ORGANIZING IN TECHNOLOGY AND INNOVATION MANAGEMENT TO SUSTAIN DIGITAL TRANSFORMATION: A LONGITUDINAL CASE ANALYSIS

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ABSTRACT

Digital Transformation (DT) introduces new challenges and opportunities to which traditional business leaders must respond promptly by nurturing the development and the interplay among three microfoundational components: organizational structures, procedures, and individuals. We explore the dynamics established among these three components through a 3-year long, longitudinal case study on an incumbent firm during a digital transformation path. Our findings support a progressive approach to organizational change in which standardization and centralization enable complex relational models capable of unleashing the potential of digital technologies. Scientific and empirical implications are discussed.

Keywords*: Digital Technology, Digital Organization, Digital Transformation, Microfoundations, Technology and innovation management*

1. INTRODUCTION

Although Digital Transformation (DT) is widely discussed into the literature (Hanelt et al., 2021; Vial, 2019), there is still limited understanding on how unfolding its potential (Warner and Wäger, 2019). Considering its complex nature, as a multifaceted and multidimensional phenomenon (Appio et al., 2021), DT can open a plethora of opportunities and demands, which companies have to tackle thoroughly.

The diffusion of digital technologies results into an ever-increasing pressure to manage a more complex, interconnected, and information-rich environment (Correani et al., 2020), forcing companies to continuously experiment new organizational forms (Marchese et al., 2023) aiming at facilitating cooperation, distributing decision-making, and employees' empowerment (Schwer and Hitz, 2018; Kretschmer and Khashabi, 2020; Verhoef et al., 2021; Mustafa et al., 2022). In line with others literature studies, changes in organizations to sustain DT must involve the repositioning and enhancement of positions dealing with technologies, especially ICT (Capitani, 2018; Singh and Hess, 2017).

In this scenario, it is unclear how and when organizational changes can occur at various levels (firm, processes, and individuals) (Felin et al., 2012). Then, the aim of this work is to investigate how an incumbent complex company should provide strategic relevance to the organizational elements (organizational structures, processes, and individuals) which sustain DT.

To analyze the case with a longitudinal perspective, a Microfoundational approach (Foss and Linder, 2019) was chosen for two reasons. First, it provides an original and in-depth perspective on DT from an organizational standpoint, searching for signs and clarifications at lower levels that can corroborate the explanations at macro-level and advance knowledge in this field (Felin, Foss, and Ployhart, 2015, Coleman, 1990). Second, the approach is appropriate since it is supported by a significant background of studies on capability development in several fields surrounding DT (Schneckenberg et al., 2015;

Scuotto et al., 2020), with just a few contributions concentrating directly on the phenomenon.
Following the microfoundational approach, our findings explore the role of individuals, processes, and organizations as enabling components of DT. The findings are summarized in propositions, which seem to suggest that a gradual approach to minimizing disruptions and ensuring business continuity would be appropriate during the beginning phases when there is no clear authority of DT function within the organization. As the firm starts to recognize the value of DT and its corresponding benefits, more radical initiatives might be implemented, with a focus on standardization and centralization to control increasing complexity.

2. THEORETICAL AND EMPIRICAL BACKGROUND

DT has become a key element in the strategic agendas of companies over the past decade (Matt, Hess, and Benlian, 2015) given the high potential it can bring to the business by altering how value is created (Fitzgerald et al., 2014) or captured. Furthermore, companies driven by the idea of obtaining a competitive advantage through the introduction of new technologies (Correani et al., 2020; Lanzolla et al., 2020) have sparked interest in this domain, significantly expanding the construct's boundaries. Several lenses can investigate the DT, creating a kaleidoscopic scenario where the DT appears differently depending on the angle, making it challenging to define it extensively and consistently. This gap has been considered by several authors who have tried to frame this concept (Warner and Wäger, 2019; Vial, 2019). Hanelt et al. (2021) performed an additional extensive literature review enhancing the perspective of organizational change and defining DT as an "organizational change that is triggered and shaped by the widespread diffusion of digital technologies". Verhoef et al. (2021) address the gap in IS literature from a multidisciplinary perspective. The authors named DT as "a change in how a firm employs digital technologies, to develop a new digital business model that helps to create and appropriate more value for the firm" (Verhoef et al., 2021). Recognizing the disruptive impact of digital technologies, this approach broadens IT-related transformation focus to encompass all business infrastructures, moving beyond IT strategies and towards a comprehensive digital business strategy (Matt, Hess and Benlian 2015). Organizations must adapt to change by enabling new business models and digital capabilities through structures, processes, and individuals, enabling new digital capabilities (Svahn, Mathiassen and Lindgren, 2017; Warner and Wäger, 2019). The proximity of DT to corporate strategy (i.e. corporate strategy) via the digital transformation strategy (Matt, Hess, and Benlian 2015) has led to the phenomena being discussed through a predominantly strategic lens. DT influenced by external scenarios, organizational evolution, evolving empirical reality. This limits the ability to generate solid propositions from existing theoretical models (Whetten, 1989 in Hanelt et al., 2021). DT has various implications for organizational structure; nevertheless, empirical research on organizational structure within digital companies is fragmented in literature.
Repositioning ICT functions and skills within companies is crucial for facilitating digital innovations, maximizing possibilities, and improving overall performance. This involves expanding scope beyond traditional operations and systems (Matt, Hess and Benlian, 2015; Corso et al., 2018). More specifically, the ICT function must widen its role, shifting to a proactive and orchestrator role capable of enabling the generation of value for the business (Leonhardt et al., 2017). ICT employees are expected to be proactive and business-savvy, supporting business development and high-value projects.

In summary, organizational changes to support DT encompass an evolution in the importance and positioning of the functions that manage technologies - primarily ICT, but also Digital and Innovation fields are covering progressively important positions (Rizzo, 2018; Capitani, 2018; Singh and Hess, 2017) - which calls for the development of new skills and novel solution to enable cross-divisional cooperation. Uncertainty exists regarding organizational changes at various levels, including firm, processes, and individuals, and their sustainability in incumbents. To understand this, it is crucial to understand how traditional, complex incumbent firms can provide strategic relevance to elements supporting digital transformation at different levels.
As anticipated, based on these premises, this paper aims to open the black box with a microfoundational approach and provide an empirical and exploratory view on the organizational change underlying the DT path.

2.1 MICROFOUNDATIONAL APPROACH

This paper uses a micro-foundational approach to understand the evolution of a company's organizational scenario through alchemy and interactions between individuals, processes, and structures. This approach provides an in-depth perspective on the DT phenomenon, tackling the fundamental problem of unobserved mechanisms (Coleman, 1990). Microfoundational movement (Barney and Felin, 2013) focuses on explaining social phenomena by examining how micro-level factors influence collective outcomes and macro-level relations through micro actions and interactions.

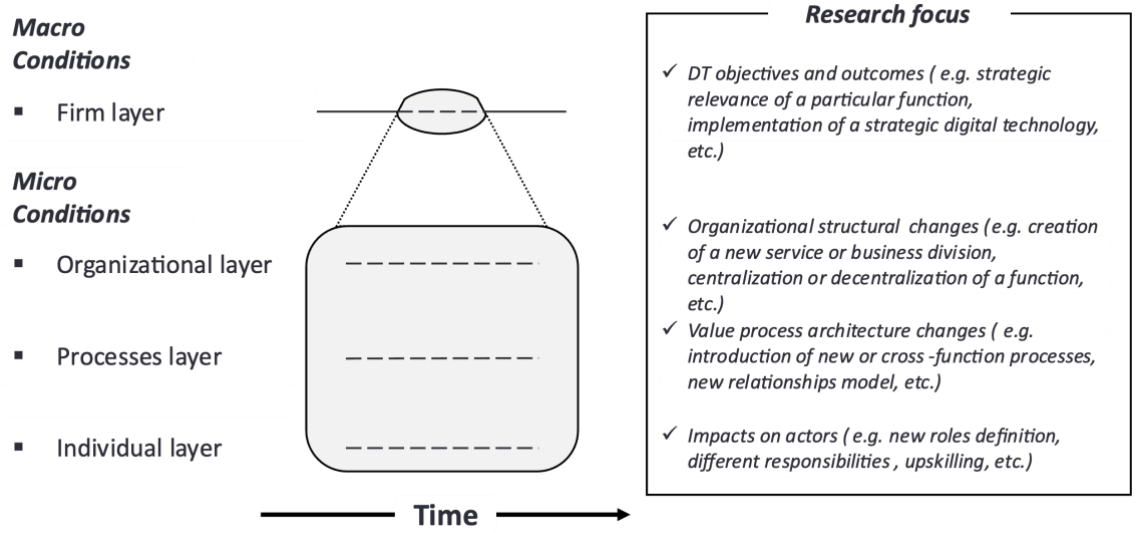

Figure 1. Microfoundational approach applied to research framework

While numerous research using a micro-foundation lens has investigated capabilities development in fields like innovation (Schneckenberg et al., 2015; Scuotto et al., 2020), few studies are directly focusing on DT (e.g. Scuotto, et al., 2022; Sousa-Zomer, Neely and Martinez, 2020; Ellström et al., 2021). This study aims to address this gap by examining the development of capabilities in various fields. On this basis, Figure 1 represents the research framework employed in this contribution, which intends to investigate the macro condition (DT objectives) with a set of micro-conditions elements (organization, processes, and individuals).

3. METHODOLOGY

This research is a longitudinal case study (Yin, 2003; Eisenhardt, 1989) focusing on incumbent companies that have taken significant DT initiatives to adapt and survive in a rapidly changing environment influenced by technological progress. A qualitative approach was chosen to better understand the subtle aspects of this multifaceted and constantly evolving phenomenon (Eisenhardt, Graebner and Sonenshein, 2016). The study focuses on a large national industrial company with multiple subsidiaries, primarily related to transportation services, which has been on the market for over 30 years and has been significantly impacted by technological progress. The selected company faces complex relationships with various sub-companies, requiring coordination to achieve strategic objectives. The Holding, Group Digital Company (GDC), and other companies are central to the analysis, as they have tried to support the DT in recent years through processes and organization.

3.1 DATA COLLECTION

The research examines digital transformation through organizational documents, interviews, focus groups, and public information. It conducts market studies to understand the macro-level ecosystem and triangulates data for robust results (Yin, 2003). The analysis aims to corroborate and enrich discussions on digital transformation strategies. An overview of the interviews and focus group conducted during the investigation is represented in Table 1.

ID	N° of respondents involved	Type of investigation	Company Role / Position	Duration (min)
INT_22_01	1	SMI	Sourcing, Sustainability & Risk	60
INT_22_02	1	SMI	Finance & Administration	60
INT_22_03	1	SMI	Business Unit	60
INT_22_04	1	SMI	Internal Audit	60
INT_22_05	1	SMI	Legal & Compliance	60
INT_22_06	1	SMI	Sourcing Transition & Integration	60
INT_22_07	1	SMI	Business Unit	60
INT_22_08	1	SMI	Business Unit (Corporate)	60
INT_22_09	1	SMI	Business Unit	60
INT_22_10	1	SMI	Business Unit	60
WS_22_01	6	FG	L2	120
WS_22_02	6	FG	L2	120
WS_22_03	6	FG	L2	120
WS_22_04	5	FG	L2	120
WS_22_05	12	FG	L2	150
RI_23_01	1	RI	DT PJT	120
RI_23_02	1	RI	DT PJT	60
RI_23_03	1	RI	DT PJT	45

Notes
Type of investigation: Semi-structured Interview (SMI); Focus Group (FG); Retrospective Interview (RI)
Company Role/Position: Second-level hierarchical reports (L2); DT Project Manager/Project Committee (DT PJT)

Table 1. Primary data source

Data collection involved 50 people directly impacted by DT initiatives. A semi-structured interview with GDC's top management members was conducted in 2022, the year in which the greatest implications in terms of organizational change occurred[1], examining their perspectives on organizational change. Interviews and workshops examined the benefits, advantages, impacts, and constraints of new organizational structures. Focus groups discussed roles, strengths, weaknesses, and improvement areas. Project representatives were interviewed retrospectively and follow-up to clarify technological, innovation, and digital management changes since 2018. To avoid informant bias, interview partners are selected from various departments and levels within the organization (Eisenhardt and Graebner, 2007), and questions are left open-ended. This reinforces the evidence base (Leonard-Barton, 1990).

3.2 DATA ANALYSIS

The interpretation phase involves constructing a case history (Eisenhardt and Graebner, 2007) and describing the organization's evolution over time. This helps in elaborating the main pattern of changes, based on evidence from interviews, press, and company documentation. Interviews and focus groups revealed relevant information, with over 100 evidences[2] extracted from detailed meeting notes. This data enables coding analysis, enriching findings by integrating objective data on changes in processes and organizational conformation with individuals' perceptions, supporting a multi-level analysis approach.

Finally, the analytical process has been iterative (Burt & Lin, 1977; Gioia, Corley, and Hamilton, 2013; Langley, 1999; Livijn 2019), to obtain more robust conclusions. Foss and Linder (2019) suggest a microfoundational lens for analysis, identifying macro-level elements and their relationships with micro-levels for each phase, and discussing antecedents and outcomes across phases (thus producing a multi-stage diagram, such as in Linder and Foss, 2018).

4. CASE ANALYSIS

4.1 COMPANY CONTEXT AND "CASE FOR CHANGE"

The holding company[3] oversees multiple subsidiaries providing various services. Since the end of 2018, the Company has been transforming radically its ICT structures in order to stay ahead of the technological market's evolution (Genzorova, Corejova, and Stalmasekova, 2019; Matt, Hess and Benlian, 2015; Corso et al., 2018) and foster the gradual shift of ICT's roles toward higher centrality regarding the business. The Group's motivations for investing in the DT have evolved over time, focusing on three main elements: cost efficiency, ICT's role empowerment, control of external funding for development.

[1] Referring to the "Strategy Centralization" phase, as discussed in the paragraph 5.2.4.

[2] By "evidence" we mean an element capable of enriching the discussion, which can be compared to a short quote.

[3] Also referred to as "Holding" or simply "the Company" to distinguish it from subsidiaries or affiliates or simply "Group companies" (GCs). The term "Group" is used in a broader sense to express the general response of the company regarding particular decisions (for example, when addressing "Group transformation", we include both the Group Companies and the Headquarter).

4.2 GROUP TRANSFORMATION PATH

The paragraph outlines the evolutionary phases of the Group's ICT structures (Figure 2), focusing on organization, processes, and individuals, to understand its transformation. The analysis aligns with the research framework and objectives.

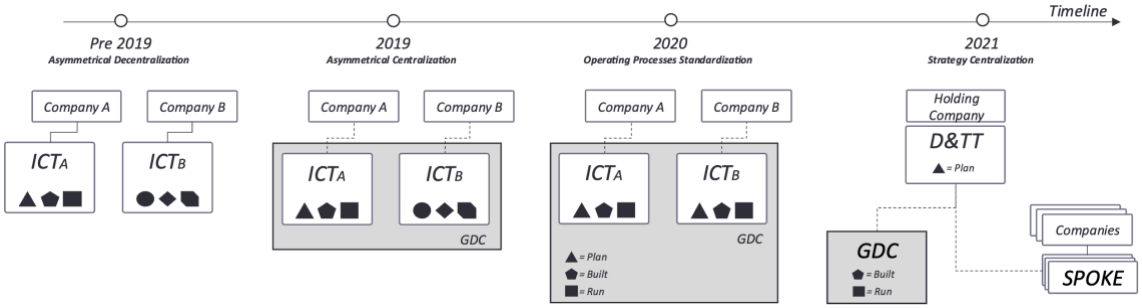

Figure 2. Group transformation path

4.2.1 PHASE 1 - ASYMMETRICAL DECENTRALIZATION

The Group presented diverse ICT structures for each firm before launching the transformation process. The internal organization was heterogeneous, evolving to meet business needs without considering other companies' organizational choices. Furthermore, there was no "widespread awareness" among managers of the benefits and limitations of the initiatives implemented, thus limiting the cross-company learning opportunities (Venkatraman, 1994). The company lacks shared operational standards and heterogeneous company composition. ICT structures support operations but are misaligned and company-centered. Services primarily focus on problem-solving, with ICT supporting business continuity. There are no significant relationships with other functions or external entities, and low investment in skills and resources is involved in projects without proper planning.

4.2.2 PHASE 2 – ASYMMETRICAL CENTRALIZATION

In 2019, the Group choose to establish a single legal company (GDC) and consolidate all the firms' ICT structures into it. GDC was established as a company that provided services to reference companies, maintaining the internal organizational structure of each company. This centralization of processes has increased the Group's technological position and increased awareness of its technological position. The appointment of a Chief Executive Officer for GDC to advance technology highlights the importance of a larger, cross-functional picture beyond a single business unit. The company's internal organizational structure remains unchanged, ensuring business continuity and varying between companies. During this phase, individuals were valued based on their existing skills, no specific change management actions were detected, and resistance was avoided by reallocating structures with the same organization and hierarchical manager.

4.2.3 PHASE 3 - OPERATING PROCESSES STANDARDIZATION

In 2020, the Group redesigned the GDC organizational model into Service Lines, aiming to provide order and organizational interdependencies across functional lines. During this phase, the most significant change came at the processes level, which were standardized according to the ICT common professional standard ITIL. A symmetry in terms of structures and processes was established through the standardization of all GDC structures and the implementation of a single operating model to enable comparisons and areas of synergy, recognizing the role of the ICT for value creation but also that of potential cost efficiency. The phase focused on existing skills, reallocating individuals

based on their performance rather than growth potential. The new operating model was deployed as part of a change management initiative to facilitate the GDC transition.

4.2.4 PHASE 4 - STRATEGY CENTRALIZATION

Beginning in 2021, a new "Chief Digital & Technology Transformation" (CD&TT) role was established at the holding level, with responsibility for the digital, other technologies, and innovation perimeters. The new position focuses on perimeter management and establishing a professional family at the holding level, focusing on digital transformation, separating strategic and governance processes from GDC, and centralized digital strategy definition and cross-company solutions planning. The step involved defining a single technology strategy at Group level, re-directing innovation activities for value generation, and converting GDC from a Strategy and Governance function to a "Digital Factory" (Iansiti and Lakhani, 2020) for Group service.

As a result of these changes, the company designed a new operational and relationship model between subsidiaries and the Holding in 2022. The model focuses on a federated "Hub & Spoke" model, defining the relationship between Holding and Companies, ensuring consistency with strategic plan objectives, and reducing delivery times. The Digital & Technology Transformation (D&TT) structure monitors technology, innovation, digitization, data governance, and common platforms, while GCs submit project initiatives and execute vertical "Operational Technology" projects.

In summary, a relationship is defined among the three organizational entities (D&TT, GCs, GDC) as represented in Figure 3.

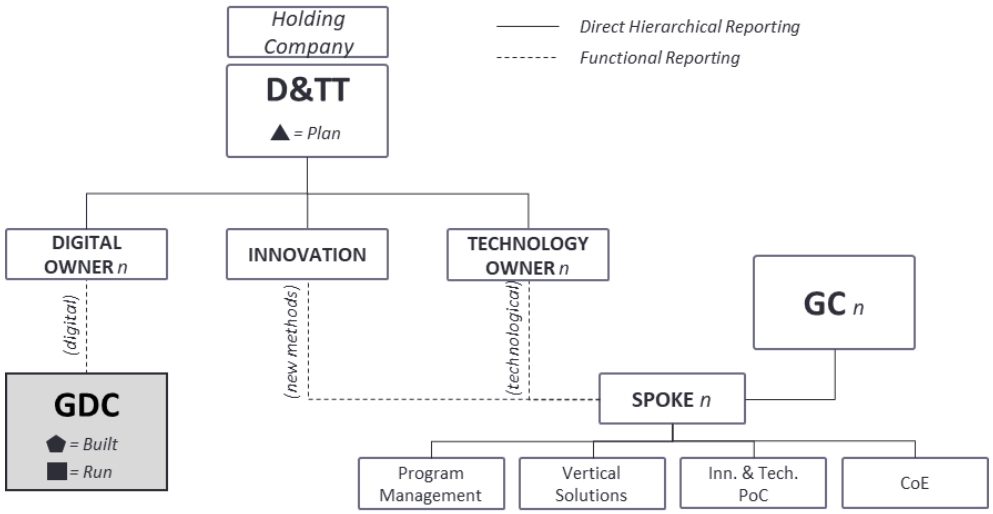

Figure 3. Group detailed organization to support DT

At the organizational level, D&TT operates with three verticals: Digital Owner, Technology Owner and Innovation. The units in this organization combine technological, innovation, and digital spheres, ensuring the convergence of GCs evolutions.

At the process level, the Group's transformation takes the form of a significant centralization of the activities of strategy definition, monitoring, and control of solution breeding within the GCs. Through the definition of stringent guidelines, the maximum possible standardization is achieved.

> "[...] at the Holding level, there is someone who tells you how to do the processes, specifying activities regardless of the structure to which you

belong, since the defined guidelines are valid wherever the ICT processes arrive".
(RI_23_01_F)

At this stage, the digital strategy and governance processes have been totally transferred to D&TT, while the service strategy, service design, and service transition processes are controlled by D&TT only for those elements related to major digital outcomes (e.g. Group common solutions). Portfolio management and financial management processes are currently required in both D&TT and GDC, albeit with complementing competence perimeters and in coordination with the respective owners (Digital Owner, Technology Owner) located in the Holding.
The individual perspective is crucial in empowering ICT professionals by reevaluating their abilities and considering both present and future skills. This involves skill assessment activities to develop specialized training programs based on the role's requirements, considering employees' knowledge levels at the beginning of each program. These actions also include personnel not strictly belonging to the ICT structure, testifying to the enlargement and introduction of a new professional family.

"[...] people are no longer ICT because hierarchically they report to ICT but they are ICT because they fall within a broader definition of professional family, regardless of where they are allocated organizationally speaking".
(RI_23_03_F)

4.3 GROUP TRANSITION ANALYSIS

ICT's gradual development as a Group core-business function is associated with significant changes in terms of processes (Venkatraman, 1994). In the case of the GDCs standardization sets the ground to address the complexity of the processes created during DT, in particular the ones which emerged from the new interactions of roles and structures:

"The GDC procedures are extremely complicated, both in terms of project intrinsic complexity and technical complexity related to management aspects".
(L1_22_INT01_M)

Furthermore, given the Group's progressive increase in complexity during the initial phase of definition of the target model, it is appropriate that control and monitoring mechanisms be established or adapted to address this complexity while ensuring an appropriate level of awareness to management:

"There is a chance that the new operating model may introduce rules that are excessively rigid, which could freeze operations, as well as components [...], which could lengthen the process chain".
(L2_22_WS04_N)

However, in recent interviews has emerged that the Group was considering the reinstatement of some competence centers near the business and within the GCs themselves. The restoration of ICT structures close to the business (i.e. business proximity) seems to facilitate understanding of needs, identification of appropriate solutions, and speeding up implementation.

Such a need appears to be confirmed by the perception of the individuals, who express a desire for clarity about interactions that can sometimes be excessively complicated, risking drops in terms of execution speed and activities management:

> "The new Model requires that the received inputs come from the Business Architecture rather than the technology. The latter must solely serve as a tool for carrying out the efforts outlined in the project portfolio".
> (L1_22_INT08_M)

This evolutionary tendency inside GCs to relocate some ICT processes closer to the business underlines the need to properly investigate how they relate with the business itself.

> "What did we understand along the way? That the business proximity had to be real "integration with the business", while the entire strategy and implementation guidelines part must be carried out by a centralized structure".
> (RI_23_03_F)

GCs initially had ICT but lacked a 360° vision for managing digital transformation. They transitioned to a centralized model, preserving business line integration and processes. They gained advantage by centralizing strategy processes. The Group plans to centralize ICT capabilities and assets, aligning with control trends. However, centralization may have downsides, such as separating ICT functions from business functions. ICT functions must be close to business processes, enabling integration with production lines and DT (Matzler et al., 2018). The Group implements a complex hub-and-spoke model to enhance control, centralize strategy processes, and maintain ICT closeness to business functions while implementing standardized processes.

DT is a crucial component of the Group's strategy and is linked to organizational transformation (Chandler, 1969). Relational models support DT, with ICT being a close enabler to business operations. To enhance its impact, the ICT structure should shift from hierarchical control to a hybrid model, with strategy and guidelines defined at the holding level. A relationship-driven approach to information and knowledge system design addresses knowledge needs by linking internal and external units, leveraging IT capabilities, and establishing connections where needed.

The Group's organizational evolution necessitates adapting structures and processes to meet new efficiency and performance needs, especially in terms of volume and time. This often involves individuals changing routines, processes, and positions within the organization:

> "The implementation of this model in which it will be a competence center will facilitate the optimization of the use of resources since, under previous conditions, the workforce could have been excessive".
> (L1_22_INT01_M)

Individuals, in these situations, could suffer significant tensions and resistances during the change process, which may hinder the initiative if they are not addressed and managed effectively (Miles, 2010). The Group successfully managed resistance by implementing change management activities, fostering shared knowledge of the new organizational model's advantages and vision of responsibilities and structures:

> "The level of complexity that the new model introduces is high, making it challenging to understand and adopt".
> (L2_22_WS03_N)

On the other hand, the Group has launched skills assessment and training initiatives targeted at determining existing expertise and mapping the essential skills in response to the demand for employees capable of managing the new processes and responsibilities contemplated in the new roles outlined by the model.

> "Because the resources have not gained experience in the field of Digital operations and the management of the operational phase, which was before the prerogative of the supplier, evolving towards the Digital Factory will be one of the most difficult steps"
> (L1_22_INT06_M)

Furthermore, managing skills to successfully cope with organizational change implies managing and enhancing current expertise, which should not disappear with the transition to the new role or structure, but should be formalized to be transferable.

> "The [...] BU is now in need of renovation. This BU has internalized transversal talents over the years, and there is a risk of losing these skills if placed in a system with other BUs that manage higher economic volumes"
> (L1_22_INT03_M)

4.3.1 MICROFOUNDATIONAL COMPONENTS INTERACTIONS DURING PHASES TRANSITION

This work explores the role of individuals, processes, and organizations as primary components in the DT path, examining their interactions and potential implications. It focuses on the shift from one phase to the next[4], following the microfoundational approach (Foss and Linder, 2019).

The transition from the first to the second phase aims to increase ICT Group awareness and capitalize on technology propagation advantages. The new company is appointed a Digital Leader (C-Level) to assess technological conditions and processes within the ICT structure. This shift ensures business continuity by avoiding large changes in roles, processes, and hierarchical relationships, ensuring full understanding and authority to reorganize without disruption.

Proposition 1: *In the early phases of the DT path, an organizational outpost dedicated to management and technological development might provide knowledge on the affiliates' technical positions and the needs of the various businesses, without compromising business continuity.*

The Digital Company moves towards the third phase, gaining authority and redesigning organizational structures to enhance services and identify operational and economic synergies. This involves evolving structures, processes, standardization initiatives, and searching for symmetries to support cross-company comparisons and add value to services. The focus is on individuals as process enablers, focusing on their skills and resource allocation for new processes.

[4] Please refer to paragraph 4.2 for a description of each phase. For the sake of simplicity, we are referring to each phase by its corresponding number (from 1 to 4).

Proposition 2: *During the transition and to achieve a competitive advantage, some initiatives of structure and process calibration and reorganization must be implemented, especially leveraging standardization and organizational symmetries between different areas while addressing resource allocation and individual capability coverage.*

The study emphasizes the importance of ICT in transforming a Digital Company into a Digital Factory, focusing on strategy definition and technological governance processes in an ad hoc structure led by a Chief of Digital Transformation. This new model exchanges information through a hub-and-spoke structure, bridging gaps between companies and aligning with group direction. The process follows established criteria and well-defined roles in interdisciplinary teams, supporting business development in digital, technological, and innovation domains. This shift emphasizes business proximity and joint ICT-business approaches, broadening the professional family in terms of roles and abilities. To sustain this transformation, multiple change management activities, incentives, skill assessments, and training are implemented.

Proposition 3: *Once the Digital Company's role is established, ICT capabilities can return closer to the business by implementing models with functional reporting that bridge the gap between the Holding company and group companies, leveraging the Group's capabilities to harmonize solutions and define coherent strategy, and generating a new professional family with multidisciplinary skills and greater value for the business.*

5. DISCUSSION

The microfoundational approach (Foss and Linder, 1969) and organizational design perspective provide innovative insights into the pursuit of a digital transformation (DT) in a Group. The four phases of DT involve changes in organization, processes, and individuals. The Group's evolution is influenced by understanding and controlling the "status quo" of technologies and creating a widespread awareness of the company's technological position. This leads to standardization and redesign of structures and processes, accompanied by centralization initiatives. On the other hand, there is an opposite trend, aiming to bring ICT structures closer to the business within the Group Companies.

This aligns with the business-centric perspective of DT, requiring ICT to move beyond system-centric and operational focus. The analysis of propositions highlights a temporal increase in ICT function authority, emphasizing the importance of creating legitimacy in individuals, making them aware of benefits, and protecting business continuity, especially during early stages when transformation benefits and boundaries are blurred. A microfoundational perspective can help managers understand how micro-components, such as individual-level skills and change management actions, contribute to the expression of a new capability (Foss and Linder, 2019). Applying “reductive operations” to the study of DT would result in discovering the most direct cause of a phenomena, which are the levers a manager needs to manage projects successfully (Foss and Linder, 2019). Finally, we provide two recommendations to practitioners who are about to embark on or accompany firms on a DT path.

Recommendation 1: *In conducting a DT, Group progressively standardizes and aligns ICT structures and processes across affiliates, while balancing levels of process centralization to drive transformation strategy and stay closer to business units.*

Recommendation 2*: In achieving a successful DT, Individuals play a critical role and the company should concern about enhancing the skills they already possess and potential ones, listen to the aspirations for professional growth and clarify the expectations of the new role and the relative benefits, for the individual and for the organization.*

5.1 STUDY LIMITATIONS AND RESEARCH AGENDA

The findings of this study have limitations, but they offer potential avenues for future research. First, it acknowledges that there is no ideal configuration in complex organizations and that numerous solutions may coexist. Therefore, corporations should consider various additional aspects when choosing the most suitable organizational structure (for example, see Burton and Obel, 2004). Second, the authors propose combining microfoundational analysis with quantitative data and a larger sample of cases for future research. Further study is needed to decode the complexity connected to DT from an organizational perspective, drawing on various fields like organizational behavior, strategy management, and innovation (Qin, 2023). The limited understanding of this phenomenon and growing managerial interest suggest that this phenomenon will be of interest for the next few years.

REFERENCES

Appio, F. P., Frattini, F., Petruzzelli, A. M., & Neirotti, P. (2021). Digital transformation and innovation management: A synthesis of existing research and an agenda for future studies. *Journal of Product Innovation Management*, 38(1), 4-20.

Burton, R. M., & Obel, B. (2004). Strategic organizational diagnosis and design: The dynamics of fit (Vol. 4). *Springer Science & Business Media*.

Burt, R. S., & Lin, N. (1977). Network time series from archival records. *Sociological methodology*, 8, 224-254.

Capitani, G. (2018). CIO's: Drivers or followers of digital transformation?. CIOs and the Digital Transformation: A New Leadership Role, 69-83.

Chandler Jr, A. D. (1969). Strategy and structure: Chapters in the history of the American industrial enterprise (Vol. 120). *MIT press*.

Coleman, J. S. (1990). Foundations of social theory. *Harvard university press*.

Correani, A., De Massis, A., Frattini, F., Petruzzelli, A. M., & Natalicchio, A. (2020). Implementing a digital strategy: Learning from the experience of three digital transformation projects. *California Management Review*, 62(4), 37-56.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of management review*, 14(4), 532-550.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of management journal*, 50(1), 25-32.

Eisenhardt, K. M., Graebner, M. E., & Sonenshein, S. (2016). Grand challenges and inductive methods: Rigor without rigor mortis. *Academy of management journal*, 59(4), 1113-1123.

Ellström, D., Holtström, J., Berg, E., & Josefsson, C. (2021). Dynamic capabilities for digital transformation. *Journal of Strategy and Management*, 15(2), 272-286.

Felin, T., Foss, N. J., Heimeriks, K. H., & Madsen, T. L. (2012). Microfoundations of routines and capabilities: Individuals, processes, and structure. *Journal of management studies*, 49(8), 1351-1374.

Felin, T., Foss, N. J., & Ployhart, R. E. (2015). The microfoundations movement in strategy and organization theory. *Academy of Management Annals*, 9(1), 575-632.

Fitzgerald, M., Kruschwitz, N., Bonnet, D., & Welch, M. (2014). Embracing digital technology: A new strategic imperative. *MIT sloan management review*, 55(2), 1.

Foss, N. J., & Linder, S. (2019). Microfoundations: nature, debate, and promise. *Cambridge University Press*.

Genzorova, T., Corejova, T., & Stalmasekova, N. (2019). How digital transformation can influence business model, Case study for transport industry. *Transportation Research Procedia*, 40, 1053-1058.

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational research methods*, 16(1), 15-31.

Hanelt, A., Bohnsack, R., Marz, D., & Antunes Marante, C. (2021). A systematic review of the literature on digital transformation: Insights and implications for strategy and organizational change. *Journal of Management Studies*, 58(5), 1159-1197.

Iansiti, M., & Lakhani, K. R. (2020). Competing in the age of AI: Strategy and leadership when algorithms and networks run the world. *Harvard Business Press*.

Kretschmer, T., & Khashabi, P. (2020). Digital transformation and organization design: An integrated approach. *California Management Review*, 62(4), 86-104.

Lanzolla, G., Lorenz, A., Miron-Spektor, E., Schilling, M., Solinas, G., & Tucci, C. L. (2020). Digital transformation: What is new if anything? Emerging patterns and management research. *Academy of Management Discoveries*, 6(3), 341-350.

Leonhardt, D., Haffke, I., Kranz, J., & Benlian, A. (2017, June). Reinventing the IT function: the Role of IT Agility and IT Ambidexterity in Supporting Digital Business Transformation. In ECIS (Vol. 63, pp. 968-984).

Linder, S., & Foss, N. J. (2018). Microfoundations of organizational goals: a review and new directions for future research. *International Journal of Management Reviews*, 20, S39-S62.

Livijn, M. (2019). Navigating in a hierarchy: How middle managers adapt macro design. *Journal of Organization Design*, 8(1), 1-27.

Marchese, S., Gastaldi, L., & Corso, M. (2023). Thriving in turbulent environments through adaptive forms of organizing. *Management Decision*.

Matt, C., Hess, T., & Benlian, A. (2015). Digital transformation strategies. *Business & information systems engineering*, 57, 339-343.

Matzler, K., Friedrich von den Eichen, S., Anschober, M., & Kohler, T. (2018). The crusade of digital disruption. *Journal of Business Strategy*, 39(6), 13-20.

Miles, R. H. (2010). Accelerating corporate transformations (Don't lose your nerve!). *Harvard Business Review*, 88(1).

Mustafa, G., Solli-Sæther, H., Bodolica, V., Håvold, J. I., & Ilyas, A. (2022). Digitalization trends and organizational structure: bureaucracy, ambidexterity or post-bureaucracy? *Eurasian Business Review*, 12(4), 671-694.

Qin, R. (2023). Overcoming the digital transformation paradoxes: a digital affordance perspective. *Management Decision*.

Rizzo, D. (2018). The CIO and the digital challenge. In Bongiorno, G., Rizzo, D., & Vaia, G. (2018). CIOs and the digital transformation: A new leadership role (pp. 1-9). Springer International Publishing.

Schneckenberg, D., Truong, Y., & Mazloomi, H. (2015). Microfoundations of innovative capabilities: The leverage of collaborative technologies on organizational learning and knowledge management in a multinational corporation. *Technological Forecasting and Social Change*, 100, 356-368.

Schwer, K., & Hitz, C. (2018). Designing organizational structure in the age of digitization. *Journal of Eastern European and Central Asian Research* (JEECAR), 5(1), 11-11.

Scuotto, V., Beatrice, O., Valentina, C., Nicotra, M., Di Gioia, L., & Briamonte, M. F. (2020). Uncovering the micro-foundations of knowledge sharing in open innovation partnerships: An intention-based perspective of technology transfer. *Technological forecasting and social change*, 152, 119906.

Scuotto, V., Magni, D., Palladino, R., & Nicotra, M. (2022). Triggering disruptive technology absorptive capacity by CIOs. Explorative research on a micro-foundation lens. *Technological Forecasting and Social Change*, 174, 121234.

Singh, A., Hess, T., 2017. How chief digital officers promote the digital transformation of their companies. *MIS Q. Exec*. 16 (1).

Sousa-Zomer, T. T., Neely, A., & Martinez, V. (2020). Digital transforming capability and performance: a microfoundational perspective. *International Journal of Operations & Production Management*, 40(7/8), 1095-1128.

Svahn, F., Mathiassen, L., & Lindgren, R. (2017). Embracing digital innovation in incumbent firms. *MIS quarterly*, 41(1), 239-254.

Venkatraman, N. (1994). IT-enabled business transformation: from automation to business scope redefinition. *Sloan management review*, 35, 73-73.

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of business research*, 122, 889-901.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The journal of strategic information systems*, 28(2), 118-144.

Warner, K. S., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. *Long range planning*, 52(3), 326-349.

Whetten, D. (1989). 'What constitutes a theoretical contribution?'. *Academy of Management Review*, 14, 490–5.

Yin, R. K. (2003). Case study research: design and methods (ed.). Thousand Oaks.