<HARMONY WITHIN THE NEW DIGITAL PARADIGM: MANAGEMENT OF HUMAN FACTOR AND BALANCE BETWEEN NEW AND LEGACY PRACTICES>

by

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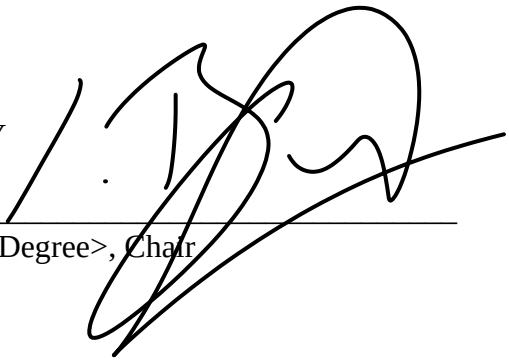

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Dedication

To my dear husband who have always supported, encouraged and inspired me throughout all my endeavors. His unwavering love and understanding have made this research possible. Thank you for always being by my side.

Esta tesis también está dedicada a mi familia, especialmente mi madre, padre y hermano, con quienes siempre pude contar y con quienes estoy agradecida de por vida. Su amor incondicional, apoyo, paciencia, inspiración y ayuda (siempre y especialmente durante este proceso) hicieron que este trabajo sea posible.

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ABSTRACT

< HARMONY WITHIN THE NEW DIGITAL PARADIGM:
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<Camila Calcagno>
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Digitalization has become a central topic within societies and organizations, being described as a new paradigm or as the fourth industrial revolution. This is a change taking place at many layers, including social, economic, private and public layers that is impacting people's needs, behaviour and expectations. The impact has been so profound that even the markets and industries are shifting, and organizations are finding themselves in extremely fast-changing environments where the competition is greater than ever and where the customers are demanding and behaving in a different way than before.

The purpose of this research is to place the management of the reaction of the people involved in change due to digitalization as a central moderating factor that can

have a direct positive impact on these processes, being a main enabler. Reactions will be different, depending on many variables such as the people perception, knowledge and understanding but, by placing the management of their reaction at the center and by proactively addressing it, that expected resistance can be brought to significantly lower levels. This thesis aims to show that the human variable is such a central piece in digital transformation processes that the success of them can be directly dependent on it.

The research was performed doing a sistematic literature review together with a measurement instrument in the form of a comprehensive survey that was filled by one-hundred and thirty-four respondents across the globe and from many industries.

Based on this research, it is important to understand that the environment in which organizations operate is fast and ever-changing. There are constantly new ways of doing things, new technologies and frameworks that could be implemented, new strategies to be explored, etc. What is not different is the need for change with its human centricity. This is just the beginning of this new digital era and there are many more transformational processes coming our way. Regardless of their shape or form, it is critical to be not only relying on traditional pillars such as technology, culture and human resources, but to also include change management practices and human behavior.

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1.1 Introduction

Digitalization or digital transformation processes are becoming increasingly important within today's society and organizations across all industries. In Parviainen et al. (2017) this process is even described as one of the key tendencies that are transforming not only businesses but also the society as a whole. In the same way, in Zaoui and Souissi (2020), digital transformation is seen as a social change that has a direct impact on the economic development while in Henriette et al. (2016) is also perceived as a cultural evolution. What is common across the different definitions is the balance between the social, cultural and/or business aspects with the technological advancements. The raising importance of this topic is also reflected when analyzing Google Trends: the search for the words "digital transformation" and "digitalization" in the Google search engine has practically quadrupled in the last seven years, as shown in the Figure 1 and Figure 2.

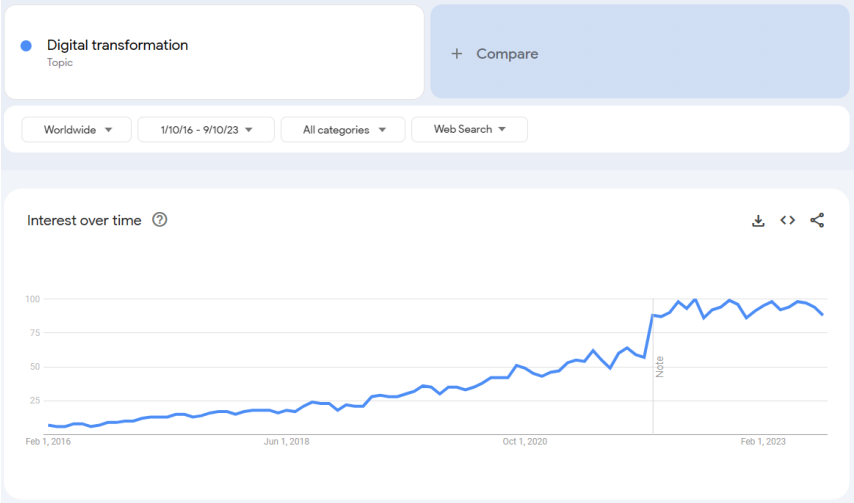

Figure 1
Digital transformation search from 10/01/2016 to 10/09/2023, worldwide
(Google Trends Digital Transformation, 2023)

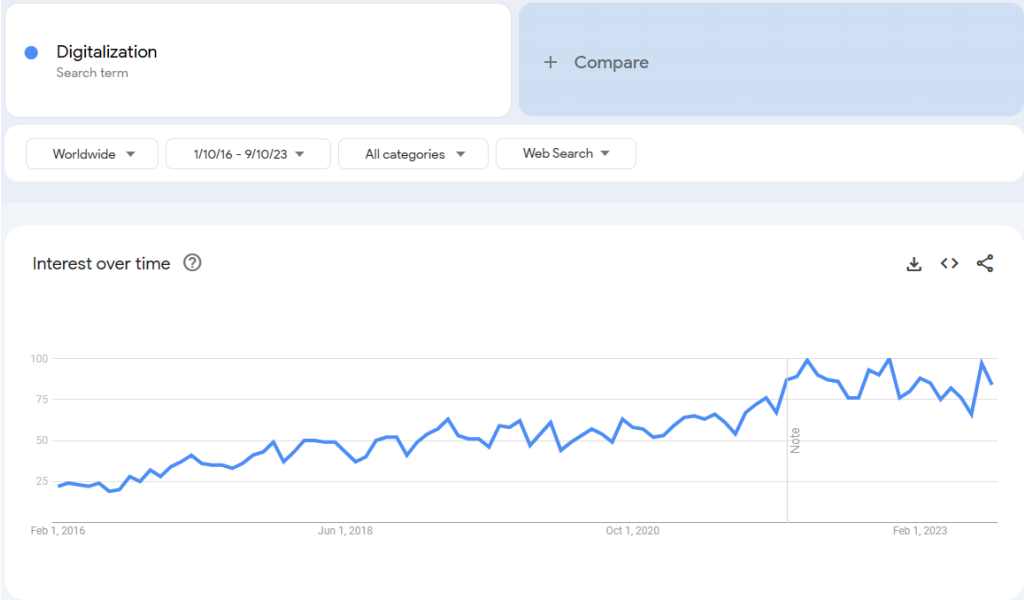

Figure 2
Digitalization search from 10/01/2016 to 10/09/2023, worldwide
(Google Trends Digitalization, 2023)

Nowadays, society is facing what can be called a “new digital paradigm” where there is a shift towards a digital first society, but lately, with a more “sustainable, human-centric and resilient” approach (European Commission, 2022). In the current literature, this new digital paradigm is even defined as the fourth industrial revolution. The different industrial revolutions can be explained as follows (Xu et al., 2018):

- First industrial revolution: this period started with the invention of the steam engine that enabled the change from agrarian economy to an economy dominated by industrial manufacturing. The main industries where most of the labor was concentrated were textile and steel
- Second industrial revolution: mass production facilitated by oil and electricity due to the invention of the internal combustion engine
- Third industrial revolution: production was automated by electronics and information technology
- Fourth industrial revolution: this concept was created by Klaus Schwab (founder and executive chairman of the World Economic Forum) and talks about the current context where people can shift between online and offline realities and manage their life using new technologies. What is highlighted especially for the fourth industrial revolution is speed and the size of the changes involved, impacting power, wealth and knowledge. It is stated that this a new revolution rather than an extension of the third industrial revolution is because of its velocity, scope and systems impact

Table 1
Main characteristics of industrial revolutions
Source: Xu et al. (2018)

Period	Transition Period	Energy Resource	Main Technical Achievement	Main Developed Industries	Transport Means
I: 1760-1900	1860-1900	Coal	Steam Engine	Textile, Steel	Train
II: 1900-1960	1940-1960	Oil Electricity	Internal Combustion Engine	Metallurgy, Auto, Machine Building	Train, Car
III: 1960-2000	1980-2000	Nuclear Energy Natural Gas	Computers, Robots	Auto, Chemistry	Car, Plane
IV: 2000-	2000-2010	Green Energies	Internet, 3D Printer, Genetic Engineering	High Tech Industries	Electric Car, Ultra-Fast Train

This paper defines digitalization as a change that can take place at many different levels and layers (society, organizations, and more), where technological advances are made and introduced that have a profound impact and where balance is sought between different social elements (strategy, vision, mission, values, processes, operation, skills, people, etc.) and the new technologies and innovations in order to be successful and add value to the end user.

Is my opinion that, given the importance, depth and impact of this new digital paradigm and industrial revolution, organizations must be aware of this social, economic and worldwide transformation in order to keep up not only with competitors but also with the new customer's, employee's and societal needs, behaviors and expectations. Therefore, this research intends to provide to the academic and corporate environments a comprehensive, holistic and structured view on this important matter where human behavior and the management of its reaction (including change management practices)

are placed at its core, becoming its main enabler, where the ‘transformational’ side is as - or even more- important as the ‘digital’ aspect.

1.2 Research problem

Based on preliminary investigations, digitalization processes are affecting organizations and even society, being an extremely relevant aspect of this new enough paradigm that is being driven by new technologies and ways of acting, behaving, expecting and doing things. Despite the criticality of this topic, the academic environment at the present is missing a comprehensive, holistic and structured approach to it, where more than one specific view or approach is taken into account. This holistic approach is a key enabler for the success on digital transformation journeys, since considering only a few aspects of these processes is not enough due to the major impact that can have.

The main challenge identified is the one that can arise from the human factor, where conflicts appear between the “old” (what is already established, the status quo, traditions and habits embedded in the culture of the organization and in the day to day of the employees) and the “new” (new processes, behaviors, expectations, technologies, ways of doing things, ways of adding value).

Digitalization is indeed a profound change, being a movement or shift from a current state to a future one. The rapidly changing and evolution of societies, companies and individuals is discussed in Cameron and Green (2019), where it is highlighted the struggle for organizations to keep up with those external (economic and political) and internal (structures, strategies, systems) changes in order to be able to keep meeting the

needs and expectations of their employees and consumers. Similarly, Burke (2017) states that changes are taking place every day at a very rapid pace where the organizations operate and that there is a need to have a better understanding of what change entails for them.

As Bellantuono et al. (2021) confirm, there are some gaps in the digital transformation literature such as change-monitoring activities, identification and management of the resistance to change and the change consolidation. The paper highlights some limitations within the digital transformation research; for example: how can the resistance to change can be not only identified but also addressed and managed, nor how to help people to accept the changes proposed.

1.3 Research purpose and questions

The purpose of this research is to place the management of the reaction of the people involved in change due to digitalization as a central moderating factor that can have a direct positive impact on these processes, being a main enabler. Reactions will be different, depending on many variables such as the people perception, knowledge and understanding but, by placing the management of their reaction at the center and by proactively addressing it, that expected resistance can be brought to significantly lower levels. This thesis aims to show that the human variable is such a central piece in digital transformation processes that the success of them can be directly dependent on it.

My research objective, as presented in Figure 3, is to encapsulate those different approaches together under the umbrella of human behavior and change management, in

order to then achieve a holistic view and perspective of such a relevant topic as digital transformation is while addressing the proposed hypotheses:

- H1: Despite the high impact of digitalization in organizations nowadays, there is no common transformational approach that fits all. But, having a holistic view of the digitalization processes, placing the human factor in the center of it and managing its reaction to the changes proposed by these transformations are crucial variables that define the outcome of the digital transformation
- H2: Transitioning into a more digital-driven environment is not only about implementing the latest technologies, updating the strategy of the company and upskilling employees, but also about trying to be part of this new digital and social paradigm and embarking on a cultural change process where proactive and clear communication regarding the reasons, impact and expectations of the digital transformation processes while balancing organizational cultural values is key for its adaptation and success

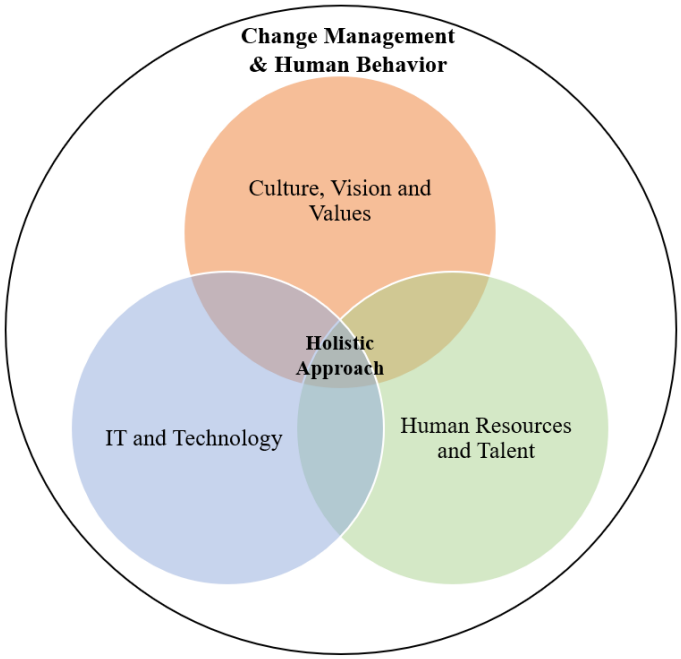

Figure 3
Holistic approach to digitalization
Source: Author

1.4 Significance of the study

As explained in the introduction, digital transformations are impacting not only organizations but societies as a whole, and at many different layers. These tranformations are a social change that have even created a new digital paradigm (where there is a shift towards a digital first society, but lately, with a more "sustainable, human-centric and resilient" approach (European Commission, 2022)) and/or a fourth industrial revolution (where people shift between online and offline realities and manage their life using new technologies). People's lifes and society are profoundly impacted by digitalization and organizations must stay on top of these changes in order to thrive and survive. Digitalization processes are affecting every layer of the markets, including their nature,

changing the way that organizations compete, how the customers behave, their expectations and demands, and even how businesses are conducted, impacting employees, customers, the way of providing services, creating and distributing goods, and more (Teichert, 2019).

Newer organizations, that are more digital driven may have already seen opportunities for further development and greater revenue and performance due to the emerging technologies, since, at least in the most developed countries, new technologies and innovations are directly connected to at least half of the economic growth of the markets (Ignat, 2017). On the contrary, more traditional organizations must suddenly operate on a fast-changing environment where competition is greater than ever and customer demands are different (Hartl, 2019). But all organizations, no matter how new, old, big or small, have their own culture that is composed of shared assumptions that were built during the organization's history, representing its values, beliefs and principles (Nikpour, 2017). The organizational culture and values are directly affected by digital transformation processes in the same way that society and people's values and expectations are (Nikitenko, 2019). Therefore, it is of critical importance for organizations of all types and nature to understand this transformation happening across macro and micro environments in order to succeed in this new paradigm.

CHAPTER II:
REVIEW OF LITERATURE

2.1 Theoretical framework

At present there is not one standard definition of “digitalization” or “digital transformation”. Some authors provide definitions that are purely business orientated and other authors see those concepts as a social phenomenon and a cultural evolution (Henriette et al., 2016) that includes not only businesses but the society as a whole.

As stated in the introduction, Zaoui and Souissi (2020) describe digital transformation as a change from a social perspective that has a direct impact on the economic development. In a similar way, digitalization is seen as changes that are related to the implementation of digital technology across the whole society (Parviainen et al., 2017). Consonantly, in Bellantuono et al. (2021), this new paradigm (called “I 5.0” or “Industry 5.0”) is defined by a change that is not solely focused on technology driven approaches but where the human plays a greater role.

From a business perspective, there are several definitions available within the academic literature, all similar in some ways but also different regarding the aspects that the digitalization processes may impact or involve. These transformations are, for example, described as a change process that can either take place in an incremental or disruptive way; where at the beginning, within the organizations, new digital technologies are starting to be utilized, to then eventually have a whole transformation in order to create value (Henriette et al., 2016). Contrary to those two options, Danuso et al.

(2021) propose four options for the implementation of digital transformation, as it can be seen in Figure 4:

- Explosive: Impacts the whole organization at once having a fast transition with high costs
- Decisive: Impacts the whole organization but the implementation is more flexible
- Distributed: The responsibility lies within each business unit, where a specific strategy and implementation plan is defined
- Reactive: An internal transformation takes place first, within the company, before exploring new business models to respond to external factors such as customer's expectations

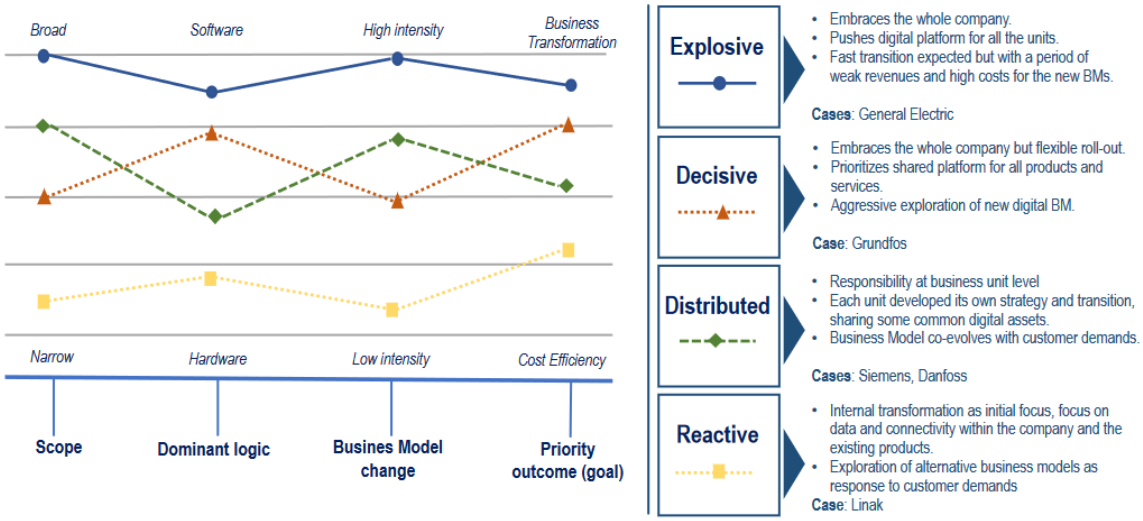

Figure 4
Choices that shape the digital transformation strategy
Source: Danuso et al. (2021)

One common variable that can be found across the different definitions and that is of agreement for this study is not only the relationship but also the balance between new technologies and the business or social aspects. For example, in Osmundsen et al. (2018), digitalization is seen as the process where social (human factor, values, norms, etc.) are leveraged with technical aspects (such as technologies, tasks, etc.). Similarly, values take an important place as well in Kirchmer (2021) where it is stated that for a digital transformation process to be successful, it must be driven by those values, while being led by established processes that should be based on reliable data.

While in Schwertner (2017) digitalization is defined as the adaptation of technologies in elements within the businesses such as processes, softwares and systems with the end goal of creating more revenue, competitiveness and efficiency; in Gurbaxani and Dunkle (2019), digital transformation is rather taken as a holistic change that includes the regeneration of the organizational vision, strategy, structure, processes and culture, while Vogelsang et al. (2019) define digitalization as the implementation of new technologies to improve the business in different perspectives (customer experience, efficiency in processes and operations, and more).

From a market, industry and competitiveness perspective, digitalization processes also play a key role. These processes are such an important factor that it is said that organizations can either adapt and embrace this transformation or they can just simply fail (Crittenden et al., 2019). In accordance with this, Henriette et al. (2016) confirm that digital transformation processes have impacted not only customers and organizations but also the structure of the markets. The paper also states that organizations must be capable

of managing new disruptive factors and adapting themselves to new markets where things are done differently.

Likewise, according to McKinsley, as cited by Ulas (2019), digital transformation is the process where technology, businesses and processes are adjusted to bring value not only to the customers but also to the employees while, at the same time, being capable of adaptation in a very dynamic environment. Similarly, in Vey et al. (2017) it is also highlighted the importance for companies to adapt and stay relevant in order to succeed in these digitalization times. Moreover, it is stated that the business landscape has been fully transformed and that it is imperative for the organizations to innovate and react in order not to fail. Following this idea, in Hanelt et al. (2021) is also said that despite the lack of clarity regarding this phenomenon of digital transformations, organizations are indeed impacted and that they must adapt.

2.2 Digitalization research approaches

Although there is a considerable amount of literature available around digital transformation and digitalization processes, there is not a one common nor holistic approach to this topic. As stated in Hanelt et al. (2021), there is a lack of agreement across the literature review regarding the definition and scope of digitalization processes and what is available, tends to have a narrow view. Not all the papers approach these topics from a similar perspective and they tend to analyze one or only a few aspects of it when discussing what makes digitalization successful (or a failure). The three approaches

identified and analyzed are (i) culture, vision and values; (ii) human resources and talent; and (iii) IT and technologies.

2.2.1 Culture, vision and values

Culture, vision and values of an organization in the current literature are deemed as the key factors that are of high importance when it comes to a successful digital transformation. This is explained in Hemerling et al. (2018), and showed in Figure 5, where it is reported that digital transformation can only take place if there is a culture that not only enables the change but also the strategic goals of the organization: culture clash is seen as the main obstacle for organizations that try to scale digital transformation programs. In this research, culture is defined as how things are done within a company that is reflected in its values and behaviors. It is explained that in order to have a successful digitalization process, having a culture that is digitally driven is of key importance, not only because it enables existing employees to deliver value but also acts as an attraction for new talent. In this study, it is shown that organizations that focus on culture throughout the digital transformation processes are five times greater to have strong financial performance. Also, companies that were focusing on culture were not only able to have strong performance but also to sustain it over time. In order to implement and embed a digital culture, a lot of effort and discipline is required from both employees and leadership. This effort includes steps such as defining what is the change required, ensure there is strong leadership and engaged employees and, lastly, ensure the organization is aligned with this new culture.

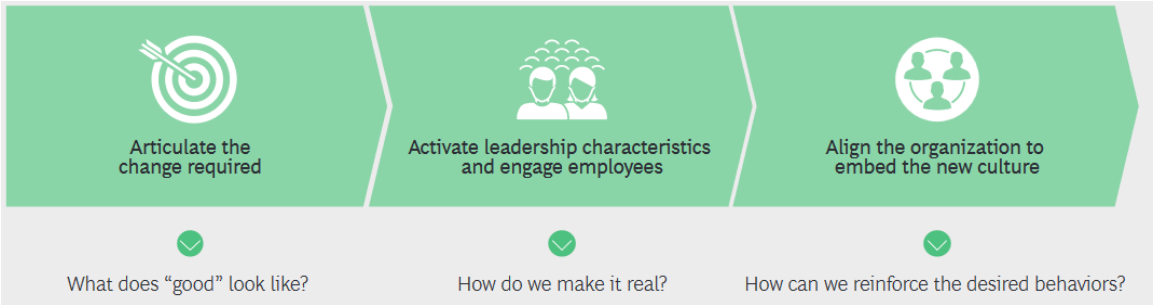

Figure 5
How to embed digital culture in companies
Source: Hemerling et al. (2018)

In Gurbaxani and Dunkle (2019), digital transformation is defined from a business perspective as its intent to reinvent their vision, strategy, structure, processes, capabilities and culture to match the evolving digital context. This paper presents six different dimensions, that can be seen in Figure 6, that are described as crucial elements for successful digital transformations. These dimensions are related to having a strategic vision in place that understands the transformation and digital initiatives needed, having a culture that enables and supports innovation and change and being supported by the right digital capabilities when it comes to technology and talent.

The first dimension is about having a clearly defined strategic vision for the digital transformation that the relevant stakeholders not only know, but also understand. The second dimension is about having a culture where innovation is perceived in a positive way and where employees are encouraged to think in new ways to find new solutions. The third-dimension talks about the importance of knowing how to use the different softwares to perform efficiently different activities such as improving customer understanding, operations performance and product know-how. The fourth dimension is about the availability of digital capability and expertise that can execute the new digital

strategy. The fifth dimension is the strategic alignment between all relevant parties and the sixth one is about having the right technological assets being used.

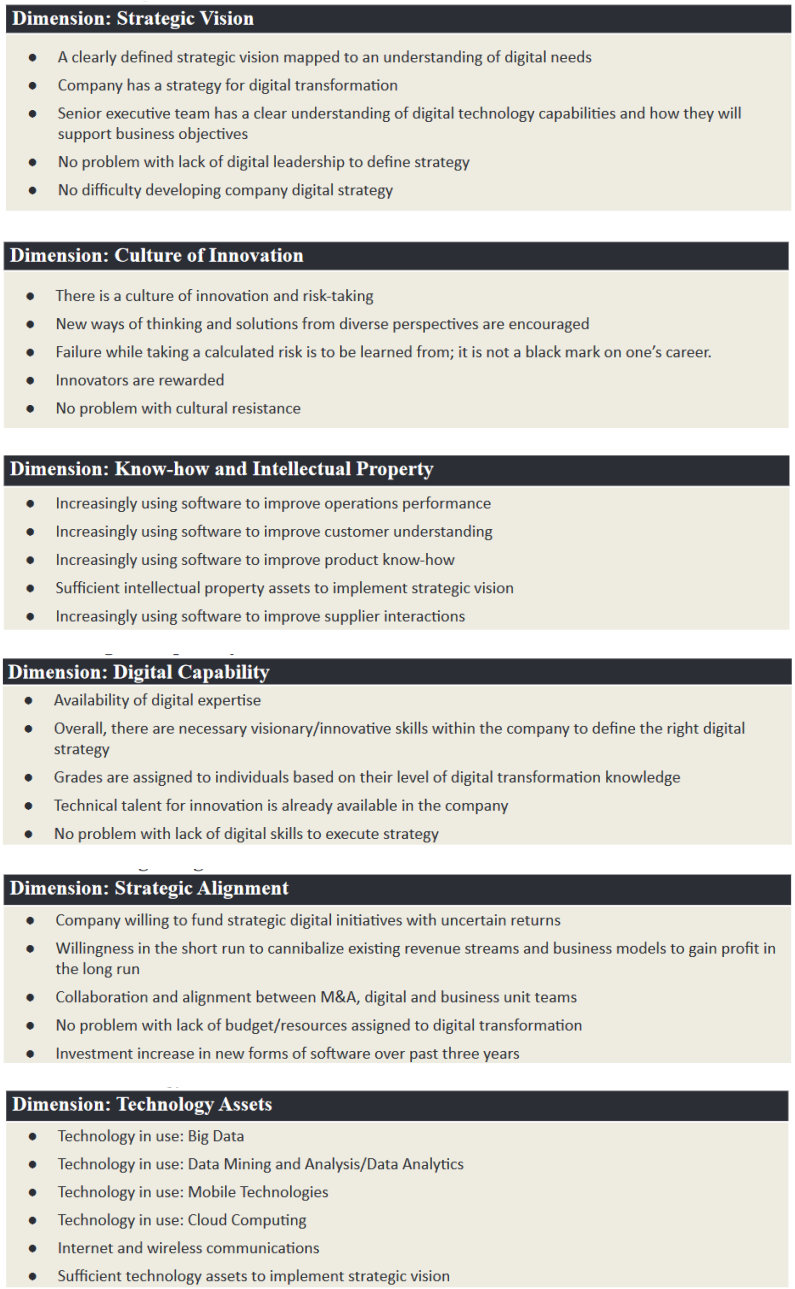

Figure 6
Enterprise-level dimensions of digital transformation
Source: Gurbaxani and Dunkle (2019)

In a similar way, Hartl and Hess (2017) state that the digitalization initiatives, within organizations, often tend to fail due to a lack of a culture that enables change. In this research, it is argued that only the implementation of new technologies is not adequate for digital transformation, that the whole business model must be adapted as well, including organizational structures, processes and, especially, culture, being defined as a key strategic asset. The cultural values identified in this study as crucial for digitalization processes are being open to change, new ideas, new skills and innovation; but also, to risks and failure and having a customer centric and agile approach, and trust, communication, participation and cooperation across the organization. These cultural values can be seen in the Table 2, ranked from more to less important.

Table 2
Cultural values crucial for digital transformation success ranked according to their importance
Source: Hartl and Hess (2017)

Organizational Value
Openness towards change: the organization's openness towards new ideas and its readiness to accept, implement and promote change
Customer centricity: the organization's orientation of all activities to meet customer needs: products and processes are designed with focus on customer needs and continuously adapted to changes thereof
Innovation: the organization's pursuit of improvement and growth through the development of innovations
Agility: the organization's willingness to work, act and re-structure and be flexible and adaptable in order to react to change
Willingness to learn: the organization's pursuit of continuous advancement through the acquisition of new skills and knowledge
Trust: refers to the mutual trust between the organization, its leadership and members, as well as the organization's trust in its external partners
Entrepreneurship: the organization's intention to promote the empowerment of its members to act proactively and independently, and take responsibility
Tolerance towards failure: the organization's tolerant attitude towards reasonable mistakes and support of learning from failure
Communication: the organization's intention to build internal and external networks for knowledge and information sharing
Risk affinity: the organization's willingness to take risks and make decisions under uncertainty
Participation: the organization's support of open, non-hierarchical discussion and democratization of decision processes
Cooperation: the organization's positive stance towards teamwork, cross-functional collaboration, and readiness for cooperation with external partners (e.g. customers)

These values and behaviors are also reflected in other studies such as the one of Osmundsen et al. (2018) where innovation, new business models and customer centricity are observed as the objectives of the digitalization process and where a supportive

culture, leveraged knowledge, engaged employees and digital capabilities are its success factors. This paper focuses on three aspects of digital transformation: (i) what are the variables that initiate and influence digital transformation (called ‘drivers and objectives’), (ii) what factors have a direct impact on the success of digital transformation and, lastly, (iii) what is the impact of digital transformation in the organization (referred as ‘implications’).

The drivers of digital transformation are mostly external, such as the new customer’s expectations, the digital changes in the industries and the higher level of competition in the markets. The objectives of digital transformation within the organizations are to ensure they are ready in this new digital landscape, that they can enhance their products, channels and customer satisfaction and that they can develop new business models. The success factors are related to the organization culture, knowledge, engagement, capabilities and strategy. And, finally, the implications are having a reformed organization with new business models and greater performance. All the objectives, drivers, success factors and implication can also be seen in the Table 3.

Table 3
Drivers, objectives, success factors and implications of digital transformation
Source: Osmundsen et al. (2018)

Drivers and Objectives
Drivers
Customer behavior and expectations
Digital shifts in the industry
Changing competitive landscape
Regulative changes
Objectives
Ensure digital readiness
Digitally enhance products
Embrace product innovation
Develop new business models
Improve digital channels
Increase customer satisfaction and dialogue
Success factors
A supportive organizational culture
Well-managed transformation activities
Leverage external and internal knowledge
Engage managers and employees
Grow IS capabilities
Develop dynamic capabilities
Develop a digital business strategy
Align business and IS
Implications
Reformed IS organization
New business models
Effects on outcome and performance

Brunetti et al. (2020) also perceive digitalization as a phenomenon that affects every aspect of human life, both in their private and work environments, transforming society and economies. But what is highlighted, based on their findings, is that before

incurring in costs related to digital technology, it is imperative to first focus on the development of a digital culture and digital skills, creating an open environment where employees feel comfortable regarding technological changes. In this paper it is also stated that encouraging the employee's participation, involvement and inclusion of different opinions is fundamental.

Three main pillars identified in this paper are: (i) culture and skills, (ii) infrastructure and technology and (iii) ecosystems. The challenge around culture and skills is to ensure that the organizations are able to develop their digital skills, including education about digitalization, talent or HR education and developing a digital culture. Regarding infrastructure and technology, the key for companies is to not only adapt to new technologies but to also have cutting-edge infrastructures and services. And, lastly, regarding the ecosystems, it is imperative that organizations develop synergies and technical solutions between all different and relevant stakeholders. The Tables 4, 5 and 6 summarize the different challenges, pillars, strategic fields of action and strategic actions.

Table 4
Culture and skills challenge and strategic actions
Source: Brunetti et al. (2020)

Key challenges	Pillars	Strategic fields of action	Strategic actions
Developing and updating digital skills within companies, public administration and organisations in the education industry	Culture and skills	Digital education	To promote digitalisation learning paths from the fourth year of primary school and to offer digital literacy courses to everyone
			To develop digital lifelong learning programs
			To create digital educational platforms
			To invest in e-learning
		Talents	To encourage talented and skilled workers to return, stay or transfer within the region by offering them perspectives
			To stimulate female students in the STEM professions
			To accompany towards new jobs, such as smart working
		Digital culture	To break down resistance to digitalisation through transparency-oriented behaviour
			To invest in reverse mentoring
			To create a "digital fit"
			To develop new digital business models through a far-sighted mentality

Table 5
Infrastructures and technologies challenge and strategic actions
Source: Brunetti et al. (2020)

Key challenges	Pillars	Strategic fields of action	Strategic actions
Continuously adapting to new digital technologies with cutting-edge infrastructures and services	Infrastructures and technologies	Information	To create fast networks by extending gig broadband and 5G and to implement infrastructures in the valleys and rural areas
			To create fast, reliable and secure networks that are able to protect data and guarantee the security of interconnected devices and their users
			To exploit the advantages of big data in SMEs
			To invest in e-government
		Interaction	To use collaborative robots (cobots) as helpers of human work
			To invest in autonomous production by developing AI
			To share data and knowledge
			To create barrier-free mobility
		AI	To define a strategic agenda in collaboration between stakeholders and AI experts from different sectors
			To use AI as a game changer in the analysis and use of big data
			To politically support AI development and to ensure the deployment of the potential of these technologies
			To invest in customer relations through AI

Table 6
Ecosystems challenge and strategic actions
Source: Brunetti et al. (2020)

Key challenges	Pillars	Strategic fields of action	Strategic actions
Developing synergies of medium- to long-term and innovative technological solutions involving different stakeholders of the public and private industry	Ecosystems	Medium- to long-term vision	To promote digital change as a continuous process To encourage citizens' involvement To leverage divergent thinking and diversity of opinions To operate in the direction of venture capital
		Partnerships	To develop digital campuses To encourage the networking of digital talents, start-up incubators, investors and scientists by exploiting start-ups To promote public–private partnerships To define the digital strategy in terms of open innovation
		Life quality	To leverage regional life quality To lower the cost of living in the macro-region To promote digital and sustainable solutions in all industries To generate virtuous improvement mechanisms in the area by supporting medium- to long-term sustainability policies

In a similar manner, Davenport and Westerman (2018) argue that when it comes to digital transformation, it is not only about implementing new technologies but also about modifying the way things are done within the organization. This includes changes in skills, structures, systems, processes, leadership and business models.

Finally, other barriers when it comes to digital transformation are exposed by Gupta (2018). One of those barriers is the lack of a common vision and goal of the organization towards this change: if there is no common understanding of the vision and purpose behind the change, it will bring up a lot of difficulties to implement and develop

this new digitally driven culture since the employees should not only feel as a part of this new culture but also, they need to understand it and share it. Another barrier is traditional leadership styles that do not fit the latest vision and strategy and that are not able to make decisions based on the new digital culture. The third barrier mentioned is the absence of an agile organizational structure that is integrated by multi-disciplinary and diverse people. The fourth one explained is about the lack of digital capabilities, communication and change management skills of middle managers in processes of change, since sometimes they only or mostly possess people management skills. The lack of rewards, incentives and motivators is also seen as a barrier in digitalization processes. The last two barriers mentioned in this paper are the lack of internal goals during transformational processes to be able to identify progress and the inadequacy of HR to actually play a central role throughout these processes, supporting the employees.

As explained by Mielli and Bulanda (2019), even if technologies are constantly used in people's life, employees may still not feel confident to be able to explain what is the digitalization process of their organization about. Therefore, it is important that the company defines properly what is and what is not part of their digitalization strategy and process. What is told is that the value that digitalization brings cannot be denied but that for it to actually bring that value, it has to be approached as a defined and well-planned project, as described in the Figure 7.

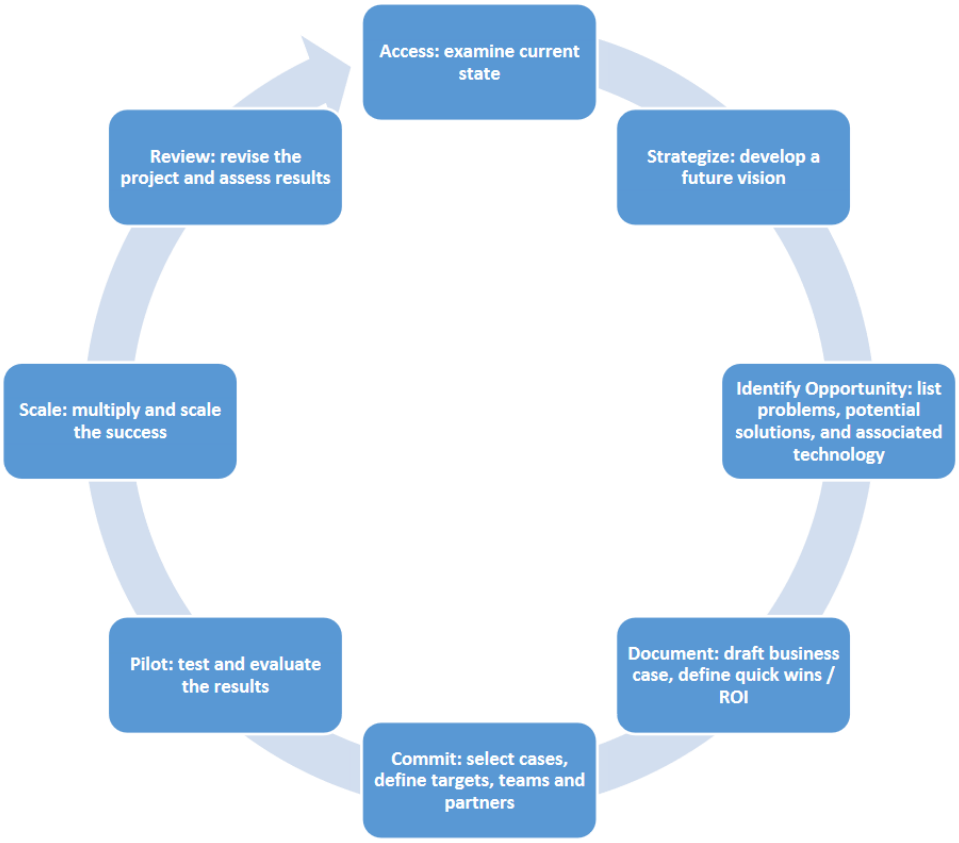

Figure 7
Digital transformation roadmap
Source: Mielli and Bulanda (2019)

2.2.2 Human resources and talent

The human factor within the digitalization processes tends to be analyzed from a talent or human resources ('HR') perspective, describing processes of upskilling, new jobs creation and the role of the people within those new jobs. For example, Bajer (2017) approaches digitalization purely from an HR point of view. He explains that HR functions will be subject of a lot of changes and that will be reduced but at the same time they will become more aligned to the business value and strategy. He believes that with

the help of new technologies, humans can actually do what they are best at, creating a partnership between digital and human, because what makes the human unique is their capability of being creative and solving issues, since they are value driven and they are capable of having empathy. He concludes that digitalization processes must be implemented in the right way in order to complement the employees with new technologies that will enable them to create as much value as possible.

On the same line, Westerman (2016) advocates for the right balance between technology and human value, saying that, in his own words,: 'digital transformation needs a heart'. The concept that he elaborates on is that there are currently three technology related forces that are transforming the way work takes place within companies: (i) automation (tasks performed at a higher and quicker rate without human intervention), (ii) data-driven management (management driven by data and experimentation) and (iii) resource fluidity (assigning the people to the different tasks that they are best at). Within this paper, these three forces are seen as positive within companies, if they are used to enhance productivity, foster innovation and improve customer satisfaction and as long as they are not brought to any extremes, for example, by letting the working relationship within organizations to become simply an 'emotionless market transaction', having a negative impact both in the employees as in the companies. To conclude, he explains that humans, ultimately, are behind the organizations and that the technologies should be complementing them, not expulsing them out of the market.

While Frankiewicz and Chamorro-Premuzic (2020) describe digital transformation as an imperative for organizations nowadays. They also emphasize the idea that digital transformation goes beyond technology and that the key to the adoption of a digital future actually relies on the "next generation of skills", combining both technology and human skills. They explain that despite the uncertainty of the future, what is sure is that is essential to ensure that employees are re-skilled and up-skilled. In that way, organizations can help employees to go through the changes taking place now and in the future. To prepare for this digital reality they propose organizations different solutions such as putting their people first, focusing on their soft skills, driving change initiatives from the top rather than from the bottom (they believe that change takes place when it comes from the top and that change management from the bottom is a romantic and intuitive idea but not realistic), ensuring that if they are trying to be data-driven, they are focusing on getting insights out of that data and acting upon it, and finally, if they do not have an agile enough environment where they can speed up, fail quickly and learn even quicker, they should ensure that the long term goals are slowly succeeding.

From the salespeople perspective, some fears are highlighted in Alavi and Habel (2021) where it is stated that digitalization processes bring some concerns to employees such as being afraid of their jobs being replaced by technologies or by new employees with greater digital skills. They also point out that digital transformation projects tend to fail due to employee resistance to use those new technologies, therefore it is of key importance to take the human factor into consideration when carrying out the digitalization process. Gupta (2018) links this resistance to the lack of incentive for

employees and leadership to embrace the change as one of the main barriers for digital transformations, as explained in the previous section. Similarly, Bughin et al. (2019), explain that digitalization is successful within an organization when special attention is paid not only to attracting digitally talented people but also developing existing employees. It also stresses the importance of having digitally minded leadership in place to guide the transformation towards success but also to empower people at all levels.

Osmundsen et al. (2018) highlight the importance of changing the employee's mindset when it comes to digital transformation. It indicates that the employees will indeed be affected by this transformation and that it is key to have them engaged throughout the process and for them to embrace the changes in order for it to be successful. Making the employees part of the process by involving, communicating and asking them for their opinion and expertise is key. Brunetti et al. (2020) also agree with this, stating that employees must be as encouraged and involved as possible, to bring and leverage different opinions and ideas and to build an open digital culture where employees feel comfortable within the transformation processes.

2.2.3 IT and technologies

In Ebert and Duarte (2018), digital transformation is approached from a technical perspective, being described as the implementation of disruptive technologies in order to increase value and productivity. It is stated that these processes are driven by new software technologies such as data and analytics, cloud services, IoT (Internet of Things), artificial intelligence, augmented reality, machine learning and more. Some of these

technologies are brand new but some of them are simple re-makes of products that societies have had access for years and years, re-configuring existing products and services such as physical infrastructures or even intangible things such as how people connect and interact (Youngjin, 2010). Since new technologies can be directly connected to half of the economic growth, at least in developed countries, aspects such as product innovation but also its protection by trademark has become increasingly important (Ignat, 2017). In Crittenden et al. (2019), an overview and explanation of several of these technologies is provided, in order to understand better the possibilities or implications of digital transformations. These technologies are artificial intelligence, augmented reality, machine learning and internet of things.

Artificial intelligence is described as a concept where machines are able to reproduce tasks in a way that could be considered smart since they would technically require human intelligence. Examples of artificial intelligence are speech recognition, natural language processing and decision-making. Machine learning is connected to artificial intelligence since it is defined as a process where data is given to machines and, through statistical techniques, the machines learn without having to receive direct input about it, getting better over time. Another layer to machine learning is deep learning where more complex techniques are used such as artificial neural networks that is useful for image and speech recognition, for example (Soori et al., 2023). There are many ways that artificial intelligence, machine learning and deep learning can be implemented and used in different environments (Soori et al., 2023). For example, as shown in Figure 8, it can be used in different industries to identify and classify objects, to predict maintenances

before they are needed and issues before they occur in different systems, processes or machines; to automate tasks in manufacturing industries; to recognize human gestures and needs and to be able to answer them helping areas such as customer services, food delivery and cleaning services; to help in the medical industry with robotic surgery or medical applications, analyzing images, identifying changes, and more; to assist in the military in tasks such as reconnaissance, surveillance and more; and to even help in agricultural industries to manage crops more efficiently, including tasks related to planting, harvesting and spraying.

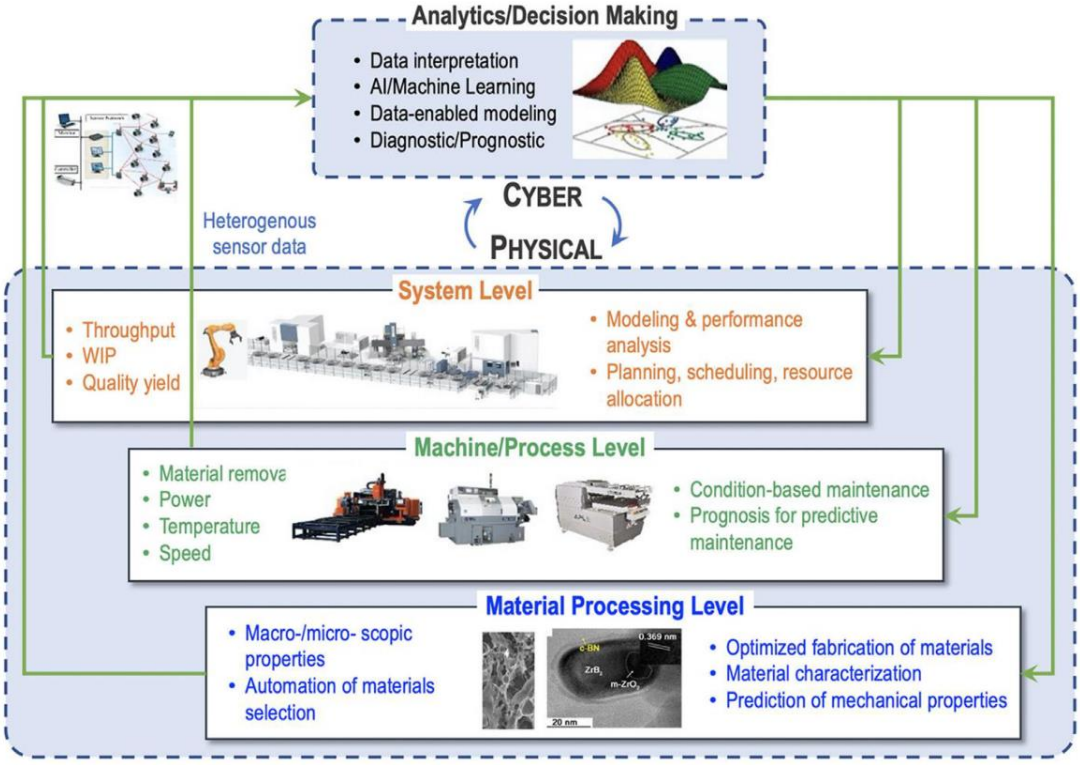

Figure 8
Application of AI (artificial intelligence) in DL (deep learning) in advanced manufacturing process and robots
Source: Soori et al. (2023)

The main advantages of these technologies, stated in this same paper, are automation possibilities, higher levels of accuracy, efficiency, safety, decision-making and lower costs. But, on the other hand, the main challenges are the lack of massive high-quality data sets that are able to train such technologies, making the creation and training of these models expensive and risky (since these processes can be biased and they are time consuming).

Augmented reality is a new technology where real environments are complemented by digital ones, enhancing the user experience and perception. The goal of this new technology is to make use of content that is generated by computers such as text, images, sound, etc. in the real world. This technology is being used across different fields such as industrial production, medical innovation, education, entertainment and more (Ahana, 2022). While Internet of Things can be explained as the interconnection of multiple devices and systems that can communicate between them, exchanging information about their usage and conditions. As explained in Tariq et al. (2023), this system is composed by smart devices that are embedded with specific technologies that enables them to collect, transmit and exchange information. This new technology has a direct impact on individuals since they are enabled to live more efficiently with greater controls of their lives and also on organizations due to the possibility of obtaining real-time insights, optimizing processes and reducing costs. But, one of the biggest challenges within the Internet of Things is, despite its massive usage by individuals and corporations, is its security, because of its software vulnerabilities, becoming a target for hackers, as explained in Figure 9.

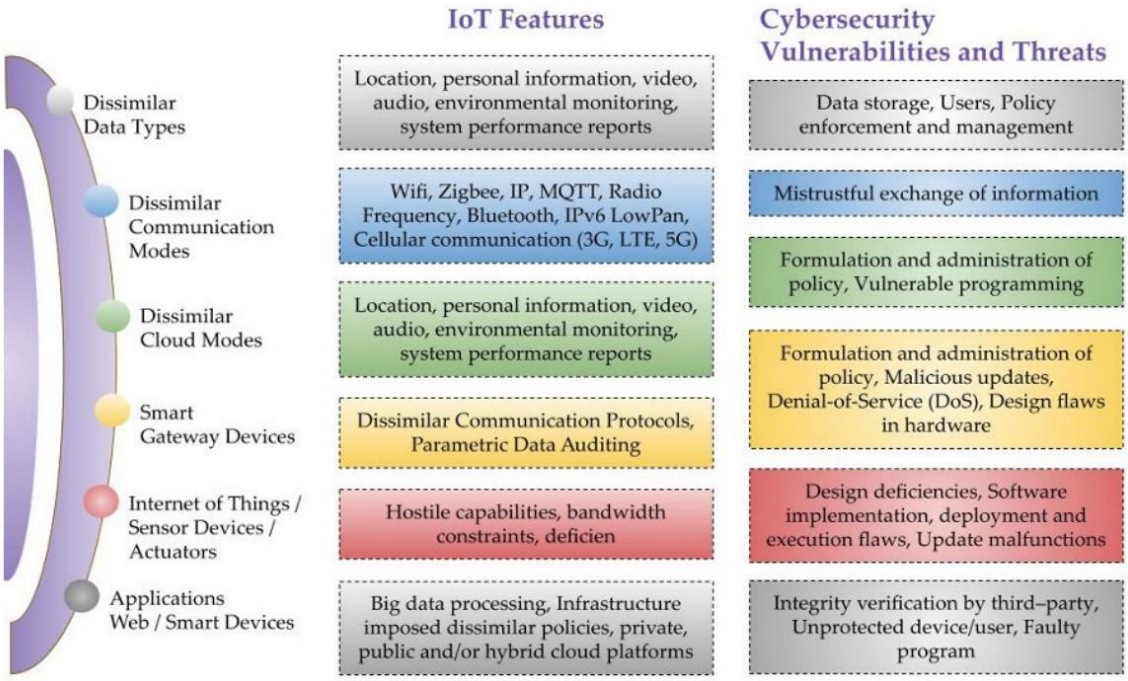

Figure 9
Internet of things security considerations
Source: Tariq et al. (2023)

The research shows that there are numerous ways of implementing digital transformation when it comes to new technologies that can have an impact across the whole organization, including areas such as Human Resources, Finance, Marketing, eCommerce, Risk, Operations, Customer Services and more. Therefore, the incorporation of these new digital technologies have indeed an impact in internal processes, products and services of the industries (Danuso et al., 2021). In Bloem et al. (2014) this is even described as a “silent revolution” that is taking place in all environments where information and operational technologies are being integrated.

It is evident that there are many definitions of digital transformation and digitalization processes within the current academic literature and even if they are all slightly different, they can be summarized as follows:

- Digital transformation is a change that takes place at macro (society) and micro (companies) level, where new technologies are introduced that have a wide and deep impact on people (as citizens, customers, consumers, providers, employees, employers and more), organizations and societies
- A balance between the different social elements (such as strategy, vision, mission, values, processes, operation, skills, people) and the new technological elements and innovation must be achieved in order for these transformation processes to be successful and be able to add value to the end user (whichever this end user may be: company, society as a whole, employee, customer, citizen, etc.)

2.3 Change management

When it comes to change management, on the other hand, there is a lot of literature available but there is a lack of connection towards digitalization processes, as described in Bellantuono et al. (2021). As explained in Youssef Elabshihy and Saad (2023) change management practices within organization are extremely important since change is not only inevitable but is also the only constant over time. The environment in which businesses operate is basically marked by constant and dynamic change, mainly due to new discoveries, revolutions and technologies. Despite of change being a constant

and a central pillar for the success and survival of organizations, there is a very high failure rate on organizational change management projects where companies are not able to carry them and neither meet expectations (Abdelouahab and Bouchra, 2021).

Following Kerber and Buono (2004), the reason behind the lack of capability to meet these expectations in change processes could be due to the wrong choice on the approach towards the change that a specific situation or context may require. In this same paper, three approaches to change management within the organizations are explained: directed change, planned change and guided change. Within the directed approach, the change is coming mostly from the top, being driven by leadership and relying on their authority and persuasion skills. On this approach, it is expected that the leadership is capable of driving the specific change, having the right persuasion skills and arguments in order to ensure acceptance across the organization, as seen in Figure 10.

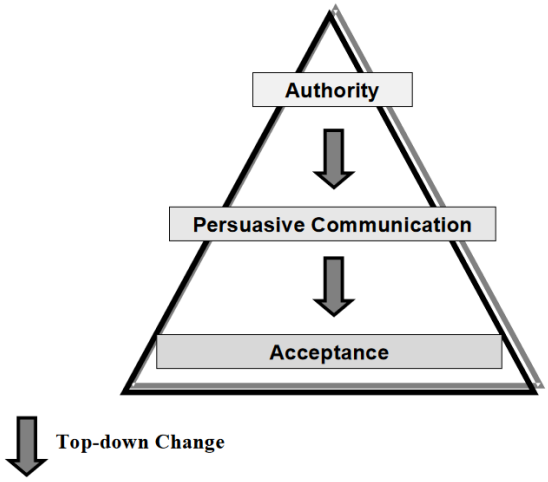

Figure 10
Directed change
Source: Kerber and Buono (2004)

While the planned change, as shown in Figure 11, is still supported by the top, it can actually be ignited at any level of the organization to then engage and involve any relevant stakeholders. The planned change is aligned with Kurt Lewin's three steps model that includes (i) unfreezing (unfreezing the status quo and creating the need for a new one. Under Lewin's view this was necessary in order to break with old behavior patterns and, eventually, adopt new ones), (ii) transition or moving (stage to move from the prior towards the new status quo, by identifying and considering different options) and (iii) refreezing (establishing the new status quo, stabilizing the situation when the desired behaviors are safe and not at risk of falling towards the old ones) (Sarayreh and Khudair, 2013).

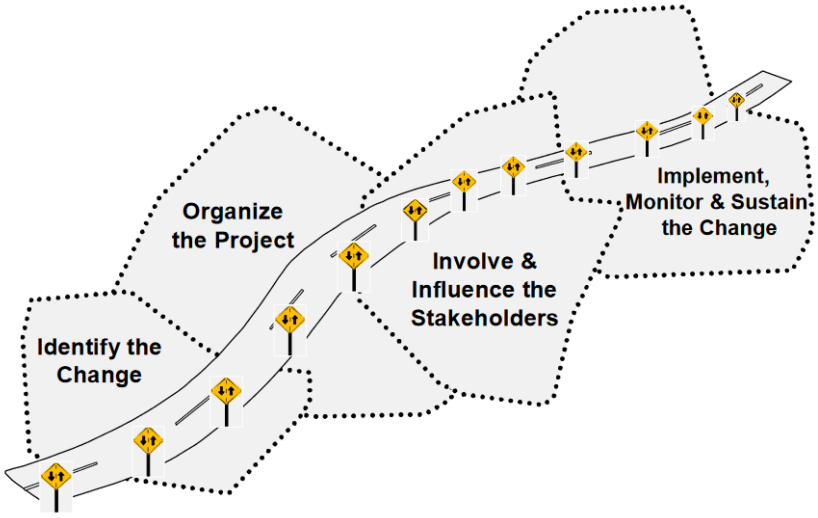

Figure 11
Planned change roadmap
Source: Kerber and Buono (2004)

Lastly, the guided change approach comes from within, based on the needs of the organization, inspiring stakeholders on the way. This approach can be seen as an iterative

one, rather than a linear process, where there is constant learning and evolution, as described in Figure 12.

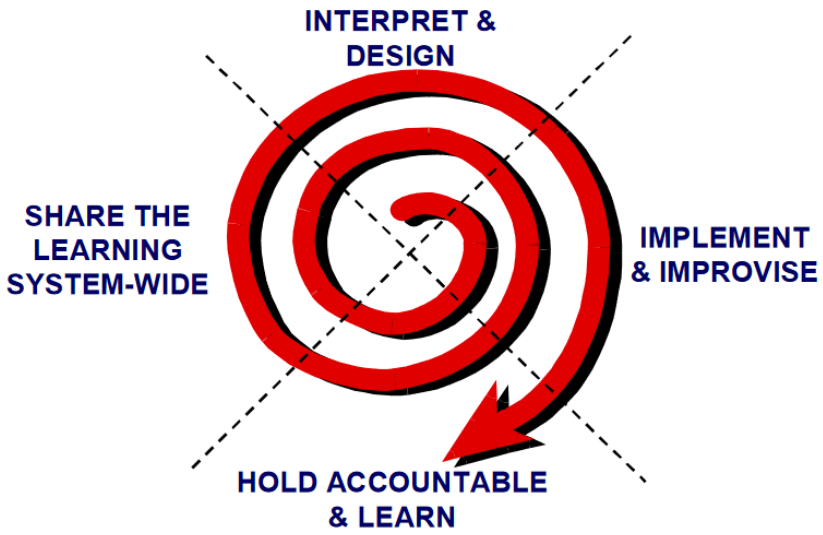

Figure 12
Guided changing spiral
Source: Kerber and Buono (2004)

What this specific paper proposes, at the end, to overcome the challenge of not meeting the objectives during change processes, is to adopt a different style or approach depending on the specific situation, as they show in the Figure 13.

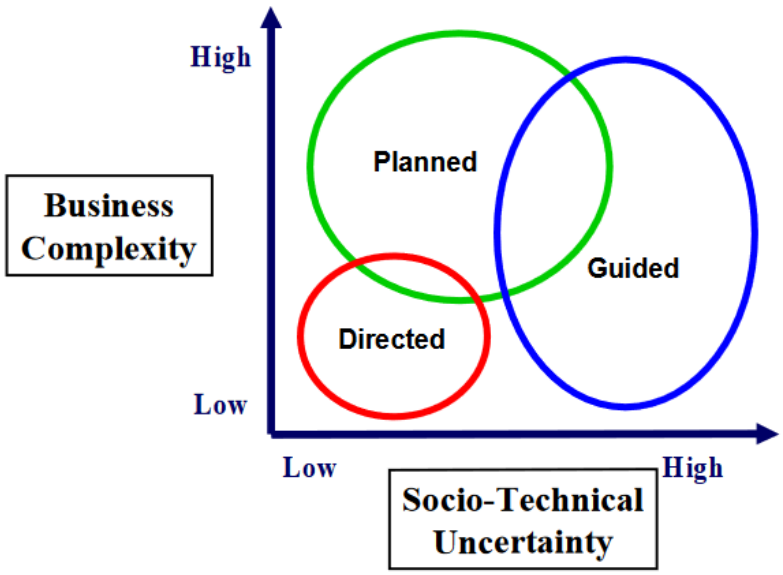

Figure 13
Complexity, uncertainty and approaches to change
Source: Kerber and Buono (2004)

Another change management model is the one proposed by Kotter (2012) that includes an eight step process that consists of: creating a sense of urgency regarding the change, gather a coalition, generate a strategy for the change, communicate the vision, empower action for the change, generate quick wins and then bigger wins to create more change and, finally, implement new approaches within the organization. The main errors stated in this paper, and reflected in Figure 14, when it comes to successfully implementing change are allowing complacency, lack of the creation of a strong and guiding force, underestimating the power of vision, under-communicating this vision, letting things get on the way of this vision, failure to create short-term wins, or, in the other hand, celebrating victories too soon and, lastly, not to ensure that those changes are firmly implemented.

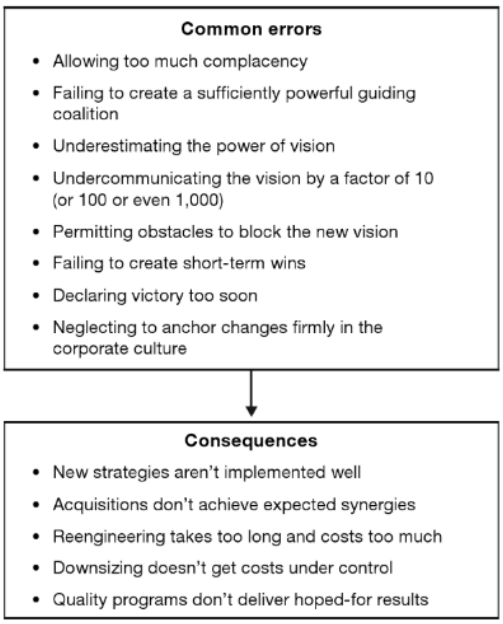

Figure 14
Eight errors common to organizational change efforts and their consequences
Source: Kotter (2012)

A very similar approach but with ten steps, rather than eight, is the one presented by Jick T. (Abdelouahab and Bouchra, 2021). This model is very much aligned with Kotter's, sharing the ideas of creating a sense of urgency, developing a vision and a strategy, communicating and enabling change to then institutionalize the change; but also includes the first step of analyzing if the change is needed first, then making a clear separation of the past and also getting strong leadership support and political alignment on the change process. Mento et al. (2002) have also an alike proposal with twelve steps that again includes determining the change needed, evaluating the specific circumstances around the change, developing a plan, identifying key stakeholders for support, preparing relevant people for the change, onboard leaders, create momentum with quick wins, rely on communication, measure the progress and bring lessons learned on board. Further

details regarding different change management models and its similarities can be found in Table 7 and Figure 15.

Table 7
Overview of change management models
Source: Bellantuono et al. (2021)

Kurt Lewin's Change Management Model [16]	Kotter's 8 Step Change Model [17]	GE's Change Acceleration Process (CAP) [18,19]	Prosci 3-Phase Change Management Process [15,20]
Unfreeze	establish a sense of urgency	lead the change	Prepare for change: – define change management strategy – prepare change management team – develop a sponsorship model
	build a powerful guiding coalition	create a shared need	Manage the change: – develop change management plans – take action and implement plans
Change	create a shared vision	shape a vision	
	communicate the vision	mobilize commitment	
	empower others to act on the vision	make change last	
	plan for and create short-term wins		
Refreeze	consolidate improvements and produce still more change	monitor the process	Reinforce the change: – collect and analyse feedbacks – diagnose gaps and manage resistance – implement corrective actions and celebrate success
	institutionalize new approaches	change systems and structures	

In the paper of Abdelouahab and Bouchra (2021), thirty-seven organizational change models were identified, analyzed and categorized into twelve categories. Clear and shared vision and strategy of change is the first category that covers the need of having the change clearly defined together with a vision and a strategy where it is understood the reasons behind the change and what can be expected out of it. The second category is the readiness and capacity for change, meaning ensuring that the organization is not only willing but also ready to adapt to the new change, both at individual and at a organizational level. The third one is about creating a team (or a coalition) that can lead and guide this change, composed by members that have enough expertise, experience, power and leadership to do so. The fourth category involves the training, coaching and empowerment of employees throughout the different stages of the change. The fifth one is about the management of change resistance, since people's resistance is seen as one of

the main challenges within change management. The sixth category talks about how important effective and constant communication is and the seventh one about how important is to motivate employees throughout the whole process so they can become and stat as an active part of this change. The eighth category is about stakeholder engagement, ensuring that there is constantly the right engagement, commitment and participation from the relevant stakeholders, together with the right leadership and sponsorship, being this the ninth category. The last three categories are ensuring the change is reinforced and sustained, that the right approach is chosen and that the right plans are made for the specific change needed and lastly, that monitoring, tracking and measuring activities are implemented.

Processual models	Descriptive models
1. Kotter's[27] 8-Step Change Model	19. Cummings and Worley's[31] change management model
2. Lewin's[26] three step change model	20. Burke and Litwin's[32] model of organizational change
3. Lippitt et al.'s[50] change theory	21. Congruence model[33]
4. Bullock and Batten's[51] change model	22. Change formula of Beckhard and Harris[41]
5. Bridges'[52] model of transition	23. Carnall's[42] change management model
6. Luecke's[30] seven steps	24. Knoster's[44] change model
7. Mento et al.'s[36] change model	25. GE'S change acceleration[38]
8. Jick's[37] 10 steps model	26. Prosci's[59] change management methodology
9. Judson's[53] five-phase model	27. Best practice model for change management[60]
10. The change leader's roadmap[54]	28. Change tracking model[21]
11. ADKAR[55]	29. Change management body of knowledge[61]
12. Accelerating Implementation Methodology (AIM)[29]	30. BCG's change delta[62]
13. ACMP's[40] Standard for Change Management	31. McKinsey's 7-S[63]
14. Whelan-Berry and Somerville[39]	32. Armenakis et al.[64]
15. Kanter et al.[28]	33. Greer and Ford[65]
16. Galpin's[56] wheel of nine wedges	34. Cawsey et al.[66]
17. Model of Fernandez and Rainey[57]	35. CMI's change Management maturity[67]
18. Kickert[58]	36. Fernandez and Rainey[57]
	37. Change first's model[43]

Figure 15
List of organizational change management models
Source: Abdelouahab and Bouchra (2021)

Despite the number of resources available in the field of change management, some common ground can be found:

- Change management is a key practice within organizations, since change (internal and/or external) tends to be the only constant over time
- The need for change can have different underlying motives and can come from different directions (from the top, from within, or from the outside)
- Whatever the motives or origin of the need of change, in order for change to actually happen, it is imperative to have clear vision, plan and/or strategy, open communication and the right amount of stakeholder engagement. As it is stated in Kotter (2012): '*Speed of change is the driving force. Leading change competently is the only answer*'

2.4 Summary

As it can be seen from the literature review and as explained in the problem statement chapter, when it comes to digitalization, there is no standard definition and most of the academic literature takes into account one specific approach such as culture, vision and values; human resources and talent and/ or IT and technology. Similarly, with change management, there is no common approach but there is a vast amount of literature available. What the current status is missing is a stronger connection between change management and digital transformations, while taking a holistic perspective.

Based on the research performed, this study defines digital transformation as a change that takes place at macro (society) and micro (companies) level, where new technologies are introduced that have a wide and deep impact on people (as citizens, customers, consumers, providers, employees, employers and more), organizations and

societies. It is of key importance that a balance between the different social elements (such as strategy, vision, mission, values, processes, operation, skills, people) and the new technological elements is achieved in order for these transformational processes to be successful and be able to add value to the end user (whichever this end user may be: company, society as a whole, employee, customer, citizen, etc.).

The approaches identified and studied in the literature review regarding digitalization processes are culture, vision and values, human resources and talent and IT and technologies. All those three approaches are seen by the authors in isolation as 'key' for digital transformation but none of them provide a holistic approach that covers two or more of those aspects. Within the culture, vision and values approach, those factors are deemed as extremely important to enable digitalization across companies and culture clashes are seen as one of its biggest challenges. Within the human resources and talent literature, what is seen as central within these processes is employee management and their re- and up-skilling, where there is a partnership between technologies and humans and where the best is taken and use from each other. In the IT and technology related papers, digital transformation is perceived as a process where disruptive technologies are implemented and value, productivity and performance are increased.

In the same way, based on the review of the change management literature, the definition of this paper is that change management is a key practice within organizations, since change (internal and/or external) tends to be the only constant over time, that can have different underlying motives and can come from different directions (from the top, from within, or from the outside) but that, whatever the motives or origin of the need of

change, in order for change to actually happen, it is imperative to have clear vision, plan and/or strategy, open communication and the right amount of stakeholder engagement.

Change management practices bring similar challenges than digitalization, there is no one solution that fits all, and some approaches may work in some organization while not in others, depending on their urgency, risks, complexity, circumstances, and other variables. But still, there are moderating factors that can, regardless of the approach taken, have a direct positive impact on the process such as the management of the reaction of the people involved in the change. The reactions of the individuals will differ, depending on their perception, understanding and participation during the change process; if the individuals understand the reasons behind the change, the resistance to it will be significantly lower (Khaw et al., 2023).

The human variable is such a central piece of change management practices, that it can even be said that the success of a change can be directly dependent on it (Lauer, 2020). And this, is the focus of this research: to place the management of the reaction of the people involved in change due to digitalization as a central moderating factor that can have a direct positive impact on these processes, being a main enabler. This thesis aims to show that the human variable is such a central piece in digital transformation processes that the success of them can be directly dependent on it. And to do so, there are gaps that need to be filled, as Bellantuono et al. (2021) confirm, there are some lack of connections between the digital transformation and the change management literature, such as incorporating change-monitoring activities, identification and management of the resistance to change and the change consolidation to digital transformation processes.

Based on these gaps identified, the following two hypotheses are proposed for this research:

- H1: Despite the high impact of digitalization in organizations nowadays, there is no common transformational approach that fits all. But, having a holistic view of the digitalization processes, placing the human factor at the center of it and managing its reaction to the changes proposed by these transformations are crucial variables that define the outcome of the digital transformation (Bellantuono et al., 2021; Danuso et al., 2021; Gupta, 2018; Westerman, 2016)
- H2: Transitioning into a more digital-driven environment is not only about implementing the latest technologies, updating the strategy of the company and upskilling employees, but also about trying to be part of this new digital and social paradigm and embarking on a cultural change process where proactive and clear communication regarding the reasons, impact and expectations of the digital transformation processes while balancing organizational cultural values is key for its adaptation and success (Gurbaxani and Dunkle, 2019; Vey et al., 2017; Hemerling et al., 2018; Hartl and Hess, 2017; Osmundsen et al., 2018)

CHAPTER III:
METHODOLOGY

3.1 Overview of the research problem

Based on my expertise and preliminary investigations, my deduction is that what is missing in the academic environment at the present is a comprehensive and structured approach around digital transformations where not only one view is taken into account. The organizations that are embarking or are already on a digital transformation journey need to approach this process with a holistic perspective. Considering not only technologies, processes and employees upskilling but understanding that "digital" is as important as "transformation", where this is seen and managed as a significant change (which it is indeed), and where the human, being at the center of it, will propose challenges.

Clashes between the "old" or "legacy practices" (what is already established, the status quo, traditions and habits embedded in the culture of the organization and in the day to day of the employees) and the "new" (new processes, behaviors, expectations, technologies, ways of doing things, ways of adding value) will take place and there will be resistance to it (which should be expected within transformational processes). These are the factors, in my opinion, that must be proactively managed and approached in order to be, at least, on the way to have a successful digital transformation.

Change is a movement or shift from a current state to a future one. All things considered, digitalization is a shift, a movement that is taking place where change is at

the core. The rapidly changing and evolution of societies, companies and individuals is discussed in Cameron and Green (2019), where it is highlighted the struggle for organizations to keep up with those external (economic and political) and internal (structures, strategies, systems) changes in order to be able to meet the needs and expectations of their employees and consumers. Similarly, Burke (2017) states that changes are taking place every day and at a very rapid pace where the organizations operate, and that there is a need to have a better understanding of what change entails for them. What is explained in this book is that, unlike a few decades ago, the changes taking place externally are happening quicker than the changes happening at organizational level, forcing the organization to constantly have to play 'catch-up'. This obliges organizations to have a better and deeper understanding of how to lead and manage change in order for them to survive. The nature of organizational change is described as a non-linear process as it can be seen in the Figure 16.

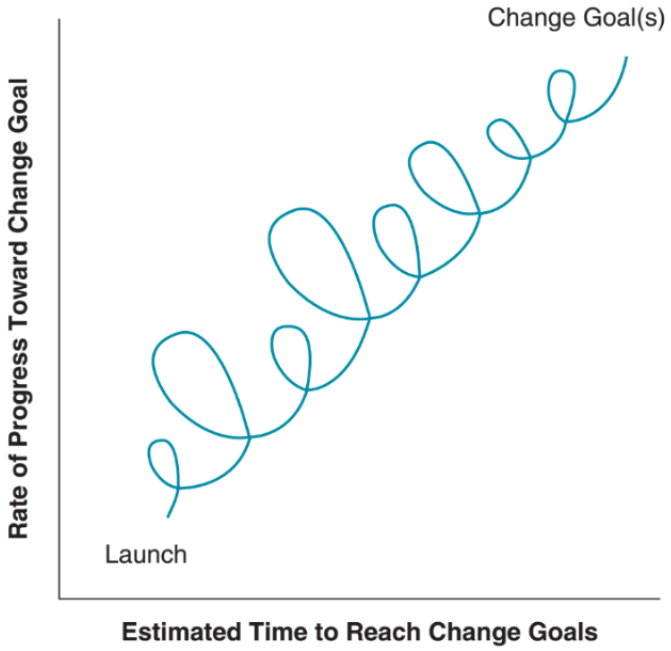

Figure 16
Depiction of the non-linear nature of organization change
Source: Burke (2017)

Following Kotter (2012), the main barriers to change are:

- Not ensuring that the employees and leaders within the organization are aware of how urgent the change is
- Lack of people leading by the example, not having leadership behaving and carrying the change forward
- Not having a clear vision in place that can inspire others to follow the change
- Not validating if employees are on-board with the changes proposed and if they see the benefits of it

- Not guarantying that this new vision will not be blocked by different obstacles
- Not enabling short-term wins in order to maintain the momentum
- Celebrating a big win too soon without ensuring first that it is indeed a victory
- Not incorporating those new changes into the culture and values of the organization

The management of change within organizations is not only about the planning and implementation of the actual change but also about the minimization and management of the resistance to it, being central to its success the right balance between strategy, culture and leadership (Schwertner, 2017). As Bellantuono et al. (2021) confirm, there are some gaps in the digital transformation literature such as change-monitoring activities, identification and management of the resistance to change and the change consolidation. The paper highlights some limitations within the digital transformation research; for example: how the resistance to change can be not only identified but also addressed and managed, nor how to help people to accept the changes proposed.

Therefore, the human is a central variable when it comes to the change management required in digitalization processes, becoming the focus of this research: placing the human factor and its reaction to change as a central factor that is the main enabler of digital transformation. This concept is reflected in the two hypotheses presented at the end of Chapter 2.

3.2 Operationalization of theoretical constructs

The conceptualization, based on the abstraction of a phenomenon (in this case digitalization), built throughout this research has to be transferred into a construct that can be validated (Afzal, 2017). The process of conceptualization and operationalization will enable this research to connect the theoretical observations with the reality (Rao and Reddy, 2013). The hypotheses of this research must be operationalized in order for them to be connected to the real world and to have an impact on academia and also organizations of all natures.

The conceptualization phase was used to describe the phenomena of digitalization and to build the hypotheses. This was done through a systematic literature review, agreement of definitions and identification of gaps. The literature review was defined as 'systematic' because it was planned, organized and had a specific goal (Goddard and Melville, 2004). First, it was organized around the research of different key words such as "digital transformation", "digitalization", "technology", "human resources", "digital technologies", "artificial intelligence", "organizational culture", "organizational values", "organizational change", "change management", "digital transformation success and failures", "digital transformation success factors", and more. Once the different papers were analyzed and studied, a backward and forward search was implemented, looking also the different sources and citations of those papers. The literature review chapter was organized in different parts: digitalization with its own sub-chapters (culture, vision and values, human resources and talent and IT and technology), and change management.

Then, to operationalize the construct, in order to be able to measure the application of those theories or hypotheses, a measurement instrument was created in the way of a holistic survey that was delivered to one-hundred and thirty-four people who filled it in. In this way, a qualitative methodology is also introduced to this research, bringing the academic perspective together with the perspective of business practitioners. The survey was created using the software Microsoft Forms and the data was analysed with Excel, Power BI and SPSS. The survey had two parts: the first one with mandatory questions related to digital transformation and change management processes and the second part was voluntary and had the question related to the demographic variables.

Further details regarding the hypotheses, literature review and the survey can be read in the sections below, specifically in the sections ‘Research purpose and questions’, ‘Research design’ and ‘Population and sample’.

3.3 Research purpose and questions

My research interest led me to further consider the behavior and role of the human in the digitalization processes that take place within organizations, what challenges arise during the digital transformation journeys especially related to change resistance and change consolidation, and how is best for the organizations to manage them. I intended to demonstrate that the placement of the human factor and the management of its reaction to the changes proposed by digitalization processes are key for its success. Resistance to change will arise during digital transformations and clashes will take place between the

old and the new ways which will have to be proactively managed and approached in order for the organizations to be successful in their transformational journeys.

My personal thinking can be best reflected in Westerman (2018) quote: “when it comes to digital transformation, digital is not the answer. Transformation is.”. In a time that is characterized by a new digital paradigm where people behave in a different way, where they have completely different expectations than only a few years ago while also constantly changing and evolving, I believe it is imperative for organizations to have a holistic view in this topic. I consider digital transformation as a very complex journey where transitioning into a more digital-driven environment is not only about implementing the latest technologies, updating the strategy of the company and simply upskilling employees, as shown in the different academic papers, but about trying to be part of this new digital and social paradigm, embarking on a cultural change process where proper change management and monitoring activities are key for its success.

In order to provide an understanding of digitalization processes end-to-end that can be helpful in academic and business environments, this study will address the following hypotheses:

- H1: Despite the high impact of digitalization in organizations nowadays, there is no common transformational approach that fits all. But, having a holistic view of the digitalization processes, placing the human factor at the center of it and managing its reaction to the changes proposed by these transformations are crucial variables that define the outcome of the digital transformation

- H2: Transitioning into a more digital-driven environment is not only about implementing the latest technologies, updating the strategy of the company and upskilling employees, but also about trying to be part of this new digital and social paradigm and embarking on a cultural change process where proactive and clear communication regarding the reasons, impact and expectations of the digital transformation processes while balancing organizational cultural values is key for its adaptation and success

3.4 Research design

As stated by Goddard and Melville (2004), research is not only about gathering information but about being able to answer questions that were not previously answered or creating ones that currently do not exist. In this case, for this specific research, two approaches were taken: literature review together with a qualitative approach.

The literature review is systematic since it is "planned, organized and has a specific goal" (Goddard and Melville, 2004), in order to be able to identify properly what has been researched so far and to, then, demonstrate the contribution of this thesis. The overall process of the literature review can be described as the collection, understanding, analysis, summarizing and evaluation of the quality of the different sources to be able to have a strong basis for the specific topic (Levy and Ellis, 2006). This literature review was performed based on a selected set of key words together with a backward and forward search, as proposed by Levy and Ellis (2006), using not only key words research

but also researching the different sources and citations of the different articles and references found.

On top of doing a literature review, a qualitative methodology was also introduced to be able to bring together both the perceptions of the academic research with the view of business practitioners in order to make this study as thorough as possible, becoming relevant not only to academic spaces but also to business orientated environments. To collect data about the view that workers have regarding digitalization processes and what these processes entail, the measurement instrument designed was a comprehensive survey. The survey was created using the software Microsoft Forms and it was configured to be anonymous by default, but it also gave the opportunity to the responders to manually add their email addresses at the end of the survey, only if they wished to have a follow up conversation or if they wanted to receive an overview of the results. This was explained at the beginning of the survey with the following parragraph and as seen in Figure 17 and 18: "*Hi, my name is Camila. I am currently doing a research about digitalization processes for my doctoral degree. I intend to provide a comprehensive and structured approach to digital transformation that can add value not only in academic but also in organizational environments. The survey is anonymous unless you manually add your email address in the last section, only if you would like to be contacted for a follow up call or to receive an overview of the results of this survey. Thank you!* ".

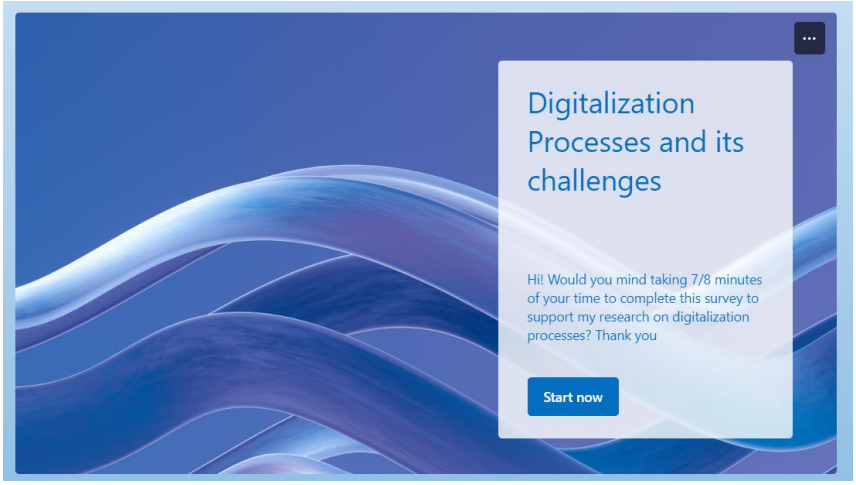

Figure 17
Cover of the survey
Source: Author

The survey consisted of two parts: the main section and the demographic section. The main section was composed by eighteen mandatory questions that are research related of which one is a boolean question (multiple choice), three questions are ranking, where the user has to "drag and drop" to place the answers in order in terms of their importance, and the rest are interval questions with options ranging from one to six where one (1) is equivalent to " Do not agree at all" and six (6) to "Fully agree". The idea behind placing an interval of an even number (one to six), rather than an interval composed by an odd amount of options (five or seven options for example) was to remove the possibility for the respondent to select a middle or neutral value as an answer, since by having an even number, the respondent is 'forced' to lean into either a negative or positive side, without being able to simple pick the middle choice, giving the researcher a better perception of the user's sentiment in each of the interval questions. At the same time, those eighteen questions can be divided in sub-categories: general

questions, implementation related questions, adaptation questions, management questions and pace and technology related questions.

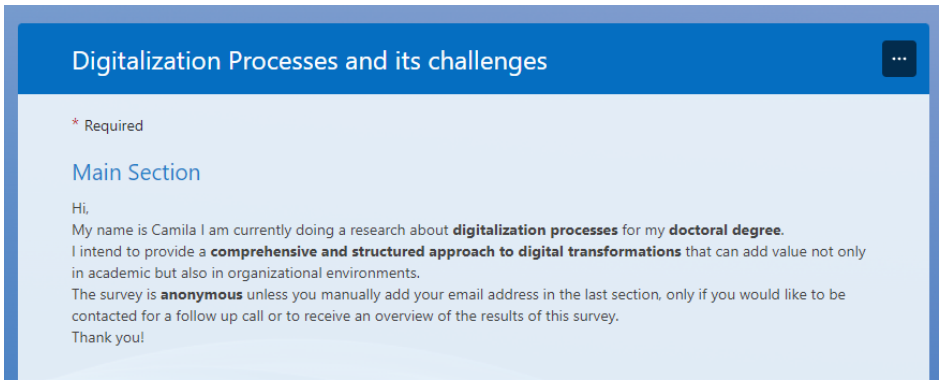

Figure 18
Introduction of the survey
Source: Author

The second part of the survey had ten questions that are deemed as demographic variables which were not mandatory (those ten questions had always the option “Prefer not to say” as one of the possible answers). The fact that those questions were not mandatory and that respondents can always select “Prefer not to say” as an answer was explained at the beginning of that section of the survey, as shown in Figure 19, within the same form using the following message: “*The demographic section in this survey asks for information such as the industry of your organization, your type of job, location, educational background, etc. to help provide context to the results of the survey. This information helps the researcher to consider how different cultural, social, and economic factors may impact the responses. However, it is important to respect your privacy and not to make you feel uncomfortable answering these questions. Therefore, you can always choose to select the option "Prefer not to say" for any question that you do not feel*

comfortable answering. This option ensures that everyone can still take part in the survey without revealing information they are not comfortable sharing".

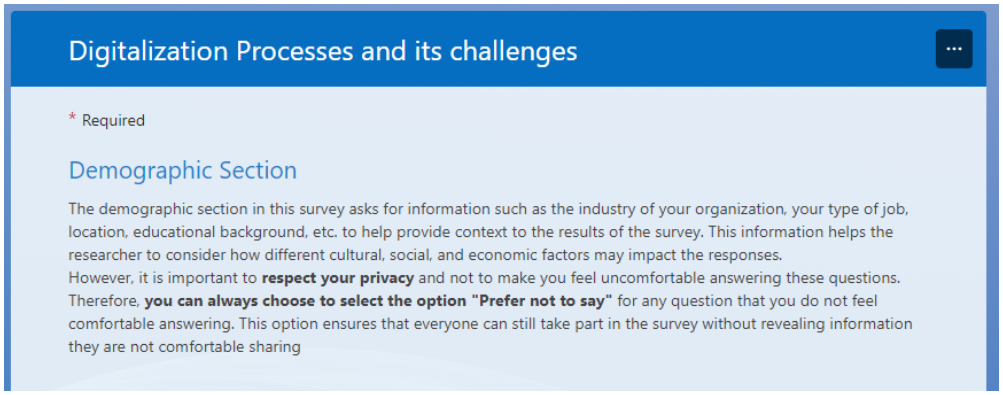

Figure 19
Introduction of the demographic section of the survey
Source: Author

In the table 8 it can be seen the complete overview of the total twenty-eight questions, including its category and the type of answer:

Table 8
Table with survey questions, category and answer type (interval, boolean or rank)
Source: Author

Question ID	Question	Category	Type Answer
1	The impact of digitalization processes or transformations in my organization is very high	General	Interval (1-6)
2	The digitalization processes or transformations in my organization is happening across the whole organization simultaneously, rather than at a business unit or division level	General	Interval (1-6)
3	How would you describe the digitalization approach taken by your organization, if any?	General	Boolean
4	Digital transformation or digitalization is a crucial topic for organizations nowadays that needs to be considered in order to maintain and/or gain competitive advantage	General	Interval (1-6)
5	Please rate the following variables based on its criticality during digitalization processes within organizations	Implementation	Rank
6	Digital transformation can be implemented successfully in the business as a holistic project taking into account different aspects such as technology, processes, employee upskilling together with human behavior and change management	Implementation	Interval (1-6)
7	Clashes or conflicts between old and new ways of working during the implementation of digitalization processes are very common	Implementation	Interval (1-6)
8	Employees are very keen to adapt to the ways of working proposed by the digitalization processes within organizations	Adaptation	Interval (1-6)
9	Most recent employees in the organization are more willing to adopt new digitalized processes than employees with several years of experience in the organization	Adaptation	Interval (1-6)
10	Younger employees in the organization are more willing to adopt new digitalized processes than older employees	Adaptation	Interval (1-6)
11	It is very critical to proactively communicate reasons, impact, expectations and lengths of the digital transformation in order to ensure adoption of the new measures among employees	Adaptation	Interval (1-6)
12	It is very important to address the concerns of employees who may feel left behind during the digital transformation	Adaptation	Interval (1-6)
13	It is critical to balance the need for new digitalized processes and/or new technologies with the need to maintain the cultural values within the organization	Adaptation	Interval (1-6)
14	Appropriate change management practices are very relevant within digital transformation processes	Implementation	Interval (1-6)
15	What do you think is most important to avoid challenges during the transition from old to new ways of working that are proposed by digitalization processes?	Management	Rank
16	What do you think is the best way to train the employees to understand better the different aspects of digitalization processes?	Management	Rank
17	Digitalization processes will soon take place in organizations at a much faster rates than before	Pace and New Tech	Interval (1-6)
18	Artificial Intelligence will have a significant impact in digitalization processes taking place in organizations in the next coming years	Pace and New Tech	Interval (1-6)
19	Which is the main industry / sector of your organization?	Demographic	Boolean
20	What is the approximate number of employees of your oganization?	Demographic	Boolean
21	How many years of experience do you have in your industry?	Demographic	Boolean
22	Which function describes your role best?	Demographic	Boolean
23	What describes your position within the organization best?	Demographic	Boolean
24	Where do you work?	Demographic	Boolean
25	What is your level of education?	Demographic	Boolean
26	What is your type of education?	Demographic	Boolean
27	What is your age?	Demographic	Boolean
28	What is your gender?	Demographic	Boolean

Since avoiding bias during the collection of the data is extremely important, different measures were taken, such as: questions were framed in a neutral way, avoiding questions that could lead the subject towards a specific answer; at the same time, questions were clear, direct and as concise as possible, to avoid confusion and ambiguity in order to help with potential acquiesence bias (when the respondents select sistematically answers such as ‘yes’, ‘agree’ without actually understanding what the question is about); the same questions were asked to all the subjects in the same manner and following the same order; long response lists were avoided to ensure respondents read all the options; and it was made clear to the subjects, prior to the completion of the survey, that it was anonymous and that it was not mandatory for them to answer the demographic questions, this helps to avoid social desirability bias (when a respondent tries to avoid embarrassment or tries to project a positive image towards others, based on what is ‘expected’) (Stantcheva, 2023).

3.5 Population and sample

In order to seek for an answer regarding the two hypotheses presented, once the survey was created, it was distributed through different personal channels of the researcher. The survey was distributed first in work channels (intranet, email, messages and work groups) as in university channels (such as platforms and forums). Then it was distributed using resources such as LinkedIn and email to personal and professional contacts. Therefore, a combination of two sampling methods was used: self-selecting (where individuals can freely chosee to participate or not in the survey) and snowball

sampling (non-probability technique where participants recruit other participants to be part of the study) (Sharma, 2017). By distributing the survey through the available personal channels of the researcher, snowball or chain sampling was applied, where acquaintances of the researcher not only filled the survey but also distributed it, helping to build up the sample. Also, since the survey was published in open channels, self-selection sampling was applicable because the respondents could freely choose to participate or not in the study. Based on this, a total of one-hundred and thirty-four people filled the online survey. The sample was composed as follows:

- In terms of gender, as it can be seen in Figure 20, 57% of respondents are males, 40% females, 1% non-binary and 1% preferred not to say

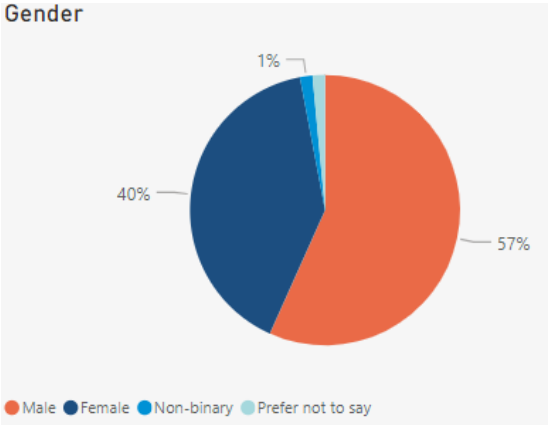

Figure 20
Gender distribution of respondents in survey
Source: Author

- Regarding the location of the respondents, as shown in Figure 21, the majority (78%) were located in Europe, while 8% were in South America, 7% in North America, 3% in Asia, 1% in the Middle-East, 1% in Australia and 1% in Africa

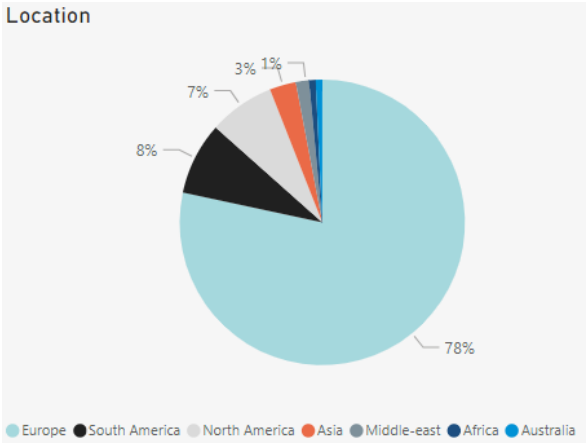

Figure 21
Location distribution of respondents in survey
Source: Author

- When it comes to the education of the participants of the survey, more than half of respondents hold a masters degree (60%), 25% have a bacherlors degree, 10% hold a doctoral degree, 4% have a high school diploma and 2% prefer not to disclose that information, as described in Figure 22.

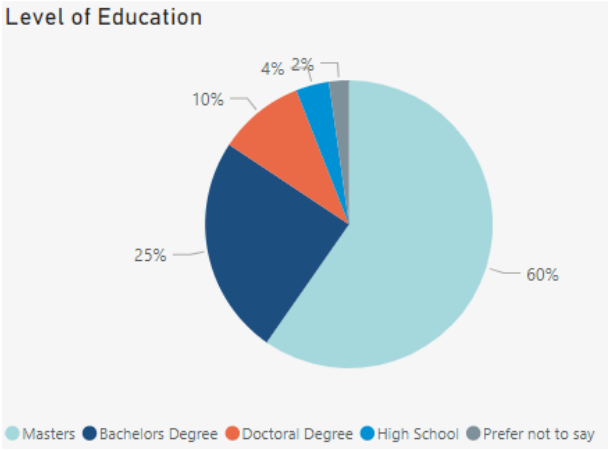

Figure 22
Level of education distribution of respondents in survey
Source: Author

- In respect to the age of the participants, as it can be seen in Figure 23, only 1% were between 18 and 24 years old, 33% between 25 and 34 years old, 43% between 35 to 44 years old, 15% were from 45 to 54 years old and, lastly, 9% were 55 years old or older

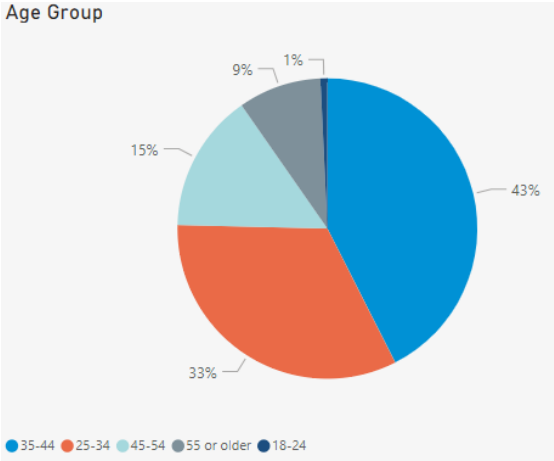

Figure 23
Age groups distribution of respondents in survey
Source: Author

- Regarding the years of experience of the respondents, there is three groups: 22% have between 0 and 5 years of work experience, 40% hold 5 to 15 years of experience and the last group that have more than 15 years of work experience represent 38% of the population of the survey, as shown in Figure 24.

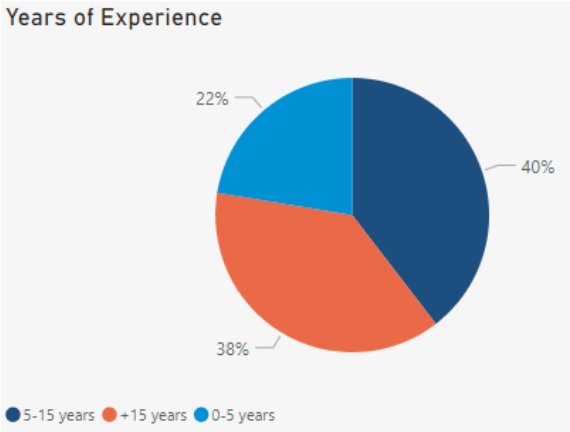

Figure 24
Years of work experience distribution of respondents in survey
Source: Author

- The positions hold by the respondents of the survey also go through a range of different options. 37% are managers, 27% are analysts, 25% are directors, 9% are board or executive members and only 2% are researchers or professors, as it can be seen in Figure 25.

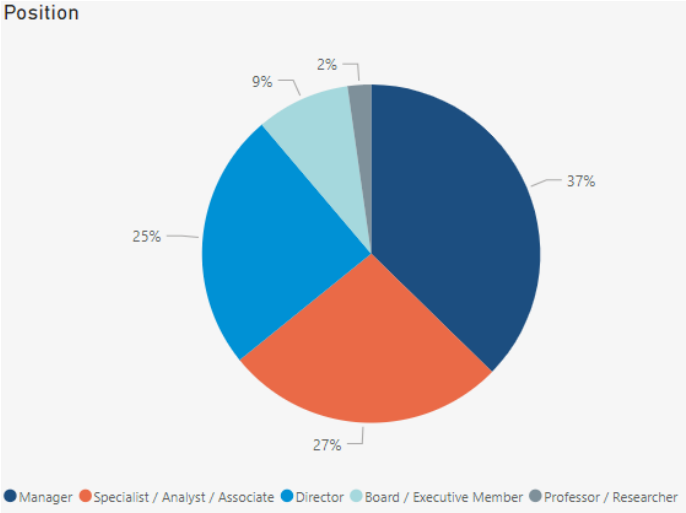

Figure 25
Position in work distribution of respondents in survey
Source: Author

- There is also a great variety of industries in which the different respondents work on, as it can be seen in Figure 26. 21% work in engineering or manufacturing industries, 13% in Information Technology related companies, 11% in consultancy, 10% in industries related to accountancy, banking and/or finance, 9% in digital, media and/or marketing industries, 9% in public services, 8% in education related industries, 7% in sciences or healthcare, 3% in legal or compliance, 2% in Retail and then very small amount of people in industries such as energy, food services, logistics, sports, HR, Travel, leisure and more.

Figure 26
Industries distribution of respondents in survey
Source: Author

3.6 Data collection procedures

The survey was performed using the program of Microsoft Forms and the answers were extracted using the Micrososft Excel data extraction feature. This Microsoft Excel, after all personal data was removed, was utilised as the main data source for the development of a Power BI model, that was used to perfom a descriptive analysis of the data. The same file was also used as the source to perform all the relevant statistical tests using the software of IBM called SPSS (version 29.0.1.0.).

Power BI was the choosen software to perform the descriptive data analysis, rather than Microsoft Excel, because it is a friendly tool that helps transform raw data into valuable insights, that then can be seen in different forms of graphs and presentations. The visualization features of Power BI enables the user to create charts, tables, maps and more to identify trends, patters and outliers. Also the Power Query enables data manipulation, cleaning, transformation and modeling with the possibility of tracking every step (Metre et al., 2024).

In the same way, SPSS was the sofwtare selected to run the statistical side of the data analysis because it is a market leader for statistical solutions products and is considered a universal system for statistical analysis and data management. This software allows the user, through a user-friendly interface, to easily upload or enter information in a table form and then to edit, if necessary. Then the user can perform any statistical analysis in the data and then present it through different charts, graphs and tables; all this without needing to write commands in programming languages, becoming a software accesible to users from all levels, from beginner to advance (Sadriddinovich, 2023).

To create the Power BI model and for the SPSS analysis, the Microsoft Excel file was set up as a source for it and manipulations of the data were performed in order to ensure that the data is available in its optimal way to then be analysed. For the descriptive analysis, the manipulations were done directly in Power BI to avoid manipulating manually the raw Microsoft Excel file used as a data source. This brings the advantage that if the source is updated (for example, with more answers), then the manipulations are executed automatically by Power BI, therefore, no extra manual work is required, reducing the time but also potential risks that can arise during manual manipulations of the data. Another important aspect is that all the manipulation done in the data within Power BI can be always traced back and modified, if needed, using the advanced editor feature, as it can be seen in Figure 27 and 28.

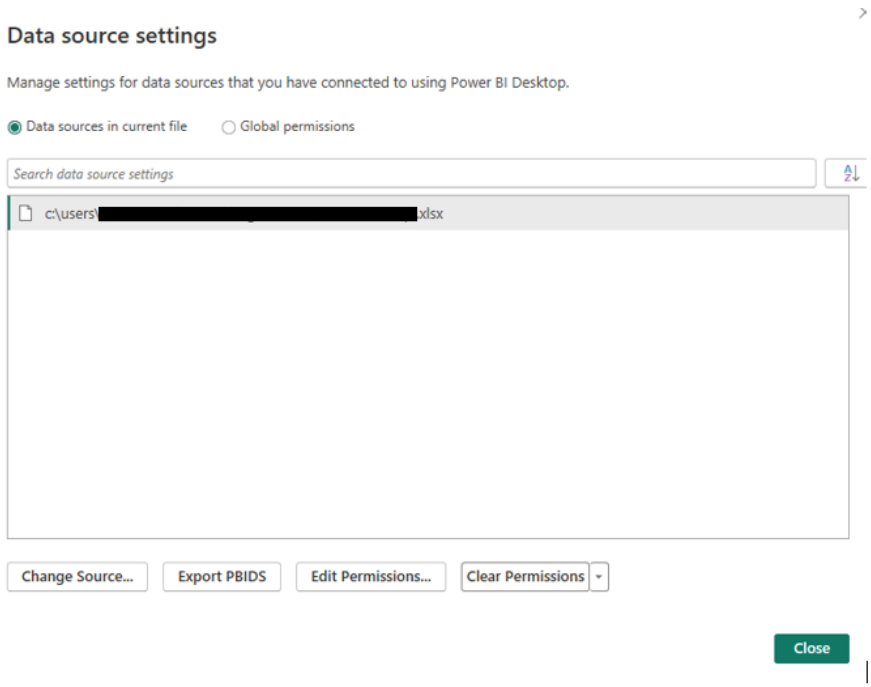

Figure 27
Data source settings in Power BI report
Source: Author

Figure 28
Advanced editor feature of Power BI
Source: Author

Part of the manipulations done was the organization of the data in a way that is best for its analysis and fit for purpose. The data was divided in different tabs (called queries in Power BI) depending on the type and/or nature of the questions. Once those queries were done, data modelling was applied to ensure that the correct connections were in place in between the tabs through common variables such as respondent ID or question ID in order to be able to perform a holistic analysis, as shown in Figure 29.

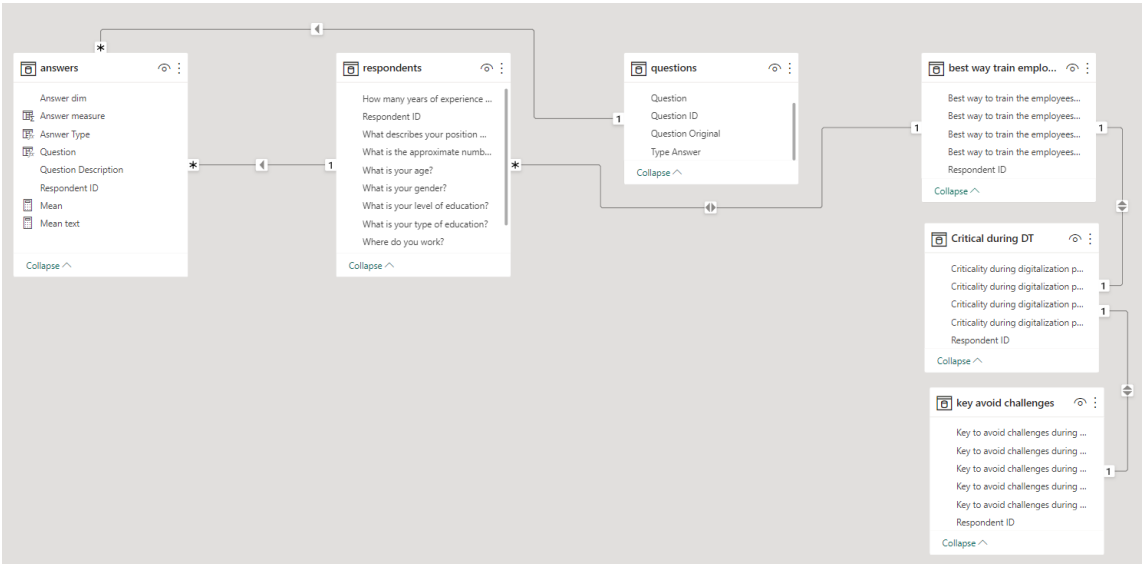

Figure 29
Data source configuration in Power BI
Source: Author

Once the data was curated and the model was working, the analysis and visualizations were executed.

3.7 Data analysis

In the descriptive data analysis performed, first, the survey demographics were analysed. As it can be seen in the Figure 30, out of the one-hundred and thirty-four respondents:

- 57% of the respondents are male, while 40% female
- 78% of the respondents are located in Europe, followed by an 8% in South America and 7% in North America
- 60% of the respondents have a reached a Masters degree in their education, while 25% had a Bachelor's degree and 10% a doctoral degree
- In terms of age of the respondents, 43% are within the 34 to 44 age bucket, 33% are between 25 to 34 years old and 15% between 45 and 54 years old
- When it comes to years of experience, 40% of the respondents have between 5 to 15 years of experience, 38% have more than 15 years of experience and 22% less than 5 years
- The positions of the respondents within their organizations is also very distributed, with 37% being managers, 27% specialists, 25% directors and 9% board members

- The main industries of the respondents are engineering/ manufacturing, IT, Consultancy, Accountancy, Marketing, Public Services, Education and Healthcare

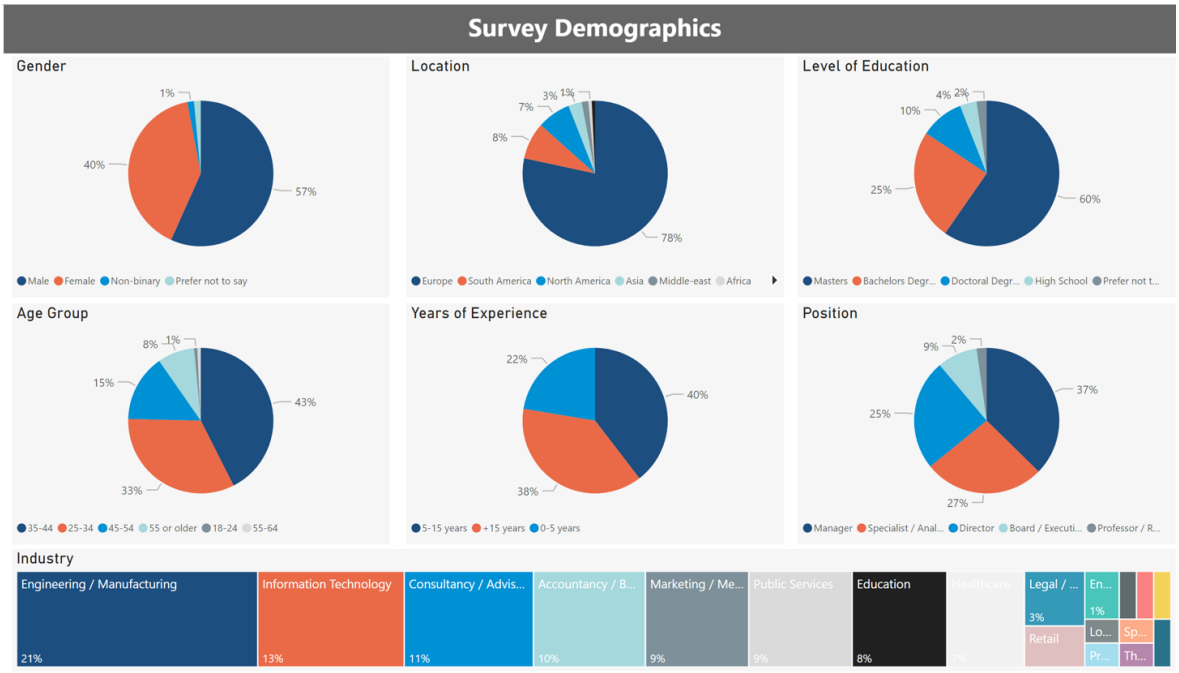

Figure 30
Survey demographics summary - Power BI Analysis
Source: Author

The analysis of the results was divided into different stages. First, the answers to the questions under the different categories (general, implementation, adaptation, management and pace and new technologies) were analyzed. Then, the answers under those categories were analysed across the main demographic variables (gender, age group and education).

The general variables of the survey were:

- The impact of digitalization processes or transformations in my organization is very high (1: Do not agree at all - 6: Fully agree)

- The digitalization processes or transformations in my organization is happening across the whole organization simultaneously, rather than at a business unit or division level (1: Do not agree at all – 6: Fully agree)
- How would you describe the digitalization approach taken by your organization, if any? (Only 1 possible answer - ***Explosive****: Holistic approach, implementing digitalization across the whole organization, having a very fast transition /* ***Decisive****: Holistic approach but with a flexible implementation and roll-out plans /* ***Distributed****: The responsibility lies within the different business units, who determine their own strategy and implementation plan /* ***Reactive****: Transformation taking place internally for the existing products while exploring new opportunities only as a response to customer or business demands /* ***Other / None***)
- Digital transformation or digitalization is a crucial topic for organizations nowadays that needs to be considered in order to maintain and/or gain competitive advantage (1: Do not agree at all – 6: Fully agree)

The implementation variables of the survey included:

- Please rate the following variables based on its criticality during digitalization processes within organizations (Use drag & drop function to re-organize the answers having the most important option on top and the least important option at the bottom) *(Options: Change management &*

Human behavior; Organizational culture, vision & values; IT & Technology; Human resources & Talent management)

- Digital transformation can be implemented successfully in the business as a holistic project taking into account different aspects such as technology, processes, employee upskilling together with human behavior and change management (1: Do not agree at all - 6: Fully agree)
- Clashes or conflicts between old and new ways of working during the implementation of digitalization processes are very common (1: Do not agree at all - 6: Fully agree)
- Appropriate change management practices are very relevant within digital transformation processes (1: Do not agree at all - 6: Fully agree)

The adaptation variables of the survey covered the following:

- Employees are very keen to adapt to the ways of working proposed by the digitalization processes within organizations (1: Do not agree at all - 6: Fully agree)
- Most recent employees in the organization are more willing to adopt new digitalized processes than employees with several years of experience in the organization (1: Do not agree at all - 6: Fully agree)
- Younger employees in the organization are more willing to adopt new digitalized processes than older employees (1: Do not agree at all - 6: Fully agree)

- It is very critical to proactively communicate reasons, impact, expectations and lengths of the digital transformation in order to ensure adoption of the new measures among employees (1: Do not agree at all - 6: Fully agree)
- It is very important to address the concerns of employees who may feel left behind during the digital transformation (1: Do not agree at all - 6: Fully agree)
- It is critical to balance the need for new digitalized processes and/or new technologies with the need to maintain the cultural values within the organization (1: Do not agree at all - 6: Fully agree)

The management variables of the survey were:

- What do you think is most important to avoid challenges during the transition from old to new ways of working that are proposed by digitalization processes? (Use drag & drop function to re-organize the answers having the most important option on top and the least important option at the bottom) *(Options: Ensure transparency on the digitalization process and ensure alignment with goals and vision of the organization; Apply Change Management practices, foresee resistance and work proactively on it; Involve employees from early stages and ask for feedback and/or suggestions regarding the ongoing digitalization process; Ensure the employees are up-skilled to be able to use the new technologies being implemented; Ensure the latest technology is acquired and implemented)*

- What do you think is the best way to train the employees to understand better the different aspects of digitalization processes? (Use drag & drop function to re-organize the answers having the most important option on top and the least important option at the bottom) *(Options: In-house training provided by the organization (workshops, talks, etc.); Hands-on-experience / Learning on the job; Informal education (webinars, conferences, etc.); Formal education (university, college, etc.).)*

Lastly, the pace and new technologies variables of the survey were:

- Digitalization processes will soon take place in organizations at a much faster rates than before (1: Do not agree at all - 6: Fully agree)
- Artificial Intelligence will have a significant impact in digitalization processes taking place in organizations in the next coming years (1: Do not agree at all - 6: Fully agree)

For the statistical analysis performed in IBM Software SPSS, the following tests were done:

- Standard deviation and mean in all interval variables. Standard deviation indicates how dispersed the probability distribution is about its center (Rice, 2007). In the analysis, standard deviation is represented as ‘SD’ and mean as ‘M’.

- T-test in all interval variables comparing gender (male/ female). T-Test is a statistical test that helps compare the means of two different groups only (Kim, 2015)
- T-test in all interval variables comparing different fields of education (Business, Finance and Economics vs. Others)
- ANOVA test in all interval variables comparing different fields of education (Business, Finance and Economics vs. Tech and Engineering vs. Others). The Anova test helps identify if there is any difference in the means between three or more groups (Kim, 2017)
- ANOVA Test in all interval variables comparing years of work experience (0-15 / 5-15 / +15)
- ANOVA Test in all interval variables comparing respondents in different age groups

For further interpretation of the tests, for T-Test, the point estimate of Cohen's d is analyzed and for ANOVA the point estimate Omega-squared Fixed-effect is looked at. For the statistically significant ANOVA results, post-hoc Tukey-b test is employed. The effect sizes values for these two point estimates can be seen for reference in Table 9 ("Rules of thumb on magnitudes of effect sizes", 2021).

Table 9
Effect sizes Cohen's d (T-Test) and Omega Squared Fixed Effect (ANOVA)
Source: Author

Effect Size	**Small**	**Medium**	**Large**
Cohen's d	0.2	0.5	0.8
Omega squared Fixed effect	0.01	0.06	0.14

After both descriptive and statistical analyses were performed, the results were interpreted based on the hypotheses of this research. Further details can be read in the results and discussion chapters.

3.8 Research design limitations

This research was performed with one-hundred and thirty-four individuals across different industries, countries, age groups and with different levels of education, providing valuable global input regarding digitalization processes and related change management practices. This study could be even more valuable if it is expanded and more people is included, especially with people located outside europe since 78% of the respondents were located there. Also, the study could be relevant by replicating it for specific industries or countries to be able to draw conclusions that belong purely under one specific context or circumnstance (a specific circumnstance of an industry or under a specific cultural context of a country or region for example).

The fact that the answers included in this research includes people from different countries is important to understand that some cultures may have specific values that need to be taken into account during transformational processes. Also the countries are

not the only ones that have their own cultures and values, this also takes place within organizations, and this needs to be considered when planning to embark into a digital transformation journey because even if they will be common key criterias like proactive change management, transparency and communication, there will not be a one solution that fits all.

3.9 Conclusion

Based on the research performed, the research problem that this study wants to address is the lack of a comprehensive and structured approach towards digital transformation in current literature where the human and its reaction to change is placed at its core. It is imperative for organisations to have a holistic take on digitalization processes in order to keep up with the constant changes not only on the markets but also on the employee taskforce and consumers. A key part that can make change a success is to minimize and manage the resistance to it while balancing strategy, culture and leadership.

The operationalization of these constructs is done through a systematic literature review and also with a qualitative methodology, through a holistic survey. The systematic, planned and organized literature review included the search of key words together with a review, study and analysis of the sources and citations of the papers found. The qualitative method helped to connect the academic view found in the different papers to the perception of business practitioners. This was done thanks to the one-hundred and thirty-four business practitioners that completed the survey across the globe. The survey was created using Microsoft Forms and the analysis of the survey was done

with Microsoft Excel, Power BI and SPSS. The idea behind the use of both methodologies (literature review and qualitative method) is to ensure that this study can be relevant for both academic environments but also business orientated environments.

In order to help accepting or rejecting the proposed hypotheses, the survey included different variables related to general aspects of digitalization, its implementation, adaptation, management and new technologies.

The limitations of the survey are related, first, to the amount of people that filled it (in this case, one-hundred and thirty-four people) and its characteristics. This survey was global, therefore people from all over the world filled it (but its majority were in Europe) and also from all different types of industries, educational backgrounds, positions, etc. For more detailed and contextual value, future research can focus on specific countries, cultures and/or industries.

Nevertheless, the results of the survey show that digital transformation as a very complex journey with several layers to it, where there is no right or wrong approach. That transitioning into a more digital-driven environment is actually not only about having the latest technologies, updating the strategy of the company and simply upskilling employees but about being part of a new digital and social paradigm that has at its core a cultural change where proper change management and monitoring activities are key.

CHAPTER IV:

RESULTS

4.1 Analysis of the first hypothesis

The first hypothesis of the research is: ‘despite the high impact of digitalization in organizations nowadays, there is no common transformational approach that fits all. But, having a holistic view of the digitalization processes, placing the human factor at the center of it and managing its reaction to the changes proposed by these transformations are crucial variables that define the outcome of the digital transformation’. This analysis is divided into two parts. The first part includes the analysis of the hypothesis from a descriptive perspective and then the second part is from an inferential statistics perspective.

4.1.1 Descriptive analysis of the first hypothesis

When it comes to the impact of the digitalization processes within the organizations of the respondents, there is a very strong agreement. As we can see in Figure 31, 88% of the respondents agree that the impact is very high (16% answered 4 (/6), 37% selected 5 (/6) and 35% answered 6 (/6), being 1 “Do not agree at all” and 6 “Fully agree”). But, as presented in Figure 32, only 57% of the population of the survey thinks that these tranformational processes are taking place across the whole organization at the sime time, while the remaining 43% does not agree fully with it (mean 3.7 /6).

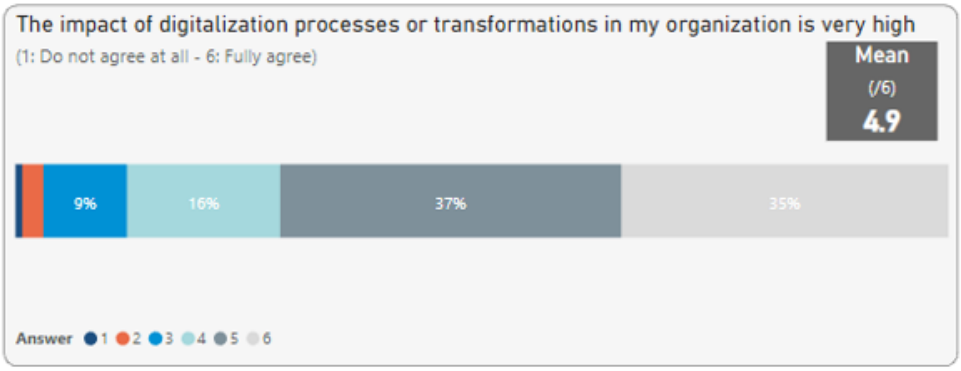

Figure 31
Answers impact on digitalization
Source: Author

Figure 32
Answers digitalization processes across the organization
Source: Author

This can also be seen in the answers of the respondents, where they describe the approach taken by their organization to implement digitalization processes. The approaches selected for this survey were inspired by the categorization of digital transformation strategies identified in Danuso et al. (2021), being explosive, decisive, distributed and reactive, as shown in Figure 33.

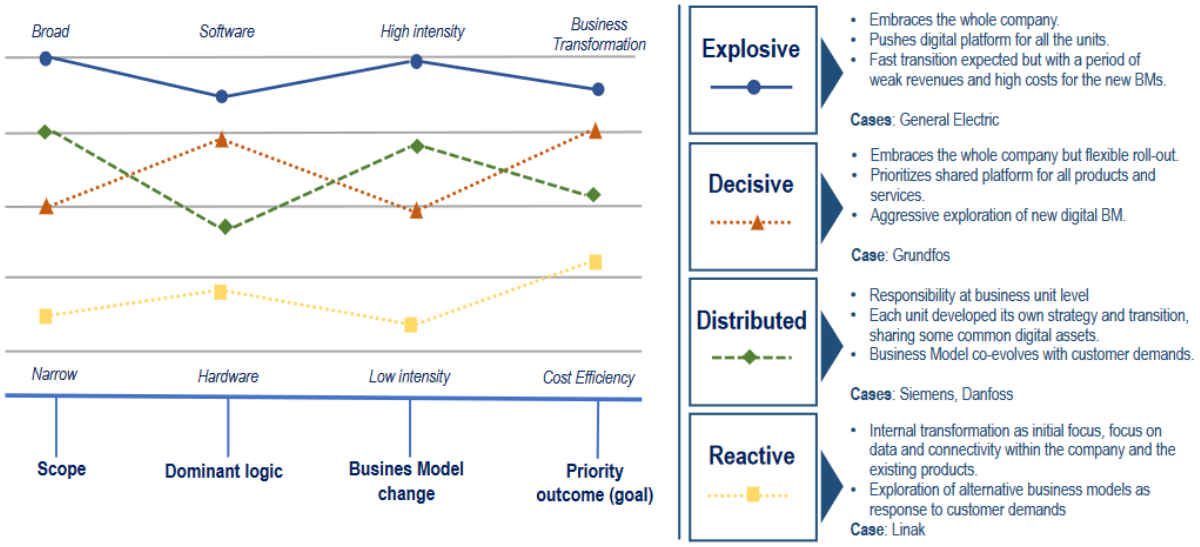

Figure 33
Digital transformation strategies
Source: Danuso et al. (2021)

As presented in Figure 34, only 9% describe the approach as explosive (defined as a holistic approach, implementing digitalization across the whole organization at a very fast pace) and 18% describe it as reactive (transformation taking place internally for the existing products while exploring new opportunities only as a response to customer or business demands). The majority of the respondents selected either decisive (31% - Holistic approach but with a flexible implementation and roll-out plans) or distributed (40% - The responsibility lies within the different business units, who determine their own strategy and implementation plan).

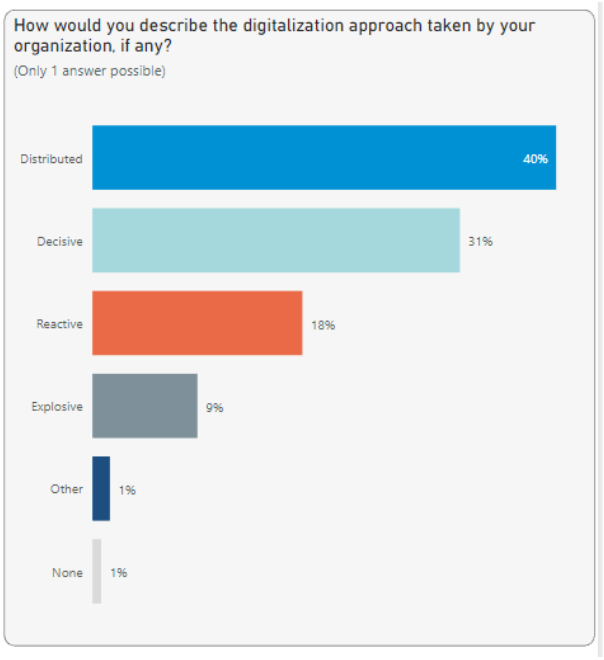

Figure 34
Digitalization approach answers
Source: Author

This shows that, even if the impact of digitalization processes in organizations is very high, the experience of those type of processes are not the same across the organization and therefore the impact can be perceived in a different way. Most of the organization are approaching digitalization with a more flexible approach, where the different business units have different responsibilities towards the same process. This can also be seen in the work done by Danuso et al. (2021), where it is stated that indeed some organization may perceive digitalization processes as a broad change but other ones consider it to be a specific challenge belonging to a business unit but that at the end, and that there is no right or wrong way.

But what is common across the respondents is the agreement on the fact that digital transformation it is indeed a critical topic for the organizations that it needs to be

taken into account to be able to maintain or gain competitive advantage (the mean of the answers for this question, for the population of the survey is of 5.6 /6), as it can be seen in Figure 35. This also matches the research performed in Henriette et al. (2016), where the participants also see digitalization processes as a strategic priority.

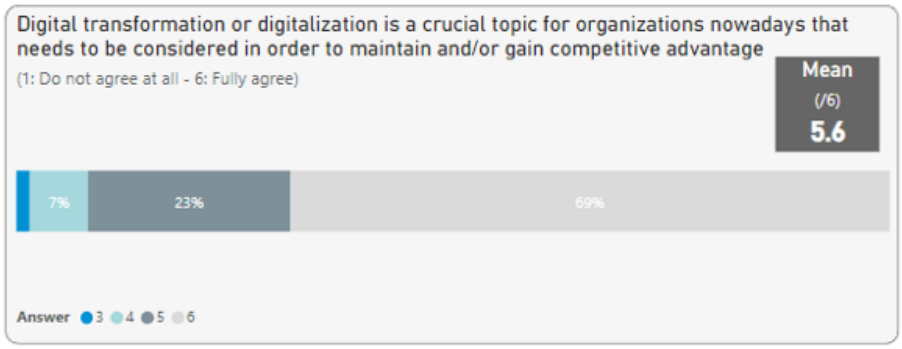

Figure 35
Digital transformation criticallity answers
Source: Author

Within the implementation questions, it can be seen in Figure 36, that the respondents had a common view when it comes to seeing digitalization processes as a holistic project (mean 5.1 /6), meaning that it has to be considered not only technology, processes and employee upskilling but also human behavior and change management.

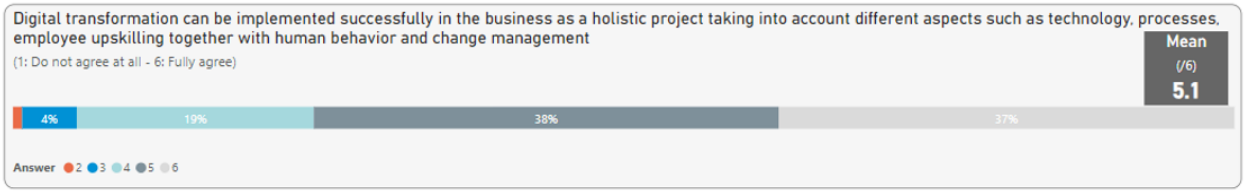

Figure 36
Implementation of digital transformation answers
Source: Author

This agreement coincides with the problem statement in this research, that states that what is currently missing is a holistic approach that does not take only the three most common variables into account (technology, culture and people) but also practices such as change management and human behavior, as shown in Figure 37.

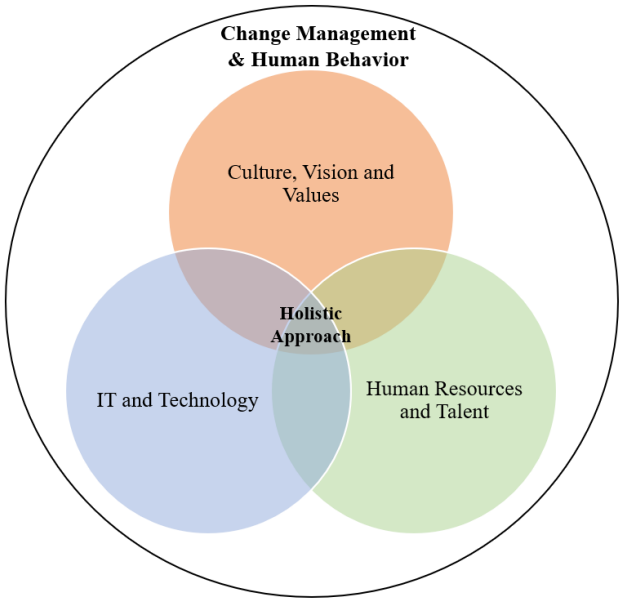

Figure 37
Holistic approach to digitalization
Source: Author

An important piece of information to highlight is that, when the respondents were asked to rank some variables in the order of its criticality during digital transformation processes, “HR & Talent Management” and “IT & Technology” were mostly selected as the third and fourth option while “Organizational culture, vision & values” and “Change management & Human behavior” were selected first and second, as it can be seen in Figure 38.

Figure 38
Critical variables within digitalization processes answer
Source: Author

This is very relevant because it can be seen in the literature review but also in the answers of the respondents: most of the academic papers that talk about digitalization processes take into account only technology, culture and people, having a clear gap on research on change management and human behavior around this topic, aligning with this research and also with Bellantuono et al. (2021) where it is confirmed that there is a lack of change-monitoring activities, identification and management of the resistance to change and the change consolidation within the digital transformation literature; this is also aligned with the opinion of the respondents of the survey, as presented in Figure 39, where more than half (54%) assigned a “Fully agree” (6/6) and 32% selected a 5/6 as an answer to the statement “appropriate change management practices are very relevant within digital transformation processes”.

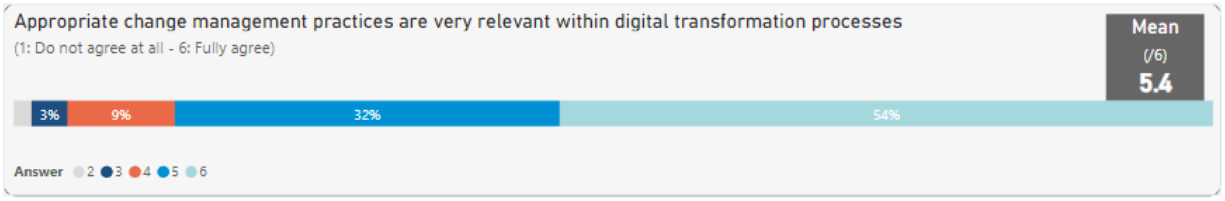

Figure 39
Change management practices within digital transformation processes answers
Source: Author

Regarding the distribution of the answers across the different variables (gender, age group, education), there is no outstanding findings since it is fairly even, as it can be seen in the Figures 40, 41 and 42.

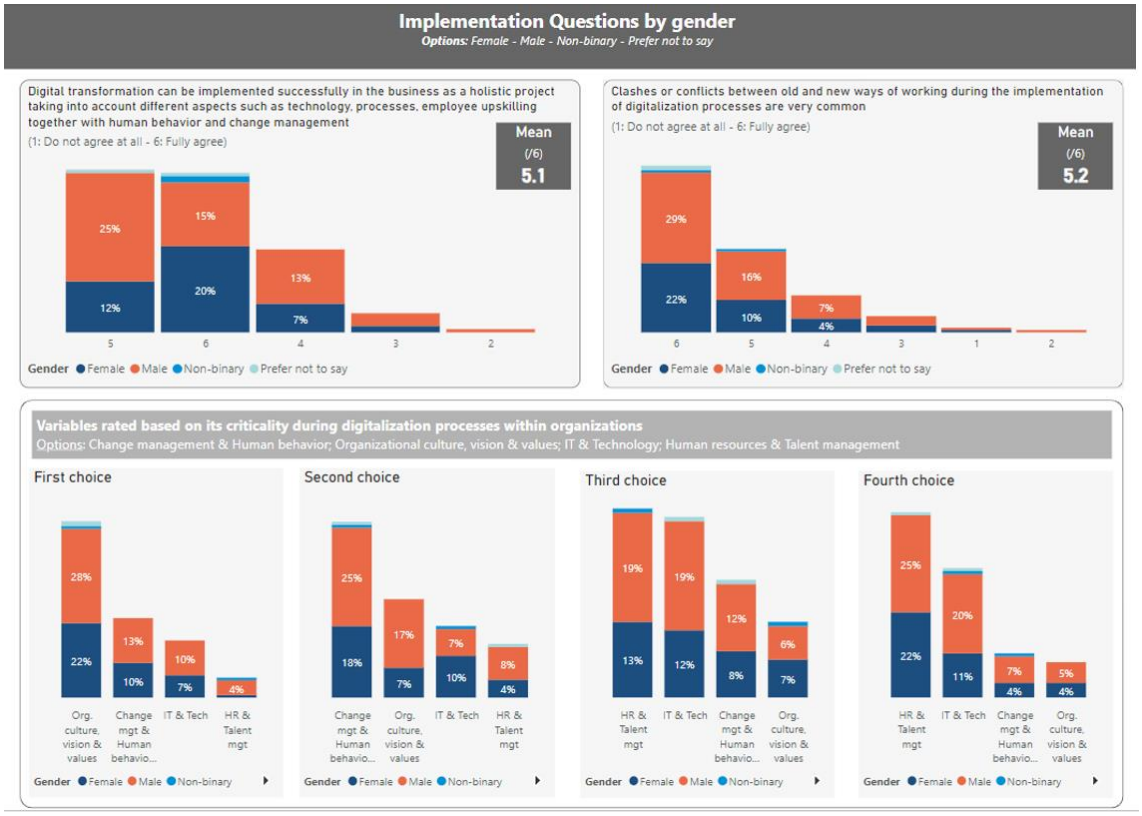

Figure 40
Implementation related variables, answers sorted by gender
Source: Author

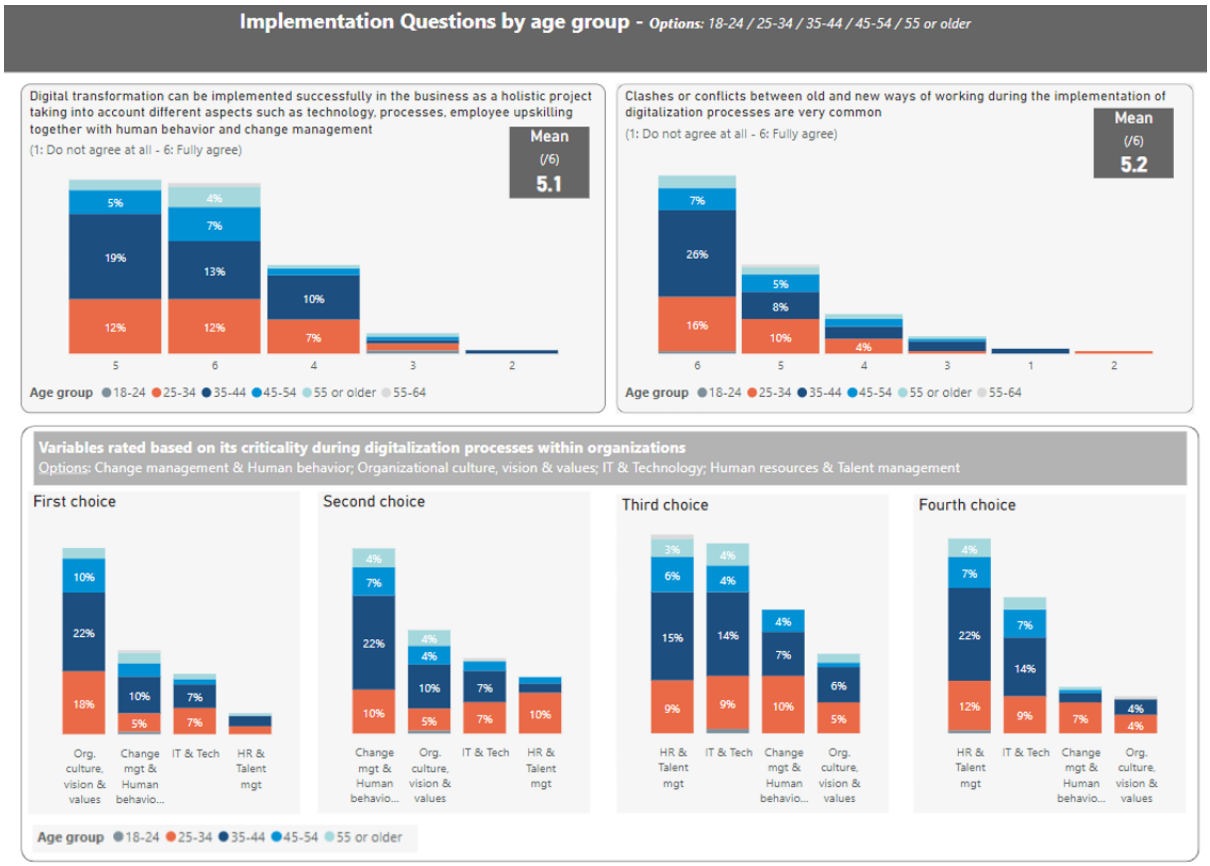

Figure 41
Implementation related variables, answers sorted by age group
Source: Author

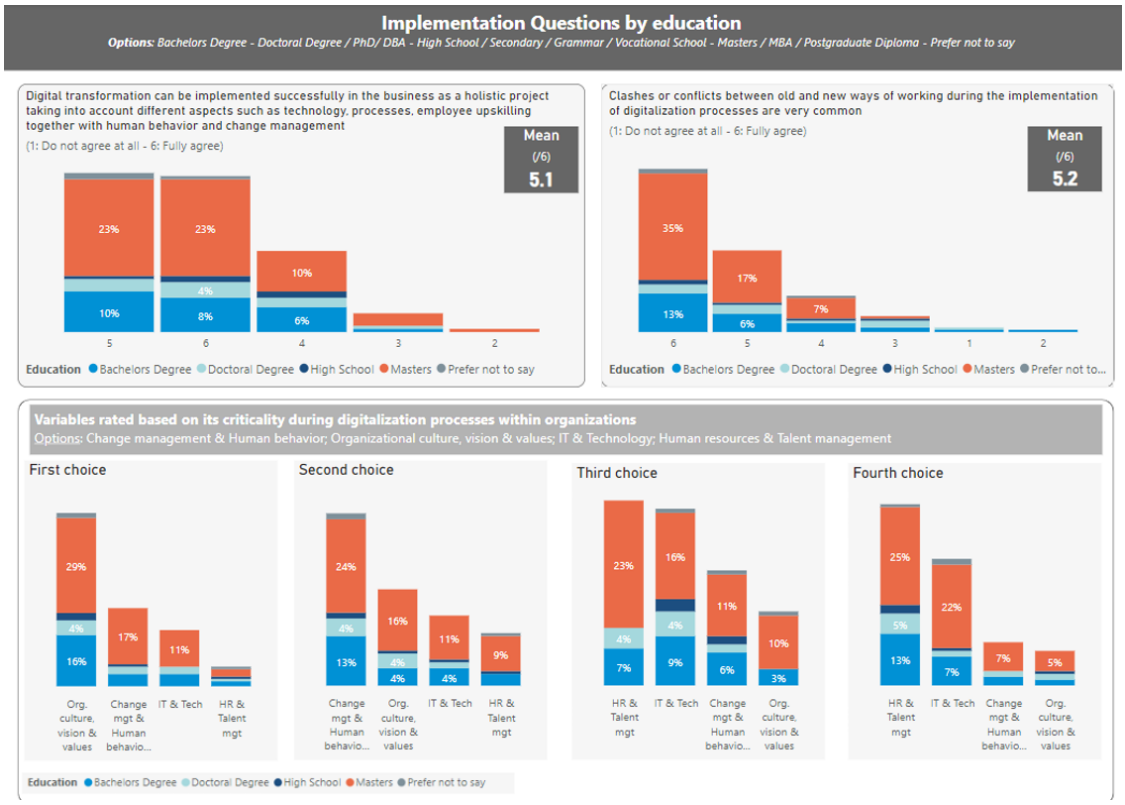

Figure 42
Implementation related variables, answers sorted by education level
Source: Author

4.1.2 Inferential statistics analysis of the first hypothesis

For all the variables presented, the standard deviation was calculated as well to check the variability within the dataset. In this case, as it can be seen in the Table 10, the standard deviation on the questions is very low, meaning that the answers are close to the mean, making the dataset consistent.

Table 10
Standard deviation – First hypothesis
Source: Author

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
The impact of digitalization processes or transformations in my organization is very high (1: Do not agree at all - 6: Fully agree)	134	1	6	4,91	**1,093**
The digitalization processes or transformations in my organization is happening across the whole organization simultaneously, rather than at a business unit or division level (1: Do not agree at a...	134	1	6	3,72	**1,530**
Digital transformation or digitalization is a crucial topic for organizations nowadays that needs to be considered in order to maintain and/or gain competitive advantage (1: Do not agree at all - ...	134	3	6	5,59	**0,685**
Digital transformation can be implemented successfully in the business as a holistic project taking into account different aspects such as technology, processes, employee upskilling together with ...	134	2	6	5,07	**0,903**
Appropriate change management practices are very relevant within digital transformation processes (1: Do not agree at all - 6: Fully agree)	134	2	6	5,35	**0,878**

Also, a T-Test was performed with SPSS in order to verify if there was, or not, a significant statistical difference between the different groups. To evaluate that, the Two-Sided p needs to be checked. If $p>\alpha$, we do not reject H0 (hypothesis) (there is no significant statistical difference between groups) but if $p<\alpha$, we reject the H0 (hypothesis), meaning there is significant statistical difference between groups.

For gender analysis, only female and male answers were taken into account since out of the hundred and thirty-four respondents, only two people had “non-binary” as their answer and two people selected “prefer not to answer”. These four answers did not constitute a sample that can be deemed as statistically big enough to become subsamples to be utilised for this specific analysis.

In the Table 11, the green cells present the questions where no significant statistical difference was found between both groups (female and male) and the orange cells present the one that had a significant statistical difference. As it can be seen, most of

the questions did not have major differences between the male and female answers. However, there is a significant statistical difference between the genders regarding two variables.

Table 11
T-Test by gender, independent samples test – First hypothesis
Source: Author

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						One-Sided p	Two-Sided p			Lower	Upper
The impact of digitalization processes or transformations in my organization is very high (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	0,692	0,407	-0,385	128	0,350	**0,701**	-0,076	0,197	-0,467	0,315
	Equal variances not assumed			-0,391	119,812	0,348	**0,697**	-0,076	0,195	-0,461	0,309
The digitalization processes or transformations in my organization is happening across the whole organization simultaneously, rather than at a business unit or division level (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	0,009	0,924	1,797	128	0,037	**0,075**	0,490	0,272	-0,049	1,029
	Equal variances not assumed			1,804	115,665	0,037	**0,074**	0,490	0,272	-0,048	1,028
Digital transformation or digitalization is a crucial topic for organizations nowadays that needs to be considered in order to maintain and/or gain competitive advantage (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	0,594	0,442	-0,625	128	0,267	**0,533**	-0,077	0,123	-0,321	0,167
	Equal variances not assumed			-0,628	116,195	0,266	**0,531**	-0,077	0,123	-0,320	0,166
Digital transformation can be implemented successfully in the business as a holistic project taking into account different aspects such as technology, processes, employee upskilling together with ...	Equal variances assumed	0,457	0,500	-2,300	128	0,012	**0,023**	-0,365	0,159	-0,678	-0,051
	Equal variances not assumed			-2,313	116,614	0,011	**0,022**	-0,365	0,158	-0,677	-0,052
Appropriate change management practices are very relevant within digital transformation processes (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	2,267	0,135	-1,977	128	0,025	**0,050**	-0,308	0,156	-0,616	0,000
	Equal variances not assumed			-2,077	127,733	0,020	**0,040**	-0,308	0,148	-0,601	-0,015

The first variable with a significant statistical difference states: 'Digital transformation can be implemented successfully in the business as a holistic project taking into account different aspects such as technology, processes, employee upskilling together with human behavior and change management'. The significant statistical difference in answers between male and female respondents can be seen in the Two-Sided p of the Independent Samples test of the T-Test (0.023). This is demonstrated as well in the difference between the mean of male respondents (M=4.89, SD=0.903) versus the mean of the female respondents (M=5.26, SD=0.873), as stated in Table 12. Therefore, female respondents have a more positive view regarding the possibility of implementing digital transformation in a successful manner seeing it as a holistic project.

Table 12
T-Test by gender, group statistics, first variable – First hypothesis
Source: Author

Group Statistics					
What is your gender?		N	Mean	Std. Deviation	Std. Error Mean
Digital transformation can be implemented successfully in the business as a holistic project taking into account different aspects such as technology, processes, employee upskilling together with ...	Male	76	**4.89**	0.903	0.104
	Female	54	**5.26**	0.873	0.119

In the table 13, with the Cohen's d effect size point estimate, it can be seen that there are statistically significant differences with a small-to-moderate higher agreement levels on the part of females compared to males regarding digital transformation implemented holistically.

Table 13
T-Test by gender, independent samples effect sizes, first variable – First hypothesis
Source: Author

Independent Samples Effect Sizes					
		Standardizera	**Point Estimate**	95% Confidence Interval	
				Lower	Upper
Digital transformation can be implemented successfully in the business as a holistic project taking into account different aspects such as technology, processes, employee upskilling together with ...	**Cohen's d**	0.891	**-0.409**	-0.761	-0.056

The second variable with a significant statistical difference states: 'Appropriate change management practices are very relevant within digital transformation processes'. This variable has a Two-Sided p of 0.0502 and as this figure is slightly higher than 0.05, as shown in Table 14, it can be considered as a marginally significant statistical difference. In this specific case, the value of equal variances assumed is taken because Levene's p is greater than 0.05 (0.135).

Table 14
T-Test by gender, independent samples test, second variable – First hypothesis
Source: Author

Independent Samples Test									
		Levene's Test for Equality of Variances		t-test for Equality of Means					
						Significance			
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference
Appropriate change management practices are very relevant within digital transformation processes (1: Do not agree at all - 6: Fully agree)	**Equal variances assumed**	2.267	**0.135**	-1.977	128	0.025	0.050	-0.308	0.156
	Equal variances not assumed			-2.077	127.733	0.020	0.040	-0.308	0.148

The difference in the means also shows this, as it can be seen in Table 15, between the male respondents (M=5.21, SD=0.97) against the female respondents (M=5.52, SD=0.72). Similarly to the first variable, the female respondents have a more positive view than males in respect to the idea that appropriate change management practices are very relevant within digital transformation processes which may be interpreted that women may be more inclined the idea that some efforts are needed to introduce novelties into organizations.

Table 15
T-Test by gender, group statistics, second variable – First hypothesis
Source: Author

Group Statistics					
What is your gender?		N	Mean	Std. Deviation	Std. Error Mean
Appropriate change management practices are very relevant within digital transformation	Male	76	**5.21**	0.970	0.111
	Female	54	**5.52**	0.720	0.098

With the Cohen's d effect size point estimate, we can see in Table 16 a relatively low agreement level on the part of females compared to males regarding this idea. This is aligning with the marginally significant difference discussed below.

Table 16
T-Test by gender, independent samples effect sizes, second variable – First hypothesis
Source: Author

Independent Samples Effect Sizes					
				95% Confidence Interval	
		Standardizera	Point Estimate	Lower	Upper
Appropriate change management practices are very relevant within digital transformation processes	Cohen's d	0.876	-0.352	-0.703	0.000

The reasons behind this slightly more positive behavior of female respondents against male ones could be related to the idea that actually digitalization can present itself as an opportunity for women's empowerment and can, eventually, lead to more equality between women and men, having a more inclusive digital world (Krchová and Höesová, 2021). If women see these further opportunities within digitalization processes, this may be the reason behind their more positive view on it. However, the speculations on gender diversity on this matter need further exploration that would go beyond the aims of this particular research.

Another analysis was performed to check different behaviour between the respondents of the survey that have business related studies versus the ones that have other studies. In this analysis, nine respondents were excluded since they answered 'Not applicable' or 'Prefer not to say', these nine examples were not enough to statistically constitute a sub-sample by itself. In this case, as it can be seen in the Table 17, there is no significant statistical difference between both groups across all questions. This is in a way surprising because it could be speculated that respondents with business educational background would have different attitudes to the challenges of different organizational transformations with no exclusion of digital transformation.

Table 17
T-Test by education – First hypothesis
Source: Author

Independent Samples Test											
		Levene's Test for		t-test for Equality of Means							
						Significance				95% Confidence	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
The impact of digitalization processes or transformations in my organization is very high (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	4,717	0,032	1,400	123	0,082	**0,164**	0,276	0,197	-0,114	0,667
	Equal variances not assumed			1,394	116,763	0,083	**0,166**	0,276	0,198	-0,116	0,669
The digitalization processes or transformations in my organization is happening across the whole organization simultaneously, rather than at a business unit or division level (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	0,014	0,907	1,786	123	0,038	**0,077**	0,493	0,276	-0,053	1,039
	Equal variances not assumed			1,787	122,918	0,038	**0,076**	0,493	0,276	-0,053	1,038
Digital transformation or digitalization is a crucial topic for organizations nowadays that needs to be considered in order to maintain and/or gain competitive advantage (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	7,024	0,009	1,474	123	0,072	**0,143**	0,180	0,122	-0,062	0,422
	Equal variances not assumed			1,462	108,421	0,073	**0,147**	0,180	0,123	-0,064	0,424
Digital transformation can be implemented successfully in the business as a holistic project taking into account different aspects such as technology, processes, employee upskilling together with ...	Equal variances assumed	0,343	0,559	0,680	123	0,249	**0,498**	0,107	0,157	-0,205	0,419
	Equal variances not assumed			0,682	122,392	0,248	**0,497**	0,107	0,157	-0,204	0,418
Appropriate change management practices are very relevant within digital transformation processes (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	0,574	0,450	-1,342	123	0,091	**0,182**	-0,209	0,156	-0,517	0,099
	Equal variances not assumed			-1,350	119,345	0,090	**0,180**	-0,209	0,155	-0,516	0,098

Similarly, an ANOVA test was performed to check different behavior between different groups among the respondents of the survey.

The first ANOVA test was performed to compare three different groups regarding their educational background: one group with technical, engineering studies, a second group with business, economics and finance related studies and the third group that have other studies. In this analysis, nine respondents were excluded since they answered 'Not applicable' or 'Prefer not to say', these nine samples were not enough to statistically constitute a sub-sample by itself. In this case, as it can be seen in the Table 18, there is no

significant statistical difference between all groups across all variables. This is in a way surprising because it could be speculated that respondents with business educational background would have different attitudes to the challenges of different organizational transformations with no exclusion of digital transformation, but it also shows that digitalization reaches to everyone, regardless of their educational background.

Table 18
ANOVA by education – First hypothesis
Source: Author

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
The impact of digitalization processes or transformations in my organization is very high	Between Groups	2.396	2	1.198	0.977	0.380
	Within Groups	149.636	122	1.227		
	Total	152.032	124			
The digitalization processes or transformations in my organization is happening across the whole organization	Between Groups	7.716	2	3.858	1.611	0.204
	Within Groups	292.092	122	2.394		
	Total	299.808	124			
Digital transformation or digitalization is a crucial topic for organizations nowadays that needs to be considered in order to maintain	Between Groups	1.868	2	0.934	2.016	0.138
	Within Groups	56.500	122	0.463		
	Total	58.368	124			
Digital transformation can be implemented successfully in the business as a holistic project taking into account different aspects	Between Groups	0.425	2	0.212	0.272	0.762
	Within Groups	95.223	122	0.781		
	Total	95.648	124			
Appropriate change management practices are very relevant within digital transformation processes	Between Groups	1.591	2	0.795	1.044	0.355
	Within Groups	92.921	122	0.762		
	Total	94.512	124			

The second ANOVA test was done to analyze differences between years of experience (from 0 to 5, from 5 to 15 and more than 15 years). In this case, as it can be seen in the Table 19, there is no significant statistical difference between all groups across all variables (there is no Sig. or p value lower than 0.05). As with the first variable, this is surprising since it could be expected to see a difference in answers between respondents with different years of experience, because they could have different perspectives regarding this.

Table 19
ANOVA by years of experience – First hypothesis
Source: Author

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
The impact of digitalization processes or transformations in my organization is very high	Between Groups	5.736	2	2.868	2.453	0.090
	Within Groups	153.189	131	1.169		
	Total	158.925	133			
The digitalization processes or transformations in my organization is happening across the whole	Between Groups	6.264	2	3.132	1.345	0.264
	Within Groups	304.960	131	2.328		
	Total	311.224	133			
Digital transformation or digitalization is a crucial topic for organizations nowadays that needs to be considered	Between Groups	1.390	2	0.695	1.491	0.229
	Within Groups	61.036	131	0.466		
	Total	62.425	133			
Digital transformation can be implemented successfully in the business as a holistic project taking into	Between Groups	1.732	2	0.866	1.063	0.348
	Within Groups	106.664	131	0.814		
	Total	108.396	133			
Appropriate change management practices are very relevant within digital transformation processes	Between Groups	1.995	2	0.997	1.300	0.276
	Within Groups	100.520	131	0.767		
	Total	102.515	133			

The third ANOVA test was done to analyze differences between ages (from 18 to 34 years old, from 35 to 44 years old and 45 years old or older). As with the first and second ANOVA test, and as it can be seen in the Table 20, there is no significant statistical difference between all groups across all variables.

Table 20
ANOVA by age – First hypothesis
Source: Author

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
The impact of digitalization processes or transformations in my organization is very high	Between Groups	0.733	2	0.367	0.304	0.739
	Within Groups	158.192	131	1.208		
	Total	158.925	133			
The digitalization processes or transformations in my organization is happening across the whole	Between Groups	1.062	2	0.531	0.224	0.799
	Within Groups	310.162	131	2.368		
	Total	311.224	133			
Digital transformation or digitalization is a crucial topic for organizations nowadays that needs to be considered	Between Groups	0.432	2	0.216	0.457	0.634
	Within Groups	61.993	131	0.473		
	Total	62.425	133			
Digital transformation can be implemented successfully in the business as a holistic project taking	Between Groups	2.538	2	1.269	1.570	0.212
	Within Groups	105.857	131	0.808		
	Total	108.396	133			
Appropriate change management practices are very relevant within digital transformation processes	Between Groups	1.545	2	0.773	1.002	0.370
	Within Groups	100.970	131	0.771		
	Total	102.515	133			

4.2 Analysis of the second hypothesis

The second hypothesis of this research is: ‘transitioning into a more digital-driven environment is not only about implementing the latest technologies, updating the strategy of the company and upskilling employees, but also about trying to be part of this new digital and social paradigm and embarking on a cultural change process where proactive and clear communication regarding the reasons, impact and expectations of the digital transformation processes while balancing organizational cultural values is key for its adaptation and success’. This analysis is divided into two parts, as done with the first hypothesis, having first the analysis done from a descriptive perspective and then from an inferential statistics perspective.

4.2.1 Descriptive analysis of the second hypothesis

One of the main findings in the adaptation questions is the difference in the answers between some of the questions. While the agreement with the statement "employees are very keen to adapt new ways of working proposed by digitalization processes" is relatively low (mean 3.4/ 6), as shown in Figure 43, it is higher when the question is rephrased, asking if the engagement is taking place with newer and younger employees, as presented in Figure 44 and 45. This finding is aligned with what it is proposed in Henriette et al. (2016), where it is highlighted that to set up a digital culture it is important to take into account the difference between generations, and how the younger generations are more and constantly exposed to new technologies while the older generations face more challenges adopting those new technologies.

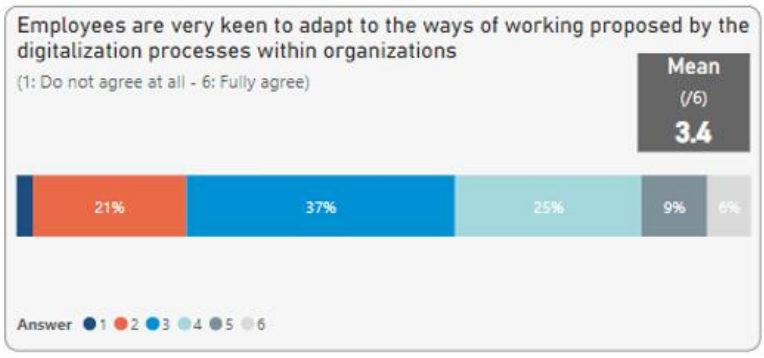

Figure 43
Employees adaptation to digitalization answers
Source: Author

Figure 44
Recent employees' adaptation to digitalization answers
Source: Author

Figure 45
Younger employees' adaptation to digitalization answers
Source: Author

This information, together with the view collected about what is important when looking for digitalization processes adaptation, becomes a very fundamental part of the research, as it can be seen in Figures 46, 47 and 48. All the variables stated were as critical for the digital transformations found common ground across most of the respondents, such as:

- Proactive communication regarding reasons, impact and expectations of the change as a successful measure to ensure adoption of the new digitalized processes

- Importance of addressing concerns of the employees that could feel that are being left behind during the change process
- Need to balance these new processes and/ or technologies, with the maintenance of the cultural values within the organization

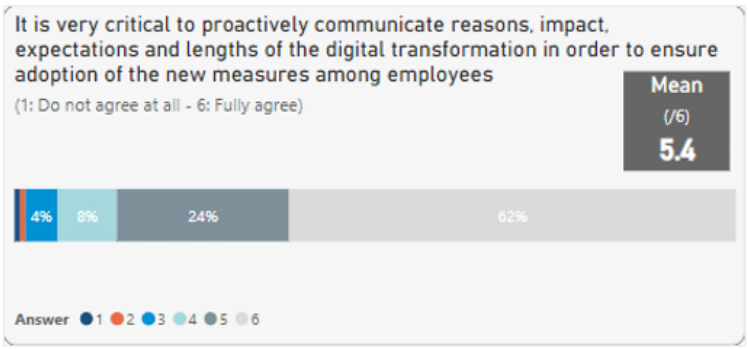

Figure 46
Communication during digitalization answers
Source: Author

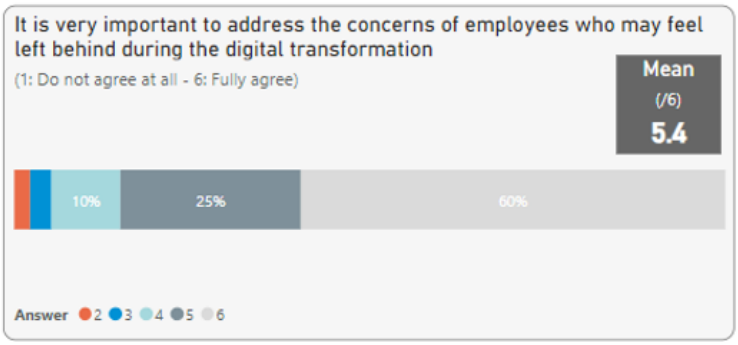

Figure 47
Concerns management during digitalization answers
Source: Author

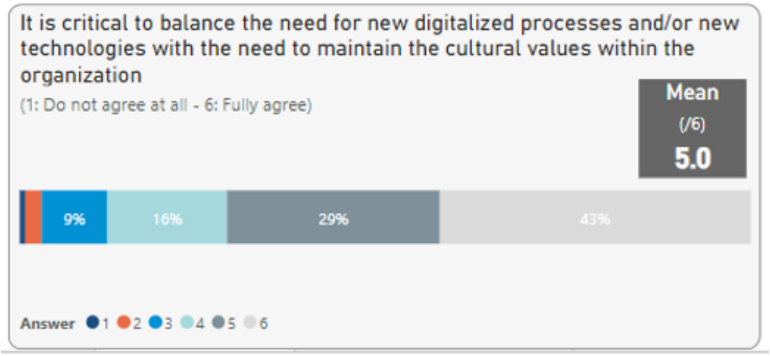

Figure 48
Balance between digitalization and cultural values answers
Source: Author

Another important variable, which can be seen in Figure 49, where the respondents found common ground is the recognition to the fact that during digitalization processes, there will be clashes or conflicts between the old and new ways of working (mean 5.2 /6). This is a key finding to take into account when carrying digitalization efforts.

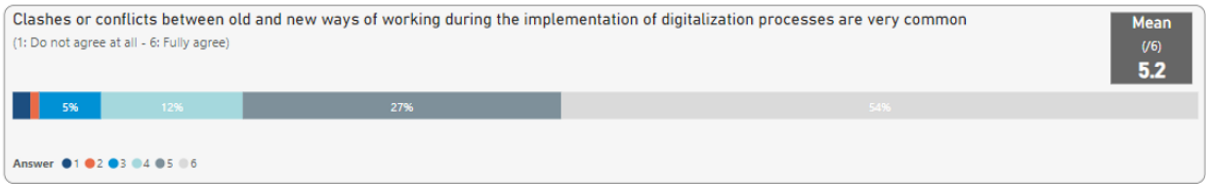

Figure 49
Conflicts within digitalization processes answers
Source: Author

What the research in the adaptation section shows is that is very important for organizations trying to become more digital to not only take into account the population that is part of the company, their age and generation but also to ensure that the process is not only transparent, but that there is a constant and proactive communication towards employees to they understand the why behind the process and they have the right

expectations. Also, being aware that some people may feel left behind with all those changes is key, so this can be successfully addressed while considering the values and culture of the company.

As presented in the Figure 50, the top three answers that were considered critical to avoid challenges during the transition from old to new ways of working that tend to take place due to digitalization processes were to involve employees from early stages and to ask for feedback, to ensure transparency and ensure alignment with the goals and vision of the organization and to apply change management practices to foresee resistance and work proactively on it. The last two selected answers were to ensure that the latest technology is acquired and implemented and that the employees are up skilled to use those technologies.

The answers in these questions highlight again, as it is said in Westerman (2018): "*when it comes to digital transformation, digital is not the answer. Transformation is.*". As stated in the research proposal, it is imperative for organizations to have the management of what the transformation entails at the core of the process, involving employees, being transparent and proactively manage the change.

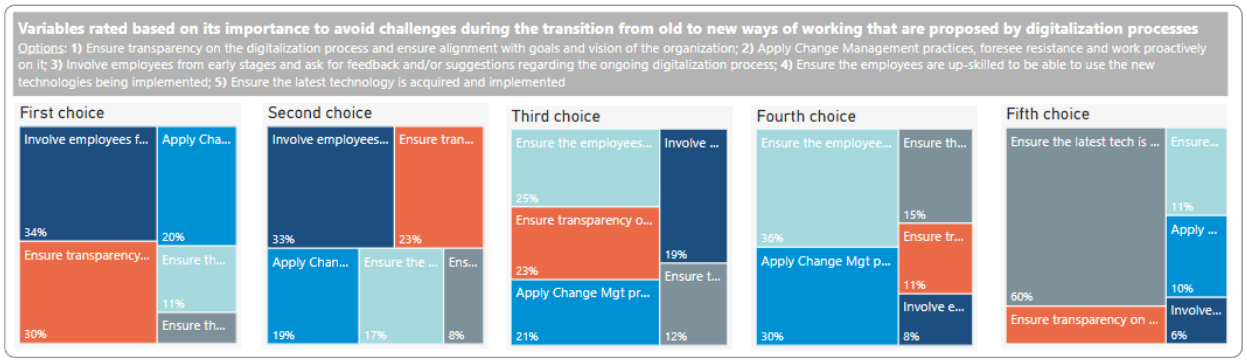

Figure 50
Variables to avoid challenges during digitalization processes answers
Source: Author

Regarding the topic of training employees to understand the digitalization process, as shown in Figure 51, the main choices of the respondents as the best ways to do so were learning on the job / hands-on-experience and in-house training provided by the organization (such as workshops, talks, etc.). The ones selected as less effective were informal education (webinars, conferences, etc.) and formal education (university/ college). This is also important for organizations to know, to be able to focus the right efforts under the right circumstances and see what initiatives can be taken to ensure employees understand these new processes, like mentoring, coaching, workshops, and more.

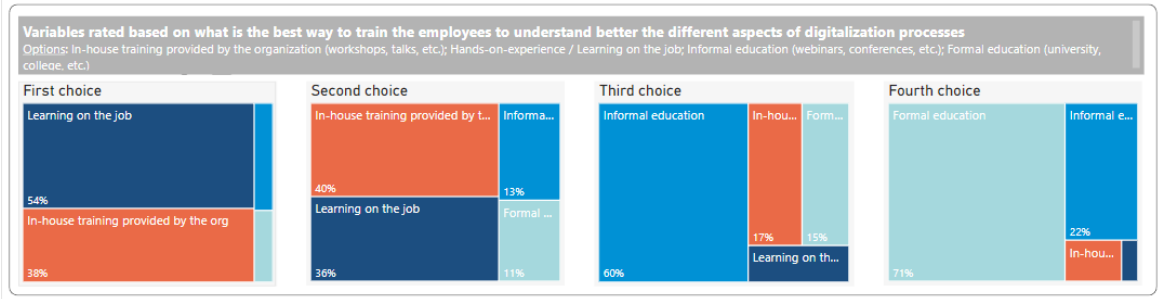

Figure 51
Ways to onboard employees on digitalization processes answers
Source: Author

4.2.2 Inferential statistics analysis of the second hypothesis

In the same way that was done for the first hypothesis, for the second one, the standard deviation was calculated as well to check the variability within the dataset. In this case, as it can be seen in the Table 21, the standard deviation on the questions is low, meaning that the answers are close to the mean, making the dataset consistent.

Table 21
Standard deviation – Second hypothesis
Source: Author

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Clashes or conflicts between old and new ways of working during the implementation of digitalization processes are very common (1: Do not agree at all - 6: Fully agree)	134	1	6	5,23	**1,061**
Employees are very keen to adapt to the ways of working proposed by the digitalization processes within organizations (1: Do not agree at all - 6: Fully agree)	134	1	6	3,36	**1,153**
Most recent employees in the organization are more willing to adopt new digitalized processes than employees with several years of experience in the organization (1: Do not agree at all - 6: Fully...	134	1	6	4,80	**1,188**
Younger employees in the organization are more willing to adopt new digitalized processes than older employees (1: Do not agree at all - 6: Fully agree)	134	1	6	4,71	**1,181**
It is very critical to proactively communicate reasons, impact, expectations and lengths of the digital transformation in order to ensure adoption of the new measures among employees (1: Do not ag...	134	1	6	5,40	**0,958**
It is very important to address the concerns of employees who may feel left behind during the digital transformation (1: Do not agree at all - 6: Fully agree)	134	2	6	5,37	**0,939**
It is critical to balance the need for new digitalized processes and/or new technologies with the need to maintain the cultural values within the organization (1: Do not agree at all - 6: Fully agree)	134	1	6	4,99	**1,130**

Also, T-Test was performed to identify if there was, or not, a significant statistical difference between the different groups. This test has been performed twice, once to compare answers across gender (female and male respondents) and a second one to compare respondents with business and non-business-related studies.

As done for the first hypothesis, for the gender analysis, only female and male answers were taken into account since out of the hundred and thirty-four respondents, only two people had “non-binary” as the answer and two people selected “prefer not to answer”. These four answers did not constitute a sample big enough to become subsamples to be utilized for this specific analysis. Very similarly, for the research analysis, nine respondents were excluded since they answered ‘Not applicable’ or ‘Prefer not to say’, and they were not big enough to constitute a sub-sample by itself.

From the Table 22, the green cells present the questions where no significant statistical difference was found between both groups (female and male) and the orange cells present the one that had a significant statistical difference. As it can be seen, most of the questions did not have major differences between the male and female answers. Only one question that enquires about the need for balance between new digitalized processes and the cultural values had a significant statistical difference between male and female respondents.

Table 22
T-Test by gender – Second hypothesis
Source: Author

Independent Samples Test												
		Levene's Test for Equality of Variances		t-test for Equality of Means								
		F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						One-Sided p	**Two-Sided p**			Lower	Upper
Clashes or conflicts between old and new ways of working during the implementation of digitalization processes are very common (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	0,014	0,906	-0,392	128	0,348	**0,695**	-0,075	0,191	-0,453	0,303
	Equal variances not assumed			-0,393	115,093	0,347	**0,695**	-0,075	0,191	-0,453	0,303
Employees are very keen to adapt to the ways of working proposed by the digitalization processes within organizations (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	0,437	0,510	0,054	128	0,478	**0,957**	0,011	0,207	-0,398	0,420
	Equal variances not assumed			0,055	121,128	0,478	**0,956**	0,011	0,203	-0,390	0,413
Most recent employees in the organization are more willing to adopt new digitalized processes than employees with several years of experience in the organization (1: Do not agree at all - 6: Fully...	Equal variances assumed	4,441	0,037	0,263	128	0,397	**0,793**	0,057	0,215	-0,369	0,483
	Equal variances not assumed			0,254	99,744	0,400	**0,800**	0,057	0,223	-0,385	0,498
Younger employees in the organization are more willing to adopt new digitalized processes than older employees (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	0,723	0,397	-0,992	128	0,162	**0,323**	-0,207	0,209	-0,620	0,206
	Equal variances not assumed			-0,973	106,004	0,166	**0,333**	-0,207	0,213	-0,629	0,215
It is very critical to proactively communicate reasons, impact, expectations and lengths of the digital transformation in order to ensure adoption of the new measures among employees (1: Do not ag...	Equal variances assumed	1,981	0,162	-1,711	128	0,045	**0,090**	-0,292	0,171	-0,631	0,046
	Equal variances not assumed			-1,773	125,785	0,039	**0,079**	-0,292	0,165	-0,619	0,034
It is very important to address the concerns of employees who may feel left behind during the digital transformation (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	2,251	0,136	-1,148	128	0,127	**0,253**	-0,192	0,167	-0,523	0,139
	Equal variances not assumed			-1,183	124,493	0,120	**0,239**	-0,192	0,162	-0,513	0,129
It is critical to balance the need for new digitalized processes and/or new technologies with the need to maintain the cultural values within the organization (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	9,524	0,002	-3,876	128	0,000	**0,000**	-0,736	0,190	-1,112	-0,360
	Equal variances not assumed			-4,137	127,600	0,000	**0,000**	-0,736	0,178	-1,089	-0,384

The variable with the significant different states ‘it is critical to balance the need for new digitalized processes and/or new technologies with the need to maintain the cultural values within the organization’. There is a significant statistical difference in

answers between male and female respondents, as it can be seen in the Two-Sided p of the Independent Samples test of the T-Test. This is seen in the table 23, that shows the difference between the mean of male respondents (M=4.67, SD=1.215) and the mean of female respondents (M=5.41, SD=0.831). Female respondents having a more positive view regarding the need of balance between digitalized processes, new technologies and cultural values of the organization. As discussed as well with the first hypothesis, this more positive view on female respondents can be due to the fact that females may see digitalization processes as an opportunity for their empowerment, leading eventually to greater equality and inclusion in this new digital landscape (Krchová and Höesová, 2021).

Table 23
T-Test by gender, group statistics – Second hypothesis
Source: Author

Group Statistics					
What is your gender?		**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
It is critical to balance the need for new digitalized processes and/or new technologies with the need to maintain the cultural values within the organization (1: Do not agree at all - 6: Fully agree)	Male	76	**4.67**	1.215	0.139
	Female	54	**5.41**	0.813	0.111

In table 24, with the Cohen's d effect size point estimate we can see that there are statistically significant differences with a moderate-to-high agreement level on the part of females compared to males regarding this.

Table 24
T-Test by gender, independent samples effect sizes – Second hypothesis
Source: Author

Independent Samples Effect Sizes					
				95% Confidence Interval	
		Standardizera	**Point Estimate**	Lower	Upper
It is critical to balance the need for new digitalized processes and/or new technologies with the need to maintain the cultural values within the organization (1: Do not agree at all - 6: Fully agree)	**Cohen's d**	1.067	**-0.690**	-1.048	-0.330

The second analysis performed to compare results between the respondents of the survey that have business related studies versus the ones that have other studies, showed no significant statistical difference across the questions, as it can be seen in the Table 25, except for the question related to the importance of addressing the concerns of the employees who may feel left behind during these types of transformation processes.

Table 25
T-Test by education – Second hypothesis
Source: Author

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Clashes or conflicts between old and new ways of working during the implementation of digitalization processes are very common (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	0,080	0,777	-0,873	123	0,192	**0,384**	-0,170	0,195	-0,556	0,215
	Equal variances not assumed			-0,876	121,897	0,191	**0,383**	-0,170	0,194	-0,554	0,214
Employees are very keen to adapt to the ways of working proposed by the digitalization processes within organizations (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	3,155	0,078	-1,245	123	0,108	**0,216**	-0,258	0,207	-0,669	0,152
	Equal variances not assumed			-1,239	115,879	0,109	**0,218**	-0,258	0,208	-0,671	0,155
Most recent employees in the organization are more willing to adopt new digitalized processes than employees with several years of experience in the organization (1: Do not agree at all - 6: Fully...	Equal variances assumed	3,881	0,051	1,091	123	0,139	**0,277**	0,234	0,215	-0,191	0,659
	Equal variances not assumed			1,088	119,391	0,139	**0,279**	0,234	0,215	-0,192	0,660
Younger employees in the organization are more willing to adopt new digitalized processes than older employees (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	0,644	0,424	0,068	123	0,473	**0,946**	0,015	0,214	-0,410	0,439
	Equal variances not assumed			0,068	121,169	0,473	**0,946**	0,015	0,213	-0,408	0,437
It is very critical to proactively communicate reasons, impact, expectations and lengths of the digital transformation in order to ensure adoption of the new measures among employees (1: Do not ag...	Equal variances assumed	0,406	0,525	-1,505	123	0,067	**0,135**	-0,259	0,172	-0,600	0,082
	Equal variances not assumed			-1,505	122,762	0,067	**0,135**	-0,259	0,172	-0,599	0,082
It is very important to address the concerns of employees who may feel left behind during the digital transformation (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	7,433	0,007	-2,081	123	0,020	**0,039**	-0,353	0,169	-0,688	-0,017
	Equal variances not assumed			-2,102	108,204	0,019	**0,038**	-0,353	0,168	-0,685	-0,020
It is critical to balance the need for new digitalized processes and/or new technologies with the need to maintain the cultural values within the organization (1: Do not agree at all - 6: Fully agree)	Equal variances assumed	1,230	0,270	-0,078	123	0,469	**0,938**	-0,016	0,201	-0,413	0,382
	Equal variances not assumed			-0,078	120,935	0,469	**0,938**	-0,016	0,201	-0,414	0,383

The question that enquires about the importance of addressing concerns of the employees that may feel behind during these processes had a significant statistical difference between the respondents of the survey that have business related studies versus the ones that have other studies. This can be seen in the Two-Sided p of the Independent Samples test of the T-Test. This is demonstrated as well, in the Table 26 that shows the difference between the mean of business-related education respondents (M=5.17, SD=1.121) versus the respondents with other educational backgrounds (M=5.52, SD=0.721). The latter group, having a more positive view regarding the need of balance

between digitalized processes, new technologies and cultural values of the organization. This could be due to the fact that the group 'other' included respondents with various educational backgrounds such as technical, humanities, natural sciences, social sciences, whom they could have another perspective towards digitalization, being maybe the ones who could potentially be mostly left behind rather than the drivers of these changes.

Table 26
T-Test by education, group statistics – Second hypothesis
Source: Author

Group Statistics					
Education		**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
It is very important to address the concerns of employees who may feel left behind during the digital transformation (1: Do not agree at all - 6: Fully agree)	Business	64	**5.17**	1.121	0.140
	Others	61	**5.52**	0.721	0.092

In the table 27, with the Cohen's d effect size point estimate we can see that there are statistically significant differences with a low-to-moderate agreement level on the part of other compared to business regarding this.

Table 27
T-Test by education, independent samples effect sizes – Second hypothesis
Source: Author

Independent Samples Effect Sizes					
		Standardizer	**Point Estimate**	**95% Confidence Interval**	
				Lower	**Upper**
It is very important to address the concerns of employees who may feel left behind during the digital transformation (1: Do not agree at all - 6: Fully agree)	**Cohen's d**	0.947	**-0.372**	-0.725	-0.018

As done as well for the first hypothesis, an ANOVA test was performed to check different behavior between different groups among the respondents of the survey.

The first ANOVA compares three different groups regarding their educational background: one group with technical, engineering studies, a second group with business, economics and finance related studies and the third group that have other studies (nine respondents were excluded since they answered 'Not applicable' or 'Prefer not to say' and these nine samples were not enough to statistically constitute a sub-sample by itself). In this case, as it can be seen in the Table 28, there is no significant statistical difference between all groups across all variables with the exception of one variable.

Table 28
ANOVA by education – Second hypothesis
Source: Author

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Clashes or conflicts between old and new ways of working during the implementation of digitalization processes are very common	Between Groups	1.341	2	0.671	0.563	0.571
	Within Groups	145.251	122	1.191		
	Total	146.592	124			
Employees are very keen to adapt to the ways of working proposed by the digitalization processes within	Between Groups	10.262	2	5.131	3.985	**0.021**
	Within Groups	157.066	122	1.287		
	Total	167.328	124			
Most recent employees in the organization are more willing to adopt new digitalized processes than employees with several years	Between Groups	3.802	2	1.901	1.327	0.269
	Within Groups	174.790	122	1.433		
	Total	178.592	124			
Younger employees in the organization are more willing to adopt new digitalized processes than older employees	Between Groups	0.007	2	0.004	0.002	0.998
	Within Groups	176.441	122	1.446		
	Total	176.448	124			
It is very critical to proactively communicate reasons, impact, expectations and lengths of the digital transformation in order to ensure	Between Groups	2.410	2	1.205	1.297	0.277
	Within Groups	113.382	122	0.929		
	Total	115.792	124			
It is very important to address the concerns of employees who may feel left behind during the digital transformation	Between Groups	3.886	2	1.943	2.148	0.121
	Within Groups	110.322	122	0.904		
	Total	114.208	124			
It is critical to balance the need for new digitalized processes and/or new technologies with the need to maintain the cultural values	Between Groups	1.231	2	0.615	0.488	0.615
	Within Groups	153.761	122	1.260		
	Total	154.992	124			

The only variable that has a significant statistical difference between those groups states 'employees are very keen to adapt to the ways of working proposed by the

digitalization processes within organizations', as it has a p value of 0.021, as seen in Table 28. In the table 29, it can be seen the Omega- squared- fixed effect, which shows that there are statistically significant differences with a small-to-moderate differences between groups.

Table 29
ANOVA by education – Second hypothesis
Source: Author

ANOVA Effect Sizesa,b				
		Point Estimate	95% Confidence Interval	
			Lower	Upper
Employees are very keen to adapt to the ways of working proposed by the digitalization processes within organizations (1: Do not agree at all - 6: Fully agree)	**Omega-squared Fixed-effect**	**0.046**	-0.015	0.134

In order to understand this further, a post-hoc analysis (in this case, Tukey-b test) is performed. Findings revealed that there are statistically significant differences between group 1 (technical background education) and group 2 (business education), with a ptukey value of 0.021 and between group 1 (technical education) and group 3 (other educational backgrounds), with a ptukey value of 0.035. The only comparison that did not have any statistically significant difference was group 2 (business education) versus group 3 (other educations), since it had a ptukey value higher than 0.05 (0.998). These differences are presented in Table 30, where the differences in the means and the ptukey value can be seen.

Table 30
Tukey-b test – Second hypothesis
Source: Author

Post Hoc Comparisons - Type Education

		Mean Difference	SE	t	ptukey
1	2	0.803	0.296	2.708	**0.021**
1	3	0.791	0.314	2.521	**0.035**
2	3	-0.012	0.225	-0.053	**0.998**

Group 1 (technical education) had the highest scores across all groups, as presented in Table 31, where it shows that Group 1 has the highest mean (M=4.053, SD=1.268), compared to Group 2 (M=3.25, SD=1.039) and Group 3 (M=3.262, SD=1.211). The fact that respondents with technical educational backgrounds have the highest scores regarding the variable that talks about willingness to adapt new ways of working proposed by digitalization is not surprising since technical people have more understanding and is closer to constant evolutions of technology than people with business or other educational backgrounds.

Table 31
Type of education analysis for significant variable – Second hypothesis
Source: Author

Type Education	N	Mean	SD	SE	Coefficient of variation
1 (technical education)	19	4.053	1.268	0.291	0.313
2 (business education)	64	3.25	1.039	0.13	0.32
3 (other education)	42	3.262	1.211	0.187	0.371

The second ANOVA test analyzes differences between respondents with years of experience (from 0 to 5, from 5 to 15 and more than 15 years). In this case, as it can be seen in the Table 32, there is no significant statistical difference between any groups across all variables.

Table 32
ANOVA by years of experience – Second hypothesis
Source: Author

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Clashes or conflicts between old and new ways of working during the implementation of digitalization	Between Groups	0.547	2	0.273	0.240	0.787
	Within Groups	149.282	131	1.140		
	Total	149.828	133			
Employees are very keen to adapt to the ways of working proposed by the digitalization processes within	Between Groups	0.575	2	0.287	0.214	0.808
	Within Groups	176.231	131	1.345		
	Total	176.806	133			
Most recent employees in the organization are more willing to adopt new digitalized processes than	Between Groups	3.200	2	1.600	1.137	0.324
	Within Groups	184.360	131	1.407		
	Total	187.560	133			
Younger employees in the organization are more willing to adopt new digitalized processes than older employees	Between Groups	0.127	2	0.063	0.045	0.956
	Within Groups	185.523	131	1.416		
	Total	185.649	133			
It is very critical to proactively communicate reasons, impact, expectations and lengths of the digital	Between Groups	1.943	2	0.972	1.060	0.349
	Within Groups	120.094	131	0.917		
	Total	122.037	133			
It is very important to address the concerns of employees who may feel left behind during the digital	Between Groups	3.357	2	1.679	1.929	0.149
	Within Groups	113.986	131	0.870		
	Total	117.343	133			
It is critical to balance the need for new digitalized processes and/or new technologies with the need to maintain	Between Groups	0.582	2	0.291	0.225	0.799
	Within Groups	169.388	131	1.293		
	Total	169.970	133			

The third ANOVA test compared differences between respondents of different ages (from 18 to 34 years old, from 35 to 44 years old and 45 years old or older). Also, in this case, as shown in the Table 33, there is no significant statistical difference between any groups across all variables.

Table 33
ANOVA by age – Second hypothesis
Source: Author

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Clashes or conflicts between old and new ways of working during the implementation of digitalization	Between Groups	0.248	2	0.124	0.109	0.897
	Within Groups	149.580	131	1.142		
	Total	149.828	133			
Employees are very keen to adapt to the ways of working proposed by the digitalization processes within	Between Groups	1.351	2	0.675	0.504	0.605
	Within Groups	175.455	131	1.339		
	Total	176.806	133			
Most recent employees in the organization are more willing to adopt new digitalized processes than	Between Groups	4.585	2	2.293	1.641	0.198
	Within Groups	182.975	131	1.397		
	Total	187.560	133			
Younger employees in the organization are more willing to adopt new digitalized processes than older	Between Groups	5.493	2	2.746	1.997	0.140
	Within Groups	180.157	131	1.375		
	Total	185.649	133			
It is very critical to proactively communicate reasons, impact, expectations and lengths of the digital	Between Groups	3.597	2	1.798	1.989	0.141
	Within Groups	118.440	131	0.904		
	Total	122.037	133			
It is very important to address the concerns of employees who may feel left behind during the digital	Between Groups	0.561	2	0.280	0.314	0.731
	Within Groups	116.783	131	0.891		
	Total	117.343	133			
It is critical to balance the need for new digitalized processes and/or new technologies with the need to maintain	Between Groups	3.217	2	1.608	1.264	0.286
	Within Groups	166.753	131	1.273		
	Total	169.970	133			

4.3 Summary of findings

The results of the analysis performed based on the answers of the respondents are strongly aligned to what is proposed in this research. One of the first inputs gained from this survey was that even if most of the respondent's organizations were affected by digitalization in one way or another, the approaches to these transformational process were very different between the organizations. Some organizations were more flexible and broad and other ones more specific and strict.

This variety of approaches towards digitalization processes, shows that there is no "one-fits-all" solution and that, specially in these complex scenarios, there is a lot to take

into account such as organizational size, maturity, industry, etc. Despite the differences in the approach, what was common to mostly everyone is that digital transformations are a critical step for organizations to be able to stay competitive in current markets.

Another important lesson provided by this research is that there is a common recognition that potential conflicts may arise between the old ways of working and the new ones being proposed by digitalization processes and that variables that can mostly help with the implementation of these new processes are related to organizational culture, vision and values and to change management and human behavior rather than IT and technology and HR and talent management. This is a key finding for this research, since it can be seen as a direct connection to the gap of the academic literature found, where there are isolated papers taking into account few of the views presented without connecting with Change management practices and human behavior.

In terms of ensuring adaptations of these new digitalized processes, this survey analysis provides a very interesting finding regarding differences in the willingness to adopt these changes among employees. In general, the agreement that employees are willing to adopt these new processes was low (3.4 mean out of 6) but the agreement that newer and younger employees were more willing to do so was significantly higher (4.7 and 4.8 mean out of 6). This is another important finding since it highlights the importance of taking into account generational differences when it comes to digital transformation processes.

Also, to enable adaption some variables were deemed as critical such as clear communication around the reasons, impact and expectations around this new

transformation, the importance of addressing potential concerns of employees and the need to balance these new technologies and processes with the cultural values of the organization.

In order to properly manage digital transformation, the most important actions that came out of this analysis are to involve employees as early as possible and to take into account their feedback, to ensure that these new processes are carried out in a transparent way while being aligned with the goals and vision of the organization and that there is an implementation of practices of change management to not only foresee resistance but also to proactively work on it. The least important variables under this context where to have the latest technology implemented and to ensure employees are up-skilled to use these new technologies.

Also, the understanding of the different aspects of these digitalization processes was highlighted as something important for employees and the best way to do so, following the answers of the respondents, is to enable people to learn on the job and to ensure there is in-house training provided by the organization. The options of informal education such as webinars, conferences, etc. and formal education such as university or college studies, were the least selected ones.

4.4 Conclusion

As it can be seen, the research shows that indeed digitalization processes is a phenomenon that is expanding and that has an impact across organizations and industries and also demonstrates the importance of not only thinking about the classical triangle that

contains people, processes and technology but also including a holistic approach including human behavior understanding and change management practices.

What is important to take out of these results is that the success of digital transformation relies on its human perspective rather than on the technological one. As it will be discussed in the following chapter, technologies are defined and specific outcomes can be expected and predicted but the most important aspects of these new technologies is their implementation and use, which are both human driven and cannot be managed in the same way that technology is.

And that is why, having the human aspect at the core of digital transformation processes is the key enabler for its success, taking into account that different populations are affected in different ways, and that communication is one of its most important pillars together with change management practices.

CHAPTER V:
DISCUSSION

5.1 Discussion of results

The results of this research are analysed from the perspective of the two proposed hypotheses which can be seen in the Table 34 together with their confirmation. The results of this research as a whole bring a new perspective into digital transformation processes. What it is learned throughout this research is that digitalization is not about the new technologies. These new technologies are already defined and organizations know how they work, what is the value of them and what can be expected from them. Digitalization is actually about how those new technologies are implemented and how they are used, both aspects being human driven, rather than driven by those new technologies. What this means is that the success of digital transformation processes are actually dependent on the human factor, rather than on the technological factors.

The discussion of both specific hypotheses are an in-depth analysis of the concept presented in this study in which the human is at the core of digital transformation. The first question includes an understanding of how organizations are affected by these processes, what are the different approaches taken by the organization and the importance of different variables for its implementation. The second question focuses on digitalization processes from a cultural and paradigm shift, how different parts of the population are impacted in different ways and how to manage these differences.

Table 34
Hypothesis confirmation
Source: Author

Hypothesis	Confirmation	Parragraph / point of discussion
1: Despite the high impact of digitalization in organizations nowadays, there is no common transformational approach that fits all. But, having a holistic view of the digitalization processes, placing the human factor at the center of it and managing its reaction to the changes proposed by these transformations are crucial variables that define the outcome of the digital transformation	Hypothesis confirmed	4.1 5.2 6.1 6.5
2: Transitioning into a more digital-driven environment is not only about implementing the latest technologies, updating the strategy of the company and upskilling employees, but also about trying to be part of this new digital and social paradigm and embarking on a cultural change process where proactive and clear communication regarding the reasons, impact and expectations of the digital transformation processes while balancing organizational cultural values is key for its adaptation and success	Hypothesis confirmed	4.2 5.3 6.1 6.5

5.2 Discussion of first hypothesis

As seen in the Results chapter, the first hypothesis of this research is: ‘despite the high impact of digitalization in organizations nowadays, there is no common transformational approach that fits all. But, having a holistic view of the digitalization processes, placing the human factor at the center of it and managing its reaction to the changes proposed by these transformations are crucial variables that define the outcome of the digital transformation’.

For the purpose of the discussion of the results of this hypothesis, it is divided into two parts. In the first part, we focus not only on the degree of the impact of digitalization processes in the organization but also on the way that organizations are impacted. The data collected shows that organizations of all types and sizes are indeed affected by digital transformation processes but that the way that this impact the organization and the approach taken towards this phenomenon can vary massively. Organizations take different approaches to implement digital transformation such as doing it across the whole organization at a fast pace, doing it only internally first for existing products, being flexible across the organization depending on the business unit, and more. What has been learned is that regardless of the approach chosen, none of them can be categorized as right or wrong but that what actually makes the difference between success or failure is seeing the topic of digital transformation as crucial for business nowadays and understanding that this is a phenomenon that affects everyone from many different perspectives.

The second part of the hypothesis is about having a holistic view of the digitalization processes, seeing both human factor and its reaction to the changes proposed by these transformations as crucial variables that can define the outcome of the digital transformation. This research shows the importance of having a holistic view on this topic, considering it a whole rather than separate pieces such as technology, culture and people that eventually may or may not come together. This study also shows that this traditional organizational triangle (technology, culture and people) must be complemented with proper change management practices in order for digital transformation to be enabled in the long and sustainable term, as presented in Figure 52. This point is a very important piece of this research, since it is covering a gap in the current literature. What the survey and the data collected have shown is that actually, IT & Technology and HR & Talent Management are not the most important variables that enable digitalization. The most critical variables are Organizational culture, vision and values and Change Management and Human behavior.

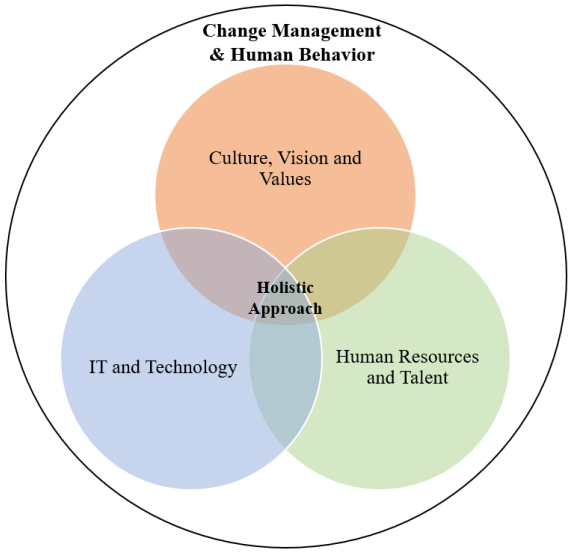

Figure 52
Holistic approach to digitalization
Source: Author

Some other learnings are related to the difference in some answers between males and females, with the latter group leaning more positively towards answers regarding the holistic approach to digitalization and the importance of change management. This can be aligned with current research (Krchová and Höesová, 2021) that explains that, actually, digitalization can be seen, from a female perspective, as an opportunity for empowerments and also to reduce gaps and to create more inclusive and equal environments. This would explain why females may find more critical than males the need of having a holistic approach, including change management during digital transformational processes, to cover broader and more systematically topics such as inequality and lack of opportunities rather than only covering maybe technological aspects. However, the speculations on gender diversity on this matter need further exploration that would go beyond the aims of this particular research.

In summary, what can be learned and used by organizations based on this study, is that in order to embark on a digital transformation journey that can be sustainable in the long term and adopted across the whole organization, it is key to implement change management practices and management of its resistance at the core of the transformational process.

5.3 Discussion of second hypothesis

The second hypothesis of this research is: ‘transitioning into a more digital-driven environment is not only about implementing the latest technologies, updating the strategy of the company and upskilling employees, but also about trying to be part of this new digital and social paradigm and embarking on a cultural change process where proactive and clear communication regarding the reasons, impact and expectations of the digital transformation processes while balancing organizational cultural values is key for its adaptation and success’.

An important aspect that came up during the analysis of this hypothesis is that when talking about a new digital, social and cultural paradigm, we must understand that even if this phenomenon impacts everyone, not everyone is affected in the same way, and this is a key variable to take into consideration, especially during digital transformations within organizations. A different behavior has been identified when it comes to adapting new ways of working as a consequence of digitalization processes within the organizations. As it has been analyzed in the survey, that newer and younger employees tend to be more willing than older employees to implement these new ways. This is due

to the generational difference that takes place during a shift in paradigm, and if this is not taken into account, then the transformation will not be successfully implemented across the whole organization.

Considering generational differences among the population is not the only key variable that defines a successful digital transformation. One of the most important variables is how communication is managed and carried out during these processes. An important aspect that can have a direct impact on digitalization is to explain not only the 'what' but also the 'why' and 'how': transformational processes must focus on having a proactive communication, explaining what the reasons for the change (the 'why') are, what will the impact potentially be and what the people can expect. Within this communicative and transparent process, probably some concerns will be raised. It is of key importance to hear these concerns, take them into account and addressing them, since for many reasons, including generational differences, some employees can feel left behind in these technological advancements. Another central aspect, as on mostly everything in life, is to strive for balance: these new technologies and processes must be balanced and aligned with the cultural values and practices of the organization.

A way to achieve this balance and ensure that everyone is on board, the main enablers identified in this research are to involve employees from early stages and to ask for feedback, to ensure transparency and ensure alignment with the goals and vision of the organization and to apply change management practices to foresee resistance and work proactively on it. Of course, employees must understand these new technologies in order to be able to implement and use them: what the research identified is that the best

way to reach this understanding among employees was by learning in the job and by in-house training provided by the organization rather than by attending formal (university/ college) or informal (webinars, conferences, etc.) education. This is another important finding for organizations since this can enable them to focus their efforts and plan their budget and approach when it comes to training the workforce on the implementation and use of the new technologies and ways of working.

For this hypothesis as well, there was slight differences between female and male answers, specifically in a variable that talks about the importance of balance between these new technologies and the cultural values of the organization. The more positive orientation towards this affirmation from females can be related to their perspective towards digital transformation that can be seen as an opportunity for their empowerment, leading to greater equality and inclusion if aspects such as cultural values, change management and holistic approaches are taken into account together with the new technologies.

Another difference found was found in the answers between respondents with business educational background versus people with other educational backgrounds regarding the variables that discusses the importance of addressing concerns of the employees that may feel behind during digital transformations. The reason behind this difference can be because under the 'other' umbrella, there was respondents with various educational backgrounds such as technical, humanities, natural sciences, social sciences, and more. These types of profiles may be the ones that are affected by digitalization rather than being the ones who could be driving these processes (respondents with

business educational backgrounds), therefore they may be the ones who could potentially feel like being left behind.

Similarly, the variable that highlights the idea that employees are very keen on adapting the new ways of working that are brought by digitalization processes also presents a difference between the respondents with technical, business and other educational backgrounds. The group of respondents with technical related education had the most positives scores in this variable. This shows that the group that actually can be deemed as the closest to technology and its advancements and with the greatest understanding about it, believes that employees are keen on adapting new ways, but this shows purely their perspective, as with the previous variable.

This comes back directly to this hypothesis that talks about the importance of seeing digital transformations as a cultural change where balancing cultural values is key; this shows the importance of taking into account different perspectives, experiences, views and approaches, especially in processes such as digitalization that is so broad, that can have so many faces and that have such a big impact across so many environments.

CHAPTER VI:

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

6.1 Summary

Digitalization has progressively become a central topic within societies and organizations, being described as a new paradigm or as the fourth industrial revolution. It is a change taking place at many layers, including social, economic, private and public layers that is impacting what people need, how they behave and what they expect. The impact has been so profound so far that even the markets and industries are shifting, and organizations are finding themselves in extremely fast-changing environments where the competition is greater than ever and where the customers are demanding and behaving in a different way than before. This study defined digital transformation as a change that takes place at macro (society) and micro (companies) level, where new technologies are introduced that have a wide and deep impact on people (as citizens, customers, consumers, providers, employees, employers and more), organizations and societies. It is of key importance that a balance between the different social elements (such as strategy, vision, mission, values, processes, operation, skills, people) and the new technological elements and innovation is achieved in order for these transformation processes to be successful and be able to add value to the end user (whichever this end user may be: company, society as a whole, employee, customer, citizen, etc.). Similarly, regarding change management, the definition of this paper is that change management is a key practice within organizations, since change (either internal or external) seems to be the only constant over time, which can have different underlying motives and can come from

different directions (from the top, from within, or from the outside) but that, whatever the motives or origin of the need of change, in order for change to actually take place, it is imperative to have clear vision, plan and/or strategy, open communication and the right amount of stakeholder engagement.

In order for organizations to be successful while navigating this cultural shift, they need to be able to have a holistic and structured approach where all the key variables are taking into account. This means, not only focusing on some aspect of this transformation, such as employee upskilling, IT and technologies or mision, vision and values, but to approach this as a whole, taking into account those areas together with human behaviour and change management. In order to do so, the human variable, instead of the new technologies, must be placed at the center of digital transformations. Therefore, this research focused on the following two hypotheses:

- H1: Despite the high impact of digitalization in organizations nowadays, there is no common transformational approach that fits all. But, having a holistic view of the digitalization processes, placing the human factor at the center of it and managing its reaction to the changes proposed by these transformations are crucial variables that define the outcome of the digital transformation
- H2: Transitioning into a more digital-driven environment is not only about implementing the latest technologies, updating the strategy of the company and upskilling employees, but also about trying to be part of this new digital and social paradigm and embarking on a cultural change

process where proactive and clear communication regarding the reasons, impact and expectations of the digital transformation processes while balancing organizational cultural values is key for its adaptation and success

What is learned throughout this research is that the success of digital transformation processes does not rely on the new technologies but on the human factor and that its most critical variables are organizational culture, vision and values, change management and human behavior. Therefore, to have a digital transformation journey that can be sustainable in the long term and adopted across the whole organization, it is of critical importance to implement appropriate change management practices and management of its resistance at the core of the transformational process.

Another very important finding to take into account is that even if this phenomenon impacts everyone, not everyone is affected in the same way. It has been identified different behaviors when it comes to adapting to these new ways brought by digitalization processes: that newer and younger employees tend to be more willing than older employees to implement these new ways. This is due to the generational difference that takes place during a shift in paradigm, and if this is not taken into account, then the transformation will not be successfully implemented across the whole organization.

Also, as always and with everything, communication is another central pillar on this type of process. Explaining not only the ‘what’ but also the ‘why’ and ‘how’ is very important. These types of processes must rely on proactive communication, explaining what the reasons for the change are, what will the impact be and what the people can

expect. If concerns are raised, it is critical to be able to hear them, take them into account and address them. Lastly, another central aspect is to strive for balance: these new technologies and processes must be balanced and aligned with the cultural values and practices of the organization.

6.2 Contribution to science and profession

This research proposes a shift in the approach towards digitalization, proposing a human and change management centric approach without disregarding, at the same time, other key aspects such as cultural and organizational values, technologies, human resources and more. The current available literature tends to focus on only some of the mentioned aspects (so called ‘traditional pillars’ within this research) taking into account only one approach. Together with this, this research also explores the difference in perception and behavior of different segments of the population and shows how important communication and proper change management practices are throughout the whole process of digital transformation.

In summary, what this research provides to academic and corporate environments is a holistic and comprehensive view on digital transformation processes, where the single aspects of the traditional pillars taken into account by the current literature (IT, HR, culture and values, etc.) are brought together under the same umbrella with human behavior and change management, showing that these last two variables have actually a direct impact on the success (or failure) of digitalization processes, making them central moderating factors in these processes and therefore, in this research.

6.3 Implications

As explained in the summary, digitalization is now a central piece of societies and organizations, changing how people behave, act and what they expect, having a direct impact on all organizations. In this new digital paradigm, organizations are operating on a fast-paced environment where there is a lot of external and internal changes happening constantly that they must keep up with.

What this research expects to do is to shift the approach towards digitalization processes: shifting from a technologic approach to a human centric approach where change management practices are also taken into account. What is shown is that new technologies can be predicted, in the sense that they are already defined, and organizations know what the new technology's purpose and value are. But for that purpose and that value to realize, it strongly depends on their implementation and use; and those two aspects and purely human driven. Meaning that the success of a digitalization process relies on its human aspect.

In order to explore the two hypotheses presented, the researcher have taken a combined approach with a systematic literature review together with a qualitative approach, creating a survey as the measurement instrument. The systematic literature review included a research based on key words and on a backward and forward search, researching different sources and citations of articles found. The qualitative approach was taken to bring together the academic view with the corporate view, by releasing a comprehensive survey through different personal and professional channels. All the

results collected via the literature review and the survey were analyzed from a descriptive data analysis perspective and also from a statistical perspective.

The results of this research can act as a guide and orientation for all organizations that are impacted by digitalization processes, since it has a holistic and structured approach and it is not limited to a specific industry or culture.

6.4 Recommendations for future research

As explained in the Research Design Limitations chapter, this research was performed based on an extensive and systematic literature review together with a survey where one-hundred and thirty-four individuals across different industries, countries, age groups and with different levels of education participated. The combination of these two approaches provided a valuable global input regarding digitalization processes and related change management practices. For future research to be performed based on this work, I recommend to do a deeper study on the cultural and industry specific contexts, together with in depth analysis of the difference in behaviour between different segments of the population (different genders, educational backgrounds, etc).

Regarding industries, this research has had input from individuals workind in several industries such as engineering, manufacturing, information technology, consultancy, accountancy, marketing, public services, healthcare, retail, legal, compliance, and more. For future research, it could be very beneficial to do specific industry research, since every industry has its own particular challenges, ways of doing and regulatory context that should be taken into account when going through a transformational process. In this way, organizations would have specific inputs that could

be directly implemented within those specific industries. Within this aspect, it could also be beneficial to take into account the size of the organization, since the challenges may differ in small, medium or large structures.

The other very important aspect that can have a very profound impact on digital transformation processes is culture, as it is stated by Meyer (2014) in her book "The culture map": "Cultural patterns of behaviour and belief frequently impact our perceptions (what we see), cognitions (what we think), and actions (what we do)". I strongly believe that culture plays a very central role in digital transformation, since, as discussed during this research, this is a human driven process; and culture is at the core of the human, affecting its way of seeing, perceiving, and doing things. The survey used for this research was launched globally, but the majority of the respondents were based in europe (78%). This research could be replicated in the future for specific cultures in order to identify factors that could propose specific challenges for transformational processes across the globe.

Lastly, this research has shown different behaviour regarding some variables related to digital transformation across diferent segments of the populations, mostly across the different genders and also between people with different educational backgrounds. This research has provided some potential reasons regarding this difference in behaviour but only at surface level, therefore, a more in depth analysis regarding this differences could be very valuable for the academia and organizations.

6.5 Conclusion

Digitalization processes are nowadays taking place at many different layers across societies and organizations of all natures, becoming a new paradigm and a fourth industrial revolution. This social change has a profound impact at macro and micro levels, namely, impacting individuals, organizations, states, competition, demands, behaviours, and more. The environments in which organizations operate have evolved massively, where change is the only constant and where competition and demand are greater than ever. These new circumnstances introduced by digital transformation are meeting -and sometimes even clashing- with the set of values, beliefs, principles and shared assumptions that compose the culture of the organizations. As it is now, if the organizations do not adapt and embrace this new environment, they will most likely fail (Crittenden et al., 2019).

The current research available is lacking of a comprehensive, structured and holistic approach towards digital transformation that takes several layers and views into account, including technology, leadership, communication, strategy, culture, change management, human behaviour and more; where the word ‘transformation’ weights as much -or even more- as the word ‘digital’. Within this research, digitalization is perceived as a change, defined as a shift or movement from a current to a future state. This specific research analyses the role of the human within the complex journey of digitalization, where there is more than implementing the latest technologies, where organizations are trying to be part of this new digital and social paradigm and embarking on a cultural change process where proper change management and monitoring activities

are key for its success. In order to perform such analysis, two hypotheses have been proposed:

- H1: Despite the high impact of digitalization in organizations nowadays, there is no common transformational approach that fits all. But, having a holistic view of the digitalization processes, placing the human factor at the center of it and managing its reaction to the changes proposed by these transformations are crucial variables that define the outcome of the digital transformation
- H2: Transitioning into a more digital-driven environment is not only about implementing the latest technologies, updating the strategy of the company and upskilling employees, but also about trying to be part of this new digital and social paradigm and embarking on a cultural change process where proactive and clear communication regarding the reasons, impact and expectations of the digital transformation processes while balancing organizational cultural values is key for its adaptation and success

After approaching the two hypotheses with a systematic literature review and with a holistic and global survey, it has been learned that the success of digital transformation processes relies on its human aspect, rather than on the technological aspects. Technologies are pre-defined, meaning that we can know in advance what is the value and what can be expected out of them. But the key to the success of new technologies, is how these technologies are implemented and how they are used; both aspects being

human driven. The results of the survey show that organizations of all industries and sizes are impacted by digitalization processes but that the way that this affects the organization and the approach taken towards this phenomenon can vary massively. What has been seen is that there is no right or wrong approach since what makes the difference between a success story or a failure is seeing this topic as crucial for business nowadays and understanding that this is a phenomenon that affects everyone from many different perspectives and in many different ways.

Aspects such as technology, culture and people cannot be taken as separate pieces of the equation, they need to be seen together and must be complemented with appropriate change management practices. The most critical variables identified within this research that are seen as enablers of digitalization are organizational culture, vision and values and change management and human behavior while IT & technology and HR & talent management are not seen as the most important ones within these processes.

Also, throughout this research, within the human behavior and change management areas, it has been understood that even if these types of transformations affect everyone, not everyone is affected in the same way. There are cultural, gender, educational and generational differences that must be taken into account to successfully implement digitalization across the whole organization, leaving no one behind. In order to do so, communication must be proactively managed throughout the whole process, explaining what the reasons for the change (the 'why') are, what will the impact potentially be and what the people can expect. What the research has shown as well is that for employees to better understand the 'why', the best ways are by learning in the job

and by in-house training provided by the organization rather than by attending formal (university/ college) or informal (webinars, conferences, etc.) education.

Another important factor that came up during this research was the need to balance the new technologies and processes with the cultural values and practices of the organization. This can be done by involving employees from the very beginning, asking for feedback, ensuring transparency and alignment with the goals and vision of the organization and applying change management practices to foresee resistance to change and working proactively on it.

But, what is very important to understand is that the environment in which organizations operate is fast and ever-changing. There are constantly new ways of doing things, new technologies and frameworks that could be implemented, new strategies to be explored and many more things. But what does not change in these processes is the need for change and its human centricity. Even artificial intelligence models and advanced algorithms are created and configured by people. This is just the beginning of this new digital era and there are many more transformational processes coming our way. Regardless of the shape or form of these transformations, it is of critical importance to be not only rely on traditional pillars such as technology, culture and human resources, but to also bring to the formula change management practices and human behavior.

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