Digital Transformation: An Enterprise Transformation Perspective

Exploring the underlying constituents of Digital transformation from the lens of Enterprise Transformation Theory

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Abstract

Digital Transformation (DT) has emerged as one of the most talked-about phenomena of the decade. The rush of things around DT also exposes its challenges towards effectively integrating digital technologies into the scheme of things. The proliferating literature on DT offers a fragmented understanding and is unclear about the constituents and configuration of the phenomena. The above concerns primarily arise from insufficient theoretical grounding and deficiencies in the extant conceptualizations. To address these concerns, the article posits an over-arching research question to examine the phenomena while theoretically uncovering its foundational elements. Accordingly, the study resorts to the enterprise transformation framework to explicate the transformative aspects based on a two-phase analysis. The first phase adopts a text-mining approach for uncovering the latent themes underlying the DT scholarship, followed by a qualitative approach involving content analysis. We finally propose a theoretically motivated conceptualization of the tenets of DT. We specifically investigate the phenomenon's scope, ways, means, and ends. The proposed framework is further validated following a multi-case analysis. Our conceptualization grounds and establishes the significance of foundational elements having a theoretical basis for identifying DT. Our examination offers an implementation guide for the practice, which we delineate subsequently.

Keywords: conceptual framework, digital transformation, enterprise transformation, theory development, topic modelling.

1 Introduction

The recent decade has witnessed the growing attention of organizations toward digital technologies. Resultantly, Digital Transformation (DT) is the focus of board room discussions, with its planning and implementation being a key concern (Chanias et al., 2019). The crucial challenge is knowing how to exploit digital technologies and integrate them into and around the organization (Hess et al., 2016). Since digital technologies have the capability to transform and reinvent businesses radically, their failure rates are also striking (Wade & Shan, 2020). The constituents of carrying out a successful transformation based on digital technology are unknown, and so is the case with the configurations of a digital strategy (Cetindamar et al., 2021; Omrani et al., 2022).

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Pertinent to organizations, these challenges arise from the need to understand the notions underlying DT. To most, DT is synonymous with Information Technology (IT)-enabled organizational transformation (Wessel et al., 2020), and to others, it is analogous to strategic renewal using digital technologies (G. C. Kane, 2017c; Sebastian et al., 2017; Vial, 2019). To the rest, DT is all about having a digital strategy in place to drive digital innovations (Baiyere et al., 2020; Hanelt et al., 2021) in tandem with the traditional viewpoints of managing technological changes to foster innovations (Faulkner & Runde, 2009, 2019). Even the academia lacks a comprehensive and unified understanding of DT as the notion of DT shares its genesis with other fields, particularly the information systems and the strategy literature (Baiyere et al., 2020; Canhoto et al., 2021; Teubner & Stockhinger, 2020; Vial, 2019; Wessel et al., 2020). Few scholarly attempts highlighting the prominence of digital technologies as IT artifacts having the potential to transform an organization, overlooking the strategic direction of the change initiatives (Faulkner & Runde, 2009, 2013, 2019). Such a mixed and unclear understanding of the field, coupled with misconceptions in the scholarship, is majorly due to a lack of transdisciplinary theoretical perspectives and deficient conceptualizations (Vial, 2019; Wessel et al., 2020; Wimelius et al., 2021).

Previous works have made a few attempts to illuminate the nuances of DT and add clarity to this scholarship; however, their efforts are limited to offering a taxonomy of the field (Matt et al., 2015; Mergel et al., 2019; Vial, 2019; Westerman et al., 2014). Even the frameworks and models offered intend to classify the contributions rather than conceptualize the tenets of DT (Hanelt et al., 2021, Nadkarni and Prügl, 2021; Warner and Wäger, 2017). Mere concentration on the phases and levels of DT (Teubner & Stockhinger, 2020) or focus on its driving force - the digital technologies and advanced IT artifacts (Faulkner & Runde, 2013, 2019; Verhoef et al., 2021), and do not cater to the fundamental questions around such initiatives. This study, therefore, has two objectives: first, to explore and understand DT using a theoretical lens, and second, to advance the theory by conceptualizing the foundational elements of DT. In pursuit of these objectives, we formulate the following research question to guide our exploration:

RQ: *What are the integral elements of a DT endeavour?*

The realm of DT is warranted with answers about the purpose, nature, extent, and constituents to ensure successful planning and execution of the transformation initiative. Therefore, to guide the exploration, this paper resorts to theorizing the foundational elements of DT. A multitude of perspectives have been used to analyse DT; however, a comprehensive and congruent conceptualization is wanting (Lindgreen et al., 2021; Philip & McKeown, 2004; Piazza & Castelluci, 2014). The existing theoretical lens either earmarks the organizational level attributes as foundational elements or focuses on the technological constructs prevalent in the IT strategy scholarship (Nwaiwu, 2018). In this study, we resort to the Enterprise Transformation (ET) framework, grounded in a transdisciplinary lens of transformation that incorporates both systems and management viewpoints (Rouse, 2005a; Rouse & Baba, 2006). This combined viewpoint helps in unveiling the complex configurations of the DT phenomenon and explaining it (Rouse, 2005a; Rouse & Baba, 2006). The relevance of the framework stems from the explication of the scope, means, and ends of a transformative phenomenon which is in tandem with the focus of our inquiry. Grounded on the ET framework, we synthesize the extant literature in two phases, involving text mining a large corpus of selected articles in phase-1, followed by an in-depth qualitative analysis of a sample of shortlisted articles in phase-2. The findings offer supporting evidence based on which we

divide the realm of DT into four conceptual elements justifying the scope, ways, means, and ends.

These foundational elements (i.e., scope, ways, means, and ends) configure our proposed DT conceptual framework as a transformational phenomenon while extending the ET framework. The exploration of value creation paths (i.e., "ways"): value co-creation and value re-creation offer a strategic outlook to substantiate the strategic standpoint of transformational endeavours leveraging digital technologies. Moreover, the role of big data analytics remains overarching for any DT initiative, while the importance of digital governance can never be ignored in advanced digital ecosystems. In continuation, we also validate our findings by drawing relevance from two cases from the practice. Overall, this study offers a clear distinction from the past works and provides a multi-fold contribution to both academia and practice as listed below:

1. The concept of DT is grounded on a transdisciplinary theoretical lens of ET, revealing the DTs purpose, nature, extent, constituents, and end results.
2. The study extends the ET framework by proposing a conceptual framework with added dimensions, validated through case studies.
3. The framework components justify the purpose and extent of any planned DT, while the ways help clearly articulate the strategic intent of such endeavours.
4. The study incrementally reveals the pivotal role of BDA (Big Data Analytics) and digital governance as cornerstones for DT.
5. The study provides insights into organizing for DT, aiding practitioners in anticipating and planning for possible challenges.

The rest of this paper is arranged as follows. Section 2 presents an overview of the literature around the main concepts supporting this research toward justifying the work. Section 3 documents our research approach relying on theory synthesis and extension. In section 4, we present our research findings contributing to the DT framework and elaborate on its validation. Section 5 includes a discussion of the results. The final section wraps up the content by offering a summary, delineating the contributions, acknowledging the limitations, and showcasing opportunities for future research. To enhance readability, some additional details are relegated to the appendices.

2 Related Studies

2.1 Transformation

Transformation characterizes "*a complete change in the appearance or character of something or someone, especially so that thing or person is improved*" (Cambridge University Press, 2013). Over a considerable period, the academic literature focusing on enterprises has conceptualized transformation as "*a process that engenders a qualitatively different organization*" (Besson & Rowe, 2012, p. 103).

Enterprise transformation is motivated by value deficiencies that lead to considerably revised or new work processes depending on management's capabilities, constraints, and preferences (Rouse & Baba, 2006). The aforementioned characteristics apply to the enterprise as a whole and the social networks of management in particular (Rouse, 2006). Enterprise transformation is about change, not repetitive but fundamental, that significantly changes how an enterprise

engages in a relationship with its primary stakeholders, such as employees, customers, suppliers, and investors (Rouse, 2005b). The transformation has been viewed as a fundamental change impacting the organization in various ways (Hess et al., 2016; Kotter, 1995). For example, a transformation may entail new value propositions for products and services and new ways to deliver and manage these offerings (Rouse, 2005a). Additionally, transformation frequently occurs in a discontinuous or even sudden manner. It differs from changes that are continuous, and that result in improvements that are realized slowly and steadily. Transformation can result in significant changes occurring sporadically, leading to gains to for the enterprise (Purchase et al., 2011; Rouse, 2005b).

2.2 Digital (Technologies)

Digital refers to electronic technology that produces, stores, and analyses data in terms of two states, viz., positive and non-positive. Various forms of digital technologies have become pervasive, representing "*... a combination of information, computing, communication, and connectivity technologies*" (Bharadwaj et al., 2013, p. 2). The implicit understanding of these varied digital technologies in the information systems literature is in the form of technologies incorporating bitstrings (digital objects) (e.g., Faulkner & Runde, 2019). The representation takes a simplistic view of digital technologies and fails to justify its uniqueness and diversity, as noted by several (Faulkner & Runde, 2019; Saeed & Sidorova, 2023). There may be uncertainties at the onset about how digital technology may be employed, resulting in ambiguity regarding its boundaries (Hund et al., 2021). In order words, individuals and groups may relate to digital technologies differently, assigning them varied meanings, thereby shaping its boundary. These arguments present a perspective of digital technology as possessing technical components (i.e., material like servers or computers that have a physical mode of being, and nonmaterial, such as operating systems or software that do not have a physical mode of being) and social components where users assign meanings and thus shape the boundary of digital artifacts (Faulkner & Runde, 2019). This viewpoint is in tandem with characterizing digital technologies as resources where apart from the material and non-material properties, considerable attention is warranted to information technology-related competencies in the form of managerial and technical knowledge, skills, and processes (Faulkner & Runde, 2019).

Digital technologies have brought significant shifts in organizations (Gerster, 2017). The shift leverages the social component of digital technology and goes beyond "digitizing resources" towards transforming processes, services, communication means, or even the overall business operations models (Haffke et al., 2017). The DT we are witnessing presently is propelled by digital technologies to fundamentally change how companies operate and bring value to customers (Henriette et al., 2015; Reis et al., 2018). Digital technologies are now considered "forces" which would change markets completely (Lucas Jr et al., 2013; Vial, 2019), such as platforms (Tan et al., 2015; Tiwana et al., 2010), analytics (Günther et al., 2017; Gust et al., 2017), cloud computing (Clohessy et al., 2017; Du et al., 2016). Hence it is also imperative for organizations to react to these changes efficiently (Li et al., 2016; Liu et al., 2013; Yeow et al., 2018).

Digital technologies have a transformative effect in three ways: (1) by fundamentally redefining "business capabilities," revolutionizing both internal and external standard operating procedures and business relationships; (2) by involving "strategic acquisitions" to gain new business capabilities or establish a new market area; and (3) by demonstrating the

use of IT to significantly alter how tasks are performed in organizations (Dehning et al., 2003). The impact of digital technologies on decision-making, customer behaviour, competitive landscape, and market dynamics is already recognized (Bharadwaj et al., 2013; Markus & Loebbecke, 2013; Vial, 2019).

2.3 Digital Transformation

2.3.1 Conceptualization and Positioning

Drawing relevance from the previous discussion, DT can now be viewed as the transformation triggered by digital technologies. DT highlights the effects of digital technologies on organizational attributes such as the structure, procedures, flow of information, and organizational capacity to accept and adapt to the digital technologies (Cui & Pan, 2015; Zhu, 2004). The majority of theorizing around DT is driven by digital technologies and how they ensure improved business outcomes (Li et al., 2018; Vial, 2019). The various efforts have conceptualized DT in diverse ways. The extant literature presents DT as the orchestration of digital technologies toward automating firm-level processes and activities, alternation of essential business processes driven by technologies (Singh et al., 2017; Demirkan et al., 2016; Nwankpa & Datta, 2017), IT impact on organizational contexts, and business outcomes (Fitzgerald et al., 2014; Hanelt et al., 2015; Liere-Netheler et al., 2018). Some other definitions relate DT to aims toward digital maturity and modernization supported by digital technologies and processes (Ivančić et al., 2019; Mergel et al., 2019), and improvement of the process triggered by technologies (Vial, 2019). As it turns out, the vast literature on DT has conceptualized the phenomenon in varied and confusing ways (e.g., Benlian & Haffke, 2016; Berghaus & Back, 2016; Hess et al., 2016; Horlacher et al., 2016). Indeed, the lack of consistency around DT conceptualization has been identified as a concern (Morakanyane et al., 2017; Riasanow et al., 2019; Vial, 2019; Wessel et al., 2020).

Apart from the conceptualization dilemma, the connection to DT as the most pervasive phenomenon affecting business operations, society, and individuals also suffers a positioning dilemma (Cetindamar et al., 2021; Omrani et al., 2022). This is evident from the calls to the academic community to distinguish it from other organizational phenomena (e.g., information systems/information technology-enabled organizational transformation) and related explorations (Riasanow et al., 2019; Wessel et al., 2020). The diverse connotations, use of unclear terminology, blurred positioning, and shared conceptions, among other challenges, are deterrents to the clarity of DT (Hanelt et al., 2021b). The vast but diverse literature on DT thereby portrays a lacking of consistent understanding of the phenomenon (Warner & Wäger, 2019; Wessel et al., 2020). Simply assuming that DT is unique and different without a theoretical basis would hinder the conceptual foundations of the field.

2.3.2 Synthesis of Contributions

In line with the increasing excitement around DT, several authors also attempted to synthesize prevalent research efforts. The list of review papers on DT is ever-increasing. Table 1 summarizes some of the notable efforts by delineating each review article's objective and supporting information, with the articles listed chronologically. We also reflect on the current study in the last row to differentiate it from the extant attempts.

The articles listed in Table 1 collectively aim to enhance our understanding of Digital Transformation (DT), focusing on various aspects of the phenomenon. Some articles concentrate on conceptualizing DT, outlining its characteristics, drivers, impact, as well as

opportunities and challenges (e.g., Morakanyane et al. 2017, Reis et al., 2018, Riasanow et al., 2019, Vial 2019). Others delve into the organizational and ecosystem aspects, exploring the supporting resources and capabilities within the DT context (e.g., Henriette et al., 2015, Leão & da Silva, 2021, Nischak et al., 2017). Furthermore, certain review articles aim to provide models and frameworks that align with their specific objectives around DT (e.g., Hanelt et al., 2021, Vial, 2019). Collectively, these reviews contribute to a nuanced understanding of DT, presenting diverse perspectives and frameworks and highlighting the multifaceted impacts on organizations.

Few other research efforts around DT have focussed on developing models and frameworks aligned with the research objectives. For example, Mergel et al. (2019) focus on exploring DT in the public sector. Following a series of interviews with experts from the public sector, the work contributes to defining DT and offering a conceptual framework segregating the reasons, objects, processes, and results of DT. Warner and Wäger (2017) explore the concept and mechanism of DT based on evidence collected from many sources over time. The findings indicated inconsistencies regarding organization leaders' understanding of the digital transformation phenomena. The authors offer a process model to clarify the DT mechanism comprising nine micro-foundations to support the dynamic capabilities required for DT. Wessel et al. (2021) investigate some of the fundamental tenets based on which DT can be differentiated from the phenomena of IT-enabled organizational transformation. The authors offer a process model of transformation for comparing the two phenomena. The differentiation aspects from their research emerged around value proposition (i.e., redefining in the case of DT versus supporting in the case of IT-enabled organizational transformation) and organizational identity (creating in the case of DT versus enhancing in the case of IT-enabled organizational transformation). These frameworks and models portray some commonalities. These adopt an organizational-level perspective on DT and delineate some of the key considerations (e.g., technological considerations, mechanisms, and outcomes) in their portrayal of DT. Most tend to place technology at the center stage, overlooking other relevant organizational characteristics and governance mechanisms.

Despite the need for more clarity about the notions of DT and multiple framing of its structure, a recurring subject in the present discussion is how modern businesses are impacted by and must adapt to the growth of digital technology. Moreover, organizations also undergo internal transformations to alter the way they structure their processes (Hanelt et al., 2015; Morakanyane et al., 2017), develop ways to address inertia (Kohli & Johnson, 2011; Röcker et al., 2017), and realize value (Dremel, Wulf, et al., 2017; Günther et al., 2017; Huang et al., 2017). The phenomenon is naturally linked with the canvas of transformation, propelled through technologies, and contributing to fundamental organizational changes in various ways (Kotter, 1995; Matt et al., 2015). In summary, the current understanding of the fundamentals of DT lacks clarity, and the contributions in the literature indicate an absence of theoretical grounding. In other words, the concept of DT seems to be obscured within the myriad of explorations dedicated to it.

Article	Objective	Sample Information
Henriette et al. (2015)	The review identifies the specific digital capabilities needed for the transformation while also earmarking how a DT journey impacts business models, operational processes, and user experience (primarily customers).	The study reports a systematic review of 202 Scopus-listed articles until 2015. The search strategy encapsulates business models, operational processes, and user experience as the study context.
Morakanyane et al. (2017)	The review attempts a reconciliation of the DT literature to offer an inclusive understanding. It focuses on components of DT, such as characteristics, drivers, and the impact of DT. The impact is motivated by earlier attempts to reemphasize the elements of business models, operational process, user experience, employees, and culture.	The study reports a systematic review of 53 articles published in conferences and journals in or after 2010.
Nischak et al. (2017)	The article concentrates on unveiling the importance and nuances of value ecosystems in the parlance of DT. The authors further posit the interactions of platforms and related ecosystems with traditional IS and other cross-disciplinary perspectives.	The study is based on 42 selective articles focusing on ecosystems in a DT endeavor and featuring in databases: Journal Storage (JSTOR), Business Source Complete, and Association for Information Systems electronic Library (AISeL).
Reis et al. (2018)	The review attempts to uncover the opportunities and challenges enveloping DT while informing scholars about digital business strategy.	The study reports a systematic survey of 206 peer-reviewed articles on process and operations management from the ISI (Institute for Scientific Information – Web of Science) database.
Riasanow et al. (2019)	The review attempts to clarify the notions of DT by attending to the disagreements and inconsistencies enveloping the field. The authors also document the diverse viewpoints of the heterogeneous schools of thought.	The study is based on 175 articles published in select IS and management journals and IS conferences. Specific to DT publications, the search year was specified as 2015 onwards.
Dang & Vartiainen (2019)	The review reports an in-depth study of articles on digital strategy to discuss strategists' various aspects and distinguish it from traditional IT/IS strategy. The discussion pivots around the environment, approaches, stakeholders, challenges, and capabilities.	The study considers 42 articles from the basket of eight senior IS journals (now updated)[1] and proceedings of the international conference on information systems (ICIS).
Vial (2019)	The study offers a detailed conceptualization and an inclusive definition of the DT phenomena. The author proposes a DT framework representing the phases of the DT process at the organizational level. This offers four compartments to understand DT in terms of the affected entity and the extent of transformation. The author also deliberates on the required technologies and other means to drive transformation while highlighting potential impacts.	The study reports a systematic review of 282 articles published in databases: AIS Library, Business Source Complete, and ScienceDirect.

[1] https://aisnet.org/page/SeniorScholarListofPremierJournals

Teubner & Stockhinger (2020)	The review focuses on resynthesizing IT/IS strategy at the current juncture dominated by emerging technologies. Accordingly, the authors delve into digitalization and related concepts such as digital ecosystems, digital innovation, and DT. They posit the role and nuances of IS/IT strategy in the digital age.	The study relies on a focused review of 141 articles between 2008-2018, featuring in databases: AIS Library, Business Source Complete, and ScienceDirect.
Nadkarni & Prügl (2021)	The article focuses on developing thematic maps and organizing contributions from a technological viewpoint and the actors/entities related to the transformation initiative. The authors further supplement their analysis by integrating cross-disciplinary perspectives involving digital disruptions and entrepreneurship.	The study reports a systematic review of 58 articles published between 2001 and 2019 within five electronic databases (Business Source Complete, Scopus, ScienceDirect, Social Sciences Citation Index (SSCI), and Google Scholar).
Leão & da Silva (2021)	The study underscores the evaluation of the impact of DT on firms' competitive advantages. It illuminates the diverse nature of these impacts, encompassing both positive and undesirable/negative outcomes.	The study draws upon a sample of 20 articles from the EBSCO database, shortlisted based on a specific focus on DT and its impact on competitive advantage.
Trenerry et al. (2021)	The review focuses on employee-related aspects of DT initiatives, categorizing them into individual factors (attitudinal), group-level factors (collaborative), and organization-level factors (cultural), delineating their roles in the DT journey.	The study reviews DT articles published in confluence with psychology, organizational behaviour, and management science in the ScienceDirect database after 2000.
Hanelt, et al. (2021)	The review presents thematic patterns related to organizational designs and digital business ecosystems in the transformative phenomenon. The authors present a multi-dimensional framework integrating contextual conditions, mechanisms, and DT outcomes toward clarifying the phenomena' boundary conditions. Through this, the authors emphasize the impact of technology, the extent of adaptation, systemic shifts, and holistic co-evolution in the context of a DT endeavor.	The study is based on 279 articles on management science listed in Business Source Complete between 2000 and 2018, with particular attention to the publications featuring in the Financial Times (FT) 50 list of journals.
Our Study	The current study investigates the foundational elements of DT. The study adopts a transformational perspective, using the lens of the ET framework to examine the phenomena. The authors introduce a comprehensive DT framework consisting of four integral components that represent the scope, ways, means, and ends of DT. The addition of the "ways" dimension contributes to the novelty, extending the ET framework by delineating the path of value-creation opportunities.	The study considers a total of 4314 articles published since 2010 and featuring in the Scopus database. This is subjected to a two-stage synthesis involving quantitative analysis of the entire corpus and followed by qualitative analysis of a subset involving 182 articles.

Table 1. *Selected Review Papers on Digital Transformation*

3 Digital Transformation- A Conceptual Frontier

3.1 Theory Synthesis

The role of theory in information systems remains pivotal (Bichler et al., 2016; Markus, 2014; Orlikowski & Iacono, 2001; Weber, 2003). More than just organizing and summarizing the notions, it helps impose a tangible directive on the phenomenon (Maanen & Bacharach, 2015). In this realm, we resort to the enterprise transformation (ET) framework (Rouse, 2005a;) as the theoretical foundation to capture and accumulate knowledge about DT as a phenomenon from an abstract perspective of an enterprise. The ET framework presents the basis for understanding the nature of transformation (Rouse, 2005a). The idea is to comprehensibly understand and identify the phenomena' nature, purpose, and purview, while uncovering the structural constituents, thereby adhering to our research question.

Earlier attempts have tried to offer a conceptual description of DT; however, most lack a theoretical grounding (Mendling et al., 2020; Rowe, 2018; Venable, 2006; Verhoef et al., 2021).

As noted above, these include conceptualizing DT in various ways, for example, offering frameworks and process models to explain DT or its facets (e.g., Hanelt, et al., 2021; Mergel et al., 2019; Vial, 2019; Warner & Wäger, 2019; Wessel et al., 2020) In this parlance, a few studies have attempted to theorize DT, and the lenses used have offered polarized viewpoints (Lindgreen et al., 2021; Nwaiwu, 2018). Business strategy has dominated the discussion around organizational capabilities, with technology playing a sub-ordinate role (Canhoto et al., 2021; Li et al., 2012; Philip & McKeown, 2004). Alternately, technology has been recommended as the engine for transformation while surpassing the role of firm-specific attributes (Kumar, 2021; Rowe, 2018; Wimelius et al., 2021).

This study, therefore, plugs this significant gap by resorting to the ET framework thereby offering a transdisciplinary perspective integrating both the systems and the management domain (Rouse, 2005a;). Figure 1 below presents the (enterprise) transformation framework borrowed from Rouse (2005a), which depicts the foundational elements of enterprise transformation.

Figure 1 classifies a transformation initiative in three dimensions (i.e., scope, means, and ends). Following the ET framework, the scope is indeed extensive, encompassing activity, function, organization, and the broader enterprise. At the most granular activity level, transformation can impact individual activities or tasks within an organization. This might involve automating repetitive tasks, streamlining data entry, or enhancing communication through appropriate tools. The goal is to make these activities more efficient, accurate, and cost-effective. Moving up the scale, at the functional level, an enterprise transformation can revamp entire functions within an organization. Human resources, marketing, finance, and supply chain management are areas where significant changes are possible using appropriate technologies. Enterprise transformation often extends across the entire organization. It involves aligning strategies, processes, and culture toward achieving broader goals. This might entail restructuring teams, fostering a culture of innovation, and redesigning workflows for greater efficiency. Finally, beyond individual organizations, ET can affect entire industries or ecosystems. It involves collaboration and integration among multiple organizations, leveraging technological advancements.

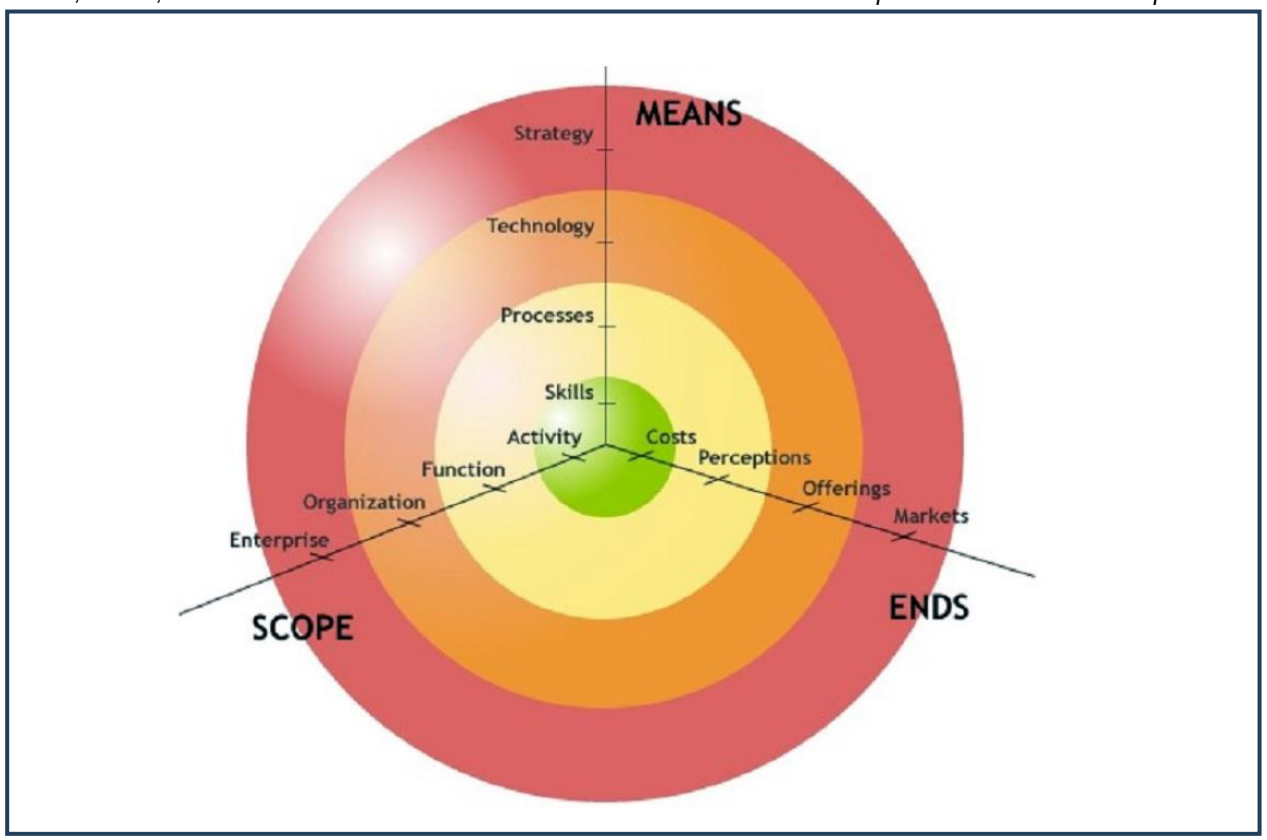

Figure 1. *(Enterprise) Transformation Framework, borrowed from Rouse (2005a).*

The approach or means adopted for transformation pursuits relates to both the goals pursued alongside the nature and competencies. Following the ET framework, this is categorized into skills, processes, technology, and strategy. Fostering a skilled workforce is paramount, necessitating the acquisition of new competencies like digital literacy and data analysis. Upskilling and reskilling initiatives guarantee that employees can effectively utilize these skills for transformative purposes. Fundamental to ET is the reassessment and redesign of existing business processes. This can involve streamlining workflows, eliminating inefficiencies, and embracing agile methodologies, ultimately boosting operational efficiency. In addition, innovative technologies such as cloud computing, artificial intelligence, data analytics, and Internet of Things (IoT) solutions are central to ET. Adopting the right technology stack empowers organizations to gather insights, automate tasks, and drive innovation in products and services. A clear transformation strategy guides the entire process. Strategic planning ensures alignment between business goals and technology investments, fostering innovation and bolstering competitiveness.

The entire ET exercise is carried out towards reaching the end, i.e., satisfying the intended goals and realizing the planned impacts of such initiatives. As depicted in the ET framework, the realized impacts on the organization can vary from mere cost savings to improved perceptions.

Cost reduction may involve streamlining processes, reducing overhead, minimizing waste, and maximizing resource allocation toward maintaining or improving overall performance and competitiveness. Likewise, as an outcome of transformation, improved perceptions can result from enhanced customer experiences, increased trust, and brand equity. For an enterprise-level change that is more strategic, the end goals can be unique offerings or entering

new markets. Enterprise transformation can lead to developing new and innovative offerings that better align with market demands and customer needs. It may involve entering new markets, expanding into different geographic regions, or targeting previously untapped customer segments. The outcome is often an increased market share, a broader customer base, and diversified revenue streams.

Resorting to the ET framework allows for a conceptualization of the DT initiative. We already recognize that the foundation of the DT initiative is in anticipation of how digital technologies contribute to value realization by impacting the work processes (Henriette et al., 2015; Reis et al., 2018). Digital transformation in enterprises can be a fallout of revamping opportunities arising out of anticipated value deficiencies in terms of loss of opportunities (markets), threats or (risks) of failure, or a crisis in the firm (e.g., stressed financial health) (Baiyere et al., 2020; Hanelt, Firk, et al., 2021; Lanamäki et al., 2020).

Accordingly, the extent of transformation can be vast, spanning from a focus on the functional aspects to societal considerations (Ganju et al., 2016; Leong et al., 2016; Pagani, 2013). Consequent to identifying the risks and the opportunities, the focus is shifted to the core elements of the work processes of the enterprise towards realizing the DT. Therefore, we focus on the means for the transformation, which largely depends on the organization, its processes, resources, and competencies (Dremel, et al., 2017; Tabrizi et al., 2019; Vial, 2019). From an organizational perspective, the structure of the firm and its networks have a crucial role in supporting DT (Nadkarni & Prügl, 2021; Verhoef et al., 2021). Moreover, at a finer level, the redistribution or allocation of firm-wide assets and resources influences on the extent of success derived. The unique characteristics underlying managerial decision-making will also be decisive at an individual level (Li et al., 2012; Zangiacomi et al., 2020). Furthermore, technology's role in data and information management, digital policies, and regulations has been observed to play a significant role in supporting DT initiatives (Kumar, 2021; Wimelius et al., 2021). The culmination of DT manifests in multifaceted impacts that redefine organizational paradigms. This can include streamlined business processes arising from the re-evaluation and re-design of workflows, coupled with the integration of automation (Dremel, et al., 2017). Embracing innovative technologies like cloud computing and artificial intelligence facilitates heightened insights, task automation, and product/service innovation (Hanelt, et al., 2021). A clear digital strategy aligns business goals with technology investments, fostering innovation and bolstering competitiveness, thereby positioning the organization for sustained success in the digital landscape (Kauffman et al., 2010).

3.2 Theory Adaptation and Extension

Here, we focus on conceptualizing the foundational elements of DT following the theoretical foundation adopted. In order to offer a holistic and integrative framework, we remain in tandem with the previous works offering similar contributions (Elliot, 2011). A comprehensive and scientific review involving two phases was undertaken to uncover and explain the foundational elements documented within the scholarship. By comprehensive and scientific review, we mean a logical article search strategy, retrieving an overarching corpus of articles and analysing and interpreting them in two phases in sequence: Phase-1 using statistical means (Hasan et al., 2017; Sharma et al., 2021), and Phase-2 involving qualitative content analysis (Krippendorff, 2018). We describe these below. Figure 2 presents our overall research design.

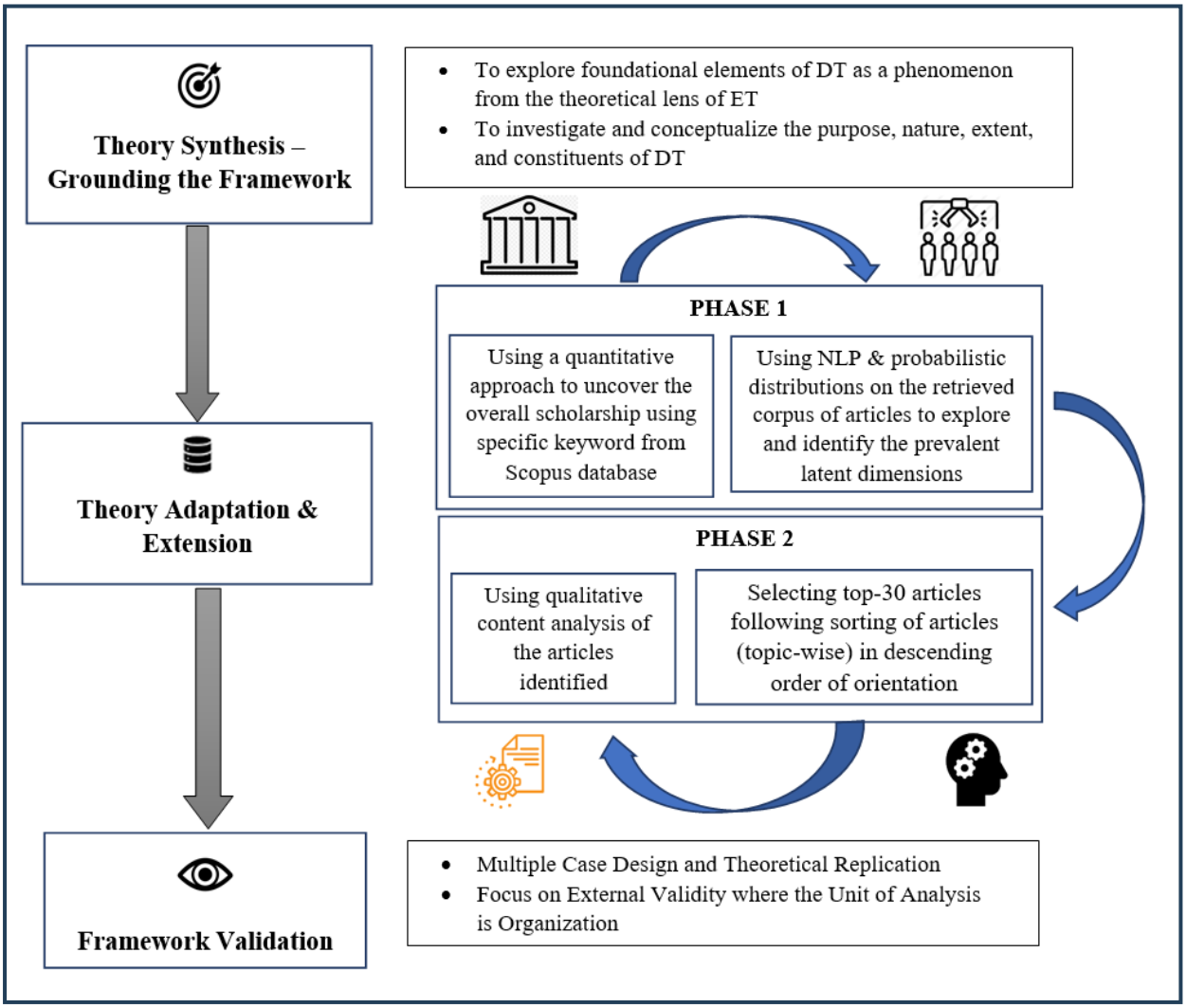

Figure 2. *Overall Research Design*

Review Methodology: In order to proceed with our inquiry, we adopt an explanatory design. The explanatory design allows researchers to explain patterns that may be observed to arrive at a general understanding of the phenomena (Creswell & Creswell, 2017). We, accordingly, resort to a mixed method design in two distinct phases – a quantitative phase (Phase 1) followed by a qualitative phase (Phase 2). (Creswell & Clark, 2017) argue that used by themselves, quantitative data are limited in explaining the nuances of a phenomenon given the complexities that may be involved. Thereby, supporting qualitative evidence is required to explain or elaborate quantitative results (Creswell & Clark, 2017; Creswell & Creswell, 2017). The combination of the quantitative and qualitative phases in a sequence should provide a more grounded explanation and insights.

Phase 1: Quantitative proceed with our exploration in the following manner: We initiate the work by reviewing the extant journal publications focusing on DT within the Scopus database since 2010, given the recognition and growing importance of the phenomena since the last decade. In order to perform a comprehensive literature review, we adopt a guided strategy. Foremost, the choice of keywords was zeroed on based on the following query:

"TITLE-ABS-KEY ("digital transformation") OR TITLE-ABS-KEY ("digital strategy") OR TITLE-ABS-KEY ("digital innovation") OR TITLE-ABS-KEY ("digitalization") OR TITLE-ABS-KEY ("digital disruption") AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "DECI") OR LIMIT-TO (SUBJAREA , "ECON")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English"))."

Figure 3: Search strategy

The above keywords were linked through a 'Boolean logic' and searched in "metadata fields: title, keywords, and abstract of the articles in the Scopus database." Scopus, one of the most widely used databases, provides superior global content coverage and gives access to relevant research published in diverse domains, including outlets focusing on management, information systems, and related disciplines (Qaiser et al., 2017). The articles were restricted to those published in journal outlets and communicated in English. The above listed search descriptors resulted in a corpus of 4314 articles (documents) for further analysis. Since the central element of this study was to synthesize and extend the conceptual frontier of DT, the primary objective focussed on unleashing the sub-structures of the scholarship. This objective was catered to using natural language processing and supporting statistical techniques. The use of this technique makes it possible to extract the underlying structure of the documents. Specifically, the topic modelling technique assumes that documents are a distribution of a group of words, while themes are a distribution of a group of documents (Blei et al., 2003; Pang & Lee, 2008).

The underlying substructures were unveiled using advanced probabilistic models, precisely structural topic modelling. Principally, structural topic modelling is used to extract the latent dimensions underlying the corpus of articles by assuming distributions corresponding to each dimension (Blei, 2012; Roberts et al., 2019). Since a detailed explanation of structural topic modelling is out of the purview of the current article, we refer readers to Appendix A for a detailed explanation. Nevertheless, in summary, one may visualize that each document arises from 'k' latent distributions (dimensions) and is oriented to these dimensions with different magnitudes. Since there are no clear guidelines concerning the optimal number of latent themes, we carried out sensitivity (ranging between 2-50 topics) for our exploration. We referred to standard metrics: exclusivity and semantic coherence to arrive at the optimal choice (Blei, 2012; Sanchez-Franco et al., 2021). Semantic coherence highlights the terms which frequently co-occur within a dimension; exclusivity echoes their unique correspondence to a particular dimension (Sharma et al., 2021). The resultant analysis led to a sub-optimal value of eight for 'k,' indicating the eight latent themes (i.e., topics) based on the above two metrics and corresponding results (Appendix B).

Foremost, we concentrated on the most probable or frequent word underlying each latent theme (Bastani et al., 2019). To capture some incremental insights, we also referred to metrics such as "Lift" and "FREX," suggested in the major "statistical text analysis" (Kuhn & Johnson, 2013; Roberts et al., 2019; Sharma et al., 2021). Lift highlights the more frequently appeared and common words within a particular theme and not elsewhere (in the remaining themes). Essentially, Lift reflects on rare words within each theme (Sharma et al., 2021). Similarly, we resorted to another measure, namely, frequency–exclusivity or FREX, which identifies both

frequency and exclusivity of words for a particular topic. Note that FREX scores were alternatively referred to identify the most frequently appeared words to describe the associated scope or topic best, thus assisting us in ratifying most of the foundational elements of DT. The detailed word clouds corresponding to all eight themes were referred to for further ratification. Due to brevity, we are reporting the word clouds in Appendix C.

Phase 2: Qualitative: In Phase 2, which followed our initial quantitative analysis in Phase 1, we engaged in qualitative inquiry to uncover the eight latent themes and provide a comprehensive interpretation of our findings. This qualitative phase is essential in mixed research designs that commence with quantitative research, as it serves to add meaning and context to Phase 1 results. Following the preliminary analysis, we noticed substantial overlap among the themes. Consequently, a thorough examination was necessary to grasp the essence of each observed theme. Thereby, the objective of this phase was to develop explanations of all the latent themes from the earlier analysis (i.e., Phase 1) towards arriving at a coherent understanding of these in the context of digital transformation.

To proceed with this phase, we first identified the articles for content analysis. Content analysis offers a systematic approach to describing and classifying text material (Krippendorff, 2018). We adopted a systematic approach to synthesize all the explored latent themes thoroughly. Structural topic modelling (Phase 1) presented a flexibility for the textual observations, articles in our case, to be aligned to each topic with different magnitudes (i.e., scores) of orientation (Roberts et al., 2019; Sharma et al., 2021). This contrasts with single-membership models or deterministic techniques such as clustering (Ding et al., 2020; Fresneda et al., 2021). Based on the descending ordering of scores of article orientation corresponding to each topic, we filtered the articles most aligned toward each topic. This exercise allowed us to retrieve the top 30 articles with orientation scores ranging from 0.65 -0.90 (on a scale of 1). This criterion indicated that the selected article's contribution (s) are dominated (more than two-thirds) by the corresponding latent theme having minimal overlap with other dimensions.

The identification process led to a basket of 240 articles spread across eight topics of interest that emerged from the preceding analysis. These articles were further screened for appropriateness. The screening procedure included a manual review of the abstract, introduction, and conclusion (if required) to determine if the article in question is attending to an aspect related to the DT phenomena. This was done as articles can resort to keywords like digital transformation or digitalization given the setting or the context, while the focus of the article may be some other phenomena, e.g., marketing or consumer behavior (Chu et al., 2019; Stewart et al., 2019; Victor et al., 2019). This process led to a shortlisting of 182 articles for a detailed analysis.

Through the review of the shortlisted articles, we primarily aimed at having a nuanced understanding of the themes. This started with a bottom-up approach where we first ingested the evidence from each article within the corresponding latent theme. Later, we synthesized these evidence to come up with broad perspectives underlying each theme. This also empowered our analysis to organically interpret the tenets of each latent theme. For this purpose, the spreadsheet application was used, and supporting evidence emerging from the articles were outlined. Corresponding to each latent theme, the topic words (primarily the top words; please refer to Table 2) emerging from Phase 1 results were treated as initial codes. These codes served as the foundation for relating textual evidence from the assigned articles

to their corresponding latent themes. The evidence from the selected articles was synthesized accordingly at the latent theme level, contributing to explaining the latent theme.

The authors of this paper carried out the task independently, with the first author dealing with articles belonging to the first, fifth, sixth, and seventh latent themes and the second author dealing with the rest (second, third, fourth, and eighth). This distribution between the authors was purely based on their areas of interest and expertise. Furthermore, to remain consistent, the analysis done by one was reviewed by the other, and observations were discussed and settled.

4 Findings and Demonstration

4.1 Review Results

Table 2 presents the results from our two-phase analysis. In the table, the proposed conceptualized foundational elements are mentioned in the first column. The second column, "Topic Identifier," presents the themes underlying the DT scholarship. Here we also include a short descriptor to highlight what the theme is all about. The third column includes, for each theme, a sub-set of the top words characterizing the theme. Our Phase 2 analysis helped us understand the broad perspectives of each theme. The articles selected within the corresponding theme(s) reflected nuances of the theme, which helped us interpret it. Resultantly, in the fourth column, we present an interpretation of each corresponding theme. The final column, "Rank," highlights the themes' relevance and importance in the DT context. In the paragraphs below, we elaborate on the Table 2 findings. Given that our findings are grounded on the evidence from the DT literature following our two-phase exploration, we include relevant citations to support our explanations.

The first foundational element (i.e., "Scope") includes Topic 5 (Table 2). The recognition of value deficiencies, either as untapped opportunities or threats and uncertainties eroding the value creation potential of firms, earmarks the purpose of any transformation. Our detailed analysis of selected papers helped us outline two broad triggers for attending to value considerations: external and internal. By external, we mean the potential opportunities and growth prospects outside the boundary, while internal points toward the deficiencies in the existing practices/processes or offerings (Chanias et al., 2019). Therefore, the primary objectives for any transformational initiative involve exploring untapped opportunities through introducing new products, entering new markets, or both. Competitive forces and industry dynamics can introduce new opportunities in the business environment, prompting companies to refresh and revitalize themselves (Koch & Windsperger, 2017). Consequently, to stay relevant, firms adjust their digital strategies, by entering new markets or revitalizing current practices (Tan et al., 2020; Yeow et al., 2018). Another crucial objective is addressing crises and threats associated with existing practices (Vial, 2019). This involves reshaping value propositions and reconfiguring systems to enhance overall value creation (Guo et al., 2021; Zutshi et al., 2021).

The above deliberations echo the fundamental considerations driving the DT endeavour by showcasing the opportunities around DT. These opportunities determine the extent of DT (Berghaus & Back, 2016) indicating whether the transformation is enacted at a process level, within a specific function, or across the entire organization. Traditionally, IT strategy has been useful as a functional-level strategy. However, with the emergence of digital technologies, the controls have percolated from a unit to the entire landscape of firms (Tabrizi et al., 2019).

Instances are documented in the extant literature where leveraging on the digital infrastructure, industrial boundaries are crossed, contributing to sectoral changes (Kane, 2016, 2017). Simultaneously, it contributes to driving societal impact (Benzerga, 2016; Leong et al., 2016). The preceding discussion presents the broad landscape of a DT endeavour by showcasing the opportunities contributing to the purview of the phenomenon. These observations delineate the purpose of any transformational journey, defining the "scope", i.e., the need and level of transformation.

We now shift our attention towards the "ways" of value creation, which fundamentally highlight the configurations inherent in any DT endeavour. Topic 6 hints at the role of digital technologies in facilitating product innovation and customer-centricity; however, the guiding principle and roadmap are always set by the generic business strategy (Lipsmeier et al., 2020). With the proliferation and percolation of digital technologies, scholars have recently advocated the concert and synchrony of formulating a business strategy coupled with digital technologies (Tabrizi et al., 2019; Tanriverdi & Lim, 2018; Vial, 2019). This has interchangeably become popular as a digital strategy leading to innovative solutions, products, and new markets for significant revenue generation (Catlin et al., 2018; Westerman, 2017). In this parlance, independent units and entities collaborate to create value, which is far more than their standalone value-creating capabilities (Chang et al., 2014).

Historically, conventional IT artifacts played a role in distributed value creation within a network. However, they fell short in co-creating heightened value, a capability now achievable through utilizing a wide range of digital technologies (Nischak et al., 2017). For example, platforms and innovative ecosystems have allowed crossing industrial boundaries to create new markets and prospects. Thus, this constituent theme delineates a crucial roadmap for realizing value by capitalizing on the potential of value co-creation with the capacity to reshape industrial structure (Constantinides et al., 2018; Kauffman et al., 2010).

Topic 7 focuses on incremental innovation, through product creation, packaging, or combining product and service (together), for increased benefits (Pagani, 2013). The associated articles present various aspects connected to streamlining and automating manufacturing processes. Emphasis on digitalizing supply chain and logistics management to enable efficient and sustainable operations is visible in these conversations (Boyes et al., 2018; Dalenogare et al., 2018). The rapid pace of technological advancement has fostered increased productivity and scaled efficiency for better customer engagement and value creation (Kumar, 2021). Digital technologies play a key role in anticipating and addressing risks related to uncertain demand, rapid market change, and heightened customer experiences (Pagani, 2013; Vial, 2019).

Foundational Elements	**Topic Identifier**	**(Select) Topic Words**	**Interpretation**	**Rank**
Scope	Topic 5 (Need) Value deficiencies (Level) *Function; Chain; Firm; Industry; Sector; Society*	[purpos(e), growth, market, improv(e), global, risk, problem, process]	At one end, the words characterizing the theme reflect the opportunities contributed by identified value deficiencies. At the other end, the words reflect the span of transformation. Focusing on the words describing these opportunities, such need can be external, such as triggered by anticipating potential growth opportunities, or internal, by sensing concerns and risks in the ongoing practices (Chanias et al., 2019). Thereby, the constituent words refer to value deficiencies in terms of risk, process, needs for improvement, and scope for growth in new markets with global presence. The above aspects, referring to the opportunities, determine the purview of the DT. The internal deficiencies result in functional or process-level transformation, or heightened growth may foster a firm or an enterprise-level transformation (Riasanow et al., 2019). Since digital technologies enable change, they have the potential to cross industrial boundaries and revolutionize the sector leaving societal marks. We observe corresponding words such as sector, industry, and society dominating the discussion within this theme.	2
Ways	Topic 6 Value Co-creation: Innovative solutions (both product and service) - Entering new markets, developing new channels - Tapping growth opportunities.	[innov(ation), transf(ormation), ecosystem, platform, (value), proposition, creation]	The topic words here earmark an essential roadmap for value creation. The thrust is on the collaboration and networking of various entities, which can together co-create more value than their individual value-creation capabilities (Kauffman et al., 2010). The transformational element spans across all the entities in the network that are digitally connected (Nischak et al., 2017). Platforms and innovative ecosystems have the potential to create more value for each contributor while passing the maximum benefits to the endpoint, which is the customers (Constantinides et al., 2018).	1
	Topic 7 Value Re-creation: Fallout of losing business to competition., risks of failures, threats from the disruption - Fostering internal deficiencies	[manufactur(ing), supply chain, function, procure(ment), manag(ing), energy, sustain(ing)]	The topic words allude to another avenue for value creation, primarily through incremental innovation achieved by either crafting distinctive content or repackaging content and services in a redefined manner (Leischnig et al., 2017). Ultimately, this approach leads to the redefinition of practices or offerings, fostering further value generation. For example, as the keywords refer, these can be around supply chain restructuring, procurement, manufacturing. The discussion and keywords advocate for the transformation of fragmented networks of strategic partnerships. These endeavors aim to address risks stemming from uncertain demand and rapid market fluctuations (Pagani, 2013).	5
Means	Topic 4 Organizational capabilities and attributes	[organiz(ation), firm, culture, manageri(al), resource(e), structur(e), conduct, readi(ness)]	The topic words here relate to the organization or its attributes (e.g., structure, culture). The evidence resonates with the element classified under means. The aspect has a clear implication on the resource (re)-allocation and managerial abilities. The literature documents that any transformational endeavor requires a delicate balance of capabilities and redistribution of resources (Tabrizi et al., 2019; Vial, 2019).Furthermore, the organizational attributes such as the leadership, composition structure, and culture, as the terms allude to remain pivotal for bringing in any change (Dremel, et al., 2017).	3

	Topic 3 Digital talent	[train, technolog(y), workplace, academ(ic), compet(ency), learn, adapt, challeng(es)]	The topic words here demonstrate the importance of the individual abilities that are instrumental in supporting DT endeavours. The words relate to competency development, training, learning, and adaptability requirements of the workforce, focusing on the supporting technologies that are considered essential for embracing the changes (Kane, 2019). The entire ecosystem needs to train and retain practices and resource people with the desired skill sets to address people-specific DT challenges (Kane, 2017). The importance of academic partnerships is also explicit in conversations supporting the skill requirements.	4
	Topic 2 Digital governance	[govern(ance), infrastructure, process, group, relat(ion)]	The topic words broadly relate to digital governance as a foundational aspect underlying DT endeavours. The keywords refer to descriptors around digital governance. The words refer to infrastructure readiness which acts as the precursor to a digital establishment. In addition, the supporting processes and the interlinkages with the supporting groups characterize the governance structure, supporting the transformational realm. The nature, extent, and outcome of transformation is a result of how various entities exercise their ownership, authority, control and contribution in the complex network of digital interconnectedness (Constantinides et al., 2018; Kauffman et al., 2010).	6
	Topic 1 Big Data Analytics (BDA)	[(big) data, network, connect, analytics, cloud, mobil(e)]	The terms characterizing the theme resonate with the nuances of BDA. The topic words refer to various digital technologies, for example, mobile, analytics (e.g., big data), cloud, and networking, which are imperative for the landscape of DT. The observed keywords pertain to technologies assisted by artificial intelligence linked to big data analytics (Gupta & George, 2016; Wamba et al., 2017). The DT literature advocates the role of BDA as a critical success factor in shaping digital transformation, particularly by leveraging vast amounts of data to supplement evidence-based decision-making (Dremel, et al., 2017).	8
Ends	Topic 8 Impact (Costs, Perceptions, Offerings, Markets)	[perceive(e), satisfact(ion), experi(ence), impact, media, brand, consum(er)]	This refers to the various consequences arising from the transformation. Value (re)-creation can be realized through improved consumer satisfaction, stakeholders' perception, and increased brand equity. As organizations navigate DT, they not only seek to optimize costs through streamlined processes but also influence stakeholder perceptions, fostering an enhanced and contemporary organizational image (Kane, 2016; Svahn et al., 2017). This transformative journey extends to offerings, where DT catalyzes the creation of innovative products and services (Constantinides et al., 2018). These changes reverberate through the market landscape, enabling organizations to competitively position themselves by realizing cost efficiencies, increased revenue, and growth in market share (Leischnig et al., 2017). Indeed, DT initiatives hold the potential not only to benefit individual firms but also to transform entire industries by addressing mass concerns and yielding sectoral outcomes (Agarwal et al., 2010; Leong et al., 2016).	7

Table 2. *Digital Transformation Conceptualization*

Thereby, this particular avenue for value creation emphasizes the incremental or recreation of value. ultimately delivering the enhanced benefits to the end consumers (Leischnig et al., 2017).

The third foundational element (i.e., "Means") presents an understanding of the support mechanisms for a DT endeavour and includes Topics 1, 2, 3, and 4 (Table 2). Articles representing Topic 1 embody big data analytics (BDA) that has immensely benefitted business tasks and processes. Over the years, BDA has evolved as an essential aid (Gupta & George, 2016; Wamba et al., 2017) rather than just a computational problem-solving resource (Kumar, 2021). Therefore, the observance of BDA as a constituent of DT was not surprising. Evidence from the constituent articles posits multiple viewpoints relating to BDA. First, the focus is more on architectural considerations, such as integration of different sources for gathering data from multiple touch points (e.g., social, mobile, cloud) and in varying formats (Zimmermann et al., 2015). The sources could be internal and external, and their proper storage and maintenance are instrumental. In this context, robust big data architectures are required to handle high-speed and voluminous data flow (Correani et al., 2020). Another set of scholars has considered analysis as another vital component, underscoring the importance of deriving insights and incremental knowledge from robust BDA architectures (Koch et al., 2021; Verma & Bhattacharyya, 2017). The widespread use of computational intelligence, such as data mining tools, machine learning, natural language processing, etc., for prediction and providing solutions to a multitude of problems has established the potential of BDA to drive transformational initiatives (Sivarajah et al., 2017; Verma & Bhattacharyya, 2017). BDA, in a nutshell, focuses on the business value underlying vast amounts of data, which fosters experience-based decision-making to understand profound customer experiences, anticipate uncertain demand, and prepare for sudden market change (Dremel, et al., 2017).

Concerning Topic 2, the articles describing the theme present various issues related to governance around digital transformation. The discussion broadly concentrates on the digital means (e.g., digital infrastructure), identification of groups (e.g., experts), designing the processes, and the governance structure (Dunleavy & Margetts, 2015; Kellogg, 2021; Nauhaus et al., 2021). All these, in combination, reflect the essence of digital governance, broadly understood as a framework for establishing accountability, roles, and decision-making authority for an organization's digital presence (Fitzgerald et al., 2014). Summarily, digital governance is a constitution that keeps businesses and people aligned with the evolution of digital technologies (Charalabidis & Lachana, 2020; Dunleavy & Margetts, 2015). Digital governance serves as a clear guide for various entities and actors within the complex network, enabling them to navigate their roles, exercise authority, uphold rights, and align incentives for the purpose of value creation (Constantinides et al., 2018; Gasser & Almeida, 2022).

Topic 3 concentrates on digital talent. Talent encompasses the skills, experience, knowledge, talents, intelligence, and competencies the employees need to resolve various situations and problems the organization faces (Ugboego et al., 2022). Talent is critical, the absence of the right skills is a challenge for organizations (Papagiannidis et al., 2020). The articles on the theme focus on the skill shortage, the requirements for reskilling and upskilling of talents, skill requirements, and the necessary support ecosystem (e.g., academic partnerships, curriculum, technology-mediated learning environment) to showcase the importance of digital talent and its relevance in the context of DT (Bennett & McWhorter, 2021; Herczeg, 2021; Klus & Müller, 2021; Manesh et al., 2021).

The discussion in the articles representing Topic 4 pivots around the organization. These articles aim to identify organizational-level attributes and capabilities that may facilitate DT. We can note deliberations around various capabilities (e.g., IT capability, digital platform capability, network capability) that are necessary for DT (Gasser & Almeida, 2022; Sebastian et al., 2017; Tabrizi et al., 2019). A section of reviewed articles also discusses the role of leadership and organizational structure (Matsunaga, 2021). Cultural aspects (organizational eagerness for DT, employee mindset toward change) have also garnered attention in these communications (Halpern et al., 2021; Ritala et al., 2021). Past studies highlight the instrumental role of leadership, structure, culture, hierarchy, size and age in any transformational journey (Faulkner & Runde, 2013; Riasanow et al., 2019; Tabrizi et al., 2019). In the context of DT, particular emphasis is placed on the redistribution of existing resources and capabilities (Dremel, et al., 2017; Riasanow et al., 2017).

The fourth and final foundational element (i.e., "Ends") includes Topic 8 (Table 2). The articles within this theme focus on the impact of DT, addressing the potential effects. DT contributes significantly to organizational cost efficiencies (Mufraini et al., 2020; Penco et al., 2021). By leveraging digital technologies, organizations streamline processes, optimize resource allocation, and enhance operational efficiency, ultimately leading to cost benefits (Kumar, 2021). Simultaneously, DT strategically shapes stakeholder perceptions, emphasizing improved customer engagement, relationship-building, and enriched experiences (Choi et al., 2020; Hirata, 2019; Rodgers et al., 2021). This external impact aligns with the transformative goal of creating favourable impressions and positioning organizations as customer-centric entities. The evolution of offerings is a central theme, where DT stimulates the design of innovative products and services, creating distinct value propositions aligned with market demands (Constantinides et al., 2018; Kauffman et al., 2010). Furthermore, DT's transformative influence extends to entering new markets and reshaping entire sectors, exemplified in healthcare, financial services, and education (Felgenhauer et al., 2017; Henderson et al., 2015; Kane, 2016, 2017; Park et al., 2019). The transformative impact is observable in improved health outcomes, enhanced financial access, quality education, and the potential to reconfigure geographical landscapes (Ganju et al., 2016; Leong et al., 2016). Thus, the effects of DT are profound and extend beyond economic value delivery, influencing consumers, fostering profitability, and generating incentives for all market players.

Supported by the preceding explanations and following our two-phase analysis, we offer our framework of DT (Figure 3). The framework includes four components that represent the foundational elements (Table 2) of a DT endeavour, binding the constituent themes of our conceptual framework. The proposed framework, grounded on the ET framework, addresses our research question regarding the integral elements of a DT initiative, encompassing aspects such as purpose and extent (scope), the path for value creation (ways), constituents (means), contributing to the impact (ends). Our framework integrates these essential components to describe the diverse facets that characterize DT. Our DT framework is theoretically grounded and comprehensive, offering a canvas to describe DT initiatives in practice. To demonstrate the same, we resort to a case study-based inductive approach. The subsequent section elaborates on the case and its findings to validate the sanctity of the proposed DT framework.

4.2 Framework Relevance

To showcase the relevance of our framework, we consider two cases (i.e., General Electric and Siemens AG) demonstrating divergent experiences with DT. Case studies are ideal for

examining DT in action because they enable exploration of a timely phenomenon "within its actual setting," mainly when the distinctions between phenomenon and setting are unclear or vague (Yin, 2018). A multi-case approach was taken because the knowledge obtained from replicated case studies enables comparisons, which contributes to external validity (Yin, 2018). As our focus is not on external variations, we chose these cases since they represent companies belonging to the same domain and have different approaches to DT. General Electric (GE) and Siemens represent highly diversified conglomerates, with various divisions operating in the same domain. These two companies have historically built their reputations on producing cutting-edge machinery like jet engines, locomotives, or industrial automation systems. Both are pitched as one other's rival and, as per reports, have 70% of the businesses[2].

We base our cases on published sources[3,4] supported by the company, and media reports available online. We have included the overview of these cases in Appendix D. We use the terms DT and digitalization interchangeably in our case description and analysis. Digitalization refers to the diverse socio-technical phenomena and processes that entail adopting and using digital technologies in larger organizational or societal contexts (Legner et al., 2017). The term has been often used to imply DT (Haffke et al., 2017).

For analyzing the cases, we draw on our DT conceptual framework components. Table 3 lists how our proposed framework components are manifested in the descriptions of these two cases, thereby demonstrating their relevance.

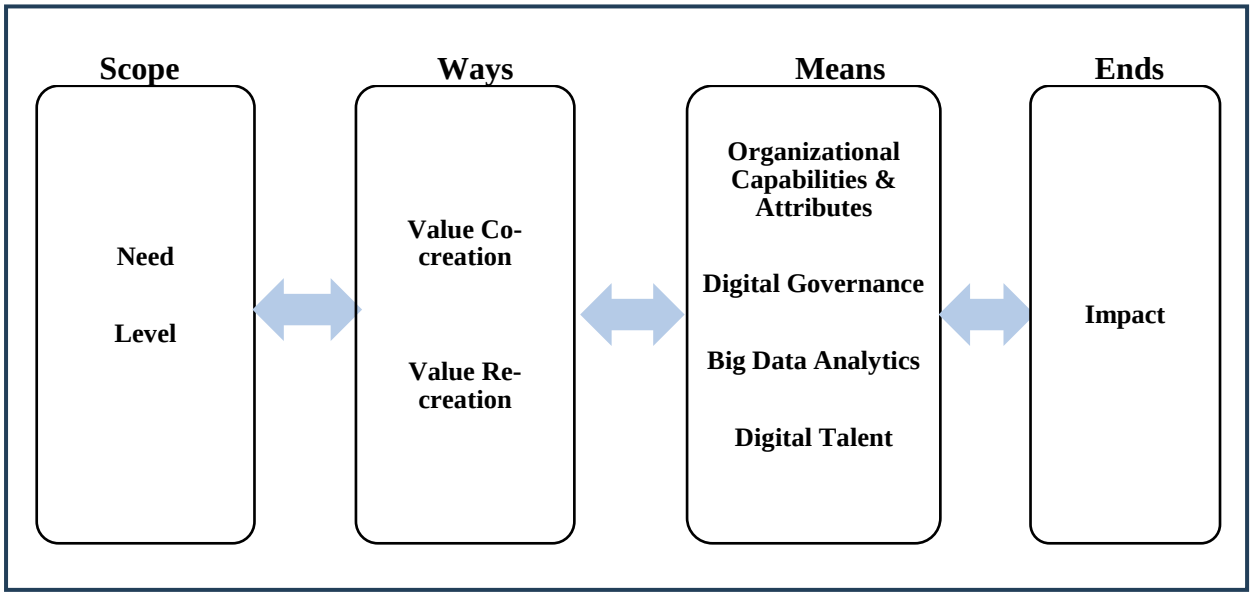

Figure 4. *Proposed Digital Transformation Conceptual Framework*

[2] https://www.economist.com/business/2016/12/03/siemens-and-general-electric-gear-up-for-the-internet-of-things

[3] Austin, R.D., & Pelow, G. (2019). *DT at GE: What Went Wrong?* W19499. Ivey Publishing (Publication Date: September 13, 2019)

[4] Collis, D.J., & Junker, T. (2017). Digitalization at Siemens. HBS No. 717-428. Harvard Business School Publishing (Publication Date: February 26, 2017)

	General Electric	**Siemens AG**
Scope	• Absence of value assessment of the proposed platform • Lack of consideration of existing deficiencies • Inadequate consideration of issues around DT scoping ambitions	• Clear delineation of DT goals • Identification of value enhancement opportunities through DT • Emphasizing DT potentials across all businesses
Ways	Roadblocks: • Absence of strategic considerations either at the business unit or at the firm level (e.g., external opportunities) • Disparate preferences of GE Digital and other business units	Thrust areas: • Focus on initiatives to strengthen different business units' contributions for co-creating value • Focus on strategic considerations with a focus on customer centricity
Means	• DT planned as a centralized initiative in a decentralized structure • Lack of relationship capital in GE Digital • Leadership displaying over-confidence • Leadership failure in visualizing the DT approach • Software getting used more as a process enablement internally • Culture hampered transparency • Dearth of pertinent talent	• Setting up of divisional organizational structure tailored to customer groups • Shifting of DT ownership to divisions • Establishing a committee to oversee DT • Visible leadership commitment • Software platform, enabling advanced analytics towards leveraging the potentials of Internet of Things • Establishing a digital culture • Talent acquisition strategies focusing on desired competencies through necessary alliances
Ends	• Focus on short-term gains • Inadequate customer perception • Inadequate appreciation in market of industrial internet's potential	• Realization of cost benefits and growth opportunities • Consolidation of the company's image • Tapping growth opportunities through a customer value-focused approach

Table 3. *Evidence from the Cases*

General Electric: A DT initiative needs to have a clear and consistent focus from the onset. This should involve identifying value deficiencies and opportunities having the potential for value creation. In the absence of a similar focus, for large conglomerates like GE, a DT can quickly become overwhelming. GE rolled out its software platform Predix intending to develop one common platform for all its business units. The platform was created to assist in networking, managing, and analysing enormous volumes of data gathered from industrial devices to assist with the automation of processes. GE did succeed in digitizing and automating several of its business processes. However, harnessing potential opportunities where operations are reinvented, flaws are addressed, and a new, digital-first business model is supported, remained out of reach. Clearly, GE lacked proper planning regarding DT. As per reports, the effort was driven solely by monetary considerations and not from the pain points in the existing offerings.

The scope of GE's digital ambitions was very apparent when the company set up GE Digital as its own business within the industrial conglomerate to propel its DT initiatives. GE Digital aimed at centralizing all of the IT operations of the company. Even though GE Digital was meant to substantiate the firm's data analytics resource(s) and present General Electric as a more technology-oriented enterprise, the objectives of the other business units (e.g., GE Power

(wind turbines), GE Aviation (jet engines), GE Transportation (railroads), and others) were strikingly different. Despite the grand aims, the Predix software mainly served as a platform to promote internal initiatives. The various business units, led by the respective CEOs (i.e., chief executive officers), had different IT requirements to be supported. Hence the efforts were less about business transformation and appeared more as IT-enabled process improvement. More importantly, the external opportunities did not get the required attention since most of the revenue was realized from existing markets and channels.

Despite significant expenditures and best-in-class people, GE struggled with digital efforts owing to the imbalance between the business demands and capabilities. GE had a decentralized governance structure, while the digitalization initiative was planned as a centralized, top-down initiative of GE Digital. This implied that a decentralized structure within GE needed to operate in a new coordinated manner. There were, thus, both mismatches and deficiencies at multiple levels. The CEO in charge of DT displayed more overconfidence around the planned initiatives. This spawned a culture in which the employees believed that the CEO did not want to hear discouraging reports; thereby, the actual problems around the transformation initiative got suppressed.

Additionally, GE created a massive organization that was not yet necessary rather than tasking a small team to create the best product and then allowing the operation to grow with the product's evolution. The leadership hurried through the transitional effort for which the company was unprepared. Adding to the concern, GE Digital lacked relationship capital with the rest of GE. Roughly GE Digital had only 2% of employees who had worked in other business units of GE, which acted as a bottleneck while rolling out the Predix platform in other units.

There needed to be more internal resources and capabilities to support the transformation initiative. GE needed to acquire new technical and analytical capabilities. It also required strategic alignment and proper planning for the DT initiative. All these requirements proved a burden for the company in the face of a hurried transition effort.

Customer perceptions regarding GE's digital initiative were not very bright. The majority of GE's stakeholders had trouble understanding its proposition. GE's market offerings suffered a hit in the absence of organizational readiness of the customer organizations. A vast majority of GE's consumer base did not appreciate the potential of the industrial internet and hence failed to realize the value of the offerings. Simultaneously, GE Digital placed more importance on profit and loss accounts and made quarterly commitments on performance. This constrained the organization to short-term objectives that failed to contribute any significant value to the company's mission.

Siemens AG: From the onset, Siemens made clear the core objectives driving the DT initiative. Vision 2020 had clearly identified goals such as a cost reduction of €1 billion and creating sustainable value with a targeted Return on Capital Employed of 15-20%. Further goals were set for a twenty-percentage improvement in the company's "Net Promoter Score" and a seventy-five percent "approval rating" in terms of "leadership and diversity" in an engagement survey to increase the company's brand image. Driven by these objectives, the management at Siemens was early to recognize the opportunities digitalization can bring to the company. For example, focusing on the service component of all its businesses, and with access to data from all machines, maintenance can be predictive (rather than scheduled), thereby contributing to machine uptime improvement and the resultant gains.

The digitalization at Siemens was a decentralized initiative. The digitalization initiative focussed on encouraging all its businesses to innovate critical digital services and to support the development of a shared platform. The key to this initiative was to motivate all business units to collaborate and incorporate new technologies for combined value creation and crafting competitive advantage in each business. The different businesses of Siemens leveraged the industrial cloud-based data platform MindSphere[5], allowing these units to develop specific components that addressed their problems. Hence, the internal initiatives concentrated on how the different businesses with Siemens took advantage of the digital offerings to their benefit. The external opportunities were also explored around value creation, combining its knowledge about the customer needs in various industries, such as railroads.

The digitalization initiative at Siemens was supported at various levels. From the organizational perspective, Siemens followed a new structure, where the organization was split into nine divisions, each serving distinct customer groups. To streamline the digitalization efforts, a committee was set up, which consisted of the chief technology officer as the official leader of the initiative and the different divisional CEOs. The committee met regularly and evaluated the progress various divisions made in their digitalization initiatives. This shifted the ownership to all divisions responsible for driving their digitalization efforts.

The leadership commitment to the digitalization effort at Siemens was noticeable. The CEO summits were launched and planned bi-yearly to raise awareness among its employees regarding how these developments would impact the various businesses. The annual strategy review was undertaken to keep the business units accountable for the digital plans. This ensured that the corporate strategy focused on the priorities and contributed to the divisions' core strategic direction. Culturally, the shift was meant to transform from being a “family” that provided “lifetime employment” to becoming a "sports team" with a shared identity, where members could be replaced if they did not deliver. The interactions among the digitally-oriented top executives also helped to establish a digital culture within Siemens. Siemens also planned its resource acquisition strategies as it sought to incorporate digitalization. The company's biggest challenge was finding people with analytical skill sets and business acumen. The company also developed partnerships with several universities to attract the necessary talents in the required realm.

Siemens's initiative focused on customer relationships and concentrated on creating value for the customers. One of the top priorities of the digitalization initiative was to improve efficiency.

Siemens also realized cost benefits through its Industrial Data Analytics initiative, catering to the entire industry. These developments enabled Siemens to effectively expand into and capitalize on new growth opportunities and eliminate those areas that were no longer carrying their weight. In this manner, Siemens regained its position as a top industry player and significantly outperformed its competitors in agility, resilience, and profitability.

The above elaboration of the two implementation examples in Siemens and GE helps us realize the importance of the various elements of the DT conceptual framework. Focusing on the scope,

[5] https://plm.sw.siemens.com/en-US/insights-hub/start/

the opportunities for DT stem from the very purpose driving such initiatives. The above delineation portrays a lack of value considerations at GE, while the initiative at Siemens attended to the opportunities and remained grounded on the purpose driving the initiative. Digital transformation at GE was primarily confined to business units; however, the planning had shortcomings. At the same time, Siemens' initiative was more balanced in terms of both unit-level focus and firm level considerations. The pathways to GE's digital ambition encountered hurdles, marked by the absence of a strategic emphasis and visible incongruency between GE Digital and the business units. These impediments significantly constrained GE's approach to DT. In contrast, Siemens crafted a roadmap for DT that prioritized initiatives to strengthen various business units' contributions, coupled with an emphasis on strategic considerations centred around customer experience and expectations. Leveraging these factors, Siemens adeptly drove their DT efforts. The end results showed more promise for Siemens as the case records.

5 Discussion

To the curious mind, the familiarity with the rich and diverse literature might lead them to ponder what exactly DT is. As selected commentaries have pointed out, assuming that DT is distinct while lacking a conceptual foundation puts us at risk of recreating the wheel that is devoid of a transparent and unique implementation proposal (Nadkarni & Prügl, 2021; Wessel et al., 2020). Accordingly, this article establishes two objectives for examining the foundational elements of DT: first, to establish a theoretical perspective and second, to recognize the foundational elements. Driven by these objectives and following a two-phase literature synthesis, our study culminates into a DT conceptual framework. Further validation is achieved through multiple case analyses to add clarity and offer a reference basis to understand, discuss, or even compare the phenomenon.

The proposed DT conceptual framework extends the ET framework on which it has been grounded. Our analysis posits "Ways" as a new dimension relevant to understanding the DT phenomenon. Ways represent the choices or the initiatives that may enable an enterprise to direct its digital transformation efforts. Broadly, this resonates with the strategic initiatives around a DT endeavour. As our findings portray, DT offers a distinct roadmap on value co-creation and re-creation; nevertheless, this viewpoint has never been emphasized in the extant literature. Value co-creation centres around innovative solutions that tap into growth and potential opportunities. Through the integration of innovative technologies, DT fosters ecosystems where various entities collaboratively contribute to and benefit from value co-creation. Platforms and interconnected systems play a pivotal role in this, transcending industrial boundaries and facilitating the convergence of diverse stakeholders. Value re-creation, on the other hand, emphasizes incremental innovation for enhanced benefits. This may involve a comprehensive transformation of functions and processes, resulting in the redefinition of practices or offerings to foster further value generation. These emphases on value co-creation and re-creation also allow us to position DT uniquely. The core of DT resides in generating value through specific pathways, establishing it as a strategic initiative. This sets DT apart from other initiatives, primarily focusing on creating value in isolation.

Based on the synthesis of the extant literature, our framework offers scope to discuss its relevance to the extant knowledge base. As previously mentioned (Section 2), we note several process models and frameworks in the literature around DT (e.g., Hanelt, et al., 2021; Mergel et al., 2019; Nadkarni & Prügl, 2021; Vial, 2019; Warner & Wäger, 2019), each shaped by its

respective objectives and examination lens. For example, the DT framework offered by Vial (2019) emphasizes technology as the "means" while remaining silent on other organizational attributes such as governance. Furthermore, specific strategies are indicated but lack considerations of pathways that generate value.

Our results are also consistent with some seminal contributions examining the notion of DT. For example, Vial (2019) also outlines the broad components for understanding DT as a phenomenon. Our framework structure also resembles commonality with the DT definitional components (Mergel et al., 2019) and includes the necessary themes that have already received importance in the extant attempts around DT nature and conceptualization (Riasanow et al., 2019; Warner & Wäger, 2019; Wessel et al., 2020). Our distinction from these presentations lies in our explicit consideration of value generation mechanisms, specifically focusing on value co-creation and re-creation, as emphasized earlier. This differentiation is achieved by adopting a transformational perspective grounded in the ET framework.

In addition, the structural aspects of the framework also warrant a mention. First, we compare the proposed framework with the ET framework (Figure 1) in terms of the common dimensions: scope, means, and ends. Focusing on the scope dimension, the DT framework includes the primary elements as the need (symbolizing opportunities for DT) and the level (indicating the purview of DT). "Need" emerges as a new entry in the context of the DT framework, signifying opportunities determining the level of DT. Contrasting the "scope" dimension of the ET framework, the purview of DT is much broader, extending beyond organizational boundaries. Focusing on "means", this dimension echoes the importance of the current digital shifts. The underlying elements: Digital talent, big data analytics, and digital governance make these preferences explicit while relating to skills, technology, and processes characterizing the ET framework. The remaining element of the proposed DT framework, i.e., organizational capabilities and attributes, demonstrate organizational preparedness for driving DT. This also serves as the basis for formulating the strategy, representing the remaining element within the means dimension of the ET framework. Finally, our findings concerning the "ends" are identical for both the frameworks. The topic words co-existed in our case, alluding to costs, perceptions, offerings, and markets. Consequently, we have designated this element as impact, encompassing these effects of DT.

We also focus on the importance (as rank) of the themes from Table 1 (column 5) results. The strategic relevance of DT is already recognized by the corporates, and the perceptions are similar within academia. Based on our results, we observe that topic 6 (value co-creation) emerges as the most prevalent (i.e., Rank 1). This further reinforces that DT is about developing collaboration and networks as part of strategic initiatives by leveraging digital technologies (Tabrizi et al., 2019; Vial, 2019; Wessel et al., 2020).

Next, we observe that topic 5 (need, level), signifying the scope, occupies the second seat of prominence (i.e., Rank 2) in the DT literature. The theme delineates the span of DT by highlighting opportunities, prompting firms to innovate or adapt in challenging times (Kumar, 2021). This is attainable by leveraging the opportunities for value co-creation, further corroborating the importance of the two themes (i.e., Topic 5 & 6) in unison.

Topic 4, signifying organizational capabilities and attributes, follows the third rank. Previous literature and the underlying theories have conceptualized DT as another synonym for strategic change or renewal, thereby highlighting the intangible aspects as support mechanisms for DT. The theme points to management preferences, which are critical to a DT

endeavour, such as redistribution of resources, leadership roles, etc. as corroborated in the extant literature (Gasser & Almeida, 2022; Sebastian et al., 2017; Tabrizi et al., 2019). In addition, there is a need for a delicate balance of structure, culture, and people (Imran et al., 2021; Sia et al., 2016) to drive the DT endeavour, which also gets emphasized through the keywords characterizing the theme.

Along with the leadership approval, the execution of a DT endeavour rests on the associated workforce's mindset and skill (Boneva, 2018; Ivančić et al., 2019). Topic 3 (digital talent) thereby emerges as the next (i.e., Rank 4) in order. Given that DT involves fundamental changes, openness to training, learning, and flexibility to adapt are pivotal for implementing the changes within an enterprise (Ossiannilsson, 2018; Trenerry et al., 2021). The importance of employee-specific skills in managerial and non-managerial roles is already established, and digital talent has started gaining attention around the DT phenomena (Kim et al., 2020).

The prominence of topic 1 (big data analytics), representing specific digital technological aids, is observed to be the least. While surprising, this result can be explained by the hygiene and motivational factors relevant to stakeholders driving the transformation. As per the "two-factor motivation theory," also commonly called "Herzberg's motivation-hygiene theory" (Herzberg, 2018), the hygiene factors correspond to elements that do not contribute to satisfaction or motivation concerning the tasks at hand, whereas the motivating factors lead to satisfaction. Digital technologies serve as the vehicle for the transformation and hence might have been viewed, from the transformational context, as the bare minimum needs (i.e., hygiene). Our study thus underscores BDA as an indispensable landscape for successful DT endeavors (Kane, 2017; Tabrizi et al., 2019; Westerman et al., 2014).

6 Conclusion

6.1 Summary

The importance of DT in the present context is absolute. Given the proliferation of its significance, the quest for clarity on the phenomenon is indispensable. Nevertheless, the popularity of any field is coupled with the challenge of falling apart (Er, 1988; Kumar & Thakurta, 2019). Thus, owing to a shared understanding of DT in the extant literature, it is essential to clarify its foundational elements. Accordingly, the article adopts a transformational perspective, using the lens of the ET framework to examine DT based on our research question. Our examination resorts to a two-phase synthesis of the extant literature around DT, involving a quantitative text-mining approach in the first phase, followed by qualitative content analysis in the second phase. Results based on the combined inquiry allow us to propose the DT conceptual framework to explain DT and satisfy the research objectives.

6.2 Contributions and Limitations

The work makes contributions to both theory and practice. First, the primary theoretical contribution is the theory-grounded framework that we offer in this piece, which is expected to serve as a notable contribution to the body of knowledge around DT. The framework comprising four foundational elements assists in reducing the intricacies of the phenomenon by offering a tangible directive. Second, our framework differs from other DT frameworks by explicitly considering the (enterprise) transdisciplinary and transformational viewpoint, which is missing in the extant contributions. Third, the proposed framework extends the ET framework on which it is grounded by incorporating a new dimension (i.e., ways). This

addition reinforces the strategic nature of the phenomenon, emphasizing the significance of specific choices and initiatives within an enterprise's DT journey. The added dimension enhances the framework's ability to capture and guide strategic efforts in the complex landscape of DT initiatives. By offering this conceptualization, we are further able to offer a narrative to supplement the phenomena from a governance point of view. Indeed, as the preceding discussions have revealed, several of the extant notions of DT have failed to clarify the importance of roles, responsibility, authority, and ownership of various entities involved in the transformational endeavour. We earmark digital governance as a crucial aspect that will regulate and govern collaborative practices in the digitally advanced ecosystem.

Through clarifying the nature of DT, our study assists managers in anticipating the complexities enveloping a transformation journey. Irrespective of the transformational objectives, the goal has been mostly to leverage digital technology in redefining their value propositions and identities. This further has implications on how to organize for transformation. Our study findings suggest that strategic considerations are supreme, and transformation endeavours must also be value-driven. Thereby managers need to have clarity on the strategic motive and value propositions as part of planning for DT. A key consideration would be defining the role of BDA in the transformation process since we observe from our findings that they are perceived as hygiene factors in the DT landscape. Consequently, recognizing and leveraging these crucial resources aligned with strategic imperatives is the central element in pursuing DT.

Our proposed conceptual framework can serve as a DT implementation guide for the practice. Before planning and investing, managers should carefully evaluate the need for any such change. Moreover, the exploration of needs would further help ascertain the DT's purview. The findings indicate that the constituents of a successful DT are the firm's ability to organize and manage its intangible assets, particularly its structure, culture, networks, and other managerial attributes. One may interpret that increased utilization of organizational resources towards planning a digital governance protocol while simultaneously leveraging BDA will be among the critical success factors for a DT initiative.

Like all research works, this study is also not free from limitations. The framework proposed here is not of a universal kind but presents a transformative perspective of DT. This viewpoint is expected to guide its subsequent usage in academia and practice. There are also methodological limitations resorting to how we have made choices while employing the text mining approach (e.g., focusing only on the journal publication) while synthesizing the DT framework. We also admit a few limitations around our qualitative examination where the existence of selection bias (in terms of shortlisting articles for review) and confirmation bias (in terms of the tendency of adherence to phase 1 results) cannot be ruled out. We acknowledge that ongoing developments in the field of DT may introduce emerging phenomena not captured in our results. However, these aspects can still be mapped with the framework elements due to their generic presentation. Our study is also silent on the interrelationships of the various themes unveiled within the DT scholarship. Therefore, investigating the interrelationships among these different themes requires further exploration, particularly the orchestration of all four constituents enabling DT.

6.3 Future Research

Apart from attending to some of the possibilities identified in the content and addressing the limitations documented above, the study motivates scholars of related disciplines to pursue

research on the specific foundational elements: scope, ways, means, and ends describing a DT endeavour. There is also enough room to extend our offering of the DT framework. Future inquiries can focus on developing testable hypotheses around our framework by envisaging the links within the foundational elements towards the ends (i.e., impact) and thereby quantifying its relevance to academia and practice. Continuing in this direction, it may also be possible to propose an explanatory theory on DT following theory development guidelines (Gregor, 2006; Swanson et al., 2013). Other explorations can extend our contribution by offering propositions around various linkages between some of the integral constituents: organizational, human, and BDA leading to planned goals and examining these. Furthermore, the sanctity of digital governance would also help formulate and align a digital strategy focusing on value co-creation and re-creation. Having digital governance in place would involve several important constituents adhering to a digital strategy. In this realm, further inquiries are warranted to uncover the planning or emerging nature of a digital strategy. Future studies can explore the nature of formulating the digital strategy for existing vis-à-vis new firms.

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