International Journal of Innovation

e-ISSN: 2318-9975
https://doi.org/10.5585/2024.25910
Received: 20 Jan. 2024 - **Approved:** 06 June 2024

Evaluation Process: Double Blind Review
Editor-in-Chefe: Priscila Rezende da Costa
Co editor: Isabel Cristina Scafuto
Scientific Editor: Vânia Maria Jorge Nassif
Assistant Editor: Angelica Pigola
Section: Article

Check for updates

Digital Transformation as a driver of Innovation Management in established companies

Rúbia Polegato Borges[1] **Mateus Frechiani Bitte**[2] **Oscar do Amaral Adorno**[3] and **Paulo Tromboni de Souza Nascimento**[4]

[1] MBA - Digital Business. Universidade de São Paulo - ESALQ. Jundiaí, São Paulo – Brazil. ru_polegato@hotmail.com

[2] Master degree. Universidade de São Paulo - Faculdade de Economia, Administração, Contabilidade e Atuária da Universidade de São Paulo (FEA – USP). São Paulo, SP – Brazil mateusbitte@usp.br

[3] Master degree. Universidade de São Paulo - Faculdade de Economia, Administração, Contabilidade e Atuária da Universidade de São Paulo (FEA – USP). São Paulo, SP – Brazil adorno@usp.br

[4] Post Doctorate. Universidade de São Paulo - Faculdade de Economia, Administração, Contabilidade e Atuária da Universidade de São Paulo (FEA – USP). São Paulo, SP - Brazil tromboni@usp.br

Authors'Notes

We have no conflicts of interest to disclose.

Correspondence concerning this article should be addressed to Mateus Frechiani Bitte

Cite as – American Psychological Association (APA)

Borges, R. P., Bitte, M. F., Adorno, O. A., & Nascimento, P. T. S. (2024, Mayo/Aug.). Digital Transformation as a driver of Innovation Management in established companies. *International Journal of Innovation - IJI*, São Paulo, *12*(2), p. 1-37, e25910. https://doi.org/10.5585/2024.25910

Abstract

Objective: In the context of the digital transformation theme, the present study aimed to explore the dynamics between the digital transformation sector and innovation within an established organization.

Methodology: To achieve the proposed objective, a qualitative approach was used, through an in-depth case study. As a collection method, interviews were used through a semi-structured questionnaire with 6 members of the organization and, subsequently, all material was transcribed and analyzed seeking to identify the dynamics between both areas.

Relevance and originality: The paper focuses on a subject that is still little explored and provides an in-depth view of the phenomenon of digital transformation within organizations.

Main results: It was possible to verify that the Digital Transformation area has tools and methodologies that can help in the propagation of Innovation management concepts and in the application of these concepts to guarantee a more fluid and efficient interaction between the other areas of the company and the Innovation area.

Theoretical contributions: As a theoretical contribution, we highlight the advancement of the discussion of digital transformation in companies and the model that illustrates how the areas and mechanisms of the organization can interact for greater synergy between digital transformation and innovation.

Managerial implications: Based on the model developed, managers can better understand the interactions between the areas of innovation management, digital transformation and business units.

Keywords: digital transformation; innovation management; established companies

A Transformação Digital como impulsionadora da gestão da Inovação em empresas estabelecidas

Resumo

Objetivo: No contexto de ascensão da temática transformação digital, o presente estudo teve como objetivo explorar a dinâmica entre o setor de transformação digital e inovação dentro de uma organização estabelecida.

Metodologia: Para alcançar o objetivo proposto foi utilizada uma abordagem qualitativa, por meio do estudo de caso em profundidade. Como método de coleta utilizou-se a entrevista por meio de questionário

semiestruturado com 6 integrantes da organização e, posteriormente, todo material foi transcrito e analisado buscando identificar as dinâmicas entre transformação digital e gestão da inovação.

Relevância e originalidade: O artigo se debruça sobre um assunto ainda pouco explorado e traz uma visão aprofundada do fenômeno da transformação digital dentro das organizações.

Principais resultados: Foi possível verificar que a área de Transformação Digital dispõe de ferramentas e de metodologias que podem auxiliar na propagação dos conceitos de gestão de Inovação e na aplicação desses conceitos para garantir uma interação mais fluida e eficiente entre as demais áreas da companhia e a área de Inovação.

Contribuições teóricas: Como contribuição teórica destaca-se o avanço da discussão da transformação digital nas empresas e o modelo que ilustra como as áreas e mecanismos da organização podem interagir para uma maior sinergia entre transformação digital e inovação.

Implicações gerenciais: Com base no modelo desenvolvido os gestores podem compreender melhor as interações entre as áreas de gestão da inovação, transformação digital e unidades de negócio.

Palavras-chave: transformação digital; gestão da inovação; empresas estabelecidas

La Transformación Digital como impulsor de la gestión de la Innovación en empresas consolidadas

Resumen

Objetivo: En el contexto del auge del tema de la transformación digital, el presente estudio tuvo como objetivo explorar la dinámica entre el sector de la transformación digital y la innovación dentro de una organización establecida.

Metodología: Para lograr el objetivo propuesto se utilizó un enfoque cualitativo, a través de un estudio de caso en profundidad. Como método de recolección se utilizó una entrevista a través de un cuestionario semiestructurado a 6 miembros de la organización y, posteriormente, todo el material fue transcrito y analizado buscando identificar la dinámica entre la transformación digital y la gestión de la innovación.

Relevancia y originalidad: El artículo se centra en un tema aún poco explorado y proporciona una visión en profundidad del fenómeno de la transformación digital dentro de las organizaciones.

Principales resultados: Se pudo comprobar que el área de Transformación Digital cuenta con herramientas y metodologías que pueden ayudar en la propagación de conceptos de gestión de la Innovación y en la aplicación de estos conceptos para garantizar una interacción más fluida y eficiente entre las demás áreas de la empresa y el área de Innovación.

Aportes teóricos: Como aporte teórico destacamos el avance de la discusión sobre la transformación digital en las empresas y el modelo que ilustra cómo las áreas y mecanismos de la organización pueden interactuar para una mayor sinergia entre la transformación digital y la innovación.

Implicaciones gerenciales: A partir del modelo desarrollado, los gerentes pueden comprender mejor las interacciones entre las áreas de gestión de la innovación, transformación digital y unidades de negocio.

Palabras clave: transformación digital; gestión de la innovación; empresas establecidas

Introduction

Faced with a scenario of technological evolution, high competitiveness and high customer expectations (Gregory et al., 2019), it becomes vital to search for alternatives and tools that accelerate growth and create competitive advantages for companies, regardless of their size or sector. Currently, Digital Transformation (DT) is seen as a way to make this entire process of expanding opportunities and consequently increasing profitability viable (Mahraz et al., 2019).

Much has been said about Digital Transformation and, in general terms, it can be defined as a social phenomenon or even a cultural evolution that has the potential to generate impacts on both the business model and the culture and structure of organizations (Henriette et al., 2016). Although the concept of Digital Transformation is broader than just the adoption of technologies, it is worth mentioning some tools that have become essential as enablers of this process (Schwertner, 2017).

Among the emerging tools, “big data”, “cloud computing”, “the internet of things” and “blockchain” can be considered the technological basis for Digital Transformation (Mahraz et al., 2019). “Big data” emerges as an alternative to process a large or complex amount of data that is constantly

changing and that conventional tools can no longer perform. “Cloud computing” can be considered a platform that hosts applications and services, centralizing the responsibility for configuring and provisioning Information Technology [IT] resources in a dynamic and transparent manner on the platform’s suppliers (Neto, 2011).

The “Internet of Things” is understood as the insertion of sensors, software and actuators into physical devices such as cars and buildings, for example, to obtain data and information that can bring economic benefits to users, in addition to reducing human intervention in some activities (Schwertner, 2017). A blockchain is a digital ledger that consists of a series of blocks, with each block containing a cryptographic hash of the previous block, a timestamp and transaction records. Cryptographic hashing links each block to the previous block, creating a chain of blocks that is resistant to tampering and modification (Zhang et al., 2023)

Innovation management processes existed even before the effects of Digital Transformation began to be perceived in organizations (Eveleens, 2010). This is one of the factors that makes this study relevant, since it will present points inherent to Digital Transformation, such as tools, for example (Vial, 2019), that can improve existing Innovation management processes. Taking into account the themes and concepts mentioned, this study proposes to approach the following research question: “How can Digital Transformation assist in the management of Innovation in established companies?”

The themes of Digital Transformation and Innovation Management are very current, addressed in studies by Birkinshaw (2008), Eveleens (2010), Vial (2019) and Mahraz (2019), among others. However, the way in which Digital Transformation can help in managing Innovation can be further explored. Thus, the present work aims to study the relationships between Digital Transformation and Innovation management in established companies. Therefore, exploring in more depth the relationship between these processes (Digital Transformation and Innovation Management) can help to better understand the concepts, limits and synergies, to consequently generate greater engagement, greater effectiveness and provide greater proximity between the areas responsible for these two processes.

In the wake of these changes is the process of digital transformation, which is related to the widespread use of technological and digital resources and the digitalization of organizational processes and people's daily lives (Bounfour, 2016; Fleury and Silva, 2019; Khan, 2016; Schwab, 2016). However, the way in which it occurs, the complexity, the relationship with the interconnections between different sectors and the impacts of this digital transformation on society are not yet well known (Azevedo, 2017).

Theoretical Framework

Digital transformation

Digital transformation (DT) can be defined as a disruptive process in which organizations change value creation processes by adopting digital technologies in response to changes in the business environment (Vial, 2019). Digital transformation drives innovation as it requires the acquisition of new knowledge and skills, demands new forms of collaboration within organizations and across sectors, promotes the creation of new business models, and leads to the sustainable use of organizational resources (Mayakova, 2019; Tabrizi et al., 2019; Armengaud et al., 2017).

For Queiroz and Wamba (2022), digital transformation, in turn, refers to the continuous process of generating value for society (i.e., customers, suppliers, government, other organizations, etc.), integrating cutting-edge technologies and qualified people. DT involves digitalization, which refers to the conversion of an analog process, which essentially includes physical processes/activities, into a digital business process, generally adopting new technologies (Artificial Intelligence, Blockchain, Big Data Analytics, 3D Printing, etc.). After adopting technologies, business processes are updated (Queiroz & Wamba, 2022).

With the organization-wide cultural and structural changes caused by digital transformation (Kraus et al., 2021; Singh and Hess, 2017; Hinings et al., 2018; Ivančić et al., 2019), DT also catalyzes other transformations, such as the transformation of governance, HR, and IT functions in organizations (Sia et al. 2021; Mergel et al., 2019; Trivedi and Pillai, 2020).

For Matt, Hess and Benlian (2015), the digital transformation model can be identified in any type of organization, regardless of the area of activity, and it can be analyzed from four dimensions: (1) use of technologies, (2) changes in value creation, (3) structural changes and (4) financial aspects.

Digital transformation is, by its nature, a fundamental change that completely overhauls how companies operate, design, develop, produce, sell their products and provide services (Prokhin, 2020), therefore, driven by innovation, making both concepts interrelated and interconnected (Robertsone; Lapina, 2023). As the digital economy advances, more companies are actively supporting digital technology to facilitate transformation and respond to innovation trends (Hung et al., 2023; Peng & Tao, 2022).

Innovation

Innovation can be understood as the transformation of an idea into a product, service or method that is new to the organization (Dereli, 2015; Damanpour; Evan, 1984). The act of innovating arises in response to changes in the external environment that require internal adaptation of the organization (Rogers, 2004). The topic has received much attention due to the role it plays in the economic, social and political scenario (Chen, 2017).

For Kahn (2018), innovation can be evaluated from two perspectives, the first being innovation as a result, that is, innovation in products, processes, in marketing, in business models, and value chain, among others. Within this perspective we can highlight two types of innovation: incremental and disruptive.

When we look at incremental innovations, it is possible to see a clear path of product improvement along the same performance trajectory and value proposition that consumers value (Christensen, 2013). In the case of disruptive innovations, a different proposal is brought to the market, something that has never been presented before. At the beginning of the disruptive process, key customers do not even care about the new product because it has lower performance and higher price, but it can meet unmet demands (Christensen, 2013). The survival of organizations in the long term is closely linked to

their ability to be ambidextrous, that is, to implement both incremental and disruptive innovations (Tushman; O'Reilly, 1996).

The second perspective, however, brings the innovation process to the center of the discussion. According to Eveleens (2010), the innovation process perspective considers everything from the development and selection of ideas to the moment when such ideas are transformed into innovation. For this innovation process to occur in a controlled manner and adapt to both internal and external changes, it is important that the concept of Innovation management be implemented (Dereli, 2015).

Eveleens (2010) understands that the management of innovation processes should aim to increase the efficiency of innovation processes, reduce their length and their chances of failure. This ensures that inventions and the generation of innovative ideas result in a return or competitive advantage for companies (Preez; Louw, 2008).

The term Digital Transformation is often associated with the implementation of new technology in organizations, such as robotization or the creation of applications, for example. However, behind all these technologies there is a process that occurs concomitantly with DT: innovation. The innovation process based on a strategic mindset is what makes transformations happen (Rogers, 2017). In recent years, DT has become a frequent topic in the business environment and a concern for leaders (Anjos et al., 2019).

Materials and Methods

Given the exploratory nature of the research question and the topic in general, we chose to use an inductive qualitative research approach and the in-depth case study as the research methodology (Creswell, 2013). The case study methodology is useful for exploratory research and the development of new theories that aim to understand phenomena in specific contexts (Eisenhardt, 1989; Gerring 2004; Yin, 2018) and also to extend existing theory (Burawoy, 1991; Daneels, 2004).

We sought to evaluate and understand the social world in which the participants were inserted through experiences, perspectives and stories. Furthermore, through this type of method, it was possible to obtain greater details about the scenario in which each participant was inserted and about what led

them to take certain positions and decisions in their work routine (Ormston et al., 2013). The recommendations were followed according to the description of semi-structured interviews based on Godoy (2010).

Considering the different types of data sources for qualitative research (Merriam, 2002), the work chose to use data from interviews conducted with employees from both the Innovation and Digital Transformation areas, using what is called guided interviews, that is, applying a semi-structured questionnaire, with a different focus and order, depending on the characteristics or area of activity of the participant (Merriam, 2002).

This was the type of interview chosen because it had the advantage of allowing the interviewer to plan which would be the most relevant topics to be addressed, allowing for greater focus, while also making the interview process more comprehensive and adaptable to each individual experience (Crawford, 1997). A critical aspect of the chosen method refers to the choice of case study and how many cases will be used to carry out the research (Seawright; Gerring, 2008; Yin, 2018). In the present research, we chose to use a single case study, aiming to explore the phenomenon in depth and extend the theory already existing in the literature (Burawoy, 1991).

The study was carried out in a financial institution, located in the metropolitan area of São Paulo and classified, according to Pinto (2021), as an established company. The company analyzed was created more than 10 years ago, with an organizational structure that is still not very flexible, hierarchical and bureaucratic, with approximately 1,500 employees, characteristics that distance it from “startups”. All the people who participated in the interviews were employees who work at the same company mentioned above and, for their selection, the following criteria were followed:

- employees who are impacted by or work directly with Digital Transformation or Innovation management issues;
- employees who have worked for at least 6 months at the company in question;

- employees who work at two different hierarchical levels within the areas of Innovation and Digital Transformation, specialists and managers.

In order to be able to reference which collaborator was being mentioned during the analysis of the interviews, the pattern described in Table 1 was followed:

Table 1

Description of interviewees

Individual	Abbreviations:	Work area
Respondent 1	INV1	Innovation Area Collaborator
Respondent 2	INV2	Innovation Area Collaborator
Respondent 3	INV3	Innovation Area Collaborator
Respondent 4	TD1	Digital Transformation Collaborator
Respondent 5	TD2	Digital Transformation Collaborator
Respondent 6	TD3	Digital Transformation Collaborator

Source: Original research data

The interviews were conducted digitally during the months of January and February 2022, using a "link" from the "Microsoft Teams" tool, and all interviewees kept their cameras on throughout the interview, allowing for better proximity between the interviewer and interviewee, in addition to making it possible to assess body language. The interviews lasted one and a half hour. After the interviews were completed, the content of the interviews was transcribed for later cross-referencing and content analysis. From the analysis we can examine the perspectives of the different research participants, highlighting similarities, triangulating the data and generating insights with greater consistency, as proposed by Paiva Junior et al. (2011).

According to Flores' approach (1994), qualitative data have rich descriptive characteristics and can address the history of companies and how they have positioned themselves as a business model over time.

Based on the proposal for qualitative analysis of categorization by Flores (1994) through a system of category definitions, where it is possible to analyze an excerpt and assign it a category, and if

necessary, also a code, the interviewees' statements were analyzed. The findings make up the analysis and discussion item of this research, and can be verified in Table 2 provided in this same analysis and discussion item.

Results

Case presentation

The company where the research was conducted is classified as established. However, in order to meet new market and consumer needs, it has undergone different changes in both its structures and work format. The first example of this adaptation movement that the company was willing to make is the creation of a new area with the objective of driving the Digital Transformation movement and everything involved in this process.

With the creation of this new Digital Transformation area, a review of the structure and dynamics design for delivering value to customers began, proposing greater synergy between the different areas, as well as enabling greater visibility and exposure of dependencies and risks for the business and consequently greater effectiveness in dealing with these impasses. Furthermore, another area — Innovation — which has become even more important in the current market context and the company has been forced to remodel itself. Thus, the new format of the Innovation area's operations aimed to separate the area from its role as the sole responsible for seeking, implementing and promoting the theme of innovation in the work routine of the company's employees.

The current proposal is that the Innovation area be just a driver of the culture of innovation for the entire company and that it serve as an aid for everyone to develop skills linked to innovation, making any employee, from any area, able to always practice the “skill” of innovation in whatever their delivery or area is. This organization of the area is still young. It is undergoing an effectiveness evaluation and has sought to evolve and adhere to the concepts that Digital Transformation proposes.

Dynamics between the Innovation and Digital Transformation sectors

The first point that was raised and could provide important inputs for the development of the work was the issue of knowledge regarding the structures and fronts of each of the areas, both in the eyes

of the interviewees from the Innovation area and those from the Digital Transformation area. Two of the respondents from the Digital Transformation area showed that they had a broader knowledge about the performance and structuring of the Innovation area and this can be evidenced through the following excerpts from respondent TD1:

> They have a cultural pillar, to spread the culture of innovation within the company [...] they have market research and to bring this to Bus, looking to the future [...] there is a connection with "startups" [...] there is intrapreneurship that fosters some campaigns within the company such as "Hacktons" and platforms such as "Teams Ideas".

Also in the excerpts from TD2 the same statement was observed:

> There is the need to look outward and understand what is happening in the world of trends and behaviors [...] and the need to look inward is how I use innovation in my day-to-day work as an area, "Business Unit" [BU] or corporate area. How I use the innovation competence to improve my work, my performance.

Respondent TD3 showed that knowledge about innovation performance as an area with a more external view of the company was more evident, leaving aside the performance and development of internal initiatives and fronts. This can be evidenced in the following excerpts:

> They do a lot of research, there is a part that is very focused on trends, markets, what is coming next; trying to act in a more predictive way. But since they don't have much connection with what's happening in terms of evolution with the products inside the house, things get a bit loose.

Regarding the performance and fronts of Digital Transformation by INV2 and INV3, the understanding was complete when related only to the application of agile methodologies and the development of the performance of agility roles. The following excerpts from INV2 demonstrate this perception about the area's performance:

> Agilists are the “Agile Masters” [AM] and these AMs must be the guardians of the method, of the process, who take care of efficiency [...] Some “capabilities” are missing. We have the “business designer” who is not a “Product Owner” [PO], but plays the role.

The same can be seen in the ENV3 excerpt:

> Digital Transformation is much more focused on governance and the articulation of bringing things together, the rites and ceremonies that will culminate in the final planning [...] For me, planning is the “endgame” and there are some rites that have different purposes and you are much more focused on governance and organization, to get people on the same page.

Regarding respondent INV2, at times it was possible to verify that he presents a slightly broader vision, not limited to the use and implementation of these methodologies, but it was not possible to verify in a tangible and practical way the vision on the fronts, which can be evaluated in the following excerpts:

> [...] There is the issue of keeping up with technological advances, there is more to do with the role of changing people's “mindset” [...] How can we deliver our daily lives in a more digital, more modern and faster way?

The assessment and vision of the three interviewees in the innovation area regarding the Digital Transformation fronts were not fully aligned with what the literature proposes, since Vial (2019) defends the concept that Digital Transformation goes beyond the implementation of tools or technologies, being a process that seeks to improve a company through the review of the value creation strategy using structural changes and the reduction of organizational barriers.

Knowledge about both areas is the first step towards ensuring that proposals for joint work and proposals for implementing improvements in the area of Innovation occur in a more assertive and fluid manner.

A common theme that converged for five of the six interviewees was the question about the need for training and acculturation in relation to the concepts of innovation and its application.

INV1 highlighted the importance of the topic in the following excerpts:

> There are some product "skills" that involve innovation and I don't know how much our "Product Manager" [PM] and PO have [...] PO should know how to do "Discovery", "design thinking", talk to users, do interviews, and identify pain points.

INV2 presented the same need in the sections:

> [...]o What we notice is that people don't have knowledge about methodologies and frameworks and it ends up being a little disconnected from what we do here [...] Culture and training are the only way to deliver a change in mindset [...] our idea is to bring a bit of methodology to product ideas. To make the area move more agilely.

This same need was cited by INV3 as follows:

> People come up with a lot of ideas because they think that innovation is about coming up with an idea, but innovation is nothing without execution [...] people have a lot of ideas, but when it comes to execution, they get stuck. And it is in this sense that transformation could help.

With regard to TD1, this need can be seen in the following excerpts:

> One thing they did in the past, but don't do anymore, is talk about innovation, how to bring innovation insights into teams [...] we should do combined agility and innovation training, bring it into teams more frequently and develop innovation skills".

TD2 highlights this importance in the following way:

> "Design Thinking" is a tool that I think should be mandatory, and they [Innovation] should promote it and call people from the "Business Unit" [BU].

The need for acculturation and methodological support is also seen as essential in the view of Borges and Moraes (2013), as it is through the development of new skills and concepts that employees become able to insert innovation themes, for example, into their work routine.

Regarding the way the Innovation area operates, it was possible to identify some points of divergence. INV1 shared the perception that many people understand evolution as operating only in new businesses, with little or almost no influence on initiatives linked to the "core", with this attribution being more linked to the product area. This positioning can be evidenced in the following excerpt:

> Our strategy is that we will not be an Innovation area, we will be a research and development area, a new business area. Things that are connected to the core and products are being touched, I don't even want to know, they do what they think is best.

INV2 and INV3, however, presented a slightly different proposal. The respondents understand that the Innovation area can also be seen as support for deliveries in other areas, as can be seen in the following excerpt from INV2:

> [...] The idea is that we support the areas to have a little more agility in H1 and H2 deliveries, mainly because of "capacity" and because many things remain in the "backlog" and end up being deprioritized.

The same view can be seen in the following excerpt by INV3:

> So, with our fronts, we want to be very close to the business teams, precisely because of the connections. People will have to actively participate in what we are doing and our deliveries will have to be very well-matched with the "backlogs", rituals and planning for them to receive the baton [...] The goal this year is to be 100% connected, to show that it is not because it is innovation, that there are themes of new avenues, that it does not have to be tied to the business.

The vision of TD1 and TD2 is more aligned with what was raised by INV2 and INV3. Thus, TD1 mentioned, in different ways, the need and importance of the connection between the initiatives of the business units and the Innovation initiatives, highlighting the benefits that both the Innovation area and the business units could obtain with this connection. These points can be noticed in the following excerpts:

> They could come up with a menu of partners who are connected to the things they are looking at [...] before mobilizing a team within the BU; Innovation will test hypotheses, possible paths and deliver this ready-made to the BU [...] everything has to be combined, not be a theme chosen by Innovation [...] we have a lot of ideas in-house, but we need to connect them more to our challenges [...]; Innovation strategy has to be together with that of the BU and they do not need to be restricted to the BU.

When TD2 addressed the same topic, he demonstrated his belief that Innovation should be more collaborative with business units, bringing more “insights” and being closer during decision-making and directions. These points can be seen in the following excerpts:

> Innovation could help people make decisions, with a vision and market information [...] if the BU is putting together the strategy, without the bias and information from Innovation, they may be taking the wrong path and Innovation has little contribution to make to the path to be chosen.

Finally, TD3 exposed both the gains that could be obtained with greater proximity and connection between the Innovation area and the business units and the absence of this connection within the company. The two views can be seen in the following excerpts:

> [...]If they were connected, we could be more predictive instead of always being “followers” [...] We do not connect the innovation area to the strategy and consequently to the business units [...] with a strategy defined by the business units, innovation should desperately go to the market to see ways to boost that business unit strategy.

Regarding the biggest pains and difficulties encountered by the Innovation area, the six interviewees shared the perception that there are many initiatives, ideas, projects and proposals led by or directed to the Innovation area, but that are not implemented, are not put into practice. In addition to it, these initiatives are many times not prioritized and even disregarded during the construction of the teams' “backlogs”.

For INV1, the biggest problem is related to bureaucratic issues that are still very present in their processes within Innovation teams and the lack of freedom to implement new tools and technologies. This issue was highlighted in the following excerpts:

> I am completely limited to the tools that the company has and we have freedom in one thing or another [...] if you are going to hire a “startup”, they want to demand things from a large company, if you want to hire a new tool, it takes a lot of time with bureaucracy.

INV1 also mentions the issue of the difficulty of prioritizing initiatives linked to Innovation in the following excerpt:

> The problem is that we have 15 months to resolve a legacy that is how many years old? So if you talk to technology people, you can't disprove them. If you talk to them about innovation, they think we're crazy.

INV2 has already highlighted the difficulties related to the execution of initiatives in the following sections:

> [...]cSince we have a large legacy, other actions may be prioritized instead of intrapreneurship actions [...] And there is the issue of products already having a huge “backlog” and legacy that cannot absorb ideas [...] The big question is how to get all this off the ground, but there is the issue of “capacity”, Alelo's systemic structure ends up having an impact.

INV3 also highlighted the obstacles encountered during the work of the Innovation area in the following sections:

> Innovation themes die. We do a lot of open innovation, we think of “startups”, but when we get to the teams they claim that it doesn’t fit into the planning or they can’t do it [...] some initiatives stay in the drawer for 6 months and since they are “too cool”, people don’t take them up and do it [...] what’s the point of me experimenting, finding new avenues, if the thing is going to die?

When asked about pain points related to managing Innovation in the company, TD1 and TD2 pointed out some points mentioned by respondents in the Innovation area, such as the difficulty in visualizing the evolution and completion of proposed projects. This point can be evidenced in the following excerpt:

> [...]They didn't come back to talk about the project idea I proposed at the "hackathon", which I found to be a very negative point. Sometimes I get the impression that they start a lot of things, do that advertising and don't see it become tangible, this is a point that I think should be improved.

TD2 has a very similar discourse on the same topic:

> This finishing process, they pull things, but then there is no continuity because what they pull is not always what the BU needs.

Finally, TD3 presents a speech aligned with what the other respondents said about the main pain in the Innovation area, which can be seen in the following excerpts:

> They held hackathons, research and events, but I didn't see a way out. What tangible initiative came out of it? What value did they deliver? [...] They spend a huge amount of effort and it's no use [...] people do it, but it doesn't generate any results and it's frustrating even for those who are doing it.

An important point is that there is awareness and concern on the part of one of the interviewees in the Innovation area regarding the visibility of the progress of the initiatives and this is evidenced in what INV2 said:

> Innovation and especially intrapreneurship depend heavily on motivation. When people see that a project has not moved forward, it ends up demotivating them.

By understanding the entire scenario in which the two areas are inserted and analyzing the vision that one area has in relation to the other, it was possible to address the question of how the interviewees understand that the Digital Transformation area could assist the innovation management process.

INV1, having some experience with agility tools in his previous professional activities and having greater knowledge about these methodologies and concepts, focused on elucidating once again the importance of the Digital Transformation area's role in disseminating agility concepts, adapting employees to agility roles, training his employees as well as employees from other areas in relation to agility tools. This perspective can be evidenced in the following excerpts:

> The agility roles established by the Digital Transformation area are the guardians of the method and the process. They are the ones who take care of efficiency [...] I don't know how much our “Product Owner” [PO] and “Product Manager” [PM] understand their role. The role of the PO is not only to serve the development team.

Throughout the interaction, INV2 highlighted different themes and fronts in which the Digital Transformation area could assist in the development and application of Innovation Management, and some of the themes mentioned went beyond issues related to the application of agility tools, as was the case with INV1. The interviewee considered that the Digital Transformation area presents a more global

and general view of the company's areas and that, for this reason, it could provide input for defining challenges to be worked on and prioritized. This point can be evidenced in the following excerpts:

> [...]I believe that you from Digital Transformation could support in the initial stage of discovering the challenges, as you end up having a macro vision, from above, which could help in the construction of the challenges [...] The more systemic vision, which looks at several fronts and can bring new possibilities for projects in the wake of experimentation or specific intrapreneurship campaigns.

The assistance of Digital Transformation could also occur when it comes to designing a prioritization model for the different demands that exist in the area of Innovation, as the existing format can present opportunities, according to the excerpt mentioned by INV2:

> We don't have a prioritization tool, we have a spreadsheet with some criteria, which may not be ideal. This is a way for you to support us.

The same positioning can be seen in the following excerpt from INV3:

> In an ideal world, you should look at what worked really well in innovation and then you will reprioritize demands, resources and teams. And this perspective of reprioritization, the Digital Transformation area could help.

The Innovation area understands that support and guidance in building a work model for innovation, as well as the dissemination of this model, are extremely important and could be done through the Digital Transformation area. This is also an issue presented by INV2, as this model would show the limits of Innovation's performance and establish criteria so that the flow of innovation would be fulfilled and, mainly, so that the initiatives would have continuity. This need and the understanding of it are evident in the following part of INV2's interview:

> The definition of gray area, when an Innovation project is successful and needs to leave the Innovation treadmill, where does it go? [...] There are several different ways that companies use, but we do not have this definition [...] in the past we had a discussion with you to try to untie this gray area. I think it is worth you getting involved, bringing us suggestions on how this can happen. I think this is a very

valid path [...] even for understanding what the role of Innovation is; the Digital Transformation area could help, because there are things that say they are Innovation, but in fact they are products.

The opportunity that the Digital Transformation area has to build a better designed work model can be seen in the following excerpt from INV3:

Digital Transformation could provide visibility, show people that Innovation has processes and deliverables. And make demands come in a better way, in addition to favoring the readiness for teams to receive demands. Understanding the process will help people bring up more mature topics at the right time.

The proposal to maintain and further involve the Innovation area in forums that aim to align areas to deliver demands, negotiate dependencies and share the strategy of business units was also raised as a relevant point and should be led by the Digital Transformation area. Even though these forums are already taking place, the maturation of the format with the increasingly active participation of the Innovation area is seen as necessary, as is the leadership of the Digital Transformation area for the review of the format.

This need can be highlighted when the approach was taken as follows by INV2:

[...]nIn the last alignment forum, the Innovation area was discussed a lot, for us it is very important [...] when I talk about culture, it is precisely that people understand that when a “feature” appears, the areas can say that Innovation can help you with that [...] this integrated vision of the business and technology areas is important for us [...] these forums end up supporting us even in the prioritization work but there is room to contribute even more [...] there are some points that we can adjust along the way, changing even more.

The same view can be seen in the following excerpts raised by INV3:

For me, planning is the endgame and there are some rites that have different purposes and the Digital Transformation area must be much more in governance and organization to get people on the same page.

A final point raised by INV2 regarding collaboration in the Digital Transformation area is linked to the application and dissemination of agility tools as a way of accelerating deliveries and bringing greater speed to meeting customer needs.

When asked how the Innovation area could be supported by the Digital Transformation area, TD1, TD2 and TD3 explored some points mentioned previously, but it was also possible to understand some views not mentioned by the Innovation area itself. TD1, TD2 and TD3 presented a similar position to INV2 when they suggested that the Digital Transformation area could design a model that would make it clear to Innovation and other areas of the company at what point it should act within the process of building and defining initiatives, something similar to a work model suggested previously. This positioning is clear in the following excerpts from TD1:

> [...] defining where each thing comes in would be where Digital Transformation could come in, not leaving the business open, and connecting to the moments and also to the challenges that we already have in the company today [...] having a calendar to define at what moment Innovation interacts to bring a “refresh” for people with a vision of the future, as we tend to look at the future when it is there and there is no more time.

Some excerpts from TD2's speech demonstrate this same view:

> We could make the timing of things clear to them. When people think about the backlog, when issues are raised, when hypotheses are validated. And according to these moments, Innovation can contribute. We could be the mediators to organize this.

Likewise, this positioning can be noted in the following excerpts from TD3:

> They need a model to define the format of action, so that there is a connection. Because, if they are in a very different model, they cannot connect [...] The Digital Transformation area could help Innovation understand which ceremonies they would participate in, show which innovation “inputs” would fit into a given ceremony and which ones they [innovation] should only enter as listeners, capturing, processing and evaluating the form of impact on their demands.

The importance of having a work model that seeks alignment between areas is also mentioned by Preez and Louw (2016), according to whom Innovation performance is linked to the alignment between Innovation structures and the organizational strategy, which is in line with what the Innovation and Digital Transformation areas think.

In TD1's view, it would also be important to make it clear to the other areas what types of services the different Innovation fronts could provide, what tools and information they could make available for defining strategies within the areas, with the definition of when and how to make these types of information available would be the responsibility of the Digital Transformation area, inserted in this designed operating model. This position is clear in the following excerpt:

> [...]what would be the best moments and what type of service they can provide from their menu [...] or we [Digital Transformation] can identify what is missing and indicate it, because we have a cycle that does not run as it should [...] bringing Innovation at these times can be important, making a proposal that you want to test, making agreements between the areas".

Like INV2, TD1 believes that the Digital Transformation area could also support in delimiting the role of the Innovation area to ensure clarity regarding processes and responsibilities. In the following excerpts it is possible to verify this positioning:

> It is necessary to clearly agree on the "input" and "output" of the Innovation team [...] make it clear that Innovation will deliver a cake recipe, lessons learned and not the finished project.

TD1 returned, in his speech, to the issue of the need to apply training and qualifications regarding innovation and tools, in addition to the structuring of roles linked to innovation. However, the interviewee presents this as something led and organized by the Digital Transformation area and not only the training that is provided daily in the contact between Innovation and the other areas. The following excerpts show this position:

> Providing training, creating the Innovation "chapter" and even the "Agile Master" [AM], who are representatives of the Digital Transformation area in the teams, supporting and replicating directly in the development teams, helping to bring innovation items to the "backlog".

With the same bias as TD1, the excerpts from TD3 highlighted the possibility of the Digital Transformation area being responsible for disseminating different concepts about innovation and its application:

> The Digital Transformation area can make the concept of innovation clearer, because it also works with methodology and could explain that innovation is not just about building rockets [...] Democratizing the term that is currently elitist and giving visibility to cool things that happen with the innovation bias.

Regarding TD2, he returns to the question regarding the integrated and macro vision of the company that the Digital Transformation area has and how this vision can help the Innovation area. In this way, he understands that the Digital Transformation area could be responsible for compiling all the views and "inputs" it receives from different areas and bringing them in an organized and prioritized way so that it can serve as input and direction for the Innovation area. The following excerpt shows such a view:

> I think it should be an organized package that should go back to Innovation and based on what they are seeing in terms of pain here, Innovation goes outside and sees how these pains are being solved, what they are doing differently that we don't do here.

In this way, TD2 understands that the Digital Transformation area, by bringing these organized guidelines, would reduce the difficulties that Innovation has in providing continuity and connection between what is being dealt with in the company and what is brought in as suggestions for Innovation projects, as internal needs would be addressed and connected to Innovation themes. This perception can be seen in the following excerpts:

> Innovation would not go outward looking for the sake of looking, nor would it bring trends that have nothing to do with the business [...] Innovation brings cool initiatives, but where does it fit into my business? And then there is a huge effort, but without looking at trends based on internal pain, so there would be a more assertive look outward.

Just like INV2, TD2 and TD3 understand that the Digital Transformation area can include the Innovation area in the delivery strategy alignment forums of the areas, so that they can bring "insights"

and questions that will help define the challenges to be prioritized. This point can be highlighted in the following excerpts from TD2 and TD3, respectively:

> We could put them on the table, have a space left for them during these forums for them to bring up these provocations before they start thinking about "backlog".
>
> Including the innovation area in quarterly "checkpoints" is a way that the Digital Transformation area could assist in the management of the company's Innovation as a whole.

A final point raised by TD2 is related to the questions that the Digital Transformation area could ask both the business units and the technology areas and the Innovation area itself, aiming to generate concerns and drive a movement in favor of using innovation for decision-making. Consequently, the Digital Transformation area would create links between areas and take people out of their comfort zone through the use of innovation, that is, it would use the Digital Transformation area as a "mindset" transformation agent. This idea can be evidenced in the following excerpts:

> We, as the "Lean Agile Center of Excellence" [LACE], could come in as people who demand and question the initiatives [...] We could get involved in the performance of tools and technologies that are currently being introduced by the areas. We could listen to what each BU is doing, take it to Innovation, structure Innovation, bring it back and make Innovation provoke the guys. We could do this, create a "link".

Summary of results

In Table 2, it is possible to see in general terms how the areas of Digital Transformation and Innovation position themselves with regard to the different aspects addressed during the interviews.

Firstly, it was observed that the Digital Transformation area has a more systemic view of the entire Innovation management process and is more aligned with its role and the role of the Innovation area within the scenario of the company in which it operates. This can be seen as a very positive issue, since it is an area responsible for seeking ways and mechanisms to promote cultural and structural evolution in the company in a more fluid manner and with as little friction as possible during this process. This point is in line with what is proposed by Schwertner (2017), who addresses in his work the main

obstacles and difficulties that companies encounter when they are seeking to evolve in the Digital Transformation process.

On the other hand, more heterogeneous behavior was observed within the area of Innovation management, with divergent opinions and positions. In addition to the often different aspects of the interviewees' vision of innovation being highlighted, the difference in maturity regarding the topics addressed became apparent, which can impact the way they act as an area, how they influence and how their performance and impact are seen by the entire company. These aspects are, in a way, aligned with what is addressed by Lavrado et al. (2020), when they mention issues that encourage and others that are barriers during the implementation of the Innovation culture in organizations.

Table 2

Summary of results obtained from the interviews

Topic approached	Vision of the Innovation area	Vision of the Digital Transformation area
Knowledge about the area other than your area of expertise	Interviewees have more superficial knowledge, focusing on some specific concepts and lack of knowledge about the operating model of the Digital Transformation area.	Interviewees have broader, more systemic knowledge and greater clarity regarding the area of Innovation.
Ideal format for the Innovation area to operate	There were points of divergence among the interviewees. One of the interviewees understands that the role of Innovation is only to be disruptive, while the other understands that it also has an incremental function.	Most of the points raised converge among the three interviewees.
Pains present in the area of Innovation	There were points of convergence between what was raised, but also some complementary points from each of the interviewees, but without divergences.	They converged on all the points raised by the three interviewees.
Ways DT supports Innovation Management	Respondents converged on only one point and the other questions were merely complementary and asked by only two of the interviewees.	They converged in relation to all the topics raised, including what was explained by one of the interviewees in the Innovation area.

Source: Original research data results

Discussion of the Results

Framework

From the results, it was observed that the Digital Transformation area has a more systemic view of the entire Innovation management process and is more aligned with its role and the role of the Innovation area within the scenario of the company in which it operates. This can be seen as a very positive issue, since it is an area responsible for seeking ways and mechanisms to promote cultural and structural evolution in the company in a more fluid manner and with as little friction as possible during this process. This point is in line with what is proposed by Schwertner (2017), who addresses in his work the main obstacles and difficulties that companies encounter when they are seeking to evolve in the Digital Transformation process.

The assessment and vision of the three interviewees in the innovation area regarding the Digital Transformation fronts were not fully aligned with what the literature proposes, since Vial (2019) defends the concept that Digital Transformation goes beyond the implementation of tools or technologies, being a process that seeks to improve a company through the review of the value creation strategy using structural changes and the reduction of organizational barriers. This issue is critical, as the need for acculturation and methodological support is also seen as essential in the view of Borges and Moraes (2013), as it is through the development of new skills and concepts that employees become able to insert innovation themes, for example, into their work routine.

More heterogeneous behavior was observed within the area of Innovation management, with divergent opinions and positions. In addition to the often different aspects of the interviewees' vision of innovation being highlighted, the difference in maturity regarding the topics addressed became apparent, which can impact the way they act as an area, how they influence and how their performance and impact are seen by the entire company. These aspects are, in a way, aligned with what is addressed by Lavrado et

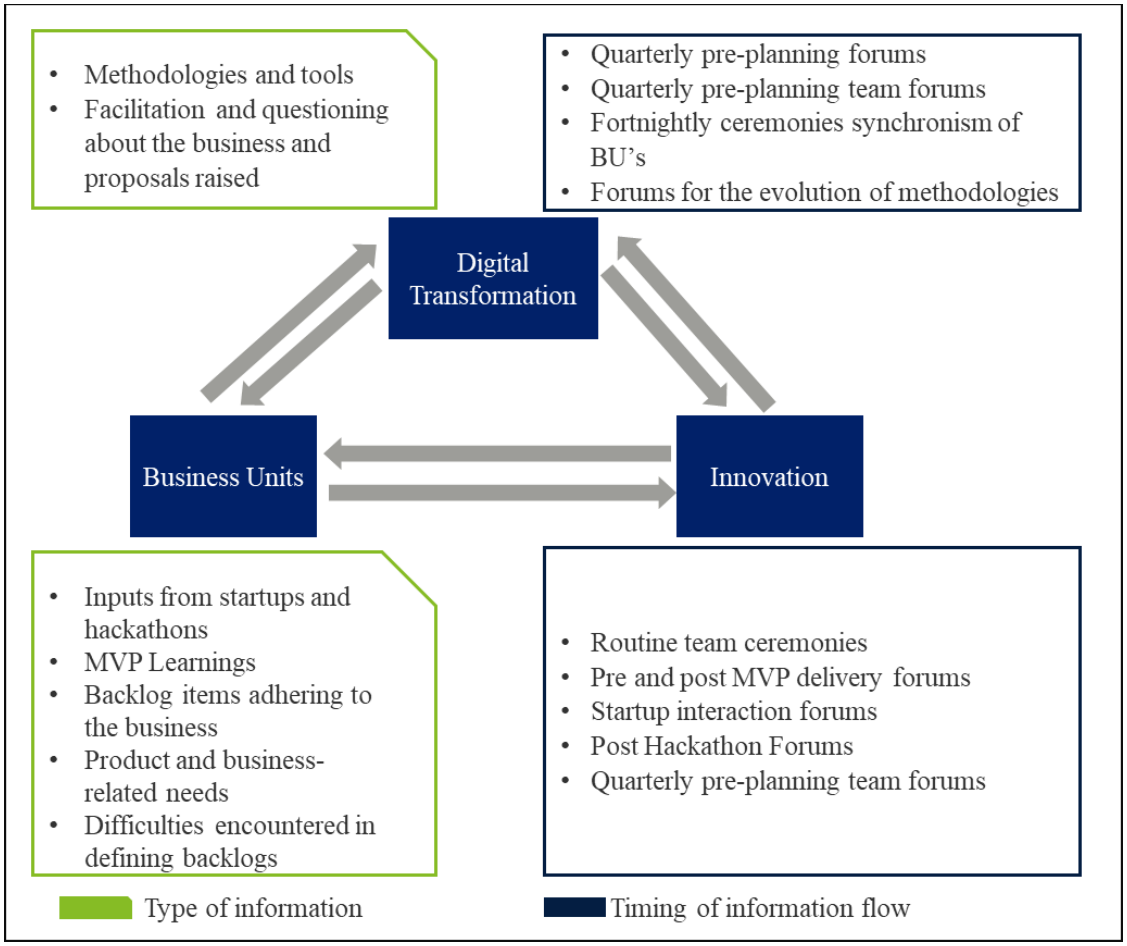
al. (2020), when they mention issues that encourage and others that are barriers during the implementation of the Innovation culture in organizations.

The topic regarding the structuring of a work model was raised, emphatically and unanimously, during the six interviews carried out. This topic was highlighted as one of the main contributions that the Digital Transformation area could provide for Innovation management. The six interviewees understood that this model could improve the flow of information and ensure the participation of the innovation area in all important moments of the company's decision-making, topics also addressed by Brodbeck et al. (2007). This makes it possible to obtain gains both for Innovation management and for other areas of the company, including the Digital Transformation area.

The importance of having a work model that seeks alignment between areas is also mentioned by Preez and Louw (2016), according to whom Innovation performance is linked to the alignment between Innovation structures and the organizational strategy, which is in line with what the Innovation and Digital Transformation areas think. Based on the results and discussions, a model of the areas involved and a dynamic information flow between them was formulated, presented in Figure 1.

Figure 1

Model of interaction between Business Units, Digital Transformation and Innovation



Source: the authors (2024)

In the work model that seeks to improve Innovation management, the importance of maintaining a flow of information is highlighted not only from the Digital Transformation area to the Innovation area, but also directly from the Business Units to the Innovation area. Furthermore, it is important that this flow also occurs in reverse, that is, that the Innovation area is the provider of information for both the Business Units and the Digital Transformation area itself. This would ensure that the flow occurs both to the Innovation area and from the same area to the others.

The construction of formal and informal structures for the exchange of information and knowledge between areas is necessary for better dynamics between the sectors involved and the success of the organization. It is worth noting that the structure alone is not enough so there is an exchange of knowledge; a change in the culture and organizational context is also necessary to encourage the use of the structures created (Barret et al., 2004). In addition to the various moments exposed in the model in figure 1, it is possible to include the various communication technologies as a base infrastructure for knowledge exchange (Zeng; Gonzalez; Lobato, 2015).

According to those interviewed, ensuring this flow of information enables gains for the three areas involved (Innovation, Digital Transformation and Business Units), since it promotes the connection between the different initiatives led by the areas, solving one of the main problems mentioned by everyone, related to the continuity and completion of the initiatives proposed by the Innovation area.

Another benefit achieved through the continuous flow of information would be that both the Innovation and Digital Transformation areas now have moments to encourage and provoke the implementation of Innovation items and concepts in initiatives that may be considered and presented by other areas.

This work model addresses two other concerns raised by interviewees: the lack of knowledge of the appropriate moments for each area to participate and interact, as well as what type of information should be addressed in each of these interactions. The importance of having an established and clear flow of information for all those potentially impacted is also highlighted by Vital et al. (2010).

Making it clear in which ceremonies each area is expected to participate and what type of information these areas should provide in these same ceremonies allows for better synchronization and fluidity between them, as well as greater assertiveness and effectiveness during such interactions. Synchronization reflects better alignment of the company's strategy as a whole, increased quality and efficiency of deliveries, reduced waste and even improved organizational climate, since this enables understanding and engagement between areas, reduces communication difficulties, brings visibility to the importance of the role of each area, in addition to encouraging the pursuit of the same objective.

The proposed work model also depends on active participation from leaders in both areas of the organization. A critical barrier to the process of implementing innovations in organizations is leadership support (ROGERS, 2017). Leaders have the ability to mobilize resources and advocate for the necessary change, joining efforts during the process of adopting and implementing the proposed model. As digital transformation is a new topic, leadership is critical to successful implementation.

Conclusion

Through this study, it was possible to verify that the Digital Transformation area has mechanisms, knowledge and influence to assist and drive the improvement of Innovation management processes, and that this support can occur in different ways, among which the most important are the assistance in disseminating the culture of Innovation through training and encouraging its application in the routine of the entire company; the insertion of methodologies and concepts common to the Digital Transformation area within the Innovation structures so that they are more adherent to the new work format that the company has sought to adopt; finally, the construction of a work model that ensures greater synchronization, connection and fluidity between the initiatives explored by the Innovation, Digital Transformation and other areas of the company.

The mere introduction of digital transformation into organizations through technologies will not bring the expected benefits. The work model developed aims to highlight the importance of communication between sectors and the key role of project leadership in creating synergy and reducing resistance to the adoption and implementation of digital transformation in organizations. In this sense, internal communication technologies can serve as infrastructure, however, companies must also develop a culture and context focused on sharing information between sectors.

Finally, the theoretical and practical contributions are highlighted, as well as the limitations of the research and suggestions for further studies. The theoretical contribution concerns the addition to the literature on Digital Transformation and Innovation, due to the analysis of the interaction between these two. The practical contribution is associated with the guidelines provided by the proposed work model and understanding how this interaction occurs in the flow of information. With the model and its

guidelines in hand, professionals interested in introducing digital transformation into their organizations will have greater support to face the challenges of integration between sectors. This explanation can help define effective practices so that innovation actions act proactively, helping organizations that are in the process of transformation.

One of the possible limitations of this study concerns the single case study, restricting the scope of the work. Future research suggests quantitative studies to build scales and statistically test the proposed relationships, as well as qualitative studies through multiple case studies in companies from different sectors of the economy, making comparisons regarding the interactions proposed in the work model and information flows between innovation and digital transformation.

Author Contributions

Contribuição	Borges, P. R.	Bitte, M. F.	Adorno, O. A.	Nascimento, P. T. S.
Contextualization	X	X	----	X
Methodology	X	X	X	----
Software	X	X	----	----
Validation	X	X	----	----
Formal Analysis	X	X	----	----
Investigation	X	----	----	----
Resources	X	----	----	----
Data Curation	X	----	---	----
Writing - Original Draft	X	X	X	X
Writing - Review & Editing	X	X	X	X
Visualization	X	X	X	X
Supervision	X	-------	----	-------
Project Administration	X	-------	----	-------
Funding Acquisition	X	----	----	----

References

Anjos, E. C. dos, Aihara, C. H., Davila, G. A., & Varvakis, G. (2019). Transformação digital e práticas de gestão do conhecimento: uma revisão sistemática da literatura. Anais Do Congresso Internacional De Conhecimento E Inovação – Ciki, 1(1). Recuperado de

https://proceeding.ciki.ufsc.br/index.php/ciki/article/view/676

Armengaud, E., Sams, C., von Falck, G., List, G., Kreiner, C., Riel, A., (2017). Industry 4.0 as digitalization over the entire product lifecycle: opportunities in the automotive domain. Commun. Comput. Inf. Sci. 334–351. https://doi.org/10.1007/978-3-319-64218-5_28

Baptista, G.L.; Figueiredo, J.S. (2017). Impacto da transformação digital nas organizações: um estudo sobre diferentes abordagens de condução do processo de transformação. In: Seminário em Tecnologia da Informação Inteligente [SeTII], 2017, São Paulo, SP, Brasil. Anais... p. 120-125.

Birkinshaw, J.; Hamel, G.; Mol, M. J. (2008). Management innovation. Academy of Management 33 (4): 825-845.

Borges, K.S.; Moraes, M.A.C. 2017. A formação do sujeito inovador no uso de projetos de aprendizagem, metodologias ágeis e ferramentas colaborativas. Monografia. Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Sul, Porto Alegre, RS, Brasil.

Brodbeck, F. C.; Kerschreiter, R.; Mojzisch, A.; Schulz-Hardt S. (2007);Group. Decidion making under conditions of distributed knowledge: the information asymmetries model. *Academy of Management 32*: 452-479.

Chen, J. (2017). Towards new and multiple perspectives on innovation. Research Center for Technological Innovation, Department of Innovation, Entrepreneurship and Strategy, School of Economics and Management, Tsinghua University, Haidian District, Beijing 100084, China. https://www.researchgate.net/publication/315470125_Towards_New_and_Multiple_Perspectives_on_Innovation. Acesso em: 2 nov. 2021.

Crawford, I.M. (1997). Marketing research and information systems. Food and Agriculture Organization of The United Nations, Roma, Itália.

Creswell, J.W. (2013). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. 4th Edition, SAGE Publications, Inc., London

Dereli, D.D. (2015). Innovation management in global competition and competitive advantage. In: World Conference on Technology, Innovation and Entrepreneurship, 2015, Istambul, Turquia. Anais...

p. 1365–1370. v. 195.

Eisenhardt, K. M. (1989). Building theories from case study research. *The Academy of Management Review*, *14*(4), 532–550. https://doi.org/10.2307/258557.

Eveleens, C. (2010). Innovation management; a literature review of innovation process models and their implications. Advisory Council for Science, Technology and Innovation [AWTI], Holanda. https://www.researchgate.net/publication/265422944_Innovation_management_a_literature_review_of_innovation_process_models_and_their_implications. Acesso em: 4 nov. 2021.

Flores, J. G. (1994). *Análisis de datos cualitativos - aplicaciones a la investigación educativa* Barcelona: PPU.

Gerring, J. (2004). What Is a Case Study and What Is It Good for? American Political Science Review, Los Angeles, v. 98, n. 2, p. 341-354, May. web.rollins.edu/~ddavison/Spring08/ Gerring_CaseStudies.pdf. Acesso em: 16.dez.2022..

Godoy, A. (2010) Estudo de caso qualitativo. In: SILVA, A. B.; GODOI, C. K.; BANDEIRA-DE MELLO, R. *Pesquisa qualitativa em estudos organizacionais: paradigmas, estratégias e métodos*. São Paulo: Saraiva, p. 115-146.

Gregory, R.; Wagner, H.; Tumbas, S.; Drechsler, K. (2019). At the crossroads between Digital Innovation and Digital Transformation. In: International Conference on Information Systems [ICIS], 2019, Munique, Alemanha.

Henriette, E.; Feki, M.; Boughzala, I. (2016). Digital Transformation Challenges. In: Mediterranean Conference on Information Systems [MCIS], 2016, Pafos, Chipre.

Hinings, B., Gegenhuber, T., Greenwood, R., (2018). Digital innovation and transformation: an institutional perspective. *Inf. Organ. 28*(1), 52–61. https://doi.org/10.1016/j.infoandorg.2018.02.004.

Hung, B. Q.; Nham, N. T. H. (2023). The importance of digitalization in powering environmental innovation performance of European countries. *Journal of Innovation & Knowledge*, *8*(1) 100284. doi: https://doi.org/10.1016/j.jik.2022.100284

Ivančić, L., Vukšić, V., Spremić, M., (2019). Mastering the digital transformation process: business practices and lessons learned. *Technol. Innov. Manag. Rev.* *9*(2), 36–50. https://doi.org/10.22215/timreview/1217

Kahn, K.B. (2018). Understanding innovation. School of Business, Virginia Commonwealth University, Richmond, Estados Unidos. Disponível em: https://www.sciencedirect.com/science/article/abs/pii/S0007681318300119. Acesso em: 4 nov. 2021.

Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., Roig-Tierno, N., (2021). Digital transformation: an overview of the current state of the art of research. *SAGE Open 11*(3). https://doi.org/10.1177/21582440211047576 .

Lavrado, F.P.; El-Khouri, N.B.D.; Barbosa, C.C.R.; Rezende, J.F.C. (2020). Inovação e cultura organizacional: características presentes em culturas de inovação. Perspectivas em Gestão & Conhecimento 10: 88-106.

Mahraz, M.; Benabbou, L.; Berrado, A. (2019). A systematic literature review of Digital Transformation. In: International Conference on Industrial Engineering and Operations Management, 2019, Toronto, Canadá. Anais… p. 917-931.

Matt, C.; Hess, T.; Benlian, A. (2015). Digital Transformation Strategies, Business and In-. formation Systems Engineering, 57(5), 339–343.

Mayakova, A., (2019). Digital transformation of modern quality management. Econ. Ann.-XXI 180 (11–12), 138–145. https://doi.org/10.21003/ea.v180-15.

Mergel, I., Edelmann, N., Haug, N., (2019). Defining digital transformation: results from expert interviews. *Gov. Inf. Q. 36*(4), 101385. https://doi.org/10.1016/j.giq.2019.06.002.

Merriam, S.B. (2001). Qualitative research in practice: examples for discussion and analysis. Jossey-Bass, São Francisco, Califórnia, Estados Unidos.

Neto, P. (2011). Demystifying cloud computing. In: Doctoral Symposium on informatics Engineering, 2011, Porto, Portugal.

Ormston, R.; Spencer, L.; Barnard, M.; Snape, D. (2013). Qualitative research practice: a guide for Social Science students and researchers. 2ed. Sage, Londres, Inglaterra; Los Angeles, Washington, Estados Unidos; Cingapura, Índia.

Paiva Jr, Leão, A, Mello, S. (2011). Validade e Confiabilidade na Pesquisa Qualitativa em Administração. *Revista de Ciências da Administração*, v 13, n 31.

Pinto, M.B.C. (2021). Startups vs. empresas estabelecidas: perfis de liderança e percepções dos líderes sobre os comportamentos de cidadania organizacional e o desempenho das suas equipas. Dissertação. Universidade Católica Portuguesa, Porto, Portugal.

Peng, Y.; Tao, C. (2022). Can digital transformation promote enterprise performance? —From the perspective of public policy and innovation. *Journal of Innovation & Knowledge, 7*(3) 100198. doi: https://doi.org/10.1016/j.jik.2022.100198

Preez, N.D.D.; Louw, L. (2008). A framework for managing the Innovation Process. In: Portland international center for management of engineering and technology [PICMET08], 2008, Cidade do Cabo, África do Sul. Anais… [*online*].

Prokhin, E. (2020). Digital Transformation Of Industrial Companies:what is management 4. 0? In: Proceedings the 11thInternational Conference on E-Business, Management and Economics , Beijing China.

Queiroz, M. M., & Wamba, S. F. (2022). Managing the Digital Transformation. CRC Press. https://doi.org/10.1201/9781003226468

Robertsone, G.; Lapina, I. (2023). Digital transformation as a catalyst for sustainability and open innovation, Journal of Open Innovation: Technology, Market, and Complexity, Volume 9, Issue 1, 100017, ISSN 2199-8531, https://doi.org/10.1016/j.joitmc.2023.100017

Rogers, D. L. (2017). Transformação digital: repensando o seu negócio para a era digital, São Paulo: Autêntica Business.

Sarmah, S.S. (2018). Understanding blockchain technology. *Computer Science and Engineering, 8*(2): 23-29. Disponível em:

https://www.researchgate.net/publication/336130918_Understanding_Blockchain_Technology. Acesso em: 2 nov. 2021.

Schwab, K. (2016). A quarta revolução industrial. Tradução de Daniel Moreira Miranda. São Paulo: Edipro.

Schwertner, K. (2017). Digital transformation of business. Trakia Journal of Science 15 (Suppl.1): 388–393.

Sia, S.K., Weill, P., Zhang, N. (2021) Designing a future-ready enterprise: the digital transformation of DBS bank. Calif. Manag. Rev. Published online March 5, 2021, 000812562199258. https://doi.org/10.1177/0008125621992583.

Singh, A., Hess, T., (2017). How chief digital officers promote the digital transformation of their companies. MIS Q. Exec. 16 (1) (Accessed 20 May 2023). https://aisel.aisnet.org/misqe/vol16/iss1/5.

Tabrizi, B., Lam, E., Girard, K., Irvin, V., (2019). Digital transformation is not about technology. Harv. Bus. Rev. 03 (Accessed 28 April 2023). ⟨https://hbr.org/2019/03/digital-transformation-is-not-about-technology⟩.

Trivedi, A., Pillai, L.H.R., (2020). Digital transformation 2020. Adv.Appl.Math.Sci.vol. 20(no.2), pp. 261–7.

Vial, G. (2019). Understanding Digital Transformation: a review and a research agenda. The Journal of Strategic Information Systems 28(2): 118–144.

Vital, L.P.; Floriani, V.M.; Varvakis, G. (2010) Gerenciamento do fluxo de informação como suporte ao processo de tomada de decisão. Informação & Informação 15: 85-103.

Yin, R. K. (2018). Case Study Research and Applications: Design and Methods (6th ed.). Thousand Oaks, CA: Sage

Zhang, Q.; He, Y.; Lai, R.;Hou, Z.;Zhao, G. (2023). A survey on the efficiency, reliability, and security of data query in blockchain systems, Future Generation Computer Systems, Volume 145, Pages 303-320, ISSN 0167-739X, https://doi.org/10.1016/j.future.2023.03.044.

ZENG, Shouzhen; GONZALEZ, Joaquin; LOBATO, Clemente. The effect of organizational learning and Web 2.0 on innovation. *Management Decision*, *53*(9), p. 2060-2072, 2015.