 2023).

Efforts to reduce inertia should prioritise governance adjustments, such as decentralised decision-making and iterative rollouts that allow for feedback and co-development (El Yaagoubi & El Baz, 2023). To mitigate resistance, managers must provide a sense of security and shared direction, ensuring that change is done with people, not to them (Fuchs & Prouska, 2014; Haqq et al., 2023). Crucially, digital strategies should be tied to meaningful narratives that resonate with employees' values and

professional identities, making the transformation collectively acceptable and sustainable (Haqq et al., 2023).

4.2.5.2 Lack of skills

A common obstacle to DT is a lack of adequate skills among the workforces. As the complexity and pace of digital tools and processes continue to increase, many employees struggle to keep up (Yang, 2024). These skills gap not only hampers efficiency, but also acceptance of and long-term engagement with new systems.

The skills gap is not limited to technical knowledge. As work environments become more digitalised, employees are expected to demonstrate a variety of soft skills, including communication, adaptability, critical thinking and resilience. This shift in expectations has created a growing mismatch between formal education and the actual demands of digital workplaces (Trenerry et al., 2021). Furthermore, constant upskilling can result in psychological pressure and change fatigue if the well-being of employees is not sufficiently considered (Ridoini et al., 2024).

To bridge this gap, companies should view learning and development as a strategic investment in human capital. Reskilling initiatives, talent development programmes and personalised learning platforms are essential to support both technical and cognitive growth (Trenerry et al., 2021; Yang, 2024). However, technical infrastructure alone is insufficient. Employees must also be motivated and empowered to take responsibility for their own learning journeys (Haqq et al., 2023). Supporting lifelong learning while fostering a culture of psychological safety can therefore be key to successful and sustainable transformation.

4.2.5.3 Unclear goals & values

Another critical challenge is the lack of clear strategic objectives or a shared sense of purpose during DT. Without clarity, employees may struggle to understand the rationale behind digital initiatives or how they align with the organisation’s broader mission. This lack of direction can lead to confusion, misalignment and a decrease in motivation (Oludapo et al., 2024; Trenerry et al., 2021; Yang, 2024).

A lack of shared values or internal consensus can weaken commitment and undermine acceptance of transformation. Misalignment between new technologies and employees' existing practices or identity can lead to reluctance or even active resistance, particularly when digital tools are perceived as threatening or irrelevant (Cieslak & Valor, 2024; Trenerry et al., 2021). In such cases, DT is not rejected based on its content, but rather because it lacks perceived purpose and meaning in employees' daily work (Ullrich et al., 2023).

Moreover, conflicting priorities and tensions over goals, which are often the result of poorly coordinated transformation strategies, can intensify frustration and scepticism within the workforce (Sahay & Goldthwaite, 2024). This risk is exacerbated when top-down targets do not integrate bottom-up engagement, creating a disconnect between leadership vision and operational realities (Trenerry et al., 2021).

To address this, organisations must define clear strategic goals and communicate them in a value-driven narrative. Clarifying the “why” behind DT and ensuring that these goals resonate across hierarchical levels will strengthen alignment, foster employee engagement and mitigate resistance (Oludapo et al., 2024; Rialti & Filieri, 2024; Yang, 2024).

4.2.5.4 Change fatigue

Change fatigue, which refers to emotional and cognitive exhaustion resulting from constant, poorly coordinated efforts to transform an organisation, is a significant barrier to successful DT. While transformation is necessary for long-term competitiveness, its relentless pace can overwhelm staff, leading to disengagement and resistance (Elia et al., 2024; Trenerry et al., 2021).

This fatigue emerges cumulatively, amplified by persistent challenges such as unclear goals, a lack of skills, organisational inertia and technostress. The latter describes the psychological strain associated

with the pressure of constantly adapting to new technologies, particularly when employees feel unable to keep up with expectations or their peers (Cieslak & Valor, 2024; Trenerry et al., 2021).

To prevent change fatigue from building up, organisations must strike a balance between ambition and care. This involves setting realistic goals, implementing initiatives at an appropriate pace and facilitating open communication. Creating an environment that values well-being, feedback and a shared sense of purpose helps to sustain engagement over time (Ghafoori et al., 2024; Rialti & Filieri, 2024).

Ultimately, change fatigue should be viewed as the downstream effect of unresolved barriers to transformation, rather than an isolated problem. Addressing it requires a systemic approach that integrates employee perspectives and actively mitigates the root causes of overload.

4.2.6 Enablers of responsible transformation

To overcome the organisational and psychological barriers to DT, systemic enablers are needed that foster trust, participation and shared direction. These enablers go beyond isolated interventions and underpin responsible and effective transformation practices. The following section outlines four key enablers that are essential for guiding a socially responsible and sustainable DT.

4.2.6.1 Participatory practices

Concrete participatory practices are essential for putting the concept of participatory change management into action. These practices aim to move beyond mere symbolism and encourage genuine collaboration at every stage of the transformation process. Successful organisations embed participation as an ongoing, multi-level process that engages individuals, teams and departments alike.

Effective participation begins with early involvement in shaping transformation goals and processes. Formats such as co-design workshops, feedback loops and collaborative analysis of “as-is” and “to-be” states enable employees to contribute their perspectives from the outset (Ullrich et al., 2023). These activities foster a sense of ownership and enable more informed decision-making based on real work situations (Yang, 2024; Zhou et al., 2019).

Training and upskilling are another key component. Rather than imposing standardised programmes, training designs that are tailored from the bottom up to existing skills, learning preferences and motivational drivers have been shown to increase participation outcomes (Trenerry et al., 2021). At the team level, agile, decentralised models with shared targets, flexible task allocation and peer-led learning enable dynamic adaptation and reinforce collaboration (Srivastava et al., 2023; Yang, 2024).

Participatory practices not only contribute to better solutions, but also to behavioural outcomes such as greater commitment, higher job satisfaction and lower resistance (Haqq et al., 2023; Shin et al., 2022; Zhou et al., 2019). However, participation must be handled responsibly, because initiatives that raise unfulfillable expectations, such as fake empowerment or selective inclusion, risk damaging trust and increasing resistance (Sahay & Goldthwaite, 2024).

In summary, participatory practices are a strategic element of responsible DT, not an optional add-on. They provide a practical way to build shared meaning, foster trust and ensure that those affected by change become genuine contributors to it.

4.2.6.2 Leadership

The literature consistently highlights leadership as a key driver of successful DT. Leadership plays a pivotal role in driving DT, not as a static, top-down authority, but as an enabling practice that guides and supports employees throughout the process (El Yaagoubi & El Baz, 2023; Ly, 2023; Rialti & Filieri, 2024; Vial, 2019). Effective leaders provide a clear, inspiring vision that helps employees understand the purpose of the transformation and motivate them to engage actively (Srivastava et al., 2023).

A critical aspect of this leadership approach is leading by example, particularly about digital competence. Leaders who understand technological developments and play an active role in their

projects are better placed to identify issues, coordinate activities and maintain credibility with their teams (Elia et al., 2024; Rialti & Filieri, 2024).

However, leadership in DT encompasses more than just strategy and technical know-how. Personal and relational qualities are equally important (Yang, 2024). These include building trust, encouraging open communication, promoting continuous learning and demonstrating empathy and emotional intelligence (Malik et al., 2024; Trenerry et al., 2021).

Additionally, leaders must be willing to delegate responsibility and empower teams to not only execute tasks, but also question routines, propose ideas and experiment with new solutions. They play a vital role in shaping a culture that treats risk and failure as part of the learning process (Diaz-Iglesias et al., 2021; Rialti & Filieri, 2024). In this sense, leadership becomes a distributed and participatory practice that reinforces autonomy, creativity and responsibility across the organisation (Elia et al., 2024; Malik et al., 2024).

While no single leadership style fits all contexts, leaders who integrate strategic thinking with hands-on involvement and support agility, adaptability and collaboration are best equipped to lead sustainable and inclusive DT (Elia et al., 2024; Ly, 2023; Srivastava et al., 2023).

4.2.6.3 Training & digital competencies

Developing digital competencies across the organisation is fundamental to enabling responsible and participatory transformation. As DT can trigger uncertainty, resistance or passivity among employees, providing tailored learning opportunities can play a key role in reducing psychological barriers and building confidence (Trenerry et al., 2021; Vial, 2019).

Effective organisations move beyond generic training programs, adopting participatory learning models that reflect employees' skills, learning preferences and motivations (Haqq et al., 2023). By offering bottom-up, peer-led learning, continuous feedback loops and opportunities for experimentation, organisations create an environment where employees become active contributors to transformation (Ullrich et al., 2023; Yang, 2024). By enabling teams to understand and shape the transformation they are part of, these learning practices actively reduce resistance and encourage a shift from passive adaptation to informed contribution (Haqq et al., 2023).

Training should not only strengthen individual capabilities but also foster a shared understanding across teams. When employees understand how digital tools align with broader business and societal goals, they are more likely to engage meaningfully in transformation processes (Elia et al., 2024; Malik et al., 2024).

Ultimately, fostering a culture of continuous learning is about more than just upskilling. It signals that adaptability, curiosity and shared responsibility are core organisational values. In this sense, training becomes a visible commitment to inclusion, empowerment and long-term resilience (Malik et al., 2024).

4.2.6.4 Organisational culture & values

Organisational culture is not just a backdrop to DT; it forms its very foundation. Although culture evolves over time, this requires deliberate action. The enablers discussed in this chapter are vital for establishing and maintaining a culture that promotes responsible transformation. Without these enablers, the social structures that enable change risk disintegrating.

Leaders shape organisational values through their actions, communication and consistency. Fostering psychological safety and encouraging innovation requires openness, emotional intelligence and integrity (Elia et al., 2024; Rialti & Filieri, 2024; Yang, 2024).

Similarly, training and learning opportunities achieve more than just building competencies. They demonstrate that development, change and active participation are valued. When designed around

existing skills and motivational needs, they reinforce a culture of continuous improvement and inclusion (Trenerry et al., 2021; Yang, 2024). In this sense, learning becomes an expression of culture.

Participatory practices also shape organisational culture by fostering trust, shared responsibility and a sense of belonging. These practices reflect democratic values, such as co-creating decisions and giving employees a voice (Haqq et al., 2023; Sahay & Goldthwaite, 2024; Shin et al., 2022). These elements are vital for establishing a collaborative, resilient and feedback-driven work environment (Srivastava et al., 2023).

Without cultural alignment, transformation remains fragile. Resistance and disengagement increase when the culture fails to provide support or address underlying issues. Rather than providing commentary, culture must act as a compass, fostering openness, learning and participation at all levels. Values must be embedded in daily practice (Shin et al., 2022). Employees who feel genuinely involved in shaping the organisation's direction are more motivated and less resistant (Zhou et al., 2019). Transformation can only reach its full potential when employees internalise these values.

Summary: From structural change to human-centred transformation

This chapter has explored how companies can embrace DT in a socially responsible and inclusive way. Drawing on CM theory and offering a critical reappraisal of traditional frameworks, it has shown that successful transformation hinges not only on technological implementation, but also on the ability to engage with and support people throughout the process. Particular emphasis was placed on participatory approaches, which foster trust, motivation and shared meaning, thereby reducing resistance and disengagement.

The chapter also identified key challenges and systemic enablers. Together, these elements shape a transformation that is co-created, not imposed. Crucially, the chapter has shown that participatory strategies can support the implementation of sustainability goals by promoting behavioural change, employee ownership and internal alignment.

In doing so, this chapter addresses the social aspect of the core research question. The chapter concludes that CM must be understood as the social infrastructure of transformation, connecting digital ambition with human values and long-term responsibility.

Literature Review Summary: Towards a sustainable and responsible digital future integrating technology, environment and social responsibility

This literature review explored how companies can digitalise in an environmentally and socially responsible way, providing a comprehensive analysis through three key chapters that support this research question.

Chapter 1 defined and contextualised DT. The chapter highlighted the technological drivers of transformation and the process of adaptation, as well as the disruptions that companies face, including changing consumer behaviour and competitive pressures. It also discussed the strategic responses required to adapt value creation paths, as well as the structural changes needed within organisations, including those relating to leadership, employee roles and cultural shifts. The chapter emphasised the need to understand DT as a complex, multifaceted process extending beyond technology to encompass human and organisational dimensions.

Chapter 2 examined the environmental impacts of DT. It provided insights into the material and intangible ecological footprints of digital technologies, focusing on issues such as e-waste, data infrastructure and energy consumption. The chapter emphasised the importance of integrating sustainability into digital strategies, offering solutions such as green technology innovations and value-based approaches. The chapter concluded that achieving digital sustainability requires more than optimising existing technologies. Rather, it necessitates a fundamental shift in the scale and purpose of digitalisation, incorporating ethical frameworks such as digital sufficiency and sobriety.

Chapter 3 shifted the focus to the social dimension of DT. It examined how CM theories, particularly participatory approaches, can facilitate responsible and inclusive change. The chapter emphasised the importance of leadership, organisational culture and employee engagement in driving successful digital change. It discussed the challenges posed by resistance, inertia and skill gaps, and proposed that participatory practices and leadership are critical enablers of transformation.

This thesis is framed by the research question, *"how can companies digitalise in an environmentally and socially responsible way?"*, and considers three key areas: technological innovation, environmental sustainability and human-centred change. This thesis proposes that, to digitalise in this manner, companies must do more than simply adapt to new technology. This requires integrating sustainable practices at every stage of the transformation, from adopting green technologies to fostering an inclusive organisational culture and engaging employees in the process.

A successful transformation requires a balanced approach that embraces technological and social change while considering environmental impacts. This integrated strategy ensures that DT drives business performance while aligning with broader societal and ecological goals.

After the methodology, the research question will be addressed by analysing interview data and discussing the findings in light of the theoretical frameworks from the literature review. The "Results & Discussion" section will show how companies can translate these concepts into environmentally and socially responsible digitalisation practices.

5 Methodology

5.1 Research objective and approach

The objective of this research thesis, titled Integrating environmental sustainability and change management into responsible digital transformation by means of a qualitative expert interview study, is to investigate the practical challenges and opportunities that arise when organisations seek to integrate DT with environmental sustainability and participatory CM. At a time when digitalisation is increasingly seen as both a necessity and a threat to sustainability, this study aims to reveal how professionals conceptualise and manage the ecological and social implications of digital projects.

5.1.1 Interview design

A qualitative research approach based on semi-structured expert interviews was adopted. This qualitative approach was chosen because it enables an in-depth exploration of perceptions, values and reasoning processes that are central to understanding how DT, sustainability, and organisational change are managed in practice. Unlike quantitative methods, which are often limited to predefined variables, qualitative interviews allow for the capture of context-specific meanings, tensions and trade-offs as experienced by professionals. Furthermore, this approach supports the emergence of new insights that may not have been anticipated during the initial research design.

In addition, this method is particularly well-suited to exploring complex perceptions, priorities and professional routines in an open yet guided format. Prior to the data collection phase, a tailored interview guide was created, structured around three core thematic dimensions derived from the theoretical phase of this thesis: (1) digital transformation, (2) environmental sustainability and (3) change management with a focus on employee engagement. The guide contained a pool of broad, open-ended questions for each topic, allowing flexibility during the interviews and enabling adaptation to each expert's area of expertise. Each topic in the interview was introduced with an open-ended question to prompt a reflective narrative, followed by more focussed sub-questions to explore specific aspects of the topics. The list of questions can be found in Appendix A.

This flexible yet consistent approach was well received by the interviewees, who often expressed their appreciation of the open structure and the opportunity it gave them to explore different aspects of their work. Drawing on their experience in strategy, consulting, project management and environmental, social and governance (ESG) implementation, the interviews provided a rich empirical basis for examining the interaction between sustainability and digitalisation in organisational practice.

5.1.2 Recruitment and sampling strategy

The interview partners were identified through a combination of professional and personal contacts, targeted searches and recommendations. The initial contacts were established during an internship at Smart2Circle (Liege, Belgium), where potential interviewees were suggested by colleagues and access to a company database was provided. These individuals were subsequently contacted by email and appointments were arranged accordingly.

Building on these initial contacts, the sample was expanded using a snowball sampling approach, whereby existing interviewees were asked to recommend other suitable experts. This method proved successful in several cases. Additional interviewees were identified and contacted through private connections and via LinkedIn.

The selection of interview partners was guided by the objective of including experts or practitioners with substantial practical experience in each of the three core areas of interest, while giving priority to individuals with transversal knowledge. This ensured that insights could be gathered across all thematic dimensions of the study. For instance, comprehensive perspectives on digital strategies, sustainability initiatives and CM practices were provided by the CEOs interviewed. Consultants offered valuable input regarding how organisations and employees could be supported in advancing digital and sustainable

transformation. The inclusion of professionals with cross-cutting expertise was regarded as essential for understanding the practical interdependencies between the thematic areas.

In addition, efforts were made to reflect the diversity of organisational contexts by selecting professionals from companies and institutions of varying sizes and sectors. This objective was successfully achieved, with interviewees representing organisations ranging from small, one-person businesses to large enterprises employing over 1,000 people. The sample included firms active in the fields of sustainability, consulting on DT and CM, as well as companies from various industrial backgrounds. External and international perspectives were also incorporated through the inclusion of a representative from the public sector and an industry expert based in Austria.

The final sample consisted of 15 interviewees. The initial target had been to recruit approximately five experts per thematic area. However, as most interviewees possessed expertise across multiple domains, a strict assignment to a single category was not considered feasible. The sample size was ultimately determined by the aim of achieving theoretical saturation – the point at which no new, substantial insights emerged and recurring themes and perspectives became apparent across the interviews.

The achievement of theoretical saturation was assessed through continuous comparison during the coding process. As additional interviews were analysed, it became increasingly apparent that key themes, tensions and enabling factors were being reiterated across different stakeholder perspectives. While nuanced variations remained, no fundamentally new categories or perspectives emerged during the final interviews. Concepts introduced in the later interviews could be fully integrated into the existing coding structure, suggesting that the relevant conceptual space had been adequately covered. Based on this convergence, it was concluded that sufficient empirical depth had been reached to support the analytical objectives of the study.

5.1.3 Sample overview

A detailed overview of the sample is provided in Table 2.

Nr.	Name	Firm	Function	Interview duration	Date
1	Sophie Pirotton	HEC	Researcher	61 min	08/05/25
2	Anthony Barbarich	Studio Colibri	Co-Founder & Digital Strategist	60 min	19/05/25
3	Séraphin Vandegar	Slinya	CEO	45 min	21/05/25
4	Jules Delcon	ISIT	Project Manager	102 min	22/05/25
5	Sylvie Delberghe	FastTrack	CEO & Managing Partner	81 min	26/05/25
6	Lucie Bernaerts	Webecode	Project Manager	54 min	30/05/25
7	Julien Hernaut	GCP Consulting	Consultant	66 min	06/06/25
8	Antoine Desait	AD Consult	Consultant	45 min	10/06/25
9	Pauline Rodberg	Smart2Circle	ESG Expert Consultant	42 min	11/06/25
10	Interviewee 10	Active in the Aviation Industry	Head of Progress and Strategy	61 min	11/06/25
11	Björn Kohnen	BK-Solut	Virtual Assistant	60 min	11/06/25
12	Delphine Gilman	CHU	Head of Institutional Relations and Strategy	52 min	26/06/25
13	Interviewee 13	Active in the Petrol Industry (AT)	Project Engineer	57 min	30/06/25
14	Bernd Hugo	Karl Hugo	CEO	59 min	07/07/25
15	David Scholzen	Karl Hugo	Project Manager	59 min	07/07/25

Table 2: Sample of interviewees.

Note: Own Illustration.

5.1.4 Ethical considerations

To ensure the accuracy of data collection and preserve the nuances of each participant's perspective, all conversations were recorded and transcribed verbatim. Prior to each interview, participants were informed about the purpose of the study and their rights regarding the use of their data. Informed consent was obtained in all cases and participants were offered the option to remain anonymous. All interviews were conducted in accordance with standard ethical research procedure. The interview data form the foundation for the subsequent analysis, which aims to identify key themes and patterns in the integration of DT, environmental sustainability and CM. The following section outlines the analytical approach used to code, categorise and interpret these data.

5.2 Data analysis

A qualitative content analysis was conducted to examine the expert interviews and to explore the intersection of DT, environmental sustainability and CM. The objective of the analysis was to identify key perceptions, challenges and enabling factors as articulated by professionals from various stakeholder groups.

5.2.1 Analytical approach

A thematic coding approach combining deductive and inductive strategies was applied. This method was chosen because it enables the systematic exploration of the complex perceptions and subjective viewpoints that characterise these 3 dimensions, as well as the contextual interdependencies between them. Qualitative content analysis was also considered suitable because it facilitates the validation of existing theoretical concepts and the discovery of novel insights that emerge directly from the data. This ensures that practice-related nuances are captured. This approach also enabled stakeholder-specific variations to be systematically compared, supporting the identification of tensions, synergies and trade-offs within the material.

All interviews were transcribed verbatim and imported into MAXQDA for systematic analysis. The coding process was carried out in several stages. First, a code system was developed based on the study's theoretical foundations and the interview guide (deductive coding). This code system was then refined iteratively through immersion in the data, with inductive codes added where relevant.

A pilot coding exercise was conducted on one interview to assess the applicability and clarity of the initial code system. This exercise confirmed that the coding approach was appropriate. Based on the results of the pilot study, the full dataset was coded using the same structure. As experience with the material increased, the coding process was further optimised. In some cases, earlier interviews were revisited and the coding was refined to ensure consistency and improved analytical precision. Subcodes were created to differentiate between specific aspects within broader thematic categories. Memos and paraphrases were used throughout the process to capture reflections, initial interpretations and emerging analytical patterns.

5.2.2 Quality assurance

The rigour of the analysis was ensured through systematic coding, the use of analytic memos to document decisions and reflexive considerations and the iterative refinement of the code system. At the end of the coding process, a final review of the code structure was carried out to ensure coherence and clarity. Theoretical saturation was considered achieved when no substantially new themes emerged and patterns recurred consistently across the interviews.

As the interviews were conducted either in German or in French, all transcripts had to be translated into English for the purpose of analysis. Every effort was made to ensure that the translations were as accurate as possible, with the aim of preserving the original meaning and avoiding unintended deviations in interpretation.

5.3 Use of artificial intelligence and technical software

AI and technical software were consistently employed throughout all stages of this thesis to support the research process in a transparent manner. ChatGPT was employed as an interactive tool to generate ideas, discuss concepts, compare theoretical perspectives and structure the content of the thesis. It was also used to provide feedback on draft texts, suggest ways to improve language and style and help shorten sections to meet length requirements. Furthermore, ChatGPT assisted in reviewing and correcting the interview transcriptions that had been produced automatically by Microsoft Teams, thereby improving their accuracy.

To enhance the linguistic quality of the text, DeepL Write was used selectively for language refinement. The software supported the improvement of phrasing and fluency.

The data analysis was supported by MAXQDA, which was used to systematically organise, code and retrieve qualitative data. The software facilitated the structured management of the code system and coded segments, the visualisation of coding patterns across stakeholder groups and themes, and the export of coded segments and memos to support the interpretation and presentation of findings.

Throughout the process, AI was applied as an aid for idea development, language improvement and technical accuracy, while all critical decisions regarding content, interpretation and analysis were made by the author.

6 Results

This chapter presents the main findings from the interviews, which are structured around the three core dimensions of responsible DT that were introduced in the literature review. The results aim to provide a clear, organised account of how practitioners and experts perceive and approach integrating these dimensions in practice.

To make sense of this complexity and establish a common thread throughout the chapter, the findings are organised around a guiding metaphor: the three-legged stool. This image illustrates that DT must rest on three equally important dimensions to achieve stability and meaning.

- **Technological dimension** – focusing on purpose and real value creation rather than technology for its own sake.
- **Environmental sustainability** – reducing ecological impact and aligning digitalisation with planetary boundaries.
- **Social responsibility *(Change Management)*** – involving employees, fostering trust and safeguarding well-being instead of reducing transformation to a purely technical exercise.

Like a stool, transformation becomes unstable if one of these legs is weak or missing, risking failure or unintended negative consequences.

The chapter begins by exploring the “seat” of the stool, examining how interviewees defined responsible DT and what makes it meaningful in practice. Each of the three legs is then examined in turn, with a short visual reminder providing an overview of the stool's evolution before each section. Finally, the chapter concludes with the interviewees' reflections on the stool metaphor, providing a bridge to the overall conclusion of the results and subsequent discussion.

6.1 General understanding of environmentally and socially responsible digital transformation

All interviewees were asked the same core question: *"How would you define 'responsible' digital transformation?" What do you see as its main components?'* The aim was to understand how participants conceptualise responsible DT and whether they place greater emphasis on its social or environmental dimensions or consider them to be inseparably linked.

The figure below summarises the five central principles that emerged from the interviews. It represents the core understanding of ESR-DT and will serve as the conceptual anchor for the following chapters.

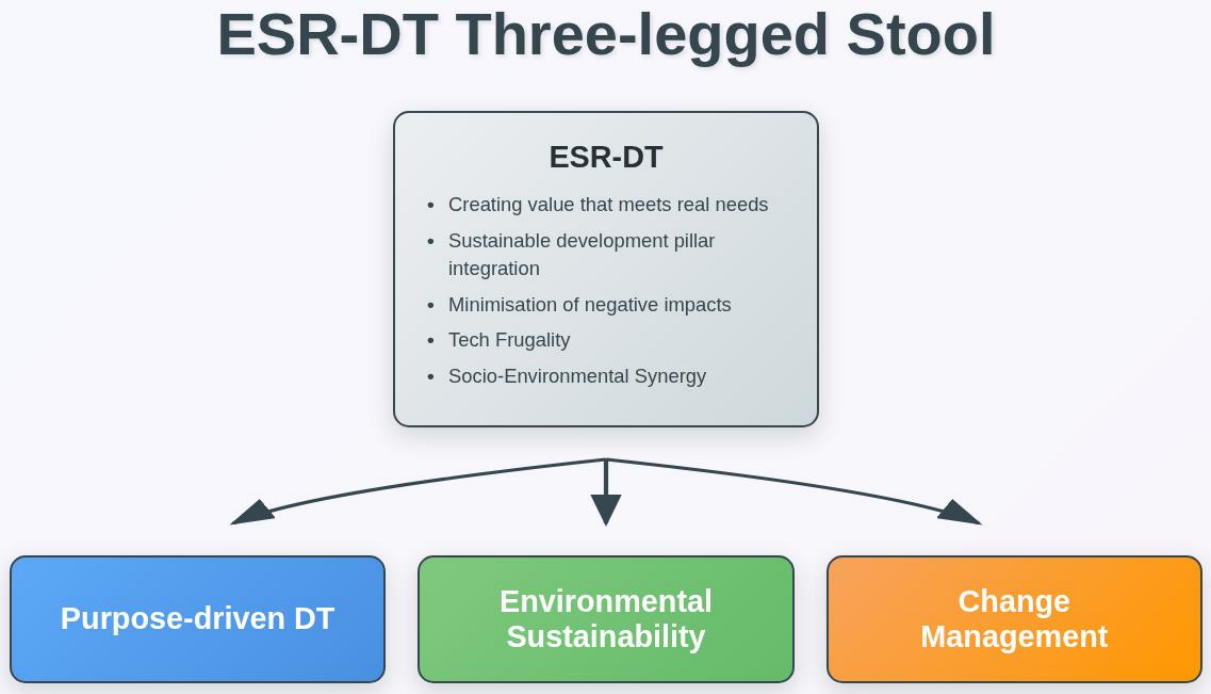

Figure 2: ESR-DT Three-legged Stool (1) (Own Illustration).

The full list of definitions provided by the interviewees can be found in Appendix B. What follows is a summary of the main points of convergence and divergence across the different perspectives.

6.1.1 Convergences of the different perspectives

Across the interviews, several points of agreement emerged regarding what constitutes ESR-DT. Despite differences in wording or emphasis, the participants described a remarkably consistent set of priorities. The following sub-sections present these convergences, structured around five core principles repeatedly mentioned in the interviews.

6.1.1.1 Creating value that meets real needs

All interviewees agreed that responsible DT must create real value and address genuine needs. The process should not be driven by trends, technology for its own sake, or marketing pressures. Instead, it must be meaningful, useful, and purposeful.

As Sophie Pirotton (HEC) put it, responsible digital transformation is *"a transformation that creates value. It must meet a real need, be useful and actually used"* (Sophie Pirotton, personal communication, May 8, 2025).

Sylvie Delberghe (Fast Track) further emphasised that *"socially responsible digitalisation always starts with a question of purpose. It is not about adopting technology to follow a trend, but about seeking to concretely improve processes, quality of working life and the company's overall impact"* (Sylvie Delberghe, personal communication, May 26, 2025).

6.1.1.2 Integration of the three pillars of sustainable development

It was emphasised that responsible digitalisation must integrate and balance the economic, social and environmental dimensions. These pillars are seen as closely interconnected and should be addressed together rather than in isolation. As Pirotton pointed out, a responsible DT is *"one that follows the rule of the 3Us (useful, usable, used) and creates economic, environmental and societal value"* (Sophie Pirotton, personal communication, May 8, 2025).

Jules Delcon (ISIT) referred to the Donut Economy as a helpful framework for understanding this balance, highlighting the idea of *"meeting fundamental social needs within the inner circle while not exceeding planetary boundaries on the outside"* (Jules Delcon, personal communication, May 22, 2025).

This integration of the three pillars was seen as essential for ensuring that DT contributes positively to both people and the planet, without compromising either dimension.

6.1.1.3 Minimisation of negative impacts

A consensus emerged among the interviewees that responsible digitalisation is not only about generating positive outcomes, but also about actively avoiding or reducing harm. Delcon underlined that a responsible DT *"takes into account the negative impacts of digital technology — not only the positive ones. You must balance both and have a clear vision"* (Jules Delcon, personal communication, May 22, 2025).

Concerning the environmental dimension, Anthony Barbarich emphasised that responsible digitalisation should *"avoid excessive or unnecessary digital uses*" to limit potential harm and contribute to sustainable development (Anthony Barbarich, personal communication, May 19, 2025).

From a social perspective, Julien Hernaut (GCP Consulting) pointed out that digital tools should *"improve a person's work processes through the implementation of a tool, in order to make their tasks more efficient, without negatively disrupting their work or imposing additional complexity"* (Julien Hernaut, personal communication, June 6, 2025).

Participants underlined that frugality and harm reduction cannot be pursued in isolation. They emphasised that social and environmental considerations are closely intertwined and must be addressed collectively.

6.1.1.4 Frugality, sufficiency and critical use of technology

The dominant view among participants was the need for a deliberate and moderate use of technology. This includes avoiding unnecessary digitalisation, excessive consumption and premature equipment replacement. The idea of doing less but doing it better appeared as a shared value. Delcon explained that *"sustainable transformation is based on two pillars: sufficiency (doing less, better, and more intelligently) and frugality (responding only to what is necessary). This means avoiding overconsumption, prolonging the lifespan of equipment, favouring repairability and resisting planned obsolescence"* (Jules Delcon, personal communication, May 22, 2025).

In addition, it was pointed out that this frugal approach requires a critical mindset towards the purpose of digitalisation. Delphine Gilmain (CHU) emphasised that *"the question of need is fundamental, but the question of intention — why we do it — is just as important"* (Delphine Gilmain, personal communication, June 26, 2025). This underlines that the intentions behind digitalisation play a crucial role in ensuring that technological choices truly contribute to a responsible and sustainable transformation.

6.1.1.5 Interconnection of social and environmental dimensions

Interviewees highlighted that social and environmental considerations in DT are inseparable. They agreed that responsible digitalisation cannot address ecological questions without considering their social implications, and vice versa. As Delcon summarised, *"there is no ecological transition without social transition – the two go hand in hand"* (Jules Delcon, personal communication, May 22, 2025).

Participants reinforced this idea, noting that environmental degradation ultimately harms society, while social neglect undermines ecological progress. Responsible DT, they concluded, must therefore adopt a systemic approach that balances both dimensions simultaneously, avoiding siloed thinking and fragmented solutions.

6.1.2 Divergences of the different perspectives

Although the experts agreed on the close connection between environmental and social responsibility, nuances emerged when it came to prioritisation. Delcon argued that protecting ecosystems must come first:

> *"You can have a thousand problems, but if you have nothing to eat at the end of the day, you have only one. In my view, we must first preserve ecosystems, biodiversity, agriculture. Otherwise, no one will be left to debate social issues"* (Jules Delcon, personal communication, 22 May, 2025).

Similarly, interviewee 13 (petrol industry, AT) highlighted the need to address social aspects in the short term, while not neglecting environmental sustainability in the long run. He stated:

> *"In the short term, the social component is crucial, as it is what we deal with every day. But long-term sustainability is essential, because if we neglect it, we risk a future where basic needs can no longer be met. It's about ensuring that future generations still have something on their plate"* (Interviewee 13, personal communication, June 30, 2025).

In contrast, Barbarich warned that focusing *"entirely on the environmental aspect and neglecting other, more societal aspects, may in fact have a greater impact on society"* (Anthony Barbarich, personal communication, May 19, 2025).

However, these differences did not reflect fundamental contradictions between the interviewees. Rather, the emphasis placed on either the social or environmental dimension tended to align with the interviewee's professional background or field of expertise. For example, technical or operational experts often focused more on environmental impacts and resource-related concerns, while interviewees working in strategy, governance or organisational development highlighted social responsibility and humanisation more strongly.

Overall, the interviews reveal a shared understanding of responsible DT. It is meaningful and creates tangible value while balancing social and environmental considerations and avoiding unnecessary harm. Based on this shared understanding, the next section explores how these principles can be put into practice, examining the role of purpose in guiding digital initiatives in more detail.

6.2 Purpose-driven digital transformation

DT can only realise its full potential when guided by a clear purpose. While the previous section set out the overarching vision of ESR-DT, this chapter focuses on the first pillar of the framework: the purposeful and legitimate implementation of digital initiatives.

This dimension emphasises that digitalisation should address specific, practical needs rather than being pursued for its own sake. Purpose acts as a compass, aligning innovation with responsibility and ensuring societal relevance. The interviews revealed that digital tools only promote sustainability when guided by clearly defined objectives and a long-term vision. Without this direction, initiatives may generate unnecessary complexity and fatigue or lose legitimacy.

The figure below summarises the core principles associated with this dimension. It highlights the importance of anchoring digital initiatives in organisational reality, seizing opportunities while managing trade-offs and setting responsible boundaries to prevent excess and maintain strategic focus.

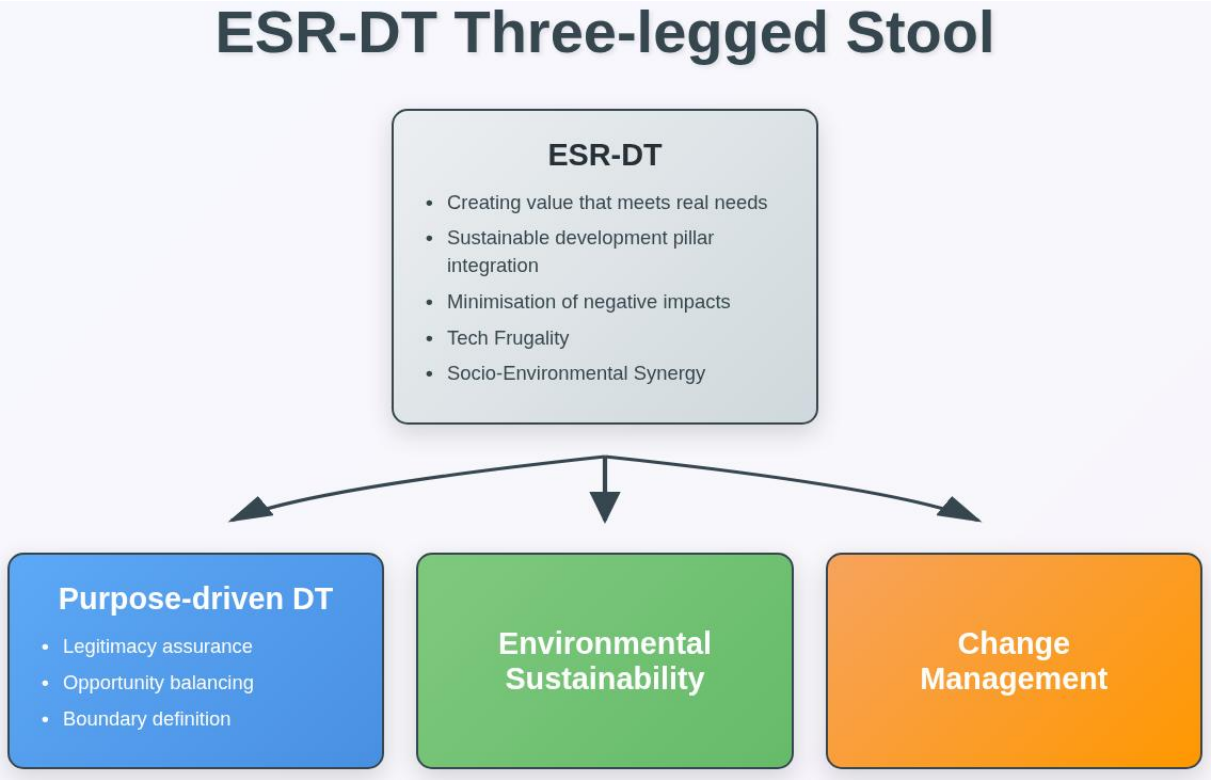

Figure 3: ESR-DT Three-legged Stool (2) (Own Illustration).

6.2.1 Ensuring legitimacy through meaningful digitalisation

As highlighted in section 6.1., digitalisation gains legitimacy only when it creates tangible value by addressing well-defined needs. The interviews consistently reflected that DT is no longer seen as an end in itself but must be driven by purpose, ethical considerations and long-term societal benefit.

6.2.1.1 Grounding digital projects in real needs

Interviewees emphasised that digital initiatives must be anchored in concrete operational challenges rather than abstract innovation goals. Hernaut stressed that DT should move organisations away from outdated and fragmented operations towards coherent, efficient systems: *"Digital transformation projects primarily aim at process optimisation. And above all: staying competitive compared to other market actors"* (Julien Hernaut, personal communication, June 6, 2025). This focus on genuine needs establishes the foundation for legitimacy: without clear, context-specific problems to solve, digital projects risk becoming empty exercises in technology adoption.

6.2.1.2 Purpose and proportionality as guiding principles

Beyond performance-driven goals, interviewees emphasised the importance of critically examining the rationale for digitalisation. Delberghe insisted that any transformation should begin with a clear sense of purpose: *"The first question to ask is: why do we want to digitalise? What is the meaning behind it? […] Is it socially responsible?"* (Sylvie Delberghe, personal communication, May 26, 2025).

This strategic "why" also implies asking whether digitalisation is the most suitable solution at all – a doubt raised by Delcon, who insists on questioning digital projects from a necessity and sufficiency perspective: *"Is it possible to do it differently, without digital technology?"* (Jules Delcon, personal communication, May 22, 2025).

At the same time, the interviews identified concerns in how digital projects are initiated. Some interviewees criticised the lack of coherent strategies and underdeveloped digital investments, while others warned against actionism. Delcon highlighted cases of *"technological mimicry",* where tools are adopted by imitation rather than relevance, often leading to project failure (Jules Delcon, personal

communication, May 22, 2025). This paradox shows that even initiatives driven by performance goals can falter when disconnected from real organisational needs.

6.2.1.3 Human-centred and legitimate transformation

The interviews also highlighted the importance of keeping people at the centre of DT. As Pauline Rodberg (Smart2Circle) argued, digital tools must remain supportive rather than dominant: *"Digital technology must remain in service of people, not replace them"* (Pauline Rodberg, personal communication, June 11, 2025). This statement aligns with Hernaut's insistence that digitalisation should enable people to focus on higher-value tasks rather than replacing employees.

Overall, the interviews show that meaningful DT is defined by three interrelated conditions: it responds to real needs, is guided by a clear and proportionate purpose and keeps human value creation at its core. Yet, participants also highlighted the persistent conflict between short-term efficiency goals and long-term legitimacy. As Pirotton summarised, organisations must *"minimise harmful environmental and societal impacts"* and avoid letting tools dictate strategy (Sophie Pirotton, personal communication, May 8, 2025). In that sense, DT becomes legitimate only when it is driven by a clear, contextualised and critically assessed purpose.

6.2.2 Leveraging digital opportunities while managing tensions

Although DT holds considerable promise, its potential does not materialise automatically. The interviews revealed a dual imperative: to actively seize the opportunities offered by digital tools and practices while also addressing the strategic, organisational and ethical factors that influence their success. The following sections explore how responsible digitalisation can create value and the circumstances in which this can be achieved sustainably.

6.2.2.1 Positive potentials and incentives for responsible digitalisation

Despite growing awareness of digital risks, interviewees highlighted that DT could create significant value when applied with clear purpose and proportionality. Beyond efficiency gains, it can simultaneously generate environmental, economic and social benefits.

One important opportunity lies in the economic advantages of responsible digital practices. Pirotton highlighted this connection by explaining that *"many actions aimed at reducing the environmental impact of digital technology involve extending hardware lifespans, which can have a significant financial effect. It's a win-win situation: Companies buy less equipment and simultaneously reduce their environmental impact"* (Sophie Pirotton, personal communication, May 8, 2025). This perspective demonstrates how sufficiency can contribute to achieving both ecological and economic goals.

Another example of digital value creation was provided by Interviewee 13, who highlighted increased efficiency and its ripple effects across different stakeholders:

> *"Digitalisation is an opportunity — for example, when processes become more efficient and ultimately benefit the customer. If fewer sick days are taken thanks to a more ergonomic system and costs are lowered for everyone while company margins are preserved, that's a success"* (Interviewee 13, personal communication, June 30, 2025).

This view points to a potential win-win-win scenario: improved workflows, healthier teams and cost-efficient services.

Besides economic factors, interviewees highlighted that responsible digitalisation can enhance employee motivation and strengthen employer attractiveness. Meaningful digital projects were described to engage staff around shared objectives and attract new talent, particularly in sectors where ecological and social responsibility are key drivers of reputation and differentiation.

These examples show that responsible DT has considerable constructive potential. However, these benefits are not automatic. They depend on deliberate strategic framing and alignment with long-term organisational goals, which is discussed in the next section.

6.2.2.2 Conditions and strategic integration

The interviews underlined that positive effects only materialise when DT is deliberately planned and embedded in long-term strategy. Participants repeatedly stressed that isolated initiatives, even when well-intentioned, rarely generate lasting value if they are disconnected from a broader vision. Strategic framing and organisational readiness were therefore described as essential preconditions for translating digital ambitions into meaningful and sustainable outcomes.

The need for strategic framing

To realise its constructive potential, digitalisation must be embedded in a deliberate, coherent strategy. Without such framing, digital initiatives risk becoming superficial, fragmented, or overly performance driven. As Gilmain warned, *"responsible digitalisation must be analysed and integrated strategically; otherwise, it risks becoming a constraint or a mere tool for performance"* (Delphine Gilmain, personal communication, June 26, 2025). Anthony Barbarich similarly stressed that DT is neither inherently good nor bad: *"We must make the right choices"* (Anthony Barbarich, personal communication, May 19, 2025).

This cautious stance reflects a growing awareness that technological potential alone does not guarantee meaningful outcomes. Instead, it is the strategic intent, governance structures and long-term orientation that determine whether a digital project contributes to resilience or merely adds complexity.

Digital maturity and integration

Another recurring theme was digital maturity, defined as the ability to use technology responsibly and in alignment with organisational needs. Delcon illustrated this idea through a metaphor: *"If you give a sharp knife to a butcher, they will know how to use it, how to store it, how not to get hurt. But if you give it to a child… That's digitalisation today"* (Jules Delcon, personal communication, May 22, 2025).

This digital maturity encompasses the ability to progress from isolated initiatives to long-term organisational alignment. It was observed that digitalisation is often implemented either reactively or without deeper integration into strategic planning. When this happens, initial enthusiasm can quickly give way to confusion or information overload. In contrast, organisations that approach digitalisation as part of a broader transformational strategy with clearly defined goals and criteria are better placed to convert ambition into lasting value.

As highlighted across interviews, the effectiveness of DT depends not only on its technical dimensions but also on the surrounding cultural and procedural context. In this light, responsible digitalisation requires more than well-meaning adoption. It demands structural readiness, cultural alignment and the ability to balance short-term performance with long-term societal value.

6.2.3 Setting responsible boundaries for sustainable digitalisation

Building on the need for a clear purpose (6.2.1) and the constructive potential highlighted above (6.2.2), interviewees emphasised that these goals cannot be achieved without setting intentional boundaries. Without these limits, digital initiatives risk becoming excessive, which undermines their societal value and ecological legitimacy. Therefore, defining technological, cultural and mental boundaries was seen as essential to ensure that digitalisation remains proportionate, sustainable and socially acceptable.

6.2.3.1 Technological overflow and digital mimicry

A recurring concern is the unthinking proliferation of digital tools. Interviewees described how the multiplication of systems, platforms and interfaces creates unnecessary complexity and operational

fatigue. As highlighted in earlier sections, there is a tendency towards "technological mimicry", whereby companies imitate others' choices without critically assessing their own needs. This unquestioning adoption of tools increases the risk of misaligned solutions and project failure.

Séraphin Vandegar (Slinya) added that marketing dynamics reinforce this tendency: *"Advertising makes us believe we absolutely need this new tool, which will change our lives,"* even if the actual benefit is negligible (Séraphin Vandegar, personal communication, May 21, 2025).

6.2.3.2 Sufficiency and informed decision-making

In response to this technical overflow, interviewees pointed to the need for a sufficiency-oriented mindset as a guiding principle. Vandegar suggested that every project should begin with a needs-based reflection: *"Which needs are essential, which are important and which are merely desirable? The more we aim to satisfy the latter, the more we risk relying on solutions that are hard to align with our values"* (Séraphin Vandegar, personal communication, May 21, 2025).

In a similar way, Delberghe underlined the importance of performance thresholds: *"Sometimes, the tool is technologically advanced but consumes too much energy or bandwidth. One must ask: what level of performance do I really need?"* (Sylvie Delberghe, personal communication, May 26, 2025). Such reflections do not call for rejecting technology. Instead, they express a form of informed pragmatism that questions excessive digital enthusiasm and focuses on making value-based choices (see section 6.3.2.4).

6.2.3.3 Cultural readiness and personal alignment

Setting digital boundaries also requires deeper cultural and personal reflection. Rodberg likened the mindset behind responsible digital use to broader lifestyle choices: *"It's a bit like […], taking public transport, buying second-hand… and then you start thinking about the software you use"* (Pauline Rodberg, personal communication, June 11, 2025). In her view, digital sobriety is not an isolated technical concept, but an extension of one's ethical positioning.

However, such awareness does not emerge spontaneously. As Delcon pointed out, *"to bring companies to adopt a more critical and strategic vision, awareness is the main lever. Once people understand the 'why', the 'how' follows naturally"* (Jules Delcon, personal communication, May 22, 2025). Rodberg added that communication needs to be adapted to the audience*: "Without a basic understanding of climate and energy issues, it's hard to talk about responsible digitalisation. Economic levers, like hardware savings, are more easily accepted"* (Pauline Rodberg, personal communication, June 11, 2025). These perspectives suggest that values, maturity and organisational readiness must align before boundaries can be meaningfully implemented.

Ultimately, boundaries are not restrictions but enablers of coherent and sustainable transformation. They help organisations resist hype-driven adoption, safeguard strategic clarity and align digital initiatives with long-term well-being and ecological consistency. Setting these limits was described as a prerequisite for ensuring that digitalisation serves real needs instead of driving uncontrolled expansion.

Summary: Purpose-driven DT

To conclude, the interviews showed that digitalisation gains legitimacy only when it serves real needs, is guided by a clear and proportionate purpose and is implemented with strategic coherence. Boundaries are not restrictions but safeguards, preventing uncontrolled expansion and ensuring that digital initiatives remain sustainable and socially relevant. In this sense, responsible DT is not about adopting technology for its own sake but about aligning innovation with meaning, sufficiency and long-term value. However, purposeful digitalisation alone is not enough. Its societal relevance also depends on how it interacts with ecological systems. The next section shifts focus from internal alignment to the environmental sustainability of DT, examining its material consequences and strategies to minimise harm.

6.3 Environmental sustainability as a pillar of responsible digital transformation

The second leg of the stool represents environmental sustainability. This leg ensures that digitalisation efforts respect ecological boundaries and promote responsible practices. It reflects how DT can contribute to meeting planetary limits and address the urgent need to minimise negative environmental impacts.

In the stool metaphor, this leg is essential for stability. Without environmental sustainability, the stool would topple. Similarly, a DT that neglects ecological concerns could cause environmental harm, fuel overconsumption or result in accusations of greenwashing. This leg anchors digital initiatives in environmental goals, ensuring coherence with broader societal values.

The following figure presents the key environmental aspects of ESR-DT, as identified in the interviews. These principles form the analytical basis for the environmental perspective discussed in this chapter.

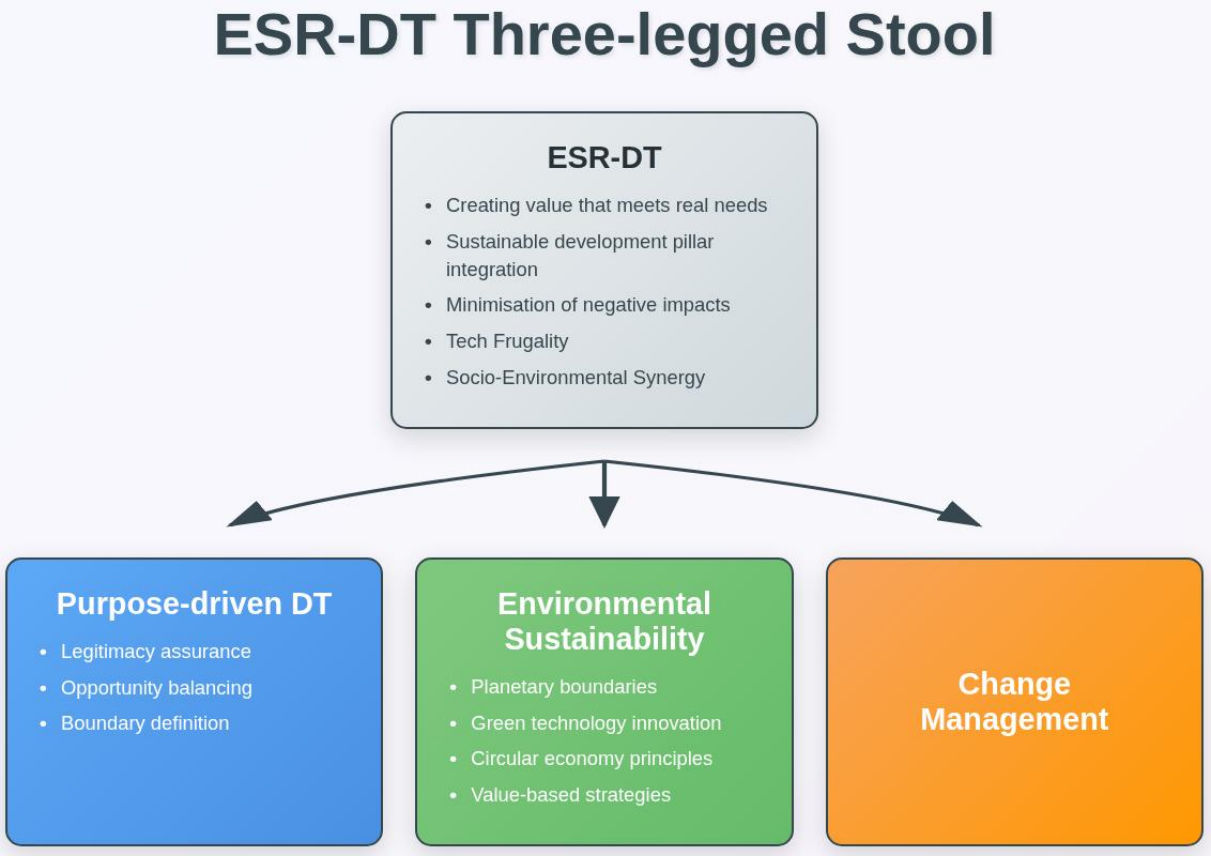

Figure 4: ESR-DT Three-legged Stool (3) (Own Illustration).

6.3.1 Environmental impacts and the need for alignment with planetary boundaries

The first step towards environmentally responsible DT is to recognise and address its potential negative effects. Interviewees emphasised that DT should operate within planetary boundaries, rather than contributing to unchecked growth.

6.3.1.1 Environmental impacts of digital technologies

All interviewees were aware of the negative environmental consequences associated with digital technologies. The experts consistently identified key sources of environmental harm, notably energy consumption, CO_2 emissions and the use of natural resources. Pirotton, for instance, described "*energy consumption, which remains a major issue even though we are moving towards greater efficiency; electronic waste, which is polluting and therefore also a priority to address; and manufacturing, which also raises concerns*" as the most significant environmental challenges (Sophie Pirotton, personal communication, May 8, 2025).

Other interviewees also highlighted the often-overlooked immaterial dimension of digital infrastructures. Lucie Bernaerts (Webecode) emphasised that *"website hosting is one of the elements that consumes the most"*, pointing to the hidden environmental footprint of cloud services and data centres (Lucie Bernaerts, personal communication, May 30, 2025*).*

Another critical issue raised was the problematic and often indiscriminate use of advanced tools such as AI. AI-based research can consume significantly more energy than standard online searches, creating hidden environmental costs when deployed without clear necessity or efficiency consideration.

While technical progress and efficiency improvements were acknowledged, the interviews revealed a shared sense of urgency about the need for more conscious and responsible use of digital technologies. As Björn Kohnen (BK-Solut) put it,

> *"I think it will get worse at first before greater awareness sets in. Only once there is enough awareness […], something can change. Until then, the pace is simply too fast. In theory, many things may be well thought out, but in practice a lot is currently being misused"* (Björn Kohnen, personal communication, June 11, 2025).

This highlights that awareness and education, as previously emphasised in section 6.2.3.3, are crucial levers for promoting responsible practices and preventing the misuse of energy-intensive tools such as AI. These findings underline the need to address environmental impacts systematically and to integrate ecological considerations as a core component of responsible DT.

6.3.1.2 Planetary boundaries and the limits of digital growth

The interviewees highlighted that DT, unlike other major transitions such as the ecological or energy transition, follows no clear path or endpoint. Delcon described it as *"a succession of technologies that are often implemented without an overall vision"*, emphasising the risk that without clear limits, digitalisation could contribute to uncontrolled growth (Jules Delcon, personal communication, May 22, 2025).

It was argued that this open-ended nature makes it even more essential for digital strategies to be aligned with planetary boundaries. Delcon illustrated this by comparing planetary limits to a budget: *"We cannot emit too much CO_2, consume too many natural resources, or pollute beyond a certain threshold. There can be no infinite growth in a finite world"* (Jules Delcon, personal communication, May 22, 2025).

Pirotton reinforced this point, warning that efficiency gains alone will not suffice: *"Even if we become more efficient in how we consume energy and resources, this will not be enough. We need to improve efficiency but also rethink our consumption and production pattern"* (Sophie Pirotton, personal communication, May 8, 2025).

Gilmain added that this rethinking must go beyond technical fixes and challenge the dominant notion of growth itself. In her words, *"growth must be about cultivating a foundation that is more robust and resilient in the face of everyday activities and the crises we will have to face, the scale of which we do not yet fully measure" (*Delphine Gilmain*,* personal communication, *June 26, 2025).*

6.3.1.3 Rebound effects as a challenge for responsible digitalisation

Interviewees cautioned that efficiency measures in DT do not automatically translate into environmental benefits. Instead, they highlighted the risk of rebound effects. As Delcon explained *"a responsible DT also means avoiding the rebound effect, which is the belief that a new, more economical tool justifies its purchase when it wasn't needed in the first place"* (Jules Delcon, personal communication, May 22, 2025).

Building on this, Hernaut stressed the importance of rigorous planning to avoid unintended rebound effects. It was argued that projects aiming to be environmentally beneficial should start with a clear business case assessing both expected savings and additional digital demand. Without such reflection,

"initiatives meant to save resources can end up consuming more energy through extra data storage or unnecessary digital interactions" (Julien Hernaut, personal communication, June 6, 2025).

Similarly, Bernaerts described how eco-design and Green IT can play a crucial role in limiting rebound effects. In her words, their objective is to *"reduce rebound effects as much as possible through eco-design and Green IT".* She emphasised that this involves designing digital services that are streamlined and efficient, guiding users directly towards their goals rather than encouraging unnecessary digital interactions (Lucie Bernaerts, personal communication, May 30, 2025).

These perspectives show that rebound effects are a major challenge for responsible DT. Without careful design and critical reflection, the increased demand and use triggered by efficiency gains may ultimately outweigh the benefits of DT.

6.3.2 Approaches for promoting environmental sustainability

The preceding sections have highlighted the significant environmental risks of DT. These challenges demonstrate the need for approaches that go beyond mere technical efficiency, requiring fundamental rethinking of digital practices. As Bernaerts aptly summarised, *"responsible digital practices and eco-design are beneficial at all levels"* (Lucie Bernaerts, personal communication, May 30, 2025).

6.3.2.1 Green IT

Green IT emerged in the interviews as a key solution for reducing the environmental footprint of digital technologies. Pirotton described Green IT as addressing *"the environmental footprint that is inherent in digital technology. This covers everything linked to the life cycle, etc"* (Sophie Pirotton, personal communication, May 8, 2025).

In practice, Green IT involves strategies such as extending hardware life cycles and prioritising the reuse and refurbishment of equipment. As Pirotton pointed out, *"why not use reconditioned equipment? This avoids having to extract new raw materials, which often has very harmful impacts in the countries where these materials are produced*" (Sophie Pirotton, personal communication, May 8, 2025).

Additionally, interviewee 13 illustrated how Green IT measures can deliver both environmental and economic benefits.

> *"By significantly reducing the volume of new hardware purchases — for example, by using 8,000 rather than 22,000 new devices annually — organisations can cut emissions related to Scope 2 and 3, lower their carbon footprint and benefit from carbon credit systems"* (Interviewee 13, personal communication, June 30, 2025).

6.3.2.2 Green IS

Interviewees highlighted that Green IS can help organisations translate sustainability ambitions into action. Pirotton described Green IS as using digital technology to measure and monitor environmental indicators, citing IoT tools and sensors as examples for capturing energy use or emissions (Sophie Pirotton, personal communication, May 8, 2025). Barbarich stressed that such systems could structure complex environmental data, making it more accessible for decision-makers and encouraging more responsible choices. This reflects the idea that Green IS can *"facilitate positive exchanges and encourage considerate action"* by transforming scattered data into actionable insights (Anthony Barbarich, personal communication, May 19, 2025).

Compared to Green IT, which was widely discussed and linked to tangible technical actions, Green IS was mentioned by fewer interviewees and often in more general terms. This may suggest that while the concept is acknowledged in theory, its implementation in practice remains less visible or more fragmented across organisations.

6.3.2.3 Circular economy practices

Interviewees shared concrete examples of circular economy practices that aimed to extend the life cycle of digital equipment and reduce environmental impact. These practices included donation, refurbishment, leasing and second-hand use of hardware. Interviewee 10 (aviation industry) described how their company collaborates with a non-profit organisation as *"they take our IT equipment, refurbish it and then provide it to schools, according to the needs of different schools"* (Interviewee 10, personal communication, June 11, 2025).

Rodberg noted that a client of hers

> *"Have even developed a small in-house workshop: when a computer breaks down, people with the right skills repair it or anticipate failures to prolong the equipment's life. […] When equipment is changed, they use it to the maximum before replacing it. And if it still works, they refuse to throw it away: they resell it second-hand or donate it to associations or schools"* (Pauline Rodberg, personal communication, June 11, 2025).

These examples show how circular economy approaches are being integrated into practice to reduce waste, limit the need for raw material extraction and promote a more resource-efficient DT.

6.3.2.4 Value-based strategies

While interviewees recognised the value of green technology innovations and circular economy practices, they also stressed that these measures alone are insufficient to guarantee environmental sustainability in DT. They emphasised the need for value-based strategies that critically question both the necessity and the scope of digitalisation, moving beyond purely technical solutions.

Delcon, for instance, criticised the fact that current innovation often serves marketing purposes rather than representing genuine progress: *"Current innovation often brings no real progress, only marketing diversification. It is economic and financial dynamics that drive us to consume more and more"* (Jules Delcon, personal communication, May 22, 2025). This critique highlights a systemic challenge: although efficiency improvements can reduce impacts at a micro level, they risk being outweighed by the broader push for consumption and growth.

In this context, interviewees advocated a "less is more" approach that focuses on actual needs rather than unquestioned technological expansion. Vandegar emphasised that digital sobriety means *"asking what we really need and what tool, procedure or solution precisely meets that need"* (Séraphin Vandegar, personal communication, May 21, 2025).

Beyond individual purchasing decisions, the interviews highlighted the importance of durable behaviour. As Delcon pointed out, "a durable product only makes sense if it is used in a sober way. Sustainable behaviour is more important than the product itself" (Jules Delcon, personal communication, May 22, 2025). In this view, true responsibility lies not in acquiring supposedly sustainable technology, but in adopting restrained, needs-based digital practices.

These findings demonstrate that value-based strategies, such as digital sobriety and sufficiency, aim to curb overconsumption and minimise unnecessary environmental impact. They encourage organisations to critically evaluate their actual requirements and challenge the notion that technological expansion invariably yields superior outcomes.

However, interviewees emphasised that the effectiveness of green technologies and moderation strategies is often constrained by overriding economic priorities. The following section examines how growth-driven logics can overshadow ecological ambitions and restrict the transformative potential of responsible digitalisation.

6.3.3 Tensions between ecological ambitions and economic priorities

The interviews showed clear tensions between ecological ambitions and the economic priorities that often drive DT. As Antoine Desait (AD Consult) put it, *"sustainability is rarely the primary objective. Companies primarily aim for performance and efficiency and if there is an ecological gain, it is seen as a bonus"* (Antoine Desait, personal communication, June 10, 2025). This perspective highlights a structural imbalance: ecological objectives are often treated as secondary, with economic drivers taking precedence.

In this context, Barbarich stressed that *"the purely environmental aspect must be placed on an equal level with the other pillars"* (Anthony Barbarich, personal communication, May 19, 2025). He argued that

> *"Eco-design, digital sobriety and editorial sobriety address this challenge as a priority. If, in your organisation, you undertake a digital transformation without paying attention to these aspects of accessibility and digital divide, you will find that your transformation does not work"* (Anthony Barbarich, personal communication, May 19, 2025).

This highlights that balancing environmental, social and economic goals is not only an ethical imperative, but also a practical necessity for achieving effective and responsible DT.

Summary: Environmental sustainability as a pillar of responsible DT

The interviews showed that environmental sustainability is widely recognised as a vital component of responsible DT. Although several strategies seek to reduce environmental harm, their impact is often limited by economic pressures and short-term priorities. As in the first stage, raising awareness and providing education were identified as key ways of guiding responsible choices and avoiding harmful practices.

In the context of the stool metaphor, this second leg provides stability by anchoring digital initiatives in environmental sustainability. Without this foundation, digitalisation risks losing legitimacy and contributing to further harm. However, technical measures and environmental intentions alone are insufficient. To strengthen this pillar, social processes are required to embed ecological awareness and value-based decision-making within organisations, a topic that will be explored in the next chapter on change management.

6.4 Change management as the social pillar of responsible digital transformation

The interviews highlight that responsible DT cannot rely solely on technology or environmental sustainability. It requires a third pillar: Change management (CM). This element provides stability, legitimacy and direction, integrating transformation into the social fabric of organisations. Without CM even well-designed digital projects often fail because they lack acceptance and genuine employee involvement.

According to the interviewees, CM is not an additional technical tool that can be implemented at the end of a project. Instead, they described it as a fundamental mindset and strategic component that accompanies and shapes the entire transformation process. CM builds a bridge between technological possibilities and human experience, fostering trust and opening spaces for dialogue while preventing change from resulting in frustration or rejection.

This chapter examines how CM is understood and implemented in socially responsible DT The five core building blocks — Foundation, Leadership, Participation, Interpreting Resistance and Culture — summarise this understanding and are represented in the graphic illustrating the stool model. The graphic shows how, together with the other two dimensions of responsible DT, CM forms a supporting pillar for successful transformation.

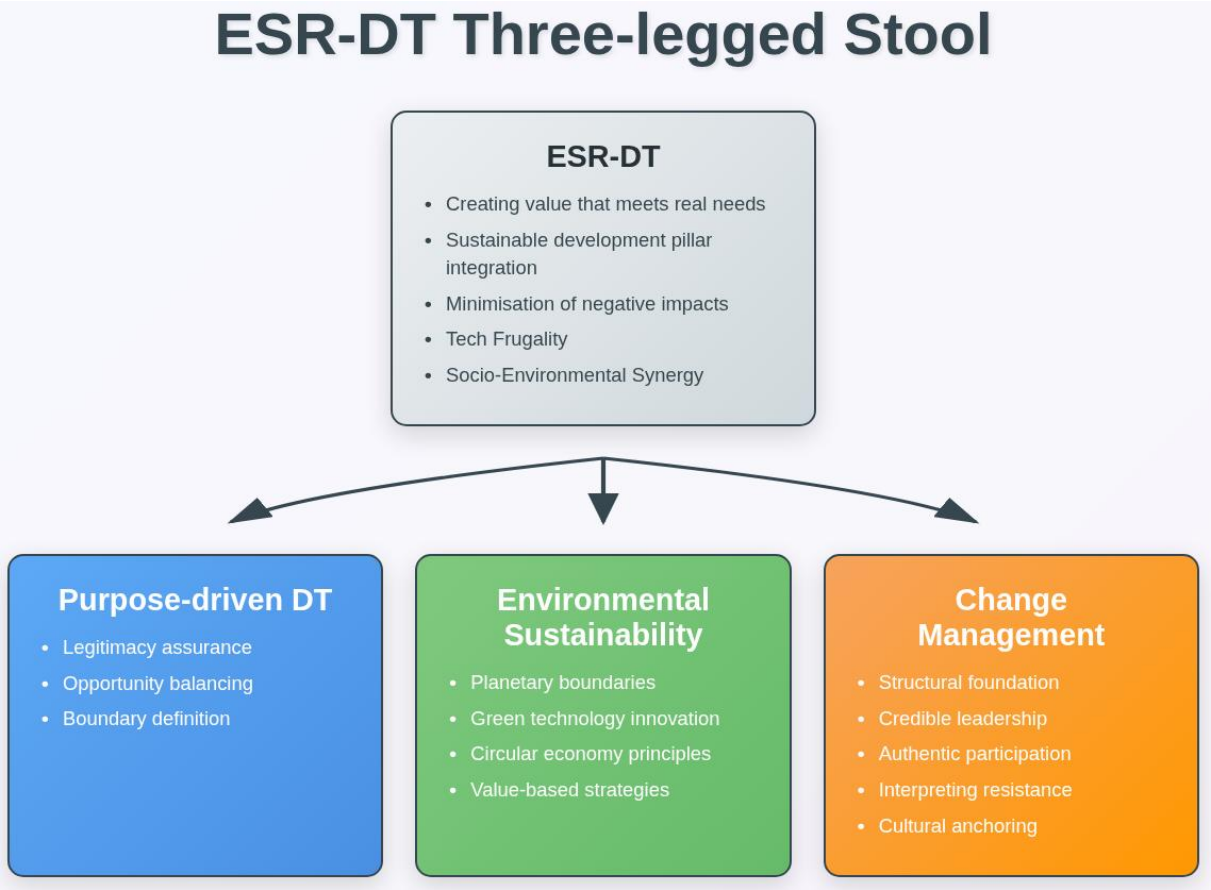

Figure 5: ESR-DT Three-legged Stool (4) (Own Illustration).

6.4.1 CM as foundation of socially responsible DT

Responsible DT requires more than deploying tools or technology. It must be anchored in a process that meaningfully involves people. Interviewees described CM as a fundamental pillar of such DT providing direction, legitimacy, stability and resilience in the face of resistance or complexity.

6.4.1.1 Strategic integration from the outset

Interviewees stressed that CM must be considered a central element of project planning from the very beginning. As Delcon put it, *"Change Management is an essential pillar in any digital transformation. […] If people don't understand why we are making this change, it won't work"* (Jules Delcon, personal communication, May 22, 2025). The mere deployment of digital tools is insufficient if the human implications are not addressed.

This strategic imperative was shared by Delberghe, who observed that proactive organisations anticipate change-related challenges early on and build participatory processes into their approach. Such anticipation, she explained, fosters internal ownership and turns employees into *"ambassadors of the project"* (Sylvie Delberghe, personal communication, May 26, 2025). By contrast, if organisations only activate CM reactively – for instance, after tools fail to deliver the expected results – the likelihood of frustration and disillusionment increases significantly.

Despite this shared understanding of CM's importance, many organisations still fail to give it the structural weight it needs to succeed.

6.4.1.2 From optional bonus to structural pillar

Interviewees noted that CM is too often treated as an optional "add-on" rather than a core project function. Delcon criticised the prevailing bias towards technical and financial priorities: *"Too often,*

[Change management] is seen as a 'bonus'. […] Technical aspects are prioritised and people are forgotten. That's where many projects fail." (Jules Delcon, personal communication, May 22, 2025).

While awareness of CM's importance is increasing, its structural integration often remains inconsistent. Budgets and dedicated planning are still postponed until late in the process, reducing its impact. Desait summarised the required mindset concisely: *"Before launching the project, you have to make sure that employees understand the initiative and feel the desire to support it"* (Antoine Desait, personal communication, June 10, 2025).

This need for early legitimacy and understanding points to a broader theme that ran through the interviews: CM succeeds only when it is anchored in people's lived experience, not just in project structures.

6.4.1.3 A human-centred approach to digital change

Interviewees repeatedly stressed that CM is fundamentally human-centred, addressing fears, emotions and perceptions rather than relying solely on rational persuasion. As Delcon put it: *"Change Management is about listening, pedagogy and iteration"* (Jules Delcon, personal communication, May 22, 2025). Interviewee 13 added that *"it is crucial to clearly show employees how this change will affect their daily work"* (Interviewee 13, personal communication, June 30, 2025). Without empathy, transparency and reinforcement, trust erodes and engagement falters.

This emphasis on the human dimension shares earlier findings in purpose-driven DT, where awareness and meaningful dialogue were described as key enablers of responsible transformation. Similarly, in CM, technical structures or tools cannot succeed unless they are grounded in a people-centred approach that makes change understandable, emotionally acceptable and connected to real needs.

Taken together, these insights depict CM as the social foundation of DT, translating technical change into meaningful experiences for employees. Yet structures alone are not enough – they only succeed when leaders give direction, embody values and actively steer the process.

6.4.2 Leadership and steering in responsible CM

Effective CM in DT requires more than tools and plans but rather demands better leadership and structured steering mechanisms. Interviewees consistently linked successful transformation processes to the presence of clear direction, personal commitment from leadership figures and operational structures that ensure coherence across teams.

6.4.2.1 Sponsor roles and strategic authority

Clear steering roles are essential for coherence and legitimacy in DT. Interviewee 10 stressed that a sponsor must be more than a symbolic figure, describing this person as *"the one who has a real stake in the project's success – someone who can unblock difficult situations"* (Interviewee 10, personal communication, June 11, 2025). This authority is crucial for resolving conflicts and ensuring that decisions translate into action.

Interviewees agreed that leadership is primarily about providing direction and clarity, even when decisions may later be adjusted. The absence of guidance creates uncertainty and slows down transformation efforts. Bernd Hugo (Karl Hugo) highlighted the role of trust built over time: *"strong leadership makes everything easier, because people trust the decisions"* (Bernd Hugo, personal communication, July 7, 2025). Effective sponsorship therefore combines influence, decisiveness and credibility, making it a cornerstone of responsible CM.

However, beyond formal authority, interviewees emphasised that leadership only becomes truly influential when put into practice every day, a point that will be explored in the next section.

6.4.2.2 Embodying values and credibility

Legitimacy in leadership goes beyond formal authority. As Delberghe noted, *"you need to be able to bring people along with you – and not everyone has that talent"* (Sylvie Delberghe, personal

communication, May 26, 2025). Leadership in CM is therefore not just about holding a title but about inspiring confidence and mobilising people through authentic behaviour.

Hernaut highlighted that credibility stems from actions as much as from hierarchy: "*key messages must come from figures high in the hierarchy. They carry the project, provide accurate information and ask for effort – while listening, supporting and valuing employees"* (Julien Hernaut, personal communication, June 6, 2025). This perspective reinforces that leadership in DT is not merely functional; it requires embodying values, fostering trust and showing genuine commitment to those affected by change.

Yet personal credibility alone does not ensure alignment. Leadership also needs clear roles and communication structures to translate intentions into consistent action.

6.4.2.3 Role clarity and communication channels

Effective leadership depends on well-defined responsibilities and strong communication channels. As Hernaut explained, "*it's not about telling others what to do, but about showing that everyone is moving in the same direction. The project lead is not an operational manager, but someone who carries the project on a strategic level"* (Julien Hernaut, personal communication, June 6, 2025).

This distinction between strategic guidance and operational execution prevents ambiguity and ensures that leadership does not dissolve into micro-management. Defined roles create a stable point of reference for teams, allowing decisions to flow consistently across the organisation. Nevertheless, structure alone does not guarantee successful change. Leadership must be complemented by active CM practices that focus on people rather than technical deliverables.

6.4.2.4 Project management as a support function – not a substitute

Effective DT requires close alignment between project management and CM. Project management provides structure, deadlines and deliverables, but on its own cannot secure employee engagement or adoption. Without deliberate attention to the human side of change, even well-executed technical projects risk falling short of their intended value.

Desait illustrated this point vividly: *"Project management builds the new ship; change management prepares the crew to function in it"* (Antoine Desait, personal communication, June 10, 2025). This distinction highlights that CM is not an optional layer but an equally critical counterpart to project management. The two functions must complement each other: one must ensure technical coherence and the other must foster legitimacy, trust and readiness among those affected by the change.

To conclude, the interviews depict leadership in CM as a multidimensional task that combines authority, credibility and structured coordination to align technical and human aspects of transformation. Leadership that fails to integrate these elements risks confusion and fragmented initiatives. As David Scholzen put it, *"You can have strong leadership and still be very horizontal and participatory"* (David Scholzen, personal communication, July 7, 2025). This highlights the fact that leadership and participation are interconnected forces, rather than opposites. This point becomes central in the next section, which explores how structured employee involvement can reinforce legitimacy and long-term success in DT.

6.4.3 Participation and employee involvement

Participatory approaches emerged as a key element of socially responsible DT across the interviews. Employees were repeatedly described as active contributors to change, not passive recipients. This section explores how participation was understood and practised, focusing on foundational principles, concrete mechanisms and the balance between bottom-up input and top-down coordination.

6.4.3.1 Participation and early involvement as a foundational principle

Participation was framed as a structural condition rather than a stylistic choice. Interviewee 13 highlighted: "*decisions are not made top-down, but all departments are actively involved […] those*

affected must be able to participate before implementation" (Interviewee 13, personal communication, June 30, 2025). Engagement and participation before decisions are finalised was repeatedly described as essential for legitimacy and ownership. Hugo summarised this shift in mindset as "*the first step is to ask people what they actually need"* (Bernd Hugo, personal communication, July 7, 2025). Early engagement was seen as essential for legitimacy and ownership.

Participation, however, is most effective when connected to a clear purpose. Delcon stressed that *"you have to explain why we are doing this, let people understand the objectives and decide if they agree with them"* (Jules Delcon, personal communication, May 22, 2025). Without a shared narrative, inclusion risks being symbolic and failing to create genuine commitment.

This logic links directly to the leadership dimension discussed earlier: visible and value-based leadership creates the trust and communication channels needed for participation to influence decisions meaningfully. The next section looks at how these principles translate into tangible practices.

6.4.3.2 Practical mechanisms and feedback loops

Turning participation into practice requires deliberate structures that go beyond intention. Interviewees described various mechanisms to make inclusion tangible, such as awareness workshops, structured dialogue formats and continuous feedback loops. These tools were seen as effective only when they fostered genuine interaction instead of symbolic gestures.

Presence – both physical and relational – emerged as a decisive factor. Interviewee 13 highlighted the difference this makes: "*When those who want to change our working processes sit down with us in our office – and listen – it creates the sense that things can still be co-shaped*" (Interviewee 13, personal communication, June 30, 2025). Authentic dialogue builds trust and fosters a sense of ownership, whereas distant communication risks alienating employees from the process.

Recognition of contributions, whether through visible appreciation or small incentives, was repeatedly mentioned as a way to sustain engagement over time. Yet interviewees agreed that these measures only have impact if they are embedded in a decision-making framework that remains responsive. Mechanisms of participation must be linked to clear governance models where feedback can influence outcomes, rather than being collected without consequence.

This connection between local dialogue and broader decision-making leads to the question of how bottom-up expertise and top-level coordination can be combined effectively, which is explored in the next point.

6.4.3.3 Bottom-Up, Top-Down, and Transversal Logic

Interviewees described participation as a process that needs both local input and overarching coordination. As Scholzen noted, *"Bottom-up approaches often produce the most valuable ideas"* (David Scholzen, personal communication, July 7, 2025). However, these ideas only gain traction when they are connected to a wider organisational framework. Gilmain explained that senior management must ensure alignment across departments, without imposing solutions unilaterally: *"It's not about top-down control. It's transversal – field teams contribute their expertise while leadership provides a shared direction"* (Delphine Gilmain, personal communication, June 26, 2025).

This dual logic creates a balance between freedom and guidance. Without top-level orientation, change risks becoming fragmented; without genuine bottom-up input, it risks being perceived as imposed. It was warned that the latter often triggers resistance or quiet disengagement, as employees feel that change is done to them rather than with them.

To summarize, across the interviews, participation emerged as a structural necessity for socially responsible DT. Early dialogue, active listening and genuine opportunities to influence decisions were repeatedly cited as key to creating legitimacy and long-term commitment.

However, participation remains fragile: when it is merely symbolic or disconnected from leadership actions, employees quickly disengage. As interviewees pointed out, lack of authentic involvement can even fuel resistance to change. The following point explores this link in more detail, examining how reluctance and fatigue arise when participation is absent or ineffective and how these signals can inform better CM practices.

6.4.4 Resistance, fatigue and limits

Resistance to DT is often mistakenly viewed as straightforward opposition. However, the interviews revealed a more nuanced picture: reluctance usually stems from emotional overload, uncertainty about the consequences or unspoken concerns, rather than an outright refusal. Therefore, resistance should be seen as a signal to interpret and address, rather than a barrier to overcome.

6.4.4.1 Understanding Real Sources of Resistance

Interviewees stressed the importance of avoiding assumptions about resistance. As Desait explained, *"you can make assumptions – but you only really know what people think if you ask them directly […] sometimes anonymously"* (Antoine Desait, personal communication, June 10, 2025). Listening closely turns resistance into a diagnostic tool, revealing underlying issues before they escalate. Participants agreed that resistance rarely originates from technology itself but from how change is introduced and perceived in daily work.

6.4.4.2 Fatigue and the emotional side of change

Continuous transformation without visible benefit can lead to "change fatigue". Interviewees noted that repeated initiatives, poorly paced or insufficiently justified, exhaust employees and erode motivation. Informal conversations were described as the most effective way to clarify misunderstandings and reduce anxiety when formal communication channels fail. Desait emphasised the need for realistic pacing: *"You can't shift from a very traditional working model to a hyper-digitalised one overnight"* (Antoine Desait, personal communication, June 10, 2025). Gradual, layered approaches were viewed as essential for maintaining engagement.

A lack of pacing and unclear benefits can often create frustration, but interviews showed that this fatigue can be mitigated by giving employees opportunities to express concerns and influence outcomes. This highlights another important factor in preventing resistance: establishing safe spaces for open dialogue where feedback is not only collected, but also visibly acted upon.

6.4.4.3 Creating space for honest dialogue

Resistance only becomes problematic when silenced. Interviewee 13 highlighted that "*you have to give people the space to understand what's happening. Ask for their opinion. Maybe you change an idea, maybe not – but you must give them that space*" (Interviewee 13, personal communication, June 30, 2025). Transparency and openness were repeatedly described as preconditions for trust: employees want to feel heard and see that their input can make a difference. Without such spaces, resistance hardens into disengagement or quiet opposition.

This aligns with earlier insights on co-creation and meaning making: inclusion must not only be symbolic but have consequences. Delberghe pointed out that *"people want to be heard – and to see that something changes as a result"* (Sylvie Delberghe, personal communication, May 26, 2025). Transparency, honesty and realism about the limits of transformation are essential conditions for trust.

In short, resistance often reflects legitimate concerns relating to the pace, meaning or lack of influence of a situation. A socially responsible approach recognises the value of these reactions and integrates feedback instead of suppressing it.

6.4.5 Cultural anchoring and long-term perspective

DT only succeeds when it is rooted in culture. Interviewees emphasised that CM should be an integral part of organisational mindset, rather than a temporary intervention. This section explores how cultural anchoring can shape responsible DT by establishing lasting routines and lived values and by avoiding cultural fragmentation.

CM cannot be viewed as a temporary intervention. It must be rooted in how organisations think, decide and evolve over time. It was mentioned that DT is not only technical or strategic but also emotional, social and cultural. Good CM, as one participant summarised, means preserving a company's identity even through technological shifts and ensuring that digitalisation grows from within existing cultural frameworks. As Hugo put it: *"Digitalisation must adapt to the culture, not the other way around."* (Bernd Hugo, personal communication, July 7, 2025).

Authentic values and shared organisational identity were mentioned as key anchors for responsible transformation. Delberghe questioned whether *"values are just written on the walls, or whether they are truly lived",* noting that genuine cultural alignment provides emotional security, particularly in uncertain contexts such as the rise of AI (Sylvie Delberghe, personal communication, May 26, 2025). When people feel connected to shared values, they are more likely to engage and adapt.

Sustainable change also requires repetition, routines and context-sensitive reinforcement. It was warned that one-size-fits-all approaches risk superficial adoption. If change is rushed or poorly anchored, cultural fractures may emerge, creating a divide between those who adapt and those who resist. As Hernaut cautioned: *"You may end up with two groups – those who have changed, and those who resist. That's when the company risks a real rupture."* (Julien Hernaut, personal communication, June 6, 2025).

In summary, culture is both the medium and the message of transformation. A responsible approach to CM must foster genuine values, emotional meaning and long-term coherence, going beyond technical fixes. Without this cultural foundation, even well-designed digital initiatives risk causing the organisation to fragment or fade; with it, however, transformation becomes part of the company's identity rather than a threat to it.

Summary: CM as the social pillar of responsible DT

The interviews confirm that CM is a fundamental pillar of responsible DT, not a peripheral support function. Five critical elements emerged across cases: a structural foundation providing direction and legitimacy; leadership combining authority and credibility; participation enabling employees to co-shape change; interpreting resistance as a valuable signal; and cultural anchoring ensuring long-term coherence.

While individual emphases varied slightly depending on professional experience and personal perspectives, the overall understanding of CM was consistent. Some participants highlighted strategic integration and structured approaches, while others focused more strongly on the emotional and cultural dimensions of change. These variations underline that socially responsible CM cannot rely on a single blueprint but must adapt to organisational realities and the lived experience of employees.

Taken together, these findings reinforce the metaphor of the three-legged stool. Alongside purpose-driven digitalisation and environmental sustainability, CM provides the social stability that enables digital initiatives to take root and deliver meaningful change. Without this aspect, even well-designed projects risk losing legitimacy, encountering resistance or causing fragmentation within organisations.

6.5 Perceptions of the three-legged stool model

At the end of each interview, participants were invited to reflect on the metaphor of the "three-legged stool" as a representation of responsible DT. Due to time constraints, however, this question could not always be explored in equal depth, resulting in shorter or more general responses in some cases. Consequently, the insights gathered primarily reflect individual perspectives and personal values rather than systematic differences between stakeholder groups.

Overall, however, the metaphor was consistently understood and accepted: participants recognised the importance of balancing technological innovation, environmental sustainability and social CM in order to achieve stability in DT. Participants emphasised three main aspects of the metaphor: the need to maintain balance across all three legs, differences in the strength or weakness of individual dimensions and the practical challenges of keeping the stool stable in real-world organisational settings.

6.5.1 General perception – Three pillars as a logical foundation

Most interviewees found the metaphor intuitive, stressing that DT cannot succeed on technology alone. Hugo highlighted that all three aspects must be considered, arguing that ignoring sustainability is no longer an option:

> *"You always have to consider all three. Change management, obviously. Digitalisation already plays a role. Sustainability […] is a must because […] in the end, everything is risk management. You can have the most successful company, but if it produces a lot of pollution, it's worth nothing"* (Bernd Hugo, personal communication, July 7, 2025).

Hernaut shared a similar view and described responsible transformation as a matter of balance between dimensions. According to him, *"it's a balance between the three dimensions: technology, environmental sustainability, social sustainability. […] If the tool doesn't help people to evolve or doesn't respect their pace, it doesn't work either"* (Julien Hernaut, personal communication, June 6, 2025).

For Delcon, the metaphor serves as a reminder that a digital project is never complete if it ignores its broader impacts. He explained that *"if you want to respect both people and the planet, you have to integrate Green IT and social aspects. […] The stool, to be sustainable, has to stand on its three legs"* (Jules Delcon, personal communication, May 22, 2025).

Taken together, these views portray the model as a simple yet powerful illustration of how technology, ecology and human factors must coexist to make DT truly sustainable. Across interviews, the model was thus seen as a clear reminder that technological innovation, environmental sustainability and human-centred implementation are inseparable if DT is to be sustainable.

6.5.2 Nuances and differing emphases

Although widely accepted, the principle of three equally strong legs was seen as difficult to achieve in practice. Rodberg illustrated this imbalance vividly, observing that organisations rarely progress at the same pace on all fronts: *"The three legs don't grow at the same speed and not at the same time. […] Your stool is wobbly for a while […] but in the end, they all must reach the same length"* (Pauline Rodberg, personal communication, June 11, 2025).

Interviewee 13 challenged this optimistic expectation of eventual balance. He argued that *"the model suffers from the fact that the three legs will never be exactly the same length. That is simply not possible"* (Interviewee 13, personal communication, June 30, 2025). This view directly contradicts Rodberg's assumption that equilibrium can ultimately be achieved, highlighting a more sceptical perspective on whether full alignment across the three pillars is realistic.

Other interviewees highlighted different aspects of imbalance. Gilmain, for instance, argued that CM is often misunderstood, being seen as an accessory rather than a true structural pillar. She noted that *"it*

is often viewed as the place where you sit on the stool, not as a leg in itself. […] Change management needs to be thought of and organised institutionally, in a structured way" (Delphine Gilmain, personal communication, June 26, 2025).

These comments underline that while the concept is theoretically sound, real-world dynamics often lead to temporary or structural imbalances between the three dimensions.

6.5.3 Critical reflections

Interviewees questioned whether true balance between the three legs is realistically achievable, particularly when economic pressures dominate. One participant described how, in practice, decisions may allow one leg to overpower the others, creating risks for the organisation. Interviewee 13 put it succinctly:

> *"It doesn't matter whether the seat is completely level or not, what matters is which side you fall from. […] In one case, you drive the company straight into a wall, in the other, you just manage to correct course"* (Interviewee 13, personal communication, June 30, 2025).

This reflection points to the fragility of the metaphor when confronted with business realities: not all imbalances carry the same weight, and the consequences depend on the direction in which priorities tip. Overall, participants viewed the three-legged stool as a useful illustration of responsible DT even if perfect balance between its dimensions is rarely achieved in practice.

Summary: Synthesising the three pillars of responsible DT

The interviews demonstrate that ESR-DT involves more than just technical implementations. Participants described it as a process that must create real value for people and organisations while remaining proportionate, legitimate and ecologically sound. This understanding — the "seat" of the stool — forms the basis of the three pillars of responsible DT.

Within the technological dimension, participants stressed that digital initiatives must always be guided by real needs rather than by trends or technological hype. The legitimacy of digitalisation derives from clear objectives, proportionate application and deliberate boundaries that prevent digital technologies from generating unnecessary complexity or wasting resources.

The environmental dimension highlighted the urgency of aligning digital strategies with planetary boundaries. Central challenges such as rebound effects and technological limits to growth require not only technical measures but also fundamental behavioural change and critical reflection on the purpose and scale of digital practices. Yet the interviews also revealed that ecological goals are often subordinated to economic priorities in practice.

In the social dimension, it became evident that the success of digital projects depends decisively on structured and early employee involvement. Clear leadership, credible role-modelling and open dialogue structures were described as essential for building trust, detecting resistance at an early stage and ensuring the long-term cultural anchoring of change.

Across interviews, the three-legged stool was consistently recognised as a meaningful and intuitive image to illustrate the interdependencies of responsible DT. Participants described it as a clear reminder that technological innovation, environmental sustainability and social CM must work together to ensure long-term success.

While the metaphor was widely appreciated for capturing this essential balance, interviewees also noted that achieving such equilibrium in practice is not always straightforward. Temporary imbalances, economic pressures and the varying maturity of each dimension can all make it challenging to maintain stability over time. In this sense, the model was considered a valuable guide, even if its ideal balance could not always be fully realised in real-world contexts.

This synthesis directly leads to the discussion chapter, which examines the resilience and realism of this three-legged model in organisational practice. Based on the findings presented here, the discussion considers the practical feasibility of achieving balance, explores ongoing tensions and trade-offs, and ultimately provides a structured response to the central research question of this study.

7 Discussion

This chapter examines how companies can approach DT, thereby addresses the central research question: ***How can companies digitalise in an environmentally and socially responsible way***? The analysis draws on empirical findings from 15 expert interviews and relevant academic literature, aiming to provide a nuanced and practice-oriented perspective that bridges theory and practice.

The discussion is structured along the three-legged stool framework introduced in the Results chapter. Each section follows the points highlighted in the stool diagram and works progressively towards answering the respective sub-question. Findings from the interviews are compared with existing research data or studies to identify conditions, tensions and potential gaps that matter for practice. These comparisons are used as building blocks to clarify what is needed for responsible DT in each dimension.

After discussing each leg of the framework, the findings are combined to provide an integrated answer to the overall research question. This is followed by a critical reflection on the three-legged stool as a conceptual lens and by the discussion of theoretical implications and managerial implications of this study.

7.1 The foundation of environmentally and socially responsible digital transformation

Across the interviews, there was a shared understanding of what defines ESR-DT. Despite variations in wording, five principles emerged. First, DT must create tangible value and meet real needs, rather than being driven by trends or technology for its own sake. Second, it should integrate social, environmental and economic considerations instead of treating them separately. Third, avoiding or minimising harmful impacts is seen as an essential criterion of responsibility. Fourth, participants highlighted frugality and sufficiency, stressing the need for deliberate, moderate use of digital tools and resources. Finally, they agreed that social and environmental aspects are deeply interconnected and cannot be addressed in isolation.

The interviews indicated that many participants assigned greater long-term importance to the environmental dimension. At the same time, it was emphasised that social aspects must not be neglected, as ecological improvements ultimately strengthen the social environment as well.

This shared understanding among participants aligns with recent academic discourse, which increasingly emphasises that digitalisation should advance in tandem with environmental and social objectives, rather than in isolation.

In the literature on DT, the technical aspect still dominates, with a strong focus on efficiency and technological capabilities. However, an increasing amount of research emphasises that digitalisation must create meaningful value, prevent harm and develop alongside ecological and social goals. This perspective is encapsulated by the concepts of digital sustainability and twin transformation (Xu et al., 2022; Lynn et al., 2024; Schmelzle & Hielscher, 2025). These approaches emphasise the necessity of societal change and sufficiency-oriented strategies to guarantee that DT contributes meaningfully to sustainable development (Santarius et al., 2023).

In this context, it can be argued that the question of prioritisation should not be addressed solely within the context of DT. Rather, it appears to be a broader societal issue that extends beyond the digital domain. A sustainable transformation is likely to succeed only if environmental and social goals are pursued in parallel, without creating a conflict between the two. As several interviewees observed, this understanding is already present in many organisations. However, they also noted that market-driven economic constraints often compel companies to address short-term financial objectives first, with environmental and social considerations following thereafter.

To conclude, an ESR-DT can be understood as the translation of the sustainability concept into the digital realm. It becomes truly sustainable only when it operates at the intersection of the three dimensions of sustainable development: *bearable* (socially and ecologically compatible), *viable* (economically sound while respecting environmental boundaries), and *equitable* (socially just and economically meaningful).

Figure 6: Sustainability Venn-Diagram (More, 2024).

This perspective provides the conceptual "seat" of the stool, forming the base on which the three legs of responsible DT rest.

7.2 Purpose-driven digital transformation

Responsible DT begins with a clear and well-founded purpose. Both interviews and literature emphasise that initiatives should only be launched when they address genuine and well-defined needs. Projects driven primarily by technological hype or competitive pressure can lead to unnecessary complexity, rebound effects or solutions that offer little real value. Practitioners emphasised that careful planning and sufficient digital maturity are essential to ensure that technology serves organisational, social and environmental goals.

Established frameworks such as Vial's (2019) describe the structural dynamics of DT – how value creation paths evolve, governance adapts and barriers emerge (Marx et al., 2021; Pirro, 2024; Verhoef et al., 2021). Interviewees generally confirmed this view, noting that it reflects the typical progression of transformation projects in practice.

However, the model remains silent on a crucial aspect for responsible DT: it does not question whether transformation should occur in the first place or under which ethical and sustainability conditions it is legitimate. Empirical findings repeatedly stressed that conscious boundaries and explicit ecological and social safeguards are necessary to avoid harm and ensure long-term value creation.

To address this blind spot, organisations need a structural mechanism to verify the legitimacy of digital initiatives before and during implementation. A "responsibility filter" could be introduced to test whether a digital initiative genuinely responds to a well-defined need and creates meaningful value for stakeholders. Embedding such a checkpoint in each phase of transformation would help prevent technology-driven projects that lack purpose or deliver little real benefit, ensuring that DT decisions remain deliberate and value-oriented from the outset.

7.2.1 How can companies digitalise responsibly?

These insights make it clear that companies should only initiate DT in response to genuine, well-defined needs, such as streamlining inefficient internal processes, improving customer access to essential services and enabling compliance with new regulatory requirements. The strategic starting point must be the why: what is the intended goal, and is digitalisation truly the most appropriate solution? These guiding questions should remain present throughout the process to prevent projects from being driven by external pressure or technological mimicry. A responsible approach to DT must therefore be both purpose-driven and human-centred, ensuring that digital initiatives deliver real value for people and organisations while minimising negative environmental and social impacts. Only under these conditions can DT be considered sustainable and meaningful in the long term.

7.3 Environmental sustainability in digital transformation

It is recognised that ensuring DT contributes to environmental sustainability is essential for long-term value creation. Both literature and empirical findings emphasise that technological efficiency alone cannot guarantee sustainability. Rather than focusing solely on speed, scale or cost-efficiency, digital initiatives must be deliberately designed to respect planetary boundaries and actively reduce harmful side effects such as increased energy consumption or resource depletion from hardware production.

Findings from literature and interviews emphasise that environmental sustainability in DT requires a combination of approaches. Green IT and Green IS measures can reduce environmental impacts (Loeser, 2013), but they reach their full potential only when paired with sufficiency-oriented strategies and digital sobriety principles (Péréa et al., 2023; Schmelzle & Hielscher, 2025). This integrated approach helps prevent rebound effects and ensures that efficiency gains do not lead to additional resource consumption.

Both sources agree that DT cannot expand indefinitely without breaching ecological limits (Lynn et al., 2024; Rosário & Dias, 2022). While sustainable digital practices promise long-term advantages such as enhanced reputation, greater stakeholder trust and improved regulatory alignment (Xu et al., 2022; Zhang et al., 2023), interviews mentioned that short-term efficiency and performance targets often take priority over ecological considerations in practice.

A gap also emerges in how value-based strategies are treated. Many interviewees highlighted sufficiency-oriented decision frameworks as essential for responsible DT, yet these approaches receive little systematic attention in academic literature. Moreover, participants noted that organisations—particularly smaller ones—struggle to implement Green IS solutions, often limiting their efforts to hardware-related Green IT measures due to resource constraints.

Participants suggested that existing value creation paths in models such as Vial's (2019) could be expanded to integrate sustainable alternatives, including circular business models, low-carbon digital channels, etc. Although recognised in literature (Péréa et al., 2023; Schmelzle & Hielscher, 2025), these strategies are not systematically embedded in current frameworks.

Building on these findings, the previously introduced responsibility filter could be extended to systematically assess ecological criteria in DT decision-making. Such a mechanism would ensure that initiatives stay within planetary boundaries, avoid unnecessary resource use and prioritise low-carbon, circular value creation paths. Embedding this assessment as a mandatory step would turn ecological safeguards from an optional add-on into a structural requirement of DT.

7.3.1 How can companies digitalise in an environmentally responsible way?

Taken together, the findings indicate that environmentally sustainable DT requires deliberate, system-wide decisions that extend well beyond incremental efficiency gains. Companies should integrate ecological safeguards into their strategies by combining digital innovation with climate-conscious design and circular business models, as well as sufficiency-oriented approaches that actively reduce

resource use and avoid rebound effects. This involves evaluating the environmental impact of every stage of the project lifecycle, from procurement and infrastructure design to operation and end-of-life disposal. Robust governance, clear sustainability metrics and defined accountability are essential to ensure initiatives remain within planetary boundaries and generate lasting value for organisations and society.

7.4 Social responsibility in digital transformation

Literature and empirical findings support the view that CM is a cornerstone of socially responsible DT. Not only does it support project success, such as meeting objectives within the planned timeframe and budget, and ensuring high adoption rates of new systems, but it also safeguards legitimacy and prevents negative social consequences. Equally important, it ensures that transformation processes respect employees' needs, including a manageable workload, opportunities for participation in decision-making, and access to relevant training. Classical CM models such as those of Lewin or Kotter remain relevant, yet both sources agree they must be applied flexibly and complemented by participatory, human-centred practices to be effective in a digital context (Bellantuono et al., 2021; Kherrazi & Roquilly, 2025).

CM should be embedded from the earliest stages of DT projects. Research highlights early stakeholder analysis, structured planning and phased implementation as essential to anticipate risks, secure employee acceptance and minimise disruptions (Ullrich et al., 2023; Zhou et al., 2019). Interviews supported this view, stressing that late or reactive approaches are often costly, meet stronger resistance and undermine project legitimacy. Successful DT requires deliberate preparation and the early involvement of those affected, ensuring that transformation is conducted with people, not imposed on them.

Leadership is widely recognised as a key enabler of socially responsible DT in both literature and practice. Academic sources emphasise its strategic and technical dimensions, such as vision setting, governance alignment and digital competence, as well as relational qualities like trust building, open communication and empathy (El Yaagoubi & El Baz, 2023; Elia et al., 2024; Malik et al., 2024). Findings from interviews reinforce this view, emphasising that effective leadership requires a combination of authority, clear role definitions and authentic engagement with employees, making it a multidimensional task rather than a purely strategic one.

Both sources described resistance as a recurring challenge, although they placed different emphases on it. The literature attributes resistance to a fear of job loss or a lack of skills, as well as threats to professional identity. It also highlights structural causes, such as uncertainty and misaligned routines (Cieslak & Valor, 2024; Sahay & Goldthwaite, 2024). However, interviews nuanced this view, presenting resistance as a sign of underlying issues in project design, pacing or communication rather than as outright opposition. Practitioners emphasised that early dialogue, transparency and visible responsiveness to feedback are essential for preventing disengagement.

Culture emerged as another key factor. Academic research stresses that aligning digital initiatives with organisational values and identity fosters stability and legitimacy during transformation (Hanelt et al., 2021; Trenerry et al., 2021). Interviewees agreed, stressing that DT should build on shared values that provide employees with emotional security and motivation. Without this cultural anchoring, digital change risks being perceived as imposed and temporary, undermining long-term success.

Social responsibility in DT therefore depends on genuine participation. Employees must not only be informed but actively involved in shaping goals, processes and solutions. True participation creates ownership, reduces resistance and ensures that transformation respects employees' needs and values, making it a collective endeavour rather than a top-down mandate.

Building on these findings, the previously introduced responsibility filter could be expanded to explicitly assess social criteria alongside ecological ones. Such a mechanism would help organisations verify whether digital initiatives protect employee well-being, guarantee meaningful participation and foster transparency at every stage of transformation. Embedding these criteria would turn CM from a supportive practice into a structural benchmark for socially responsible DT.

7.4.1 How can companies digitalise in a socially responsible way?

The combined perspective from data and literature points to socially responsible DT as requiring change to be planned and executed alongside people, rather than being imposed on them. From the start, companies should integrate CM, ensuring clarity of purpose, open communication and genuine opportunities for employees to participate in decision-making. Leaders must foster trust and transparency by aligning transformation with shared organisational values. Essential safeguards for employee well-being include manageable workloads, support for learning and space for dialogue, which help to prevent stress and resistance. DT becomes socially responsible when it respects human needs, strengthens legitimacy and creates long-term value for the organisation and its workforce.

7.5 How can companies digitalise in an environmentally and socially responsible way?

This section integrates the insights from the three preceding dimensions to provide a consolidated response to the research question. Rather than repeating each finding, the aim is to connect them and highlight overarching conditions for ESR-DT.

Across both literature and interviews, three fundamental enablers consistently emerged: a clear needs orientation, deliberate planning and ongoing awareness-building. While planning and awareness were not always made explicit, multiple findings across all dimensions point to their importance as implicit prerequisites for aligning digital initiatives with environmental and social priorities.

Firstly, companies must ensure that their digital initiatives respond to genuine organisational needs, rather than technological trends or external pressure. Without this rationale, transformations risk creating unnecessary complexity, rebound effects or limited long-term value.

Secondly, thoughtful planning is essential to anticipate risks, allocate resources effectively and integrate sustainability and participation from the very beginning. It creates the structural framework within which strategic and responsible decisions can be made.

Thirdly, fostering ongoing awareness and dialogue within the organisation ensures that both decision-makers and employees understand the purpose of change, its ecological and social implications, and their role in shaping it. This is essential for the effective implementation of various practices, including value-driven strategies, Green IT and IS, participatory change processes and safeguards for employee wellbeing.

Responsible DT is not a one-off project. As both literature and practitioners have highlighted, it is an ongoing, evolving process that requires agility and ambidexterity over time. To prevent environmental and social priorities from being sidelined by short-term pressures or shifting technological trends, organisations need a structural mechanism for continuous scrutiny. The responsibility filter proposed in this study can fulfil this role, acting as a recurring checkpoint to ensure that initiatives remain legitimate, ecologically sound and socially responsible over time.

This perspective aligns with the broader discussion on digital sustainability and the twin transformation, both of which advocate for the simultaneous and mutually reinforcing development of digital and sustainability strategies. The findings of this study show how concrete organisational mechanisms, ranging from needs assessment and early planning to continuous monitoring with a focus

on responsibility, can help to achieve these ambitious goals. These mechanisms also guarantee that digitalisation contributes to long-term societal goals.

The following section critically reflects on the three-legged stool framework itself, examining how well it captures the complexity of responsible DT and where its conceptual limitations become apparent.

7.6 Critical reflection on the three-legged stool framework

The three-legged stool framework developed in this study provided a clear structure for discussing ESR-DT. By distinguishing between technological, environmental and social dimensions, it provided a practical means of organising empirical findings and academic insights. While the metaphor has its advantages, its limitations must also be acknowledged to avoid over-simplification.

A key strength of the model is its intuitive clarity. Just as a stool requires equally strong legs to be stable, the study's central argument is that responsible DT cannot rely solely on technological progress; it must also consider environmental safeguards and social responsibility. This highlights the interdependence of dimensions that are often considered in isolation in literature and practice. Interviewees supported this view, noting that the image offered a helpful reminder that neglecting one pillar undermines stability. The framework was therefore particularly valuable for structuring and communicating theoretical reasoning and empirical insights, making the complex interactions between technology, sustainability and human factors more accessible.

Despite these strengths, the metaphor has limitations. One notable weakness is the implicit assumption that the three pillars of responsible DT progress in parallel and can eventually be brought into balance. Nevertheless, technological and economic goals often advance more quickly than ecological and social aspects, which are frequently under prioritised. This imbalance is not accidental but rooted in the realities of the market economy, where companies exist primarily to generate profits, meet shareholder expectations and respond to competitive pressures. While long-term market viability increasingly depends on addressing environmental and social impacts, these considerations are often secondary to short-term financial imperatives. The framework does not fully capture these persistent, system-embedded asymmetries and trade-offs.

Additionally, the static nature of the metaphor overlooks the dynamic and iterative character of DT processes. Priorities shift, tensions emerge and temporary imbalances are commonplace. Real-world transformation efforts rarely follow a linear path towards equilibrium, rendering the concept of a stable stool somewhat unrealistic.

A further limitation arises from the model’s inward-looking focus. While this focus was helpful for structuring the analysis, it simplifies the broader context in which DT takes place. External forces such as regulatory frameworks, market dynamics, geopolitical tensions and public pressure can strongly influence organisational decisions. However, these factors are not explicitly represented in the metaphor. One possible extension would be to depict these forces as pushing against the stool or as uneven ground — emphasising that stability is shaped not only by internal balance, but also by contextual pressures.

In sum, this critical reflection suggests that the three-legged stool should be viewed as a first-order framing device rather than a comprehensive conceptual model. It helps to visualise the minimum conditions for responsible DT but does not fully capture the complexity, dynamism and contextual influences involved. The framework proved useful for structuring this theoretical work, yet its simplifications limit its direct transferability to practice, where trade-offs, external pressures and shifting priorities make stability more fragile than the metaphor suggests.

7.7 Theoretical implications

This study improves our theoretical understanding of DT by presenting it as an inherently social and environmental process, rather than a purely technological one. While most frameworks treat these dimensions separately, the findings demonstrate that technological progress, environmental sustainability and social legitimacy are interdependent and must evolve together if transformation is to be sustainable.

Firstly, the results emphasise that legitimacy is a prerequisite for successful change. Leadership, participation and trust interact to determine whether transformation is perceived as fair, credible and worthy of support. Legitimacy is strengthened when digital initiatives visibly respect ecological boundaries, thereby fostering acceptance among employees and external stakeholders. This perspective integrates social and environmental factors as a combined source of legitimacy, expanding DT models that traditionally address these factors in isolation.

Secondly, the research offers a reframing of organisational resistance in DT. Rather than treating resistance primarily as a barrier arising from fear, competence gaps or identity threats, it is conceptualised as an informative feedback mechanism that exposes shortcomings in project design, communication or timing. This interpretation positions resistance not as a force to be suppressed, but as a diagnostic tool for identifying misalignments between transformation objectives and stakeholder expectations. By shifting the theoretical lens from overcoming resistance to learning from it, the findings underline its potential to enhance adaptive capacity, strengthen legitimacy and increase the long-term success of DT initiatives.

Thirdly, the findings contribute to CM and DT theory by demonstrating that classical CM models continue to be valuable due to their core principles of vision, communication and reinforcement, despite perceptions of obsolescence. Rather than replacing these models, flexible, participatory and iterative approaches should be adopted to complement them and suit the dynamic nature of DT. Similarly, existing DT models are enhanced by emphasising the integration of environmental and social considerations from the outset rather than as later additions.

Finally, this thesis enriches the literature on value-based strategies, such as digital sufficiency and digital sobriety, by linking conceptual ideas with concrete implementation. It demonstrates how these strategies can be embedded through participatory governance, targeted capability building and value alignment to ensure they become part of everyday routines and decision-making processes. This moves the debate from abstract aspirations to concrete, theory-based practices that can be embedded in organisational routines and decisions.

7.8 Managerial implications

The practical implications of this thesis translate its findings into guidance for managers overseeing DT. Many transformation projects encounter low levels of acceptance or have unintended consequences because the ecological and social dimensions are not given sufficient consideration. The following implications suggest ways to design and govern DT more responsibly and effectively.

Embedding responsibility in decision-making

Before launching new digital initiatives, managers should systematically assess their necessity, environmental footprint and potential social implications. Responsibility filters or structured evaluation checklists can help prioritise projects that address real needs, avoid rebound effects and respect ecological limits. This prevents technology-driven initiatives that offer little value or generate avoidable harm.

Building legitimacy as a condition for success

Legitimacy arises from credible leadership, transparent communication and meaningful involvement of those affected by change. Digital projects that visibly integrate environmental sustainability and give employees a voice gain stronger internal and external support. Managers can strengthen legitimacy through early consultations, clear accountability structures and public commitment to environmental goals.

Establishing a learning-oriented governance of DT

Responsible DT requires flexibility to adapt to unforeseen effects or stakeholder concerns. Governance structures should allow for iterative planning, regular lessons-learned reviews and mid-course corrections, instead of rigid one-off implementations. This adaptive approach reduces long-term risks and improves the resilience of transformation efforts.

Treating resistance as a valuable signal

Employee resistance should not be dismissed as reluctance to change but recognised as feedback on project design, communication gaps or poorly timed implementation. Creating safe spaces for concerns and acting on them helps managers identify flaws early, adjust their approach and improve overall project acceptance.

8 Conclusion

This master's thesis explores how environmental sustainability and socially responsible change management (CM) can be integrated into digital transformation (DT) processes. It proposes the concept of environmentally and socially responsible digital transformation (ESR-DT). Rather than viewing DT as merely a technological shift, this approach treats it as a strategic challenge requiring equal attention to economic viability, environmental sustainability and social responsibility. The research responds to the EU's twin transition agenda and the increasing pressure from regulators, investors and society at large to ensure that digitalisation is carried out in a responsible and long-term perspective.

The analysis builds on three complementary pillars: the state of the literature, the perspectives of industry practitioners, and a conceptual model developed specifically for this thesis. The model served as a structuring device to integrate insights from theory and practice, and to examine how technological, environmental and social dimensions interact in the context of responsible DT. This framework was further refined by identifying its weaknesses and possible extensions, ensuring that the analysis remained critical and adaptable. On this basis, the study offers targeted recommendations and outlines directions for future research that could address unresolved questions and test the model in different settings.

The technological dimension underscores the importance of purpose-driven DT, where adoption is guided by strategic priorities rather than the pursuit of technology for its own sake. The findings highlight the need to align digital initiatives with organisational goals, anticipate long-term implications and incorporate deliberate planning from the outset.

The environmental dimension highlights the importance of aligning DT with planetary boundaries and ecological goals. The findings show that technological innovation should be evaluated for both efficiency gains and its ability to promote environmental sustainability. This requires the integration of ecological criteria into decision-making processes from the beginning to ensure that digital initiatives contribute positively to long-term environmental goals. Approaches such as Green IT, digital sufficiency and resource-conscious design provide practical ways to reduce environmental impact while maintaining performance and innovation capacity.

The social dimension shows that CM is key to responsible transformation, with participatory and flexible methods adding to the well-established principles of vision, communication and reinforcement. Resistance is reframed as a potential source of constructive feedback, offering insights into how communication, timing and project design could be improved. Early and genuine employee involvement strengthens legitimacy, builds trust and fosters a sense of ownership over the outcomes of the transformation process.

Three cross-cutting enablers — needs orientation, deliberate planning and continuous awareness — connect these dimensions, ensuring that sustainability and legitimacy are consistently integrated into governance structures, decision-making processes and performance indicators. The proposed "responsibility filter" is a promising tool for systematically evaluating initiatives against ecological and social benchmarks, although it requires further refinement and testing in practice.

This study has several limitations that should be considered when interpreting its findings. The broad thematic scope meant that the analysis of each area could not be as in-depth as it might otherwise have been. While the integrative approach provided a comprehensive overview, topics such as social inclusion, accessibility, public policy and customer behaviour could only be addressed superficially. Participants mentioned external influences, including regulation, market dynamics and societal expectations, but these were not examined systematically as the focus was on internal organisational strategies.

The scope and participant selection may also have influenced the results. As all interviewees were professionals specialising in sustainability, digital strategy or CM, the findings predominantly emphasise the benefits and desirability of responsible DT. Consequently, purely technical or economic viewpoints, as well as more critical perspectives, are underrepresented.

Furthermore, the data were collected between May and July 2025. Due to the rapid pace of change in digital and sustainability agendas, the findings reflect a specific point in time rather than ongoing developments. As with any qualitative research, interpretation is inevitably influenced by the researcher's perspective. The analytical approach may have been shaped by an academic and thematic focus on sustainability and responsible DT. To mitigate potential bias, a reflexive stance was maintained, initial impressions were documented and alternative viewpoints were actively considered during interviews.

These limitations also suggest promising avenues for future research. For example, further studies could examine how external factors, such as market pressures, regulatory changes and societal expectations, influence the balance between technological, environmental and social priorities. Including stakeholders with predominantly technical and economic perspectives, or without a sustainability focus, could provide insight into why environmental and social considerations are sometimes deprioritised and how such attitudes might be changed. Further work on refining and operationalising the responsibility filter, as well as longitudinal studies assessing the long-term organisational impact of integrating sustainability into DT, would be particularly valuable.

In conclusion, ESR-DT should be regarded as a strategic necessity rather than an optional extra. To achieve this, technological expertise is required, as well as the consistent integration of sustainability principles and social responsibility into all stages of the transformation process. The real challenge for organisations is no longer whether to digitalise, but how to do so responsibly. Those who align technological innovation with ecological and social imperatives will not only secure their licence to operate but also define the competitive landscape of the future.

9 Appendices

A. Interview guide

The following section presents the full list of questions posed to the interviewees. For greater clarity, these questions have been organised into three broad categories: (1) Digital / Technical – covering general aspects of responsible digital transformation; (2) Environmental Sustainability – focusing on ecological impacts and strategies; and (3) Social Responsibility – addressing human, cultural, and organisational change dimensions. This categorisation should, however, be treated with caution, as the findings of this research have shown that the three dimensions are closely interconnected and that a strict separation is not always possible.

1. Questions asked to all participants

- To start, could you briefly introduce yourself and explain your current role in your organisation, as well as the link you have with digital transformation in your work or sector? (This question was always adapted to the interviewee)
- How do you define “responsible” digital transformation? In your view, what are its main components?

2. Technical dimension (general ESR-DT)

- In your opinion, what does a “socially responsible” digital transformation involve?
- Based on your experience or research, what are the main challenges related to a more responsible digital transformation? How can they best be addressed?
- Why do you think it is important to align digital projects more closely with real needs and socio-environmental criteria to make them more responsible?
- Would you say you are referring mainly to environmental sustainability, social responsibility, or both? And what criteria do you use to assess this responsibility?
- Do you believe responsible digitalisation is likely to become a pillar of corporate strategy?
- Is there, in your opinion, enough strategic reflection today on the “why” and “to what extent” companies should digitalise?
- What do you see as the most effective levers to encourage companies to adopt a more critical and strategic approach to digital technology?
- Does a socially responsible and sustainable digital transformation cost more than a “normal” one?
- Are there trade-offs to be made between technological performance, economic efficiency, and environmental sustainability? Could you provide an example?
- What role do stakeholders play in this context?
- What tools or methods would you recommend assessing the relevance and responsibility of a digital project from the outset?
- What are, in your view, the key elements for successfully supporting a digital transformation?
- Do you think it is possible to combine responsibility and technological growth?
- Have you noticed differences in maturity levels depending on the sector or company size?
- In the context of my thesis, I have been working with a framework that emphasises changes in organisational structure, organisational culture, leadership, and employees’ roles and skills. Do you consider these dimensions relevant? Do you see others?
- What are, in your view, the biggest structural changes that a digital transformation implies for an organisation?
- Do you observe growing consideration of social or environmental issues in digitalisation projects?
- Why do you think it is important to align digital projects more closely with real needs and socio-environmental criteria to make them more responsible?
- In your interactions with clients, have you noticed a shift in expectations towards a more ethical or “meaningful” digital approach? How is this expressed?

3. Environmental sustainability

- What role do environmental criteria currently play in digitalisation decisions?
- Do you see digital transformation more as an opportunity for sustainability or as a risk in terms of environmental impact?
- Is it possible to reconcile digital sobriety and technological growth? If so, how?
- In your opinion, what is the role and importance of concepts such as Green IT, digital sobriety, or digital sufficiency in a sustainable and socially responsible digital transformation strategy?
- Do you know or apply concepts such as Green IT or digital sobriety? If yes, how?
- Are you familiar with the concept of "digital sobriety? If so, what is your opinion of the idea – that is, slowing down and only digitising what is necessary?
- Should the concept of "digital sobriety" be an integral part of the definition of responsible digitalisation?
- Do you see eco-design of websites and services as a competitive advantage for companies, especially in light of upcoming regulations such as carbon footprint reporting or the CSRD?
- What obstacles or difficulties do you encounter when implementing digital sobriety measures in a demanding industrial context?
- How is digital sustainability integrated into your organisation's overall strategy?
- What specific criteria guide decisions on digital sustainability in your organisation? How are these criteria defined and updated?
- What obstacles or challenges do you encounter when integrating digital sustainability into your projects?
- In your daily work, do you encounter rebound effects? If so, how can the environmental gains be prevented from being cancelled out by increased usage?
- How do you perceive the balance between the benefits of digital transformation (e.g. automation, remote work, productivity gains) and its environmental impacts (emissions, energy consumption, rapid obsolescence)?
- What role do environmental issues play in digitalisation decisions? How are environmental criteria incorporated (or not) into these decisions?
- Are large companies more sensitive to environmental issues, or more focused on performance?
- In your client projects, how does the digital dimension fit into the overall ESG strategy?

4. Social responsibility & change management

- How would you approach change management in a digital transformation? In your view, what are the most important aspects?
- In your opinion, what is the role of change management in the success of a digital transformation project? Is it sufficiently valued?
- Do you use classical change management models or how do you manage change?
- Have you ever been involved in a digital project that failed or was slowed down due to insufficient change management support? What happened, and how was it handled?
- Is it more difficult to come in as a "firefighter" to fix issues mid-project than to support the project from the very beginning?
- How do you concretely integrate change management into digital transformation projects?
- What role should the human factor play in digital transformation? What needs to be put in place to ensure that digitalisation is a support rather than a burden?
- How can we ensure that all profiles (e.g. different hierarchical levels, ages, digital skills) are properly considered in a transformation?
- Do you know concrete practices for supporting change?
- What are the most common human or cultural barriers you encounter?
- On the cultural side, which types of changes are the most significant or most difficult to manage?
- What are the most frequent obstacles you observe in practice (e.g. lack of awareness, resources, strategic priorities)?

- How important are awareness-raising, training, and upskilling in such a process?
- Regarding change management, what role does leadership – and more specifically digital leadership – play in a transformation project?
- How would you describe the leadership within your organisation for digital transformation projects?
- How can change management engage all stakeholders, including employees at all levels, in their transition towards more responsible digital practices?
- Are there training sessions or workshops in place to raise employee awareness of these issues?
- In your view, what are the major challenges to overcome in ensuring broad and effective adoption of responsible digital practices in your organisation?
- Have you encountered the concept of "inertia" in this context?
- If there is strong resistance from an employee or business leader, how can it best be managed?
- Have you observed specific resistance from staff regarding the adoption of sustainable technologies?

5. Synthesis questions

- In your view, what are the first concrete steps an SME can take to initiate a responsible digital transformation process?
- Regarding the stool metaphor I have used to illustrate the balance between the pillars of responsible digitalisation (technology, social and environmental sustainability): Do you see this as merely a theoretical model, or can it work in practice?

B. Definitions of responsible digital transformation – summary of interviewee responses

The interviewees' answers to the question of how they define responsible or socially responsible DT varied considerably in length and detail. The following overview therefore presents the core statements extracted from their respective responses, reproduced without any changes to the original wording.

Interviewee	Definition
Sophie Pirotton (HEC)	A responsible digital transformation, in my view, is a transformation that creates value. It must meet a real need, be useful and actually used. More specifically, it is one that follows the rule of the 3Us (useful, usable, used) and creates economic, environmental and societal value while minimising negative impacts, whether environmental or social. The "3Us" can be summarised as: useful – meeting a genuine need; usable – easy to use, well-designed and adapted; and used – effectively adopted by its intended users.
Anthony Barbarich (Studio Colibri)	I believe it is a transformation that has a positive impact on the fundamentals of sustainable development – one that is more beneficial than harmful. Referring to the Sustainable Development Goals, a key question to ask in the context of responsible digital transformation would be: am I at risk of failing to meet some of these indicators in what I am implementing?
Séaphin Vandegar (Slinya)	I would say there are really all the human aspects – at several levels. First, there are the human aspects related to the people who will use the tools being implemented. Digital transition often means introducing new tools, but care must be taken to ensure these tools are inclusive. It is also a crucial social dimension to ensure that all people involved in the tool's production chain are treated fairly and in a way that reflects our values. Ultimately, it always comes down to values – knowing where we stand and how attentive we want to be to these issues. I think this aspect is particularly important.
Jules Delcon (ISIT)	Responsible digital transformation, in my view, is grounded in frugality – responding to actual needs and focusing on what is truly essential, without going too far. On the social side, it involves issues such as inclusion, accessibility, ethics and data protection. When implementing a digital solution, the aim is to ensure it has the lowest possible negative impact, and, ideally, that it delivers added value to society.
Lucie Bernaerts (Webecode)	A socially responsible digitalisation involves a combination of elements: eco-designed websites, refurbished hardware, sustainable hosting, responsible advertising, accessibility, and transparency.
Sylvie Delberghe (FastTrack)	I would say that the first question to ask is: why do we want to digitalise? What is the meaning behind it? What are we trying to achieve? What is the value we are seeking through digitalisation? That, in my view, is the first point to consider. Is it socially responsible? – that is a question we can address afterwards. But first, we need to ask: why are we doing it in the first place?

Julien Heraut (GCP Consulting)	A socially responsible digital transformation can be defined as the effort to improve a person's work processes through the implementation of a tool, in order to make their tasks more efficient, without negatively disrupting their work or imposing additional complexity. As I like to put it: while digitalisation – and even artificial intelligence – is increasingly integrated into processes, the aim is not to replace humans, but to enable them to focus on tasks with higher added value.
Antoine Desait (AD Consult)	When you say "socially responsible", I immediately think of respecting the various needs of the stakeholders involved in a project. Today, when we look at large-scale digital transformations, the goal is generally to move towards greater efficiency. Very often, such transformations begin with the introduction of a tool. This means shifting from a way of working where everyone operates somewhat independently, with unaligned processes and different systems, to a more modern, centralised, and harmonised setup. The aim is to ensure that the entire organisation uses common tools for communication, document management, project tracking, ticketing, and so on. For me, the real strength of digital transformation lies in this shift from an outdated and fragmented mode of operation to a coherent, digitalised system shared by all. But for it to be socially responsible, it must take into account the real needs of stakeholders.
Pauline Rodberg (Smart2Circle)	Responsible digitalisation begins with the awareness that such processes are not "magical" but have tangible impacts, including CO_2 emissions. While living without digitalisation has become nearly impossible, being socially responsible means deliberately choosing the best available alternatives. Much like opting for higher-quality rather than lower-quality food, the idea is to minimise negative impacts wherever possible. In digitalisation, this could mean selecting servers located closer to home – for example, in Belgium rather than on the other side of the world – or working with companies that actively seek to reduce their environmental footprint.
Interviewee 10 (Aviation industry)	Socially responsible digitalisation is, above all, about respecting people. It is not enough to state that people are at the centre of digital transformation – this must be translated into concrete action. It involves training and supporting all staff so that no one is excluded due to a lack of skills. The aim is to avoid situations where employees are "left behind" because they do not understand the new tools or lack the required capabilities.

Björn Kohnen (BK-Solut)	Sustainability also means using technology thoughtfully. It is not necessary to have a separate tool for every task; many activities can be consolidated into one or two software solutions that cover multiple functions. Digitalisation is beneficial – but not for its own sake. There must be a practical benefit. The goal should be to make processes simpler, faster and less error-prone.
Delphine Gilmain (CHU)	For a hospital, digital transformation – or more precisely, digitalisation practices – is a significant issue. While a hospital is indeed a highly technological environment, it is also a place where humans care for other humans, supported by technology. This means that, when considering technological tools and the digitalisation process, we must constantly consider the question of humanisation. For me, the main component of socially responsible digitalisation is precisely this humanisation – the articulation between humanisation and digitalisation. The key elements behind this idea are that we care for particularly vulnerable people, patients who come to us because they trust us to provide expertise, care and support.
Interviewee 13 (Petrol Industry)	If a digital transformation is to be sustainable, it must be carried out in such a way that the resources it requires are inexhaustible — like renewable energy, which is only renewable because it can never be depleted. This is what I associate with the term sustainable, whether the resource is electricity, fuel, or something else: it must be sustainable. Social responsibility, in my view, is something slightly different. It is also a form of resource — a common — but in another dimension. For me, there are two key aspects to it. First, much like during the Industrial Revolution, digital transformation can affect or even replace the human and economic components. Socially responsible digitalisation therefore means ensuring that people are either given other tasks that digitalisation cannot perform well, or that would otherwise simply create more work, or that the human component works in harmony with digitalisation so that it facilitates their work rather than making it harder.
Bernd Hugo (Karl Hugo)	Responsible digitalisation is a digitalisation that makes sense and focuses on what is essential. While it is technically possible to digitalise everything, it is important to remain aware of the underlying consequences, such as electricity consumption and the strain on national power grids. In Belgium, for example, data centres are expected to significantly increase energy demand, requiring substantial network adjustments. Against this backdrop, digitalisation should not be pursued at all costs — for instance, by integrating AI into every possible process — but rather implemented thoughtfully, while ensuring that people remain engaged and think critically.
David Scholzen (Karl Hugo)	Responsible digitalisation should not replace people but rather support them in their work. Its aim should be to simplify repetitive daily tasks and provide assistance so that employees can focus more effectively on essential matters and address them with greater precision, without fostering mental passivity.

Table 3: Definitions of responsible digital transformation – summary of interviewee responses.

Note: Own Illustration.

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EXECUTIVE SUMMARY

This thesis examines how environmental sustainability and socially responsible change management can be integrated into digital transformation (DT), advancing the concept of environmentally and socially responsible digital transformation (ESR-DT). It reframes DT as a strategic challenge that calls for balancing economic viability, environmental sustainability and social responsibility, amid rising policy and stakeholder expectations. Expanding digital footprints, growing volumes of e-waste and persistent rebound effects heighten the pressure on organisations to comply, maintain legitimacy and remain competitive—making responsible DT indispensable.

Methodologically, the study combines three pillars: a literature review, fifteen semi-structured interviews with practitioners from consulting, industry, public institutions and academia conducted between May and July 2025, and an integrative analytical framework that structures analysis across technological, environmental and social dimensions.

The findings suggest that DT is most effective when it is purpose-driven, strategically aligned and deliberately planned, rather than being technology-led. In terms of technology, organisations benefit from clear problem definition, realistic scope and phased delivery that links digital initiatives to business objectives. In terms of the environment, DT should be aligned with planetary boundaries by embedding ecological criteria from the outset, combining Green IT/IS with value-based approaches such as digital sufficiency and sobriety. In the social dimension, change management is essential. Early and genuine participation, supportive leadership and cultural integration foster adoption, safeguard legitimacy and ensure sustainable outcomes.

Overall, this thesis demonstrates that ESR-DT is a strategic capability, not an add-on. Integrating technological, environmental and social logics into a single decision-making framework improves adoption, reduces unintended ecological impacts and strengthens legitimacy. Three cross-cutting enablers — needs orientation, deliberate planning and continuous awareness — offer a pragmatic basis for embedding responsibility into everyday governance and metrics. Organisations that cultivate this capability are better positioned to create durable value and resilience in a rapidly evolving context.

KEYWORDS: Environmentally and Socially Responsible Digital Transformation (ESR-DT); Digital Transformation; Digitalisation; Change Management; Employee Participation; Leadership; Environmental Sustainability; Green IT; Green IS; Digital Sufficiency; Digital Sobriety; Planetary Boundaries.

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