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Enhancing Collaboration Inside a Company: Digital Transformation and Digital Tool' case study in Amadori.

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Dedicated to my family and my friends. People that inspire my life everyday.
"La pioggia che cade. Io ed io soltanto. Nel silenzio"

Abstract

The objective of this thesis is to study how to enhance collaboration within the organization by leveraging digital workplace tools and digital transformation to save time, costs, and resources. A review of relevant literature will be conducted to present the state of the art regarding digital workplace tools and digital transformation processes, aiming to identify what is currently relevant and what is lacking. The Amadori case study introduces a real-world scenario utilizing "Interacta," a collaborative digital workplace tool. An analysis will explore how different areas within the company implemented it, the characteristics of the software, and how employees reacted to it. A survey (adopting the TAM model) will be employed to demonstrate the results of the methods adopted for implementing the new digital workplace tool during the internship, as well as the role employees can play in driving digital transformation.

Contents

1 Introduction

Due to recent advancements in digital transformation practices, many companies are dealing with limits imposed by the costs and resources needed to align their mode of operation with competitors. From an internal perspective, a company must be able to retain digital talents and select the right software to extract value from big data, to streamline business operations, and to provide employees with tools that have the characteristic of interoperatibility within different needs and stakeholders as well as adaptability and flexibility in changing requirements over the time. From an external perspective, a company must communicate innovation and best practices to navigate emerging trends that are transforming the way work is done, such as the potential of artificial intelligence and cloud computing, if applicable, within the organization. Digital workplace tools enable companies to transform interaction and collaboration among workers, where knowledge and information sharing are considered a key factor in achieving potential competitive advantage in the market and efficient and not redundant workflow inside the company. How workers perceive technology consistently emphasizes what managers and leaders must do to drive digital transformation in a way tailored so that the adoption of new technology does not become an obstacle to the organization.

Regarding the originality of the chosen topic, this thesis combines two different fields: Computer science and engineering, which focus on software configuration and development, and work and organizational psychology, which examines employees' perceptions of new technologies. This approach is supported by the methodology of the Technology Acceptance Model (TAM). The main focus of the thesis is the role of employees in the digitalization process, a topic that is often overlooked in research, where more attention is given to the leadership's role in promoting digital transformation. The goal of this thesis is to shift the focus from a top-down approach to a bottom-up approach, where leadership should support digitalization by addressing employees' digital skills and needs. Additionally, this thesis explores the role of leadership style during digitalization, aiming to understand how leadership styles can be aligned with employees' needs and potential to drive digital change. Employees should be seen as leaders, alongside managers and top executives, each in their own context. The depth of the analysis is shown through a review of the following concepts:

- How digital transformation has been adopted [1] around the world [2], analyzing benefits and criticalities [3] from the studied industries [4] [5];

- How digital workplace tools have been designed [6] [7] to facilitate the adoption of new practices [8] [9];
- The perception of new technology by workers [10] [11] to adjust the implementation of a new potential software [12].

The TAM model focuses on three key constructs: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Intention to Use (IU) a software. In this thesis, a new construct, Digital Transformation Competence (DTC), was introduced. This construct assesses employees' perceptions of their digital skills and how these skills can be leveraged by the company. In the body of research presented in this thesis, attention was given to understanding the main drivers of digitalization and to examining testimonies from other use cases that adopted a similar approach. However, a construct similar to Digital Transformation Competences was not explicitly mentioned. In case it was already studied in one of the papers reviewed but not highlighted, the responsibility lies solely with the author. Therefore, the following hypotheses were tested:

- There is a significant relationship between DTC and PU, PEOU, and IU. Understanding whether the perception of digital skills is correlated with perceived usefulness, perceived ease of use, and intention to use can provide valuable insights for companies. In particular, this correlation could highlight the importance of improving employees' digital skills through training programs, thereby increasing the level of technology acceptance for new company software.
- There is a significant relationship between DTC and IU when controlling for PU and PEOU. Building on the first hypothesis, a possible positive correlation—translated into a cause-and-effect relationship—can confirm and support the first hypothesis.
- There is a significant difference in IU across different age groups. Understanding whether age is a relevant factor influencing the intention to use a technology may reveal that employees' age is not a barrier to digitalization within the organization.

The hypothesis stated in the thesis aims to change the main criticality arising from academic discussions about the digitalization of a company: the role of leaders in driving digitalization [12]. Here, the main topic is no longer centralizing attention [13] and responsibility on this role to drive digitalization but rather involving workers as ambassadors in promoting digitalization [12]. This consideration will be explored in the research, working on the technology acceptance model (TAM) [10], a tested and validated survey developed by Davis et al used over the years in the field of information system [10] [14] [15] research to evaluate the impact software has on organization [10]. Insights will be derived from the internship activity conducted at Amadori, where the focus of

the project was to configure Interacta [16], a digital workplace tool used to improve collaboration and knowledge sharing within the company [16]. The research will explore the characteristics of the software [16] and how workers responded to the new tool, stemming from a real digital transformation case study applied in some areas of the company the perception and adoption of the new tool.

2 Theoretical foundation

2.1 Introduction

To understand the context in which this thesis is situated, a theoretical framework is established by examining the process of digital transformation [17] adopted across various industries over the years [2] [18] [19]. This framework highlights both critical and successful factors of digitalization [1] to understand how companies are approaching the transition [1], how the decision-making process is influenced by transformation [12], and how employees can benefit from the adoption of new modes of work [9] [3].

2.2 Interacta case study in Amadori

In the real-world case scenario that will be developed, knowledge sharing and collaboration among employees represent the primary focus driving the adoption of the implemented software, Interacta [16]. Connection and social interaction are fundamental to a community [9]; the experience within the company, as perceived by employees, should be based on a work environment where a community is created and nurtured [8]. Every company must pursue a direction toward building a community, and especially a digital transformation process can enhance in a positive way how a community is formed [20] and sustained [8] [21].

2.3 Digital transformation and digital workplace tool: understanding the concepts

The theoretical framework aims to align the intersection between digital transformation [17] and digital workplace tools [22], with the latter being one of the means through which digital transformation can be pursued [12] [10]. The discussion will examine the role that digital workplace tools play [6] [7] in the digital transformation process [23] [8] and in building a community of users [9] that can improve social capital [21] [8] and functional efficiency inside and outside the company

[23]. This research excludes the theme of hybrid work, which was well-discussed in the academic literature on digital workplace tools as one of the main reason why new digital workplaces have been designed [6] and their impact on employees and organizations [7]. The objective of this thesis is not to study the cause-and-effect relationship of hybrid work but rather to investigate how digital workplaces have been designed [6], which factors are essential to consider during the software development stage [6], and what role end users have in designing this tool [7] [8].

2.4 Integrating psychological perspectives with the Technology Acceptance Model: understanding employee adoption of software in the workplace

The focus is on studying the role users (employees) play in software development dedicated to digital workplace tools. Therefore, after having examined the academic debate on the design principles [6] [22] of digital workplace tools, the case study of Interacta [16], the software used during the internship at Amadori, will be investigated to highlight the flexibility and adaptability [24] that this tool brings in developing customized environments and workflows (processes) for the specific case under examination (the area of the company). The thesis aims to develop a bottom-up approach [12] to drive digital transformation, where the transition to new modes of operation is not just imposed as command/order instruction from a top-down perspective [12] and the responsibility [25] does not solely lie with leaders [13] [26] [27] or CEOs of a company [28]. This perspective narrates the active role employees have in the digital transformation process where employees play a leading role during the process [12] [25]; CEOs and leaders are responsible for implementing digital transformation [25], but they serve as the connection [13] between the transition (the tools) and the end-users (employees), rather than being the only active actors in this transition [25] . This means that when deciding which software best suits the dynamics of a company [29] [30], the role of leaders and CEOs is to understand the needs and perceptions of the software, particularly from the employees' perspectives [10], who are ultimately the end-users of the digital tools. Engaging employees in the decision-making process for adopting new digital tools can dramatically reduce the risks associated with improper software implementation [31]. These risks include increased costs of data migration from one platform to another, expenses related to dismantling software that is not utilized by employees after implementation, and the time and costs required for training employees on new tools [31].

To understand if employees are willing to be ambassadors of the digital transformation process, a well-curated analysis of employees' perceptions of the technology used is necessary [10]. In academic literature, the technology acceptance model [10] has been used to assess the effect a

software solution has on the company [12] [11]. Employees have been asked about their perceptions of the usefulness and ease of use of tools that influence future usage, whether for newly implemented or already established tools [10]. This evaluation is self-reported and based on subjective analysis [10]. It provides insights into users' propensity to use software in the long run. Typically, this assessment is conducted by comparing two software solutions [10], where a comparison of the results obtained from the analyses of the two surveys clarifies which software is expected to be used in the long term, along with insights regarding the usefulness and ease of use of both software solutions.

2.5 Configuration of Interacta: a bottom-up approach

In relation to the case study under analysis, the company Amadori adopted the software solution and a process of digital transformation has been initiated to help users understand the software and develop use cases from various company areas where Interacta can be adapted and customized, taking into account users' needs and their levels of digital skills, as well as the specific purposes of each area and its related functions [16]. The areas under investigation were chosen based on the prioritization [32] made initially by the IT and digital transformation teams. Subsequently, new use cases emerged following online events dedicated to introducing the new software to the entire company, where employees were encouraged to propose suggestions for improving workflow using Interacta. Initially, Interacta was used to transition from the company's static intranet to a new interactive and collaborative intranet that allows for more user-centric involvement of employees due to the flexibility of the software solution in creating specific spaces and communities dedicated to individual areas of the company or to the whole company [16]. On one side, we see intra-area communication (an example is IT and digital transformation communities where storage of manuals, projects and communication related to IT function is developed to maintain order and efficiency where all the employees in this area do not miss important updates); on the other side, we see broadcast communication from one area to all (an example is People and Organization area' posts dedicated to the introduction of new employees or to new convention or initiatives that could interest all the company' employees). In the first case, a single area specifies its needs to the people and organization area or directly to the digital office. Then, a series of meetings is conducted to define requirements and use cases, and a draft of the space/community is designed for that area. This draft may include a design for a customized process that is tailored specifically to that area, based on the communicated requirements. The customized process is tested and refined based on feedback received from area representatives who, utilizing manuals and live testing of the new space along with the new community, redefine requirements to enhance the project design. After this iteration phase, the digital office trains the area representatives on how to use the new solution in

hypothetical use-case scenarios. Conversely, if there is no customized process to create but rather a space or community dedicated to an area with customized "posts" representing individual units of communication within Interacta, created with fields that change depending on usage scenarios, then a prototype of this new customized space/community is created, and users are instructed on how to access and use it. The difference between a space and a community is that a space encompasses one or more communities. A space can be dedicated to the entire company or to one or more business areas, whereas a community concentrates on specific types of communication either within an area (intra-area) or between different areas (inter-area) or broadcast (one area versus all). [16] The way in which Interacta works will be explored in the section dedicated to the case study.

3 Digital workplace tool

3.1 Introduction

The concept of a digital workplace [6] [7] has evolved significantly in recent decades, reflecting advancements in technology, organizational changes, and the increasing integration of social media frameworks [8] [21]. At its core, the digital workplace represents a dynamic ecosystem of tools and platforms [8] designed to enhance collaboration, innovation, and efficiency [7]. digital workplace is an umbrella term: It can encompass digital workplace tools used to perform work activities [23], a digital environment where employees meet remotely, and a digitalized infrastructure for knowledge repository of the company [22]. This chapter examines the theoretical evolution and practical implications of digital workplace design, tracing the field's development from early principles [6] to the incorporation of social media frameworks [21] [8] and digital tools for innovation. This analysis focuses on studying articles[6][7][8][21] related to the topic of digital workplace design [22]. Together, these works provide a comprehensive view of the evolution of digital workplace concepts, emphasizing the transformative role of social media frameworks in fostering connectivity and collaboration.

3.2 Digital workplace tools an overview

Digital workplace tools can be viewed not only as software used to perform specific activities, but also as means of connecting with colleagues without limitations imposed by physical location or time. In academic discussions, numerous studies have been conducted to extract principles and guidelines for designing these tools.

3.2.1 Definition of digital workplace tool

Based on the work done by Khamooshi et al. [17] "we can define digital workplace as digital technology-supported working system consisted of not only the physical space, employees and tasks, but also set of strategically accepted procedures and rules in order to maximize productivity and improve collaboration, communication and knowledge management". [17]. The purpose of

this definition is to emphasize the flexibility and scalability of digital workplaces compared to physical workplaces. Olaniyi et al. introduced the concept of the digital workplace not only as a tool for operational efficiency but also as playing "a pivotal role in enhancing social interactions, employee engagement, and ultimately, the organization's social capital." [8] This new opportunity hinges on two concerns: strategic communications advocated by Acree [28] and digital inclusivity issues raised by Mossberger [20]. As Olaniyi et al. stated: "At the heart of successful digital transformation efforts is the focus on reimagining business models and processes from the ground up". [8] Moving away from traditional paradigms toward more integrated, agile, and experimental approaches where employees have a leading role in implementation of new solution inside the organization. Milana et al. note that "social capital refers to networks of relationships among people who work within or are connected to an organization." [9] These networks are valuable assets because they facilitate cooperation, information exchange, and influence across various stakeholders. Social capital dramatically impacts how individuals within an organization perceive their jobs and interact with colleagues [21]. The workforce embodies two interconnected elements: human capital [20], focused on hard and soft skills, and social capital [8], centered on community creation engaging all participants. "These tools facilitate a culture of open dialogue, knowledge sharing, and innovative thinking," [9] which are crucial for modern organizational productivity, growth, and success. Digital workplace tools aim to strengthen knowledge sharing across companies while improving communication quality among different departments. The effects arising from digital workplace environments and tools have shaped new ways organizations mediate the flow of information inside and outside the workplace. At the individual level, employees need updated tools to properly start, elaborate on, and conclude a task. At the team level, teams need tools and environments where they can freely access knowledge repositories, track progress, and share insights. Meanwhile, at the organizational level, instruments that allow proper access to information at any place and at any time are necessary to maintain coordination and align the efforts made by each team with the goals stated by the company. [12]

3.2.2 Principles and design of digital workplace tool

Starting from the research conducted by Grantham in 1996: "work in the virtual workplace, where people are separated in time and space, significantly changes the pattern of work behavior, attitudes about work, and towards employers." [6] Eight points have been outlined to synthesize assumptions about human behavior when discussing digital workplace tools. [6]

1. People strive to develop in a positive fashion towards greater self-actualization
2. The meaning of work is derived from the phenomenon of interaction with others and the environment

3. Symbiotic evolution of people and social groups is facilitated by open communication
4. Purposeful communication provides a material benefit to human action
5. A person or group has meaning only within the identity of a larger social context
6. Development of technology tends to increase the scope and rate of human interaction
7. Clear, concise conversations, based on mutual non-judgmental respect, provide a clear pathway for people to transcend narrow self-serving behavior
8. The creative aspect of people arises from the act of serving beyond self

One of these eight points is crucial and highlights the need for a profound study of digital workplace design: "Development of technology tends to increase the scope and rate of human interaction." [6] It is well-established that communication is a primary driver of successful strategies within a company. [23] This leads us to consider how employee communication plays a pivotal role. Grantham was correct when he stated that "the shift in values has been towards the inclusion of technology users in the design and development process [...] the purpose of the system is to serve users [...] software is increasingly designed and built by virtual groups of people for use by virtual groups of people." [6] In this sense, different user needs emerged, leading to an approach in which developers collaborated with groups of workers to shape the characteristics of the tool. This evolution reflects organizational design principles first and then participatory design methods adopted in digital workplace design[6].

Grantham proposed six principles for organizational design [6]:

1. Assessment: understanding requirements provided by end users about the software solution design
2. Design: to draft the idea from the requirements gathered from the users
3. Prototype: to create a prototype used to test the viable solution
4. Planning: organizing the way in which the software will be used
5. Action: running the solution
6. System Audit: measuring the performance of the solution

The main idea behind Grantham's work was that "participatory design means: users of technology have roles as equal partners in the design process [...] the requirements for sufficiency of organizational description include processes of interaction, systems that support these interactions, and

finally, the material structure that emerges from these interactions." [6] Interaction has become a central component of digital workplace tools, supported by structured environments that facilitate the free flow of information. Within a company context, this information transforms into knowledge, enhancing collaboration and decision-making processes.

In the work done by Oldham et al. considerations to drive the design of digital workplace environments have enlarged the academic discussion related to the possibilities offered by these tools, ranging from computing devices providing employees with access to new and diverse information that fosters creativity and innovation processes, engagement in work roles to allow individuals to have the necessary tools to express their work in the best way, and promote cross-team collaboration leveraging resources across the organization. [23] Support and sponsorship of creative ideas for implementation are also essential to provide individuals with tools that significantly contribute to innovation processes inside the company [23].

3.2.3 Agile methodologies and user-centric design

As Schmidt et al. stated "daily work is dominated by knowledge-intensive tasks and IT-supported activities." [7] Sharing knowledge is regarded as a primary task accomplished within digital workplace environments. Schmidt et al. define this environment as "the relation to a clearly delimitable spatial area in which people within the company's working environment interact with work equipment and objects."[7] They further argue that "customer satisfaction and loyalty can be increased through greater individualization and user orientation of IT, resulting in a shift away from one-size-fits-all approaches toward tailor-made IT environments." [7] Knowledge gathered from end-users (employees) is proposed as starting point to design and configure digital workplace tool. Grantham emphasized that software developers must make target groups central actors in software design [6]; Schmidt et al. also agree and add that target groups should be direct participants and integrated users in software development, making the overall experience of designing digital workplace tools personalized based on team requirements. [7] Schmidt et al. state that "ambiguity and uncertainty for developers increase with complexity arising from tasks within an organization."[7] User participation leads to a reduction in complexity and minimizes the probability of failures during software development processes. They consider two aspects during software design: "user participation" and "inclusion of users" (user involvement). [7] A key point from their theory is encapsulated in the concept of "System Use": "In collaboration systems where benefits for individual users increase when the number of users increases, a critical number can be reached at an early stage." [7] Their approach is based on participatory design that recalls Grantham's work on designing digital workplaces [6]; however, they employ Agile methodologies to initiate workplace creation processes including elements from design thinking. [7] The design thinking methodology is based on the development

of solutions through the creation of multiple prototypes, with users at the center of the process. This involves identifying the problem, brainstorming possible solutions, ideating prototypes, refining them, and measuring outcomes until an effective solution is achieved

Starting from identified problems, participatory design develops into need-finding and benchmarking, collecting requirements actively involving users during ideation phases. [6] [7] A prototype is then built and tested to redefine problems effectively. In addressing need-finding and benchmarking use cases, an agile approach is utilized following SCRUM methodologies to create a product backlog where user stories are prioritized based on importance and functionality [7]. However, "many common prioritization methods used in agile development reach their limits with large quantities of items to be prioritized and large numbers of participants" [7]. Consequently, in the studies done by Schmidt et al, KANO models have been employed to prioritize user requirements based on attribute classes investigated through surveys [32]. These attribute classes include:

- Basic or must-be: essential, they represent the back-bone of the solution
- Performance (one dimensional): the more you provide this function, the more satisfied the users will be
- Attractive: oriented towards user interface customization, not essential to users
- Indifferent: attributes that are not essential for the solution to behave as expected
- Reverse: attributes that have a negative interaction with the expected idea of the solution

After mapping user requirements into these attribute classes, prioritization will focus on basic or must-be attributes over indifferent or reverse classes. [32]

3.2.4 Categories of digital workplace tool

In creating the space where employees interact and collaborate in accordance with the aims of the organization, several requirements need to be mapped to understand "the specific context of the business (industry sector), historical path (e.g., motivation/pain points for starting the project), and the nature of the implementation project (resources dedicated to introduce users over the new tool)" [22]. As stated by Williams et al., a digital workplace environment is "an integrated technology platform that provides all the tools and services to enable employees to effectively undertake their work, both alone and with others, regardless of location, and is strategically coordinated and managed through digital workplace designs that are agile and capable of being adapted to meet future organizational requirements and technologies" [22]. Based on their studies, there are three thematic categories where a digital workplace environment could be categorized [22]:

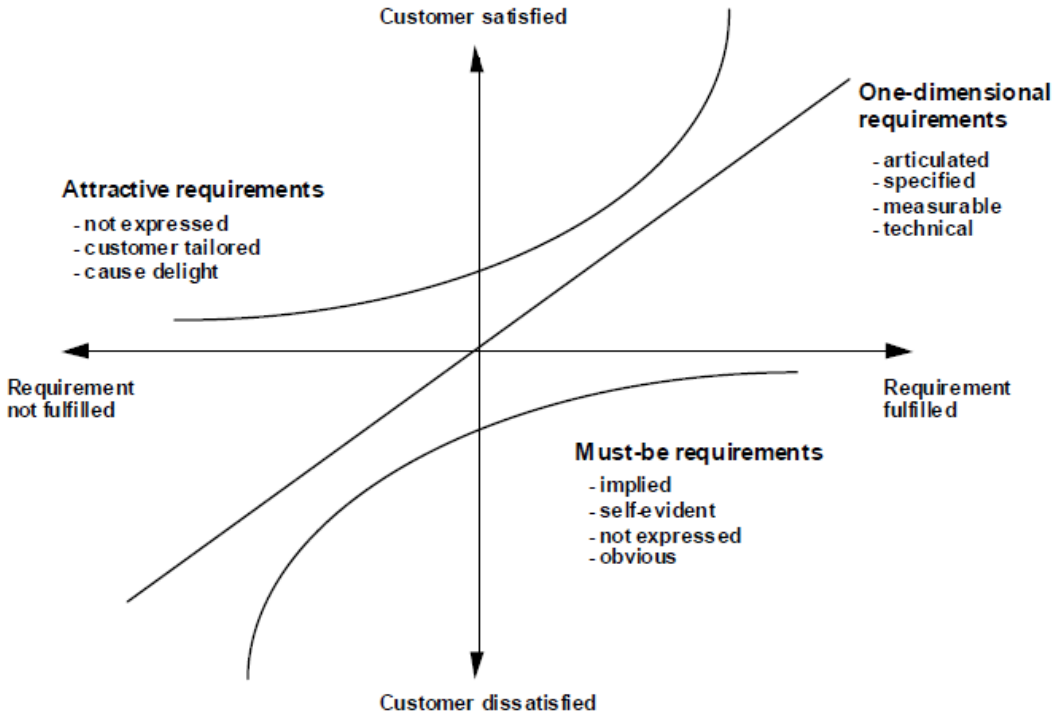

Figure 3.1: Kano's model of customer satisfaction (Berger et al., 1993) [33]

- Organizational strategy and design: The environment is seen as part of a coordinated organizational strategy to change corporate culture and create a new kind of workplace.
- People and work: The environment should provide the conditions to enable people to be productive in their work and predictive and intelligent.
- Technology platform: The environment should be an integrated platform that provides all the tools and functionality required to support people and their work practices.

They identified six workplace designs based on basic use cases and specific use cases where the focus shifts from people-focused to process-focused. [22]

Focus-oriented	Functionality	Description
People-focused: information and knowledge management	Information Exchange	Sharing documents: Platform used to exchange information to do jobs.
	Portal solution	Central access point for information on specific topics of interest for employees.
	Networked Enterprise platform	Employees in a globally distributed organization have access to information-rich social profiles.
Process-focused: business process support	Project support	The main use of the tools is for coordination of information, people, and tasks.
	Efficiency tool for business processes	Platform designed for specific ongoing business processes.
	Multi-function integration platform	The platform integrates data and functionality from different business software systems and provides uniform access to different functional areas of the company.

Six workplace designs based on the work of Williams et al. [22]

Each of these designs represent a possibility where to start projects on creating digital workplace environment where each of the functionality is not-mutually exclusive.[22]

3.2.5 Challenges in designing digital workplace tools

One of the main points to consider when deciding which tool is appropriate for your company lies in balancing usability with purpose. From a corporate perspective, the search activity to determine which software to adopt represents a critical task. [29] [30] In the long run, adopting the wrong software can cause various damages, including data migration costs, time invested in learning new tools, and economic costs derived from consulting, implementation, and adoption activities.

Challenges arise when implementing new digital workplace tools since investing in training and change management practices requires significant time and resources for workforce alignment. [34] [31] [18] The benefits derived from using these tools evolve continuously due to dynamics occurring during implementation phase. In initial stages, employees may struggle with unfamiliar tools; despite workshops held to communicate new solutions, guidance materials such as manuals and follow-ups are essential for helping employees understand how to use them effectively. Subsequently, IT areas manage initial configuration activities while providing assistance for user access information and use cases necessary for adopting solutions effectively. One major risk for IT areas involves investing in appropriate digital workplace tools while balancing internal factors related to user experience alongside external factors concerning software flexibility and adaptability. Indeed, greater adaptability of software to disclosed user requirements enhances long-term benefits regarding collaboration and evolving user needs.

Providing the right tools and environment for employees is not enough to establish a stable new work method, especially when it comes to digital workplace tools, which require a certain level of digital skills and adaptability to be fully embraced. For this reason, as we have seen in the academic literature, many researchers have attempted to analyze how digital workplace tools could be designed [6] [22] by leveraging user engagement and involvement through agile methodologies [7]. This approach aims to create workplaces that resemble familiar environments, such as social media frameworks [21], in order to reduce the time needed for employees to learn and adapt to these tools. Based on the work of Hult et al. digitalization not only transforms the construction of workplaces and work processes but also affects how employees interact and learn at work. [34] Their research question was: What kinds of learning challenges are emerging in the digital workplace? [34] Through an analysis of employees' perceptions and experiences at work, several themes emerged from their studies conducted over five years in a company in Sweden. The main challenges identified were related to learning and leadership rather than technology and the flexibility of digital workplace methods. [34]

Type of challenge	Description
Learning the flexibility	Dual demands of freedom and flexibility. Work-life dilemmas. Self-leadership
Learning in context	Reconstruction of work tasks. New competencies for new ways of working. Social and informal aspects
Learning to support	Blending of personal and professional technologies. Legal, ethical and privacy concerns
Learning to lead	Leap of faith. Workplace in transition. Responsibility, new leadership practices

Dimensions of the digital workplace and related challenges for learning based on the studies of Hult et al [34]

Current academic research highlights the significant responsibility placed on individual employees to continuously learn and develop new skills in the digital workplace. [34] This emphasis on self-directed learning raises concerns about employees potentially lacking guidance in utilizing digital tools, which are valuable assets for organizations. [34] The literature indicates that employees need to learn not only how to participate in digital work but also how to lead effectively within this environment. [12] Digital workplaces offer opportunities for extensive collaboration, knowledge sharing, and informal learning. However, employees have expressed a demand for new competencies when working in these settings.[34] They also report frustration due to perceived deficiencies in digital strategies within their organizations, along with passive leadership and unclear motivations for digital change. [34] Research by Hult et al. shows that digitalization transforms not only the physical aspects of workplaces but also how employees interact and learn. [34] Their study addresses emerging learning challenges in the digital workplace, revealing themes related to navigating information flow and managing transitions effectively. [34] It suggests that leadership should empower employees rather than relying solely on IT departments as the driving force behind digital transformation. [34] The challenges identified include a need for clear communication regarding motivations for digital changes, as well as fostering an environment where employees feel supported in their learning journeys. [34] As organizations continue to adapt to digital workplaces, understanding these dynamics is crucial for effective implementation and employee engagement.

There are points to consider in assessing the impact these functionalities should have on digital workplace designs: information overload must be addressed in order to create appropriate spaces from the beginning by properly dividing the three levels within a company (individual, team, and organizational levels), an increase in stress resulting from high expectations due to operating with technical tools that may require time to learn and properly manage, judgmental evaluation and

criticism of ideas and actions performed in the environment that could inhibit individuals from using these tools to share real insights and ideas for fear of making mistakes, and a reduction in spontaneous face-to-face meetings that can lead to an austere environment. Changing leadership practices was also highlighted as a key consideration in implementing new digital workplace tools, taking into account the social context in which these tools operate. [34]

The focus shifts to defining common and validated procedures that allow employees to navigate these environments, addressing specific limitations that organizations may perceive [35], such as ineffective meetings, email management, difficulties in finding information and people, and duplication of work. Attaran et al indicate that the main challenges employees face in implementing a digital workplace include [35]:

1. Challenges and difficulties of applying to different applications
2. Inability to access data and applications in and out of the office
3. Need for help in accessing data

[35]

Current academic research is working to understand the implications that certain digital workplace environments may have in tackling these challenges, for example, using agile methodologies and social media frameworks. [9] [8] [21]

3.2.6 Social network framework to improve social capital

Today's approach towards providing familiar environments involves designing digital workplace tools that resemble social media platforms, fostering relationships while crafting organizational narratives resonating across diverse audiences. [9] [21] Based on studies conducted by Putnam, he emphasizes "the importance of networks, norms, and trust in fostering collaborative engaged communities [...] these digital networks, characterized by their size, connectivity, and diversity—mirror social networks essential to social capital" [36]. "By fostering frequent and meaningful interactions across various levels and departments within an organization, digital networks can significantly contribute to the shared goals, collective problem-solving capabilities, and innovation that are indicative of high social capital" [36]. Drawing on the paper introduced by Olaniyi et al, the contribution provided from digital workplace tools can significantly increase the social capital of the company [8]. Once again, interaction is at the center of this process of creating a community of users where limitations imposed by space and time are removed, and knowledge sharing is improved, "the inclusivity of digital practices, ensuring that all members of the organization have access and the ability to participate fully, is crucial for the development of a digital community that contributes

positively to social capital"[8]. The role digital workplace tools have in increasing social capital also depends on the way in which it is perceived by the end-users, the workforce.[21] The impact of social media highlighted how user-friendly are these tools when designed as digital workplaces since they have been used over the years by most of the people for several purposes ranging from social connection, networking, commercial and field-oriented platforms. [21] As Herlle and Caneda stated "with social media, people interact not only with a single person, but they can choose to connect with many other individuals to speak concurrently, though they are at various locations. In addition, people may engage in a variety of activities; for instance, they can download photographs, upload videos, and electronically transfer information." [21] However, "when employees are distracted with social media, it can become a concern for organizations". [21] Social medias have changed the way in which the world is perceived, information is easily retrieved everywhere and in every moment, connection is created in very short time, and digital contents become viral in few days. Today, industries noticed these changes and social media have been exploited properly to take advantage of these features. "Due to the ease of Internet connections and access in the workplace, organizations can enhance business operations and employee communications by having their own inter-office social media platforms. This offers employees the opportunity to share knowledge and collaborate with each other."[8].

3.3 Software selection websites

Today, organizations whether their size is big or not, have to deal with deciding which tool is appropriate for its operational activities as well as well-being of employees and efficiency of work-flow. An analysis of the main digital workplace tools from the main websites of software solution online provides us an overview and list of digital workplace solution with their characteristics and functionalities. [29] [30] Visiting each website, it is possible to see a raking of software based on overall score given by users and the characteristics of the software solution that might best suite the purpose of the company. [29] [30]

3.3.1 Exploring Capterra: a platform for software selection

Capterra is a software review and comparison website that helps businesses and individuals find and evaluate software products across various industries. [29] Founded in 1999 and based in Arlington, Virginia, Capterra serves as a marketplace connecting business managers to a vast database of insights from millions of users. Users can read verified reviews, compare solutions side-by-side, and analyze the strengths and weaknesses of different software products. [37] Capterra offers a comprehensive directory of over 50,000 software products across more than 900 categories,

including accounting, project management, marketing, customer relationship management (CRM), IT services, and more. [37] The platform provides around 2 million reviews from real users, allowing potential buyers to make informed decisions based on authentic feedback. [37] It works as a comparison tools: users can compare multiple software products side-by-side based on features, pricing, and user ratings to determine which product best meets their needs. Capterra is free for users looking to research and evaluate software products. However, it charges vendors for promoting their products on the platform through various advertising options. Capterra has evolved significantly since its inception, particularly after being acquired by Gartner in 2015. It has become a trusted resource for businesses seeking to navigate the complexities of selecting software solutions. Here high rated digital workplace tools reviewd by capterra users along with price and characteristics of each software. The data were extracted from Capterra software's profile and using ChatGPT prompt to retrieve a brief description of the tool. [29]

- Google workspace: is a cloud-based productivity suite that integrates various tools and applications, such as Gmail, Google Drive, Google Docs, Google Sheets, and Google Meet, to facilitate collaboration, communication, and efficient workflow management for businesses of all sizes. It enables real-time collaboration on documents, offers secure file storage, and provides advanced features for video conferencing and project management. [38]
  - Starting price 6 dollars per month, per user
  - Ratings 4.7/5 (16966 reviews)
  - Ease of use 4.6/5
  - Free Trial and Free Version available
- Notion: is a versatile productivity and collaboration platform that combines note-taking, task management, databases, and project organization into a single workspace. It allows users to create customizable pages and templates, facilitating real-time collaboration among team members. With features like Kanban boards, calendars, and document management. Its integration capabilities with various tools enhance workflow efficiency, making it suitable for both individuals and teams across different industries. [39]
  - Starting price 12 dollars per month, per user
  - Ratings 4.7/5 (2435 reviews)
  - Ease of use 4.3/5
  - Free Trial and Free Version available

- Slack: is a collaboration and communication platform designed to facilitate team interactions through features like direct messaging, channels for organized discussions, and integrations with various applications. It enables users to share files, conduct audio and video calls, and automate workflows, all within a single interface. It supports efficient communication and project management, making it a versatile tool for businesses of all sizes. [40]
  - Starting price 8.75 dollars per month, per user
  - Ratings 4.7/5 (23527 reviews)
  - Ease of use 4.6/5
  - Free Trial and Free Version available
- Miro: is an online collaborative whiteboard platform designed to facilitate teamwork and innovation through visual collaboration. It enables users to brainstorm, plan projects, and manage workflows in real-time or asynchronously, using a variety of tools such as sticky notes, diagrams, and templates. It supports integration with popular applications like Jira, Slack, and Zoom, allowing teams to streamline their processes.[41]
  - Starting price 10 dollars per month, per user
  - Ratings 4.7/5 (1604 reviews)
  - Ease of use 4.5/5
  - Free Trial and Free Version available
- Process Street: is a workflow management tool designed to streamline and automate business processes. It allows teams to create, track, and manage recurring tasks through customizable templates and checklists, ensuring consistency and efficiency in operations. With features such as real-time collaboration, integrations with other tools, and automated workflows and its user-friendly interface makes it accessible for teams of all sizes, enabling them to focus on strategic tasks while maintaining accountability and visibility into their workflows. [42]
  - Starting price 100 dollars per month, flat rate
  - Ratings 4.7/5 (631 reviews)
  - Ease of use 4.6/5
  - Free Trial available
- Project.co: is a cloud-based project management platform designed to streamline collaboration and task management for teams of all sizes. It allows users to create and manage unlimited

projects, assign tasks, and track progress using various views, including lists and Kanban boards. With built-in communication tools such as chat functionalities and email notifications, it facilitates seamless collaboration among team members, clients, and freelancers. It also supports file storage, payment processing, and integration with third-party applications like Stripe and Google Drive. [43]

  - Starting price 10 dollars per month, per user
  - Ratings 4.9/5 (208 reviews)
  - Ease of use 4.9/5
  - Free Version

- Zoom Workplace: is an integrated collaboration platform that combines video conferencing, team chat, and productivity tools to enhance teamwork and communication in organizations. It features tools such as collaborative whiteboards, document co-editing, meeting scheduling, and an AI Companion that assists with automated meeting summaries and task management. [44]

  - Starting price 14.99 dollars per month, per user
  - Ratings 4.6/5 (14106 reviews)
  - Ease of use 4.6/5
  - Free Version

- Othership: is a collaborative workplace software platform designed to facilitate hybrid and remote working environments. It enables users to find and share their work locations quickly, promoting coworking and connections among team members. The platform offers features such as workspace scheduling, on-demand workspace booking by the hour or day, management of fixed and hot desking, meeting room reservations, and visitor management. [45]

  - Missing information
  - Ratings 4.8/5 (122 reviews)
  - Ease of use 4.9/5
  - Free Version and Free Trial available

- Airtable: is a cloud-based project management and database tool that combines the simplicity of a spreadsheet with the powerful features of a relational database. It allows users to organize

workflows, manage projects, and collaborate in real-time using customizable fields and views, such as grid, Kanban, calendar, and gallery formats. It supports various data types, including text, attachments, and checkboxes, enabling users to create rich databases tailored to their specific needs. Its automation capabilities and seamless integration with other applications enhance productivity by streamlining workflows. It also provides collaboration features like task assignments, comments, and permission settings, making it suitable for teams and organizations of all sizes. [46]

- Starting price 24 dollars per month, per user
- Ratings 4.7/5 (2115 reviews)
- Ease of use 4.4/5
- Free Version and Free Trial available

Factors upon which the decision to choose digital workplace tools is based are enlisted according to the main purpose the software should serve in its implementation within an organization.

3.3.2 Analyzing G2: a user-driven platform for software reviews

G2 is a comprehensive online platform that specializes in business software reviews, providing valuable insights into various digital workplace tools available in the market. [30] The website features millions of real user reviews, enabling potential buyers to make informed decisions based on the experiences of others and the use cases described for each digital workplace tool. [30] The characteristics of G2 include extensive software categorization, organizing software into numerous categories such as project management, video conferencing, e-commerce platforms, marketing automation, and more. This structured approach allows users to easily navigate and find the tools that best suit their needs. [30] Each software listed on G2 includes ratings and detailed reviews from actual users. This feedback is crucial for understanding the strengths and weaknesses of different tools, helping organizations select solutions that align with their specific requirements. [30] G2 provides insights into software trends and buyer behavior through reports and analyses, which can be particularly useful for businesses looking to stay updated on the latest developments in digital workplace technologies. [30] The platform encourages user engagement by allowing individuals to write reviews, share experiences, and contribute to discussions about various software tools. [30] This community aspect fosters a collaborative environment for knowledge sharing. [30] In exploring digital workplace tools, organizations can consider using G2 as a vital resource by leveraging comprehensive categorization, user-generated ratings, and insights that facilitate informed decision-making regarding software implementation. [30]

3.3.3 Categories of software for businesses

The most popular categories of digital workplace tools are enlisted below: [30]

- Video Conferencing: technology enables real-time communication and interaction between individuals or groups using audio and video transmission over the internet. It replicates in-person meetings, allowing participants to join discussions, share screens, and collaborate on documents from different locations. [47]

- E-Commerce Platforms: a web-based solution that allows businesses to sell products or services online. These platforms provide functionalities such as product management, secure payment processing, and order management, catering to various business models like B2C, B2B, and C2C. [48]

- Marketing Automation: it refers to the use of software to automate marketing tasks and workflows. This technology helps businesses streamline their marketing efforts by segmenting audiences, triggering campaigns based on user behavior, and analyzing campaign performance across multiple channels. [49]

- Accounting: software is designed to help businesses manage financial data, track transactions, and generate reports. It automates key tasks such as invoicing, expense tracking, and financial reporting, providing real-time insights into financial performance while reducing manual errors. [50]

- CRM (customer relationship management): are tools that help organizations manage interactions with customers through data analysis of customer information from various communication channels. They enable businesses to improve customer relationships, enhance service delivery, and drive sales growth by understanding customer behavior. [51]

- Expense Management: simplifies the process of tracking, recording, and analyzing business expenses. These tools automate tasks such as receipt capture and approval workflows, helping organizations maintain control over spending while improving efficiency in expense reporting. [52]

- ERP (enterprise resource planning) Systems: integrates core business processes such as finance, HR, supply chain management, and inventory into a single system. It streamlines operations by providing a unified view of business data and processes, facilitating better decision-making across the organization.

- Online Backup: allows users to store data remotely on cloud servers for protection against data loss due to hardware failure or disasters. These services provide automated backups

and easy recovery options, ensuring data security and accessibility from anywhere with an internet connection.

- Artificial Intelligence Chatbots: AI chatbots are automated conversational agents powered by artificial intelligence that can interact with users through text or voice. They are used in customer service to handle inquiries, provide information, and assist with transactions 24/7, enhancing user experience while reducing operational costs.

3.3.4 Proposed methodology to decide which digital workplace tools to choose

In considering which digital workplace tool to adopt, comparing functionalities, reviews, alternatives, and use cases represents a valid methodology to determine if a software solution may be beneficial for our organization. Capterra and G2 are reliable sources of information regarding this topic. [29] [30] The methodology that could be applied in deciding which digital workplace tool may be beneficial for our company could be outlined as follows:

Step	Description
1	Identify a problem within the organization that needs to be solved through digitalization.
2	Define the application of use cases (categories) based on the relevant business area; collect requirements and use cases from interviews with representatives of that area.
3	Define a budget to understand financial constraints.
4	Analyze Capterra and G2 (and possibly other sources) to compare reviews, use cases, prices, alternatives, and integrations.
5	Look for a free trial or free version to test the tool.
6	If the tool suits the use cases, define the next steps in deciding on a plan for adoption.

Methodology for Adopting a Digital Workplace Tool, elaboration made by the author

3.4 Considerations

The body of research dedicated to the design and principles of digital workplace tools highlights the importance of clear and meaningful communication within an organization. Creating an environment characterized by openness, interaction, and a culture of continuous improvement represents the foundation for building innovative digital workplaces.

3.4.1 Benefits derived from digital workplace tools

One of the main reasons for establishing a digital workplace is to enhance knowledge sharing within the organization. Academic literature has explored several approaches to understand how to create

environments that benefit various business areas. Based on Grantham's work, involving people in the design of these workplaces must be a priority for developers. Those involved in the creation process will become co-authors of the new environment, leading to increased interest in developing the content it will generate, which fosters new innovative social capital. Participatory design has been identified as a key methodology for designing digital workplaces because it involves users from the very beginning. Additionally, agile methodologies that prioritize tasks using the KANO model can improve decision-making regarding how user requirements should be prioritized. Social media has influenced how the design of these digital workplace tools should be approached since familiarity with these platforms can significantly reduce the learning curve needed for effective implementation. The benefits arising from the effective implementation of digital workplace tools include employees having access to new and diverse information that enhances creativity and innovation processes, as well as promoting cross-team collaboration by leveraging resources across the organization.

3.4.2 High-level categorization and functionalities of digital workplace tools

At a high level, digital workplace environments can be categorized into three thematic areas: improving organizational strategy and design, providing conditions that enable people to be productive in their work, and creating an integrated platform that offers all the tools and functionalities required to support employees. Based on use cases developed in the research, six workplace designs have been created based on two pillars: people-focused (oriented towards information and knowledge management) and process-focused (oriented towards business process support). From the people-focused pillar, three main functionalities must be provided: information exchange, portal solutions, and a networked enterprise platform. From the process-focused pillar, project support, efficiency tools for business processes, and a multi-function integration platform must adhere to organizational innovation. In designing digital workplace tools, three different perspectives must be considered: individual, team, and organizational. At the individual level, employees need updated tools to conduct their tasks effectively. At the team level, teams require tools and environments that allow them to freely access knowledge repositories, track progress, and share insights. Meanwhile, at the organizational level, proper access to information anytime and anywhere is necessary to maintain coordination and align the entire organization. Support and sponsorship of creative ideas for implementation must also be considered as key drivers for including users in the development stage.

3.4.3 Challenges in implementing digital workplace tools

However, there are challenges when many users participate in the design process, such as information overload and increased stress resulting from high expectations when operating technical tools that

may require time to learn and manage. Other challenges include criticism of ideas and fear of making mistakes. In designing digital workplaces accessing and managing data from different applications, employee engagement with new digital tools, strategic communication regarding tool implementation, and configuration requirements collected from various business units represent key concerns. Reported studies highlight an increasing demand for new competencies when working in new digital workplace settings, frustration due to perceived deficiencies in digital strategies within organizations, passive leadership, unclear motivations for digital change, and a lack of empowerment for employees during transitions.

3.4.4 Digital workplace tools selection phase

Several websites are available for studying and selecting digital workplace tools tailored to specific use cases. Among these, Capterra and G2 serve as valuable sources for comparing tools based on reviews, use cases, pricing, integrations, alternatives, and the availability of free trials or versions for testing the software. We developed a framework to guide the decision making process in finding the proper tool for a business use case starting from an identified problem, definition of a budget, business area, collection of requirements, analyzing softwares, test the tools and if the software suits the business use case, implement the tool.

4 Digital transformation: critical and successful factors

4.1 Introduction

An organization willing to undertake a digital transformation process faces several challenges related to internal and external factors that influence the likelihood of success. [2] [1] Critical and successful factors must be understood in order to establish a theoretical foundation for those in charge of digital transformation processes, enabling them to recognize potential and often underestimated contributions that can help foster the implementation of new ways of working. [5] [3] Several studies have been conducted to explore the dynamics of digital transformation within a corporate environment. [18] [4] [12] [13] In the case study under analysis, Amadori is considered a leading company in the agrifood sector, and its digital transformation process is perceived as a priority. The evolution of technological trends and advancements in best practices related to new digital methods of interacting with customers (whether business-to-business or business-to-consumer) and within the organization (such as software solutions used for managing logistics, B2B contact lead generation, workforce management, etc.) led Amadori to establish a digital office more than ten years ago with the aim of smoothing the transition. The digital office is responsible for understanding the desires, needs, and requirements of business units and for selecting the appropriate software solutions for each unit's use case. To achieve this, the digital office conducts a scouting process for possible software solutions available on the market, and meetings are held with third-party vendors to determine which software solution to implement within the company. Factors such as cost-benefit analysis, employee learning curves, and the rigidity of new software solutions related to how adaptable they are to be connected with other applications, are considered when deciding which software to adopt.

4.2 Digital transformation strategy

Many organizations are currently navigating the transition to digital workplaces, with new roles emerging as conductors of change management processes [1]. While digital transformation brings innovation and updated technologies that create new user experiences and workflows, it also presents

critical factors that must be understood to successfully navigate this wave of innovation and maintain competitiveness in the market. [1] As highlighted in the case study, establishing a dedicated unit within the business area to understand the needs of the company from both internal (employees) and external (customers) perspectives is a powerful strategy. Internally, employees learn new tools, enhancing their digital competencies and providing efficient methods to better organize intra- and inter-departmental work. [12] [3] Externally, customers engage with new digital touchpoints, leading to increased satisfaction. To remain competitive, organizations must focus not only on the quality and diversification of products or services but also on finding new ways to enhance efficiency for employees and understanding customer needs. [5] Today, data and the technologies used to manage it represent crucial resources for addressing these two imperative goals. [3] Factors that facilitate digital transformation must be leveraged effectively to prepare for dynamic customer needs and evolving employee workflows.

4.2.1 Definition of digital transformation

Based on the work conducted by Kim et al. digital transformation strategy refers to how a company adapts to the rapidly changing management environment driven by technologies such as cloud computing, big data, artificial intelligence, and the Internet of Things (IoT) [3]. According to Heinze et al., digital transformation involves transitioning specific sections of a company—such as operations, products, business models, and organizational structures—from traditional methods to digitalized operations. This transition equips employees with the necessary tools and knowledge to adapt their work in line with emerging technologies. [53] Leveraging these technologies enables organizations to stay updated and make quality decisions based on data-driven insights. It also allows for rapid responses to new market needs, effective monitoring across operational areas, and the use of advanced software for predictive maintenance and data analysis. However, as noted by Kim et al., maintaining a stable competitive advantage is increasingly challenging due to the swift evolution of technology. [3] This challenge stems from the high risks associated with investments that may quickly become obsolete and the complexities involved in transitioning to new digital practices.

4.2.2 Digitalization in organization

Today, several technologies are based on the latest advancements in the IT market, such as artificial intelligence, cloud platforms, big data analytics, cybersecurity, and business intelligence platforms. [3] In terms of the operation of each technology, many areas are impacted, and employees must deal with these technologies to keep up with the evolution of new ways of working. As stated in a study conducted by McKinsey "more than eight in ten respondents say their organizations

have undertaken such efforts in the past five years."[1] The study investigated responses from companies undergoing digital transformation processes, and several critical and successful factors emerged. [1] First, five categories make digital transformation more likely to succeed: leadership, capability building, empowerment of workers, upgrading tools, and communication.[1] The theme of leadership is a constant theme in the academic literature. [1] [12] [25] [18] Many researchers agree that leadership style influences digital transformation processes. [12] [1] [25] Regarding the theme of empowering workers, many researchers, specifically concerning the design and construction of digital workplaces, stress how user-centricity is fundamental to successfully creating a digital workplace environment where knowledge sharing and interactivity are strong pillars, connecting to the themes of communication and upgrading tools. [6] [7] [22] With respect to the user-centric view of software design, several methodologies are adopted to actively engage end users during proper software configuration: design thinking, lean methods, service design processes, and agile methodology are foundational theories that promote effective user participation and involvement in driving digital transformation. [7] However, based on the survey conducted by McKinsey, success rates vary by company size; the larger the company size, the more difficult it is to implement successful digital transformation practices. [1] [2] First, what changes during digital transformation processes? "Organizations tend to look inward when making such changes [...] the most commonly cited objective for digital transformation is digitizing the organization's operating model."[1] "Their recent change efforts involved either multiple functions or business units or the whole enterprise."[1] Among many other types of technologies, the top three types currently used by organizations as stated by McKinsey are traditional web technologies, cloud-based services, and mobile internet technologies.[1] Currently, organizations that have already succeeded in this transition are willing to implement more sophisticated technologies such as Artificial Intelligence, the Internet of Things, and neural machine learning techniques.[1]

Key factors that contribute to an optimal transition are highlighted in digital self-service technologies implemented for employees and/or business partners, digital tools designed to make information more accessible across organizations, and individuals engaged in key roles who ensure collaboration between units on transformation initiatives.[1] These individuals in key roles are called "integrators," who translate and integrate new digital methods and processes into existing ways of working.[1] "Two primary ways in which companies with successful transformations empower employees to embrace these changes are [...] reinforcing new behaviors and ways of working and giving employees a say in where digitization could and should be adopted."[1] Collaboration within the company significantly impacts new modes of work. As stated by McKinsey, the top three structural changes reported for successful digital transformation are: implementing digital tools to facilitate the analysis of complex information, adapting business processes to enable rapid prototyping and testing with customers, and creating a network of cross-functional teams with

end-to-end accountability.[1] Communication and collaboration are, therefore, strategic keys to leveraging and improving the use of new technologies available on the market. Regarding future objectives, a company might pursue to stay aligned with new innovative technologies are "to develop clear workforce strategies to help determine the digital skills and capabilities that they currently have—and will need—to meet their future goals."[1] From this study, several keywords emerged: the role of leaders and individuals within an organization in creating integrators of transformative initiatives, a bottom-up approach to delivering these transformative initiatives across business units, and coordination between leaders and integrators in measuring the impact of these newly implemented processes.[1]

4.2.3 Digital transformation in industry

First of all, what is the definition of industry? Porter's definition of industry states that "it is a group of companies producing products that are close substitutes for each other," [54] while DiMaggio and Powell state that "those organizations that, in aggregate, constitute a recognized area of institutional life: key suppliers, resources and product customers, regulatory agencies, and other organizations that produce similar services and products."[55] In the industry in which the company operates, behaviors toward digital transformation initiatives are dramatically impacted. [54] [2] [4] Amadori works in the agrifood industry, characterized by intense competition despite the primary role the company holds in the market, with a market share of approximately 30 percent. [56] Nevertheless, digital solutions that encompass different user experiences to engage with the company and facilitate dialogue enhance its value. [56] Recently, Amadori developed several digital initiatives aimed not only at improving user experience through its website and immersive reality but also at enhancing trade by improving knowledge sharing and communication among branches across the country. [56] The characteristics of the agrifood industry, where many factors are important, such as innovative technologies applied in the food processing sector, underscore the relevance of digital initiatives undertaken to be the first mover in the industry. Another characteristic of this sector is the number of farm workers comprising Amadori's workforce. This type of employees is not often exposed to new digital technologies. For this reason, while a few large areas of the company may not have employees exposed every day to new digital technologies, many smaller areas have employees who are frequently exposed to new types of software. [57] In this case, another aspect to consider is how to coordinate so many small areas (in comparison to farm workers) while providing accurate information through effective communication. Often, achieving effective communication is challenging; in fact, the digital workplaces used by Amadori are numerous and characterized by the specific use cases of each area. This raises concerns related to managing different software solutions, data integration, data migration, and learning curves if one of the software solutions is

discontinued. When discussing other types of industries, digitalization is perceived from a different perspective. [2] [4] Studying the variance between one industry and another could help highlight what is missing and what could be leveraged in the sector where your company operates, learning from critical and successful factors from other use cases. [2] [4] As Agarwal et al. stated, "not all industries can undertake digital transformation effectively. The architecture, engineering, and construction industry is claimed to considerably lag behind other industries in the uptake of digital technologies."[58] Chatterjee et al. argued that "firms in very dynamic industries whose business processes and product/service offerings are highly digitizable are likely to engage in a seemingly continuous stream of IT deployments." [59] In this context, a relevant factor influencing innovation comes from the interaction between four key actors in the architecture, engineering and construction (AEC) industry: architects, clients, contractors, and consultants. In specific use cases developed by Linderoth et al. they studied the adoption of a software solution used to design project prototypes. [19] [18]

In the case of the building and construction industry, the relationships between key actors are characterized by "short-term market-based interactions," as stated by Gann. [60] "It is driven by the lowest price tender policy; a focus on action and short-term gains in operations" [19] [18], which results in actors optimizing their own processes instead of the construction process as a whole, as stated by Love et al [61]. Due to the fact that this industry is characterized by short-term market-based interactions driven by the lowest price tender policy, the drivers for installing new software and digital solutions are diminished due to the high initial cost of installation and the learning curve required to adopt a solution that might not be suited for the actors involved. [4] Innovation in this case has to be fast and visible. [4] The industries leading the way in digital transformation practices were electronics, high-tech, and automotive [2]; meanwhile, in industries such as chemicals and building materials, only a small share of companies embarked on the transition. [2] In the logistics industry, there is another behavior where emerging companies are more willing to pursue digital transformation practices compared to more stable companies [2].

4.2.4 Drivers and factors of digital transformation

An organization is willing to undertake digital transformation processes based on specific drivers that could arise both internally and externally to the company. [5] [3] Currently, considering these drivers as a levels to gain a competitive advantage is of dramatic importance due to the rapid evolution of technologies that cover many aspects of a business. A study conducted by Verina et al analyzed how digital transformation is perceived and which are the most important factors and drivers regading this change management practice in organization. [5] The categories that represent the most important factors that influence digital transformation are: technologies, management/processes and people

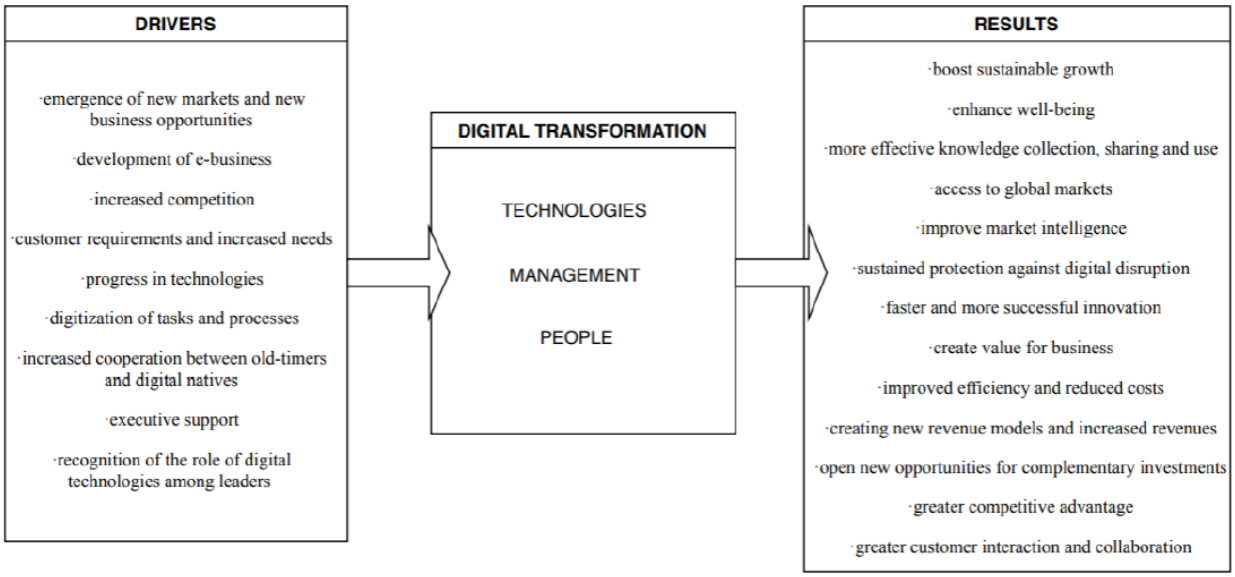

Figure 4.1: Conceptual model of digital transformation developed by Verina et al [5]

[5] meanwhile a list of drivers was extracted from the paper review made by the authors that act as input to the factors. [5] The figure 4.1 shows what are the drivers and the results these factors have regarding digital transformation.

The emergence of new markets and new business opportunities using new technologies to access to global markets, create new value for businesses. [5] [1] [3] Increased cooperation between old-timers and digital natives using management and people to boost sustainable growth, enhance well-being and be more effective knowledge collection, sharing and use. [5] [12] Digitalization of tasks and processes through technologies and people to improve market intelligence, to be faster and more successful innovation, improved efficiency and reduced costs and greater competitive advantage. [5] [1]

For what concern the perceived importance of factors affecting digital transformation processes, it was discovered that the elements that were highly rated as most important to pursue in organization are [5]: Company strategy: well-established digital trasformation programme that set specific goals and specific results to reach in a considerable amount of time, aligning resources and people. [5] Organizational culture: promoting a culture of open innovation through webinars, digital resources and open dialogue to understand the needs of employees and the organization as a whole. [5] Self-motivation of employees: readiness to accept changes, encouraging people with the motivation they need to embark on digitalization through upgrade of skills and upgrade of tools. [5]

Meanwhile, the element that was perceived as less important is the financial situation in a company. [5]

Kim et al. mapped the factors that contribute to the reinforcement of digital transformation,

which emphasizes dynamic capabilities through integrated access, coordination, learning, and selection capabilities within an organization's environment and resources. [3]

Factors	Description
Subject • CEO • Core Talent • Technical Development Organization • Business Strategy and Organization	A factor affecting a firm's strategy establishment and implementation, organizational structure design and composition
Environment • Compliance and Regulation • Industry Competition • Market Digitization • Social Responsability	An industrial structure, customer and market changes, competition environment and governmental and social constrains
Resource • Technology • Quality Big Data • Data Related Infrastructure • Capital and Investment	Tangible and intangible resources and a physical factor that includes corporate culture existing in the combined form of resources
Mechanism • Coordination • Learning • Selection • Change Supervision	Factor affecting management strategies and activities through organic interactions between subject, environment and resource

Factors strengthening digital transformation based on the study conducted by Kim et al. [3]

What Kim et al. did was to use the analytic hierarchy process that is is a multi-criteria decision-making technique that helps individuals and organizations make complex decisions. It involves breaking down a complex problem into a hierarchy of elements, comparing these elements pairwise, and assigning weights to represent their relative importance. The final decision is based on the weighted sum of the elements. [62] In the study made by Kim et al, AHP was used to analyze the priority influence of decision-making factors for planning, resource distribution, and prediction in the context of digital transformation processes to identify which factors hold greater priority in driving the transition. [3] This approach draws conclusions about the relative importance of factors affecting the transition based on evaluators' knowledge gathered through a survey. [3] In their analysis, Kim et al. discovered that the importance of the subject was highest, followed by resources, mechanisms, and environmental factors. [3] Specifically, the CEO demonstrated the highest importance, followed by core talent, technical development organization, business development organization, high-quality data, and selection capability. [3] To summarize, their conclusions indicate that internal factors such as subjects, resources, and mechanisms are significantly more important than external factors like the environment in driving digital transformation strategies. [3] Additionally, they found that factors influencing strategic activities can vary depending on countries and organizational environments; their studies primarily focus on AI-based technologies implemented during digital transformation processes. [3]

From a study conducted on the influencing factors of corporate digital transformation in Chinese companies, Zhao et al. showed that companies from three main sectors—private, state-owned, and foreign—have two types of drivers toward digitalization that can be internal or external to the company. [2] Internal drivers include the life cycle of the enterprise, the financial situation, and the organizational situation of the enterprise, with a specific focus on improving the process of information sharing between departments. [2] Meanwhile, external drivers include market competition, push-back mechanisms from clients, and the leading role of technological development, with a specific focus on the deployment of next-generation shared technologies. [2] The companies under analysis exhibited these common features: companies with higher gearing, overhead, and accounts receivable ratios showed a stronger inclination toward digital transformation. [2] That is due that digital transformation improve optimised asset allocation, reducing gearing ratios and enhancing asset utilisation efficiency. [2] The main driving force is related to the pressure to enhance financial stability and to reduce dependency on borrowed capital. [2] From the perspective of account receivable, digital transformation can help optimise account receivable management, accelerate the speed of capital turnover, reduce the risk of bad debts and improve liquidity and solvency. [2] Companies with high overhead ratios pursue digital transformation to streamline

operations and reduce costs. [2] Whereas companies in monopolistic industries and those at the inception stage of their life cycle showed less propensity for digital transformation. [2] This cautiousness is attributed to the potential risks of disrupting established processes and the high investments required for digital transformation. The study was conducted from 2007 to 2021. [2] To summarize their findings, Zhao et al. studied the influence of these independent variables on the extent of a company's digital transformation:

- Enterprise size: The size of an enterprise is proportional to its degree of digital transformation. [2]
- Capital structure: The higher the indebtedness, the more willing the company is to undergo digital transformation. [2]
- Percentage of accounts receivable: The higher the ratio, the more willing the company is to undergo digital transformation. [2]
- Management overhead ratio: The higher the expense ratio, the more willing the company is to undergo digital transformation. [2]
- Profitability (ROA): There is no significant effect on digital transformation. [2]
- Revenue share of overseas business: Companies with a high percentage of overseas revenue have a lower willingness to engage in digital transformation. [2]
- Shareholding structure: The more concentrated the shareholding structure, the lower the willingness of firms to transform digitally. [2]
- Ownership: State-owned companies have a lower willingness to undertake digital transformation compared to private companies. [2]
- Enterprise life cycle: Companies in the growth and maturity stages of their life cycle have a stronger willingness to engage in digital transformation. [2]
- Business age: The earlier a company is established, the more experienced it is in operation and the more willing it is to undergo digital transformation. [2]
- Industry competition: The higher the competition in a market, the more willing the company is to undergo digital transformation. [2]

In cases of high gearing, this does not apply to state-owned companies as they can receive financial support from financial institutions; meanwhile, for private companies, it is more difficult to obtain financing. [2] To reduce costs and minimize debt expenses, they are more willing to pursue digital

transformation. [2] With respect to profitability, state-owned companies view digital transformation as a way to improve their success; meanwhile, for private companies, it is seen as a way to enhance their performance. [2] State-owned companies tend to be more cautious and adopt a risk-averse approach compared to private companies. [2]

4.3 Consideration

From the identified studies in academic and organizational settings, digital workplace tools are implemented through a dedicated plan known as digital transformation. This process is managed by two key business areas: ICT and Human Resources. It involves change management processes where innovation and updated technologies are explored and implemented to enhance workflows and provide innovative user experiences. These procedures are advocated from two perspectives: internal (focused on change management within the organization, where employees are the main actors improving their digital competencies with efficient methods to better organize intra- and inter-departmental work) and external (focused on creating new digital touchpoints and services that allow customers to connect with the company, leading to increased satisfaction). Data is a fundamental resource in managing digital transformation processes and can be derived from both internal (user requirements) and external (customer data) perspectives. Several technologies are key components of this transition, including big data analytics, cloud platforms, cybersecurity, and artificial intelligence. The changes during digital transformation processes primarily occur within the organization, particularly in operating models that involve multiple functions or business units across the enterprise.

4.3.1 Factors driving digitalization

The top three technologies used by organizations are traditional web technologies, cloud-based services, and mobile internet technologies. Organizations that have successfully transitioned are more willing to implement artificial intelligence, the Internet of Things (IoT), and neural machine learning techniques. Key factors contributing to an optimal transition include digital self-service technologies for employees and/or business partners, digital tools that make information more accessible across organizations, and individuals engaged in key roles to ensure collaboration between units. These individuals are referred to as integrators who translate and integrate new digital methods and processes into existing ones. A strategy to facilitate a smooth transition is empowering employees by reinforcing new behaviors and giving them a voice in where digitization could and should be adopted. The top three structural changes include implementing digital tools to facilitate the analysis of complex information, adapting business processes to enable rapid prototyping

and testing with customers, and creating a network of cross-functional teams with end-to-end accountability. Five categories contribute to successful digital transformation: leadership, capability building, employee empowerment, upgrading tools, and communication. Various methodologies are applied to design this process, such as design thinking, lean methods, service design processes, and agile methodologies to promote user participation during software configuration. A study conducted on corporate digital transformation in Chinese companies across private, state-owned, and foreign sectors identified two drivers toward digitalization: internal drivers, including the life cycle of the enterprise, financial status, and organizational structure (with a focus on improving information sharing between departments), and external drivers, including market competition, client push-back mechanisms, and the deployment of next-generation shared technologies. The variables influencing digital transformation include: Enterprise size, capital structure, accounts receviables, revenue share of overseas business, shareholding structure, business age and industry competition. Based on the SERM model, four crucial factors have been identified for implementing the transition: Subjects, including CEOs and developing core talents from both technical and business strategy perspectives. Environment, Including compliance dynamics, industry competition, market digitization, and social responsibility. Resources, such as technologies, big data quality, data-related infrastructure, capital, and investment. However, these factors can vary depending on countries and organizational contexts. Additional drivers influencing digital transformation include: The emergence of new markets using new technologies to access global markets, the increased cooperation between experienced employees ("old-timers") and digital natives to boost sustainable growth and digitalization of tasks through technology to improve market intelligence. From within organizations, perceived factors influencing positive digital transformation include: A well-established digital transformation program that sets specific goals aligned with resources and promoting open innovation through webinars and dialogue to understand employee needs and readiness to accept change by encouraging skill upgrades. High risks related to digital transformation practices include investments that may quickly become obsolete along with complexities involved in transitioning to new practices.

4.3.2 Industries leading digitalization

Academic literature shows that industries leading digital transformation include electronics, high-tech sectors, automotive and manufacturing. In contrast, industries like chemicals and building materials have seen only a small share of companies embark on this transition. In logistics, emerging companies are more willing to pursue digitalization compared to stable firms. Companies in highly dynamic industries whose processes are easily digitizable tend to engage in continuous streams of digital transformation. However, industries characterized by short-term market interactions may prefer optimizing existing processes over investing in long-term collaborative efforts due to high

initial costs associated with establishing new practices.

5 Technology acceptance model and leadership style

5.1 Technology acceptance model

The thesis aims to measure the willingness of employees to be ambassadors of digital transformation practices, specifically in leading the adoption of a new digital workplace tool. To achieve this, we decided to adopt the technology acceptance model theorized by Fred D. Davis in 1989 [10], which is based on two constructs: perceived usefulness and perceived ease of use, "which are hypothesized to be fundamental determinants of user acceptance."[10] By studying these two variables, decision-makers can evaluate the adoption of a specific technology.

The hypothesis under consideration are the follow ones:

- There is a significant relationship between DTC and PU, PEOU, and IU. Understanding whether the perception of digital skills is correlated with perceived usefulness, perceived ease of use, and intention to use can provide valuable insights for companies. In particular, this correlation could highlight the importance of improving employees' digital skills through training programs, thereby increasing the level of technology acceptance for new company software.

- There is a significant relationship between DTC and IU when controlling for PU and PEOU. Building on the first hypothesis, a possible positive correlation—translated into a cause-and-effect relationship—can confirm and support the first hypothesis.

- There is a significant difference in IU across different age groups. Understanding whether age is a relevant factor influencing the intention to use a technology may reveal that employees' age is not a barrier to digitalization within the organization.

Usually, TAM methodology starts with a pilot study involving a niche group of employees to develop, in a positive case, a smoother adoption of the technology for the entire company. This validated test drive is based on the notion that "better measures for predicting and explaining system use would have great practical value, both for vendors who would like to assess user demand for new design ideas and for information systems managers within user organizations who would like

to evaluate these vendor offerings."[10] The practical implication lies in the value that software provides to the company. Thus, the questions arise: how can we know if a software solution is appropriate for our use case? What if employees decide to accept the technology but find it challenging to implement and use due to varying learning curves? Can we estimate how much effort is needed to adopt a new software solution? In practice, the technology acceptance model (hereafter referred to as TAM) studies the following question: "What causes people to accept or reject information technology?".[10] "People tend to use or not use an application based on their belief that it will help them perform their job better. We refer to this first variable as perceived usefulness. Second, even if potential users believe that a given application is useful, they may simultaneously believe that the system is too hard to use and that the performance benefits of usage are outweighed by the effort required to use the application. In addition to usefulness, usage is theorized to be influenced by perceived ease of use." [10]The two basic constructs under analysis are: perceived usefulness, defined as "the degree to which a person believes that using a particular system would enhance his or her job performance,"[10] and perceived ease of use, defined as "the degree to which a person believes that using a particular system would be free of effort."[10]

The decision to study individuals' perceptions, which are subjective measures, rather than actual usage, which is an objective measure, is based on Davis's discovery that research on human behavior and attitudes indicates people tend to follow ideas based on their perceptions of those ideas.[10] Specifically, if the perception of an idea is negative, individuals may only adhere to it for a short period. In the context of the Technology Acceptance Model (TAM), if a new technology (or idea) is perceived as useful and easy to use, its adoption is likely to continue. Davis also discovered that perceived ease of use is not always positively correlated with technology usage; however, perceived usefulness consistently is. [10] This means that a technology may be viewed as difficult to use, but if individuals believe it improves their job performance, they will use it regardless of the learning curve required. Davis's initial Technology Acceptance Model (TAM) consisted of 10 items for each construct. However, after applying it to empirical case studies, he decided to remove 4 items from each construct to simplify the model and make it easier for individuals to complete.[10] Over the years, several variants of TAM have been developed to enhance its explanatory power and applicability across different contexts. TAM2 was proposed by Venkatesh and Davis in 2000 to address limitations of the original TAM [14]. This model incorporates additional factors such as social influence (subjective norms) and cognitive instrumental processes (job relevance and result demonstrability) to better explain perceived usefulness and usage intentions. TAM2 has shown improved predictive capabilities regarding technology acceptance, accounting for a significant portion of variance in user behavior.[14] TAM3, developed by Venkatesh and Bala in 2008, extends the model by integrating additional antecedents that influence perceived ease of use and perceived usefulness.[15] This version emphasizes the role of individual differences, including experience

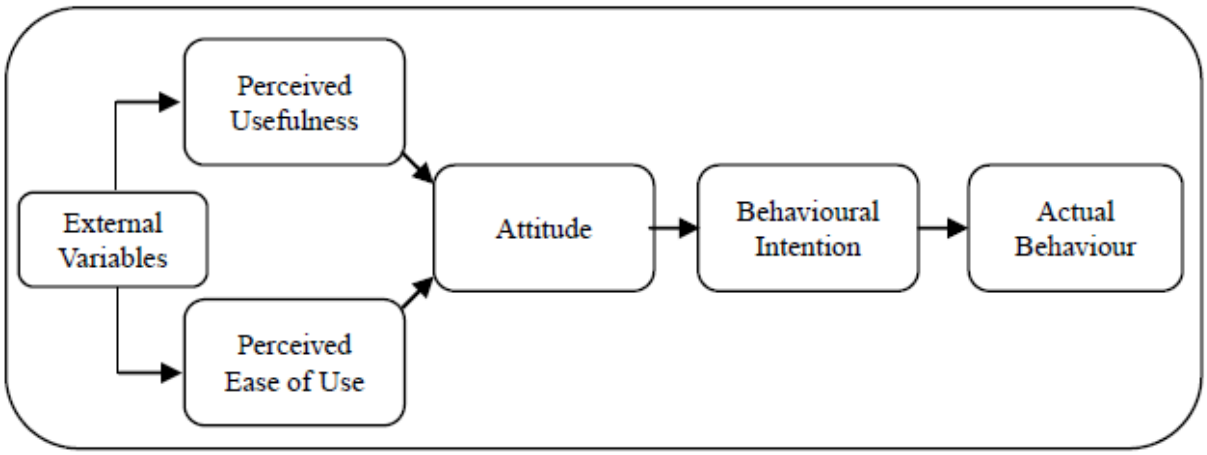

Figure 5.1: Technology acceptance model, Davis et al 1989

and self-efficacy, and how these factors interact with the core constructs of TAM. TAM3 provides a more comprehensive framework for understanding technology acceptance by detailing conditions under which acceptance is likely to occur.[15] The Unified Theory of Acceptance and Use of Technology (UTAUT), introduced by Venkatesh et al. in 2003, synthesizes elements from various technology acceptance models, including TAM.[11] It incorporates four key constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions. UTAUT has been widely adopted for its robust explanatory power across different technologies and user contexts.[11]

An extension of UTAUT, UTAUT2 was developed specifically to address consumer technology acceptance. It adds three new constructs: hedonic motivation, price value, and habit.[63]

The way in which a technology is perceived by employees, as stated by Aziz et al., could be influenced by the role leaders play in delivering this digital transformation process: "A strategic change management plan for effective technological implementation requires functional leadership that can strategize the change and communicate it effectively." [64]

5.2 Leadership in driving digitalization

Apart from studying the intention to use derived from the TAM, leadership style must be considered in order to develop reasoning about how to properly deliver a new software solution to the company. The theme of leadership has been discussed as one of the main drivers of the digital transformation process. For this reason, this theme is examined to gather insights about different leadership styles and how they influence the adoption of new technology by employees. In the Amadori' case under examination, effective leadership style derived especially from employees carries their needs for the areas they work in. In essence, they were the primary spokespersons for the requirements and

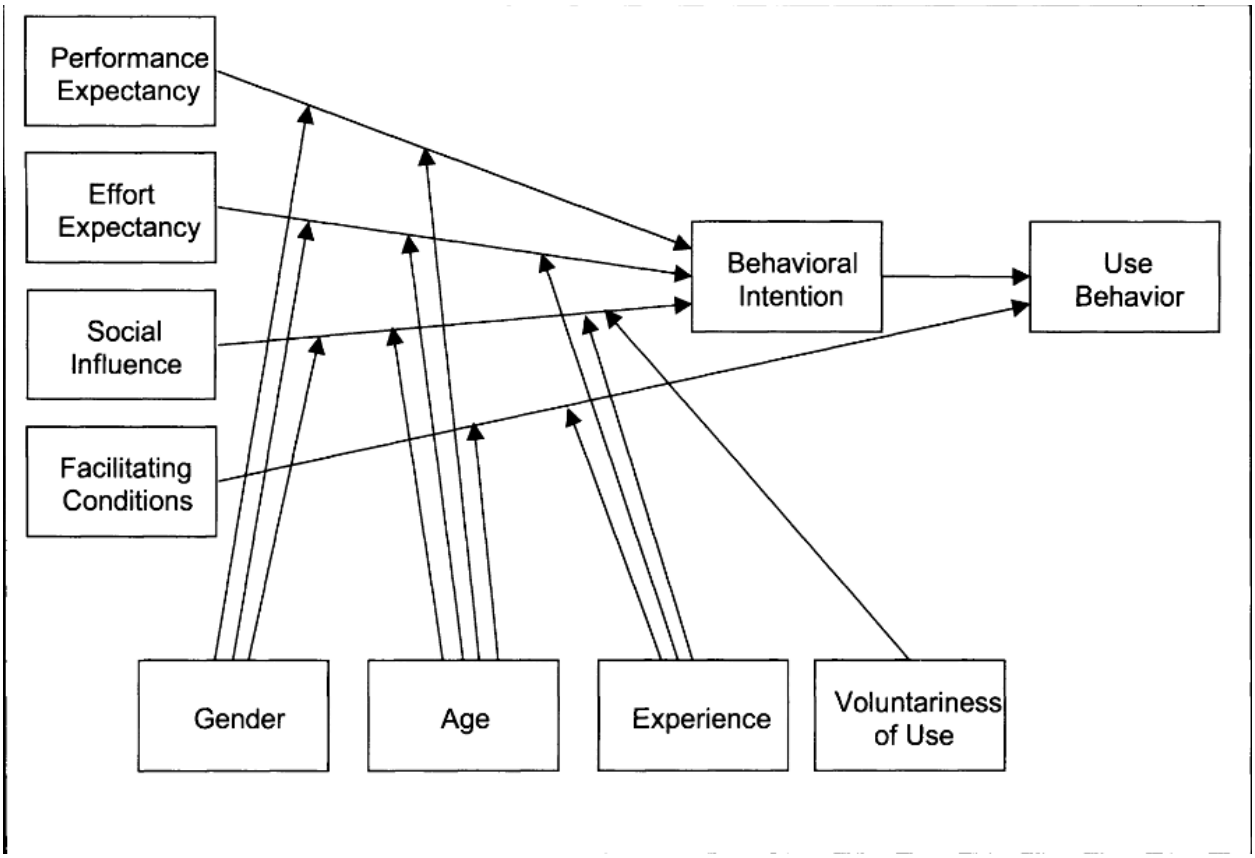

Figure 5.2: Unified Theory of Acceptance and Use of Technology model (UTAUT) Venkatesh et al. 2003 [11]

new modes of work they wanted to achieve using a new software solution. We found that they were willing to teach and communicate the new software solution to their colleagues, starting a process of becoming ambassadors for the new software solution. From the academic literature, several notion of leadership style have been encountered but two main direction define leadership style:

Transformational leadership is characterized by leaders who inspire and motivate their followers to achieve higher levels of performance and foster positive change within the organization. This style emphasizes the importance of creating a vision, encouraging innovation, and providing support to followers. They create an environment where employees feel empowered to learn and adapt, which enhances perceived usefulness and ease of use of new software solutions. [13]

Transactional leadership focuses on the exchanges between leaders and followers, where compliance is achieved through rewards and punishments. This style is effective for maintaining routine operations but may not inspire innovation or change. Transactional leaders may ensure compliance with new technologies but might not inspire the same level of enthusiasm or commitment from employees. [26]

Aziz et al. studied the influence transformational and transactional leadership styles have on employees when accepting new technology. [64] "The notion of positive leadership styles such as transformational, ethical, and charismatic leadership is assumed to be rooted in authentic leadership." [64] They found that "there is a significant relationship between authentic leadership style and perceived usefulness" and "there is a substantial relationship between authentic leadership style and perceived ease of use." [64] "Authentic leaders will first create positive beliefs and perceptions among their employees when any change takes place in the workplace." [64] Studying perceived usefulness and perceived ease of use makes it possible to derive the intention to use from the users. "When an application is not only useful but also easy to use for employees' day-to-day tasks, it will attract more users to continuously utilize the technology provided at work." [64] Based on the work made by Aziz et al results suggest a belief that charismatic leaders can effectively increase the likelihood of a new digital process being installed in a company. [64] This assumes a company where there is a leader capable of fostering employees' willingness to accept new technology. However, this might not be the case in most companies today. Critiques can arise from many points of view: first of all, considering the size of the company and the effective communication and knowledge sharing between departments. The larger the company size, the more difficult it is to communicate effectively without biases and misunderstandings. Furthermore, we cannot assume that an authentic leader has a complete understanding of employees' needs and technological skill levels that drive how technology is perceived. Considering the size of the company and the diversity of employees' needs regarding new technology, authentic leadership alone could encounter challenges in delivering the digital transformation process also because leadership might not know which are the use cases for which the new technology could be applied or how employees can take advantage of it.

5.2.1 Leadership style in multi-level factors framework

Through a paper review research made by the Trenerry et al. digital transformation processes could be viewed from three perspectives that influence the direction of the transition. [12] These three perspectives are centralized in a multi-level factors framework that enlist the positive drivers of each level regarding digital transformation. [12] These factors influence positively digital transformation among employees. [12] They recognized three levels: individual, group and organizational to understand drivers related to technology adoption in organizations:

- Individual level

  Technology adoption: a new disposition to use a technology could be ideally viewed as adopted voluntary or mandatory but whether the technology use follows one of the two, it was discovered that new technology and systems should be useful and easy to be use. It was discovered that technology adoption varied by gender, age and experience. Male employees were more comfortable operating new technology meanwhile female are more encouraging of technological changes. [65]. It was found that personal resources, such as resilience, and organizational resources, such as information and training, led to greater technology acceptance [66]

  Perceptions and attitudes toward technological change: it was discovered that employees who were engaged in making decisions related to the technology changes reacted more positively to the digital transformation changes than individuals with lower levels of involvement [67] and in another study [68] was discovered that employees' expectations of autonomy, competence, and connectedness in the digital workplace were linked to increased support for digital transformation.

  Skills and training: it was discovered that cognitive competencies such as willingness to learn and openness to change were valuable in digital competences as a prerequisite for digital capabilities [69]. It was discovered that adaptive and self-directed learning is more common in highly-skilled employees and that employees with non-routine tasks were more likely to partecipate in training than those doing routine tasks [70]. Trenerry et al suggest that less skilled employees need more encouragement and support to upskill [12]

  Workplace resilience and adaptability: studies shows that the presence of social support, feedback, sharing of responsabilities and work tasks are related to resilience in employees that increase positive attitudes towards digital transformation meanwhile adaptability helps worker perform better at work

  Work-related well-being: it was discovered that when implementing digital technologies, stress can result in a phenomenom called technostress, stress perceived due to the inability

to deal with use of new technology [71]. it is important to compensate the impact of new technologies on the workforce with the right support and especially is important to understand the digital skills of the users in order to decide the tool that fits the user need and user skills [12]

- Group level

  Team communication and collaboration: it was discovered that enhancing virtuality of communication helps to drive improved collaborative work-practices linked to efficient knowledge sharing and information flow, precise task coordination and transparency of work processes [72] [73] [74] [75]

  Workplace relationships and team identification: it was discovered that the persistence of an integrated workflow plays a crucial role in creating social capital among team members. [12]

- Organizational level

  Leadership: there is a positive relationship between effective leadership style and digital transformation. [12] From the literature, several leadership styles has been tested to provide an overview of characteristics each leadership style brings to the successfully implementation of a new digital process. The five main skills that characterize effective leadership in digital era are: communicating through digital media, high-speed decision-making, managing disruptive change, managing connectivity, and the renaissance of technical skills. [76]

  Human resources: it was discovered that HR departments have leading role in driving digital transformation managing allocation of resources, supporting workplace learning and development, and facilitating organizational change in the context of new technology [77] [78] [79]. From the literature, two divergent options have been considered from HR perspective when dealing with digital transformation: training and/or hiring digital skilled employees or outsourcing hard-to-find skills and competencies. [80].

  Organizational culture/climate: It was discovered that two different organizational structure have been extracted when dealing with digital transformation processes: traditional command and control structure, that reinforce work-group silos and make it much harder for employees to respond rapidly to customer demands and needs [81], and bottom-up approach such as employee and representative engagement across different organizational departments helped facilitate the change process [82]. Benefits have been analyzed when collaborative technologies, such as social media platforms were implemented in companies [81] [82] meanwhile key challenges are related to employee turnover, slow pace of change and leadership [82]

[12]. What Trenerry et al wanted to stressed out is that "high-quality supervisor-subordinate relationships and team members' exchange positively promote innovative work behaviors, while misalignment between new technologies and established team identities can lead to resistance" [12]. And that "most of the studies have mostly focused on executives and organizational leaders' perspectives rather than those of employees" [12].

5.3 Consideration

Analyzing user behaviors towards digital transformation practices requires considering validated models to facilitate a smooth transition during the implementation stage of a new technology. Several models have been developed based on the original Technology Acceptance Model (TAM) created by Davis in 1989. This model addresses the question: "What causes people to accept or reject information technology?" It is based on two key constructs that predict future intentions to use a software solution: Perceived Usefulness: This is defined as the degree to which a person believes that using a particular system will enhance their job performance. In essence, individuals tend to use or refrain from using an application based on their belief that it will help them perform their job better. Perceived Ease of Use: This refers to the degree to which a person believes that using a particular system will be free of effort. Even if potential users find an application useful, they may still perceive it as too difficult to use, leading them to conclude that the performance benefits do not outweigh the effort required for its use. Empirical case studies conducted by Davis indicate that perceived ease of use is not always positively correlated with technology usage, while perceived usefulness consistently is. This implies that under certain conditions, if a system is difficult to use but provides significant benefits for employees, they will still choose to use it despite the effort required. To enhance the explanatory power and applicability of the original model, several extensions have been developed. These include the TAM2 model incorporates additional factors influencing perceived ease of use and perceived usefulness. TAM3 integrates further antecedents, including individual differences such as experience and self-efficacy. UTAUT (Unified Theory of Acceptance and Use of Technology) incorporates key constructs such as performance expectancy, effort expectancy, social influence, and facilitating conditions. UTAUT2 is An extension of UTAUT that specifically addresses consumer technology acceptance by adding three new constructs: hedonic motivation, price value, and habit. These models collectively contribute to a deeper understanding of user acceptance and behaviors regarding digital transformation initiatives.

In this thesis, although the evolved versions of the TAM model would likely have provided more comprehensive insights, the decision to use the simpler, original version of TAM was driven by the need to keep the survey understandable and easy to complete, as well as the time constraints for analyzing the responses. Additionally, the company prioritized maintaining employee anonymity,

which led to the exclusion of certain constructs typically found in more advanced models. As a result, more complex models, such as UTAUT or models like TAM2 or TAM3, were not applied to this study.

5.3.1 Leadership style across organization

Based on academic research, leadership plays a pivotal role in driving successful digital transformation. Depending on the leadership style adopted, employees can perceive technology in different ways. Leadership is not just a top-down approach; it can also be a bottom-up approach where employees become ambassadors of digital transformation processes. The definition of leadership is multi-faceted and there are several points to consider when deciding which leadership style to adopt. A transformational style fosters enthusiasm and commitment among employees, while authentic and charismatic styles can create strong connections. It has been discovered that there is a significant relationship between authentic leadership and the perceived usefulness and ease of use of new technology.

5.3.2 Adoption of digital transformation practices

From the body of research, three perspectives influence digital transformation processes when considering the effect leadership style can have in driving successful technology acceptance among employees: At the individual level, technology adoption, whether voluntary or mandatory, influences how users perceive it. Adoption varies by gender, age, and experience; for example, males may feel more comfortable operating new technology, while females may be more encouraging of technological changes. Organizational resources such as information and training lead to greater technology acceptance. Employees engaged in deciding which technology to adopt react more positively to digital transformation changes than those with lower levels of involvement. Employees' expectations of autonomy, competence, and connectedness are key requisites in the digital workplace that show increased support for transition. Adaptive and self-directed learning is more common among highly skilled employees, so less skilled employees require more encouragement and support to upskill. Social support, feedback, and shared responsibilities are relevant factors that positively contribute to increased participation in digital transformation processes. At the group level, enhancing the virtuality of communication increases collaborative work practices. The persistence of an integrated workflow enhances social capital among team members. At the organizational level, the main skills a leader must possess to drive digitalization include communicating through digital media, making high-speed decisions, managing disruptive change, managing connectivity, and revitalizing technical skills. Human resources play a leading role in driving digital transformation by allocating resources, supporting workplace learning and development, and facilitating organizational

change related to new technology. There are two approaches human resources can take to deal with digital transformation: training or hiring digitally skilled employees or outsourcing hard-to-find skills and competencies.

5.3.3 Challenges in adopting digitalization

Despite these positive aspects, there are challenges associated with implementing digital transformation. There are two organizational structures when dealing with digital transformation processes: a command-and-control structure that reinforces work-group silos and makes it much harder for employees to respond rapidly to customer demands; and a bottom-up approach that engages employees across different areas, which facilitates the change process. Collaborative technologies such as social media platforms can improve this change process. Employee turnover, slow pace of change, and leadership style present significant challenges during digital transformation efforts. In implementing new technology, attitudes and perceptions are moderated by occupation, job role, gender, age, and technology type. High-quality supervisor-subordinate relationships and team members' exchanges positively promote innovative work behaviors; however, misalignment between new technologies and established team identities can lead to resistance. Additionally, most studies in academic research have primarily focused on executives' and organizational leaders' perspectives rather than those of employees.

5.3.4 Perception of new technology

In the use case under examination, the survey does not include questions directly related to leadership style, but rather addresses it indirectly through questions concerning digital transformation competences where, a bottom-up approach is preferred to study the way in which employees perceive a new technology and how can they benefit from leadership styles studied over the years, applied not only in the context of managers and top executives, but also at the individual and group level, where teams are the main driving force of the implementation of a new technology.

6 Case study

6.1 Introduction

The curricular internship pursued at Amadori, was based on implementation and coordination of the collaborative platform “Interacta”. This tool aims to substitute the old company intranet, changing the way in which the employees perceived the overall logic of the company’s communication and to enhance team organization and collaboration thanks to the user-friendly interface and customization of processes and features that permit users to share information, track processes of workflow and manage projects. The curricular internship lasted 270 hours full time, five days per week, in presence, in the main location of the company in Cesena. The area where I was assigned was IT and Digital Transformation, digital office. My company tutor was Enrico Nanni, digital specialist at Amadori, and I worked also with my colleague Alberto, digital specialist as well, IT section colleagues and several other areas of the company such as People and Organization, Trade marketing, Normal Trade, and Maintenance. My academic tutor and relator is professor Timothy O’Connell, entrepreneur and professor of entrepreneurship in the master’s degree in digital transformation management at university of Bologna and H-Farm, and my co-relator Professor Ferdinando Toscano, psychologist and professor of work and organizational psychology at university of Luigi Vanvitelli, Campania. As an intern, I had many roles in the implementation of the platform within the company. I performed analysis of the data from data marts of Interacta, listening to the areas to develop use cases and needs to properly configure the platform, designing processes in collaboration with the third-party vendor Dinova, to deliver a tailored process or a specific customization to the users, creation and preparation of manuals and workshop activities to introduce Interacta to the users, as well as coordinating together with my colleagues, the meeting with the functional areas to collect their needs and testing the software. Reference people from Dinova were helped us both for the part of collection of requirements of specific customization outside of the license bought by Amadori, and to promote the software to the whole Amadori through ad hoc webinars organized in collaboration with people and organization colleagues (that is referred to Human and resource area) that were in charge of promoting the platform as well, manage the communities dedicated to well-being of people inside Amadori, collecting first needs of each area to use the platform and to

propose suggestions on improving the user experience and to monitor how the platform is perceived.

6.2 Motivation

My motivation for choosing this project as my internship activity was driven by the type of challenge, the company, and the modality of the internship. The challenge involved improving collaboration within the company among various departments. During my first interview, I was informed that pursuing this project would mean working with different needs and diverse individuals. This dynamic approach, meeting many people, brainstorming, designing and testing the software, was an experience that made me aware of the complexity of communication within a company structured around hierarchical organization and coordination, depending on the purpose of the project undertaken and the goals to be achieved, where collaboration among multiple areas is essential. It was important to identify the key aspects of the software to deliver while reducing user experience complexity and clarifying the functionality we wanted to convey to users. Time is valuable, especially when dealing with technology, and not many people understand the processes behind the software we are working on. Although we aimed to provide more than one option to the functional areas, we consistently pushed for a final approach that favored the easiest and most comprehensible workflow for implementation into the software. This was crucial for users to easily understand how to use it and for us to manage potential modifications to the process after its implementation. In conclusion, my motivation linked to this type of challenge illustrates how to navigate digital transformation, not only from a technological perspective but especially from a subjective and human viewpoint, which I will elaborate on later in the conclusion and relevance of digital transformation section. As far as regard the company itself my reasoning behind deciding to embark on this project also relates to understanding a structured framework that can assist me in future work experiences in companies of similar sizes or different ones. Starting at a well-structured company allowed me to grasp the complexity of an environment where one must engage with multiple departments at each step of a project. Coordination and communication were fundamental not only for informing people about subsequent stages of the project but also for making them aware of their impact on overall digital transformation activities. This engagement helped people feel valued at every phase of the journey.

6.3 Amadori: introduction to the company

Founded in 1969 in San Vittore di Cesena (FC), Amadori is now one of the leaders in the Italian agri-food sector. This long-time poultry specialist is extending its product offerings to encompass the entire field of proteins: "white" (chicken and turkey), "pink" (pork), "yellow" (eggs) and "green"

(vegetables). The key figures for Amadori include 18 production plants, around 800 farms, 16 distribution centers, more than 2,500 products, more than 9,300 employees, and a market share in the poultry sector of 30 percent. As stated on their website, their mission is "to satisfy consumers' evolving tastes and food culture daily with the healthiest, most innovative, and tastiest protein-based foods, following an integrated supply chain approach while safeguarding the well-being of people, animals, and the environment." Their products range from free-range chicken that is reared outdoors without antibiotics or GMO feed; plant-based products targeting vegan and vegetarian consumers; to the Amadori organic line, roast meats, and many other offerings. Amadori is actively expanding its business focus beyond pre-prepared chicken and meat products to include vegetarian and organic options to target emerging markets consistently. This strategy has positioned Amadori as a leading company in food production with a prominent market position. Recently, the strategy has evolved to specifically address operational efficiency through acquisitions, aiming to expand its production line across different parts of Italy while enhancing internal resource valorization and increasing investments to reduce dependency on external factors and strengthen brand reputation. In the IT and digital transformation office, most resources are dedicated to software and data management. The digital office's role includes designing software implementations based on the needs of the areas that will use that software, managing websites, tracking analytics, coordinating with marketing, auditing digital content management, and assisting employees in using software for specific functions. This means that Amadori employs various software solutions for different needs. Each year, the digital office assesses which software is still in use or needs replacement. Economic aspects of software management are also considered; a trade-off between usability and long-term costs is evaluated to determine which software to maintain or discard. This has relevant implications for time spent on new software implementation, user training, and associated costs.

6.4 Interacta

Interacta is a software included in the set of tools referred to as digital workplace tool. It utilizes a web and smartphone application to digitize collaboration among people in various aspects of their daily work routines, such as sharing documents, designing products and services, communicating, and managing projects. Tools like Miro, Jira, the Microsoft Suite, Google Cloud, and many others can be compared with Interacta, although they are typically used in conjunction with it. Interacta, a software as a service solution, is well-known as a collaborative platform with a user-friendly interface that shapes user workflows to create an experience that lies between a social network and a business environment. This design makes the tool accessible to both skilled and unskilled employees regarding digital skills. This aspect is crucial, and my experience at Amadori illustrates why delivering digital transformation within a company today is not as straightforward as many

might expect. The team behind Interacta has thoughtfully considered how the software will be perceived by users. In my studies, I learned that software design must adhere to guidelines that encompass cybersecurity requirements, functionality, and ease of use. The latter must follow the KISS principle (Keep It Simple, Stupid), which emphasizes that software is for people, not for computers. From the academic literature, several design methods have been explored to establish a participatory methodology that combines dynamically changing requirements with user engagement techniques. Users have varying levels of familiarity with technology; therefore, it is essential to deliver software that is comprehensible and simple from the outset. For instance, in the case study involving the normal trade business area, it was fundamental to provide a solution that was straightforward for users to understand because we had individuals who were either unfamiliar with technology or lacked the time to learn a complicated tool. Ultimately, it is not only about precision and efficiency in communication but also about the time required to learn the software and address bugs, changes, and customizations. From the perspective of those administering it, software must not be overly complicated to allow for rapid responses to these issues. Describing the software features, Interacta comprises spaces. The ontology of this term includes containers for communities. A community serves as a deep-level container for a specific group of people where information is collected, organized, and shared. A space represents the first level of segmentation. For example, Amadori's space is dedicated to all employees without regard to their specific areas. However, multiple spaces can exist; this introduces another aspect of the definition of space: purpose. Spaces are designed based on their intended purpose. For instance, Amadori's space is used for general communication, news updates, and employee conventions. Another space called IT and digital transformation is specifically dedicated to personnel from this area, featuring specific communities focused on activities performed by sub-areas of the IT section. This flexibility allows for the creation of numerous spaces and communities to effectively map the entire structure of the company while isolating and aggregating communication. Communities are sub-containers within spaces. A community focuses on centralizing specific types of information. While a space has an overarching purpose, a community serves as the tool to achieve that purpose. Indeed, a community allows you to "interact" with your colleagues; it represents the digital workplace. What makes each community unique compared to others is the customization that can be applied based on an area's needs. I will elaborate on this later; however, I can introduce that this represents one of the main aspects of my internship activity where service design processes have been relevant for designing, testing, and iterating customizations created within the software for specific use cases.

Characteristics of the tool

Based on the information retrieved from Capterra Interacta has been rated 4.7 from the users meanwhile the ease of use is rated 4.3. Interacta is described as a comprehensive business platform

designed to enhance interaction and communication within organizations. It aims to streamline business processes across various domains, including operations, sales, production, and human resources. By fostering a more natural and efficient way for teams to collaborate, Interacta seeks to improve overall productivity and quality within the workplace. It is not possible to have a free version or to have a free trial of the software. It has received ratings from 15 people and all the ratings range from 4 to 5 stars based on the data gathered from Capterra [24]

Based on the information retrieved from the website of Interacta, the platform has user-friendly interface designed to be intuitive, allowing users to navigate with minimal training. This ease of use contributes to quick adoption among teams. Users have the ability to personalize various workspaces by selecting team members and creating thematic (spaces) or territorial subgroups (community), enhancing collaboration tailored to specific needs. Interacta structures information effectively, capitalizing on knowledge sharing to increase engagement and ensure that management maintains oversight of processes. The platform includes a repository feature that allows for organized storage and easy access to important documents and information. Interacta can be customized to fit various organizational functions, although some features may require additional development for specific needs. While the platform offers numerous functionalities out of the box, it also supports custom developments to meet unique organizational requirements. The design incorporates elements familiar from social media, making it easier for users to engage with the platform. [16]

Based on the reviews analyzed on the platform Capterra, users have reported significant enhancements in communication and collaboration within their organizations since adopting Interacta. It has become the main tool for sharing information among employees. The ability to customize workspaces and manage user groups has been highlighted as a strong point, allowing teams to work more effectively according to their specific contexts. Many users appreciate the intuitive interface that enables quick onboarding with minimal training requirements. This has led to a smooth transition into daily operations. Users have praised the sales and development teams for their guidance during implementation, ensuring that the platform is tailored to meet organizational needs. The platform has improved interdepartmental communication, leading to better coordination across different business units. Some users have suggested that while the tool is comprehensive, the interface could be updated to appear more modern and visually appealing. A common critique is that posts are not displayed in chronological order; newer comments can push older posts back into visibility, which can disrupt workflow. Actually this is no more a problem since it is possible to organize posts based on filters that users can manage or create by themselves depending on the requirements. Users noted the absence of integrated tools for data analysis and graph creation, which could enhance decision-making capabilities. Actually it is possible to enable Google Data studio to analyze datamarts from the platform using Looker, a business intelligence tool for data visualization. While flexibility is an advantage, some users have encountered limitations with

out-of-the-box functionalities that require custom development for specific applications. Learning to use the platform properly, it is possible to create alternative workflow or processes to handle certain use cases but still custom development may be necessary in some cases. It has been reported that the system is a bit slow loading on boot and login. [24]

Human resources	Sales and Marketing	General Management	Operations
• News, information and corporate communications • Corporate events • Culture and engagement • Recruiting and onboarding • Training • Wiki and Knowledge base • HR processes	• CRM and Funnel • Customer and prospect records • Product catalogs • Campaign and project management • Creative and content approval • Digital asset organization • Event management	• Commercial planning • Purchasing and supplier management • Legal and contract management • Budgeting • Member management • IT projects • Document management • Approval and signatures	• Work order management • Operational checklists • Maintenance management • Customer support • Ticketing • Process best practices • Quality and safety processes

Possible use cases of Interacta [16]

6.4.1 Flexibility of Interacta

Interacta is based on flexibility, adaptability, and interaction, three qualities that, in the case of digital transformation of most daily work activities, represent a tailored solution to overcome limitations derived from overly rigid settings. Apart from adapting the solution to the needs, flexibility allows designers to reshape the space or community dedicated to the workforce if the requirements change over time. Interaction is built on processes that are customizable, as we have seen in the use

cases under analysis. A process allows users to start an interaction from a communication that is served through a post that can be edited, commented on, removed, and expanded with various other information such as attachments, documents, files from a cloud repository, links, and even connections to other posts or communities.

Permissions are assigned through a role-based framework where roles define the actions users can take inside the tool. For instance, a dedicated group of users has the permission to publish communications, while another group of users can only read this communication (such as in the case of the community "Comunicazioni e attività commerciali," where the trade marketing group shares information about specific activities and the normal trade group reads this information but cannot publish other communications). Hence, user accounts are managed through groups.

6.5 Use cases

The internship was not focused on a specific role or activity to perform. Instead, the mode of operation was primarily driven by the type of tasks we were engaged in during these two months and the current state of the software. Initially, my main activity was to understand what the software could do and how it could be applied for users. After grasping the software's characteristics, we extracted data from it to establish an initial assessment of the platform at the start of my internship.

Next, we concentrated on learning how to use the platform by studying the existing spaces and communities, the digital content within them, and the administrative settings of the tool. This involved understanding how to manipulate the platform, add new users, create features, and respond promptly to users' needs. Eventually, we gained insights into Interacta by examining its usage within the IT and digital transformation and people and organization areas. We developed a mode of operation based on data analysis, software configuration, and implementation. Specifically, we extracted data to uncover insights, configured the software based on this data, and implemented the tested configurations. This process was repeated for all use cases addressed during the internship. This activity was justified by the need for a clear assessment of the current state of the software and the use cases under consideration. Using Python, Excel, and Looker, we analyzed the platform from three perspectives categorized as follows:

- 1. Initial Stage: When the internship started (September 9 2024).
- 2. Intermediate Stage: One month after the beginning of the internship (October 9 2024).
- 3. Final Stage: The last day of the internship activity on the project (October 29 2024).

The results were linked to user behavior within the platform, providing us with a reference point to improve the user experience of Interacta. The analysis began with extracting data from the platform,

Figure 6.1: First analysis: section related to the index of non access for each area of Amadori

specifically information about users and community behaviors. Initially, we extracted a CSV file from the web application. After inspecting, cleaning, and manipulating this data, we derived insights into how many users accessed Interacta (which had been used by Amadori since March 2023 as a pilot and was more fully implemented from March 2024) while segmenting users based on their types and originating areas. From this data, we identified who had not yet accessed Interacta, what type of users they were, and which areas they belonged to. Using Google Colab and Python, we created an API to retrieve this information and calculated an access index that indicates, for each area or group of users, their rate of access or non-access to the platform.

From the figure 6.1, which is part of the initial analysis conducted, it is clear which areas have the highest number of individuals who have not yet accessed the software. Based on these results, we can promote the use of the platform through targeted communication to these areas or conduct interviews to understand why individuals are not utilizing the platform. This approach can help increase the access index and decrease the non-access index. For example, if the access rate for the IT and digital transformation area is 90 percent, it indicates that only 10 percent of users have not accessed Interacta yet. The second and third analyses were performed by directly accessing the data marts of Interacta. My tutor, Enrico Nanni, requested Dinova to grant us access to the data behind the platform, allowing us to access all the data marts created for Amadori. BigQuery is the datawarehouse that manages these data marts, and using SQL language, we extracted information from the relevant data mart based on our needs. This provided us with a more detailed tool for data analysis. We analyzed user behaviors related to time spent on the platform, most-viewed

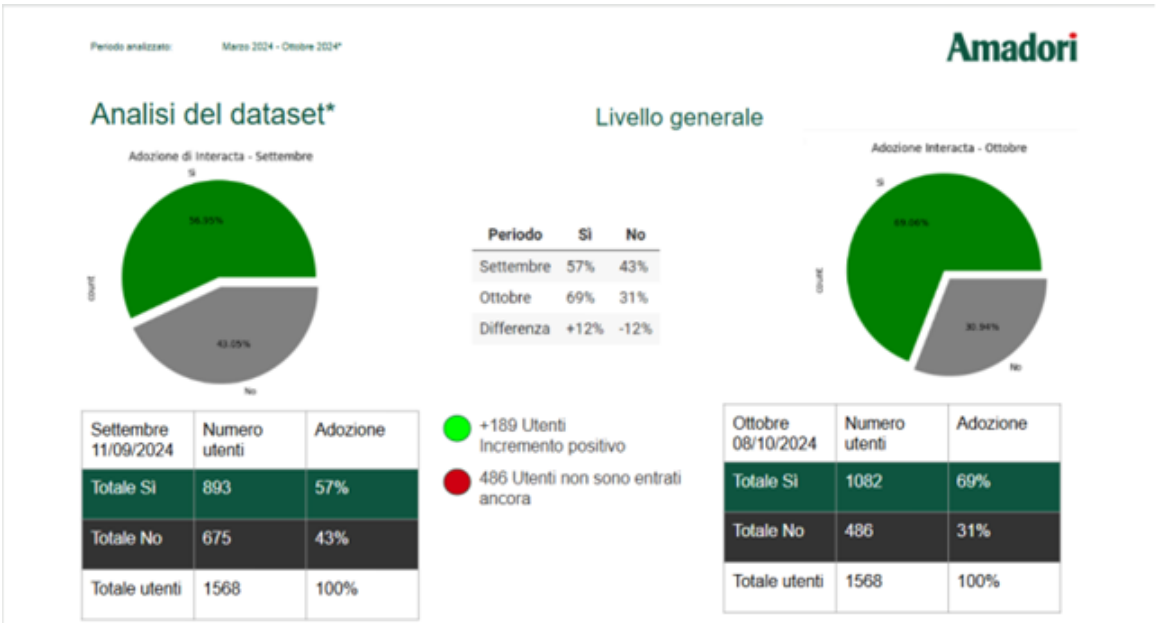

Figure 6.2: Second analysis: section related to the index of access for the totality of the user of Interacta

communities, and trends (increases or decreases in activity over time) or seasonality (repeated low or high peaks during approximately the same time range over a specified period). The second analysis also included variations in access from the beginning of september to the end of that month to understand how webinars and meetings with functional areas influenced access rates. This analysis involved answering several key questions:

- Did platform usage increase during the analysis period?
- At what times of day was the platform used most frequently?
- Is there a positive trend or seasonality in how people use the platform?
- Which communities were viewed the most?

From the figure 6.2, which is part of the second analysis, it is evident that there has been an increase in the number of users accessing Interacta. Although some users have not yet accessed the platform, we can observe a significant change over the course of one month, with a 12 percent increase in the access index. This index is calculated by dividing the number of users who accessed the platform by the total number of users during the period under analysis.

From the figure 6.3, which is part of the second analysis, it is possible to see the hours during which users prefer to use Interacta. As observed, users primarily connect to the platform in the early morning and during lunch. At 11 AM, there is a noticeable drop in usage, which could be attributed

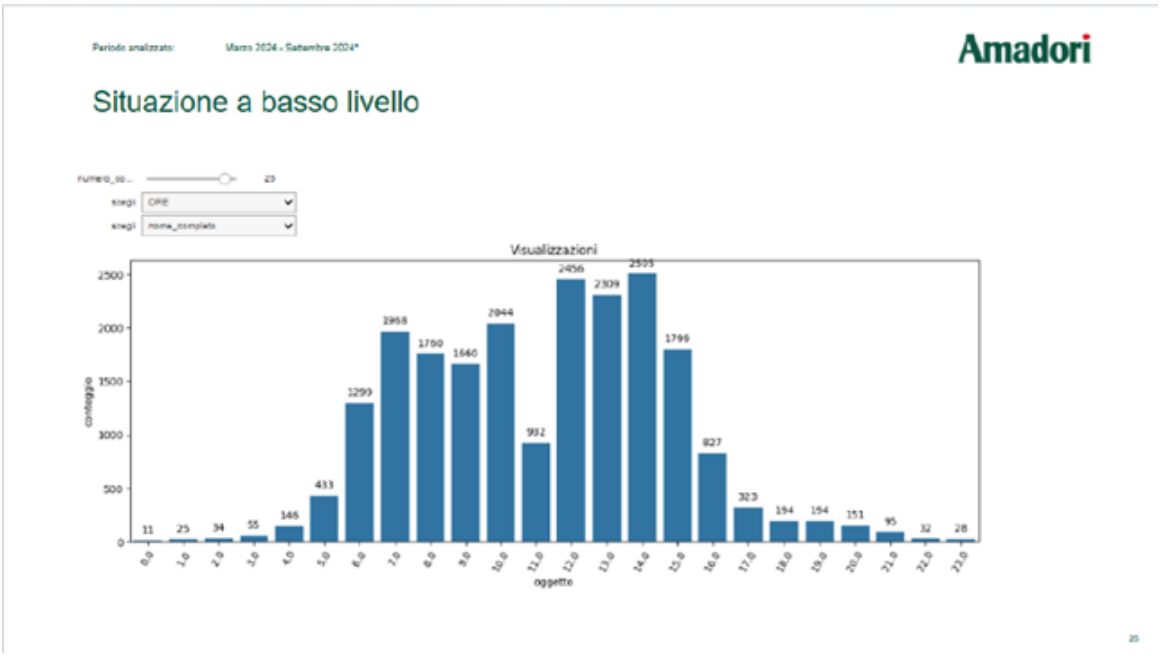

Figure 6.3: Second analysis: section related to the hours of the day in which users accessed Interacta

to various factors, such as job meetings. Similarly, from 4 PM onward, usage decreases drastically; this may be due to job meetings or the flexibility of working hours, as many people leave for home between 5:30 PM and 7:00 PM, leading them to focus on completing their work. The third analysis was useful for comparing the month of september to october. A time series analysis was performed, and the two lines representing the two months were plotted on the same graph to derive differences. This analysis provides insights into user behavior patterns and can inform strategies for enhancing engagement with Interacta.

From the figure 6.4, which is part of the third analysis, we can observe how the visualization in the specific space dedicated to the normal trade channel has changed during the internship period. This fluctuation is partially attributed to the promotion of the platform across all branches, the workshops organized, and the engagement with district chiefs to encourage their colleagues to use the platform. We analyzed the average variation in visualization, which is 91 percent for the community “Collaboration Filiale” and 86 percent for the community “Comunicazioni e Attività Commerciali.” These two communities exhibited different behaviors when analyzed individually. The “Collaboration Filiale” community is more interactive than “Comunicazioni e Attività Commerciali,” which is primarily used for broadcast communication rather than collaboration. In contrast, “Collaboration Filiale” serves as a more interactive and collaborative space because district chiefs need to communicate and coordinate with their colleagues to share information. Ultimately, most of the visualizations come from the “Collaboration Filiale” community. We have prepared reports and presentations to communicate these insights, which we hope will be beneficial for decision-makers

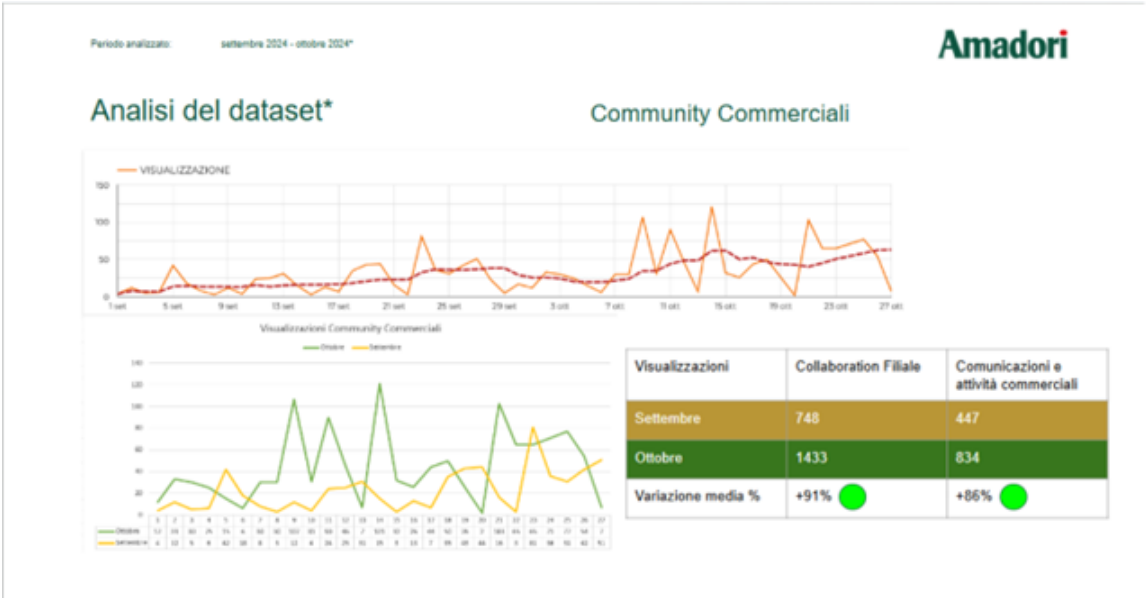

Figure 6.4: Third analysis: section related to the average variation of visualization considering the internship period of the space Community Commerciali

in the long run.

6.5.1 Service design process

The second activity involved selecting a methodology to map the needs of various areas and translate them into the software. This methodology naturally emerged during meetings and brainstorming sessions. Ultimately, we aligned our approach closely with the service design process. The reason for this alignment is that, due to the flexibility of the tool, each area can design its own space and community to achieve goals that may relate to various aspects of the company's workflow. For example, these workflows or goals could include a knowledge repository, manuals, documentation, project management, and assistance, among other potential uses. The primary reason Amadori decided to purchase a license for this product was to replace the old intranet. The previous intranet was static and lacked interactivity; it was primarily used to share company news and serve as a repository for web applications and services. Amadori sought a new intranet that would provide a more engaging, adaptable, and user-friendly workplace experience. Interacta met these requirements, and the service design process emerged as the approach used to adapt the software to meet user needs rather than the other way around. This method was suggested by my relator, professor Timothy O'Connell. I studied this framework during my courses in entrepreneurship and digital marketing, and I had prior experience with it during two programs abroad: a summer school at the University of Ingolstadt [83] in Germany and a crash course in qualitative and quantitative analysis at IdeaSquare at CERN [84]. The theme of my experience in Germany was bridging sustainability

and digital transformation to design a service aimed at mapping one of the sustainability goals through digitalization. To achieve this, we employed brainstorming sessions, interviews, and prototypes following the Design Thinking approach. This methodology places people at the center of the ideation process rather than focusing solely on solutions. The crash course in Switzerland approached speculative design to map solutions considering various future scenarios while also centering on people in the ideation process. The service design process we utilized was a blend of these two methodologies. We began with gathering requirements; then we considered users' mindsets during the configuration of the service, creating different prototypes based on our findings. Design Thinking encourages rapid prototyping so that clients can use it and provide feedback for improvements; similarly, we applied this principle within the service design methodology, which focuses more on services than products but follows an iterative process of testing, measuring, and refining prototypes. To provide context, the focus of the service design process is to start from the "problem," which corresponds to "requirements." We begin with one or more requirements; brainstorming sessions are then conducted with sketches and proposals. Once a proposal is defined (which could be a new community with features such as customized processes and specific fields for posts), testing is performed to derive improvements and assess usability. We aimed to create multiple proposals to give users choices between workflows. Feedback from users was gathered, and we iterated on our method until we identified the simplest solution for implementation. Finally, a meeting was organized to present the workflow and teach users how to utilize it effectively.

6.5.2 Areas under analysis

The cases we encountered during my internship came from the following business units: People and organization, IT and digital transformation, Normal trade, and Trade marketing.

People and organization: Business card

From the People and organization area, the requirement was to provide employees with a community where they could request digital business cards. HR needed to manage these requests in an organized manner rather than relying on emails, which lacked tracking capabilities regarding the status of each employee's request. We improved the existing prototype process that had been developed prior to my internship by refining it and adding more steps. This enhancement allowed requests to be put on hold, reopened, or commented on as needed.

As illustrated in Figure 6.6, this is the workflow for requesting a digital business card, referred to as "biglietto da visita" in Italian. The user initiates the process by creating a post, filling out specific mandatory sections that are customizable. Once the post is completed, it enters the "Aperto" (Open) state. The possible states for the post include: "Aperto," "Approvato" (Approved), "Consegnato"

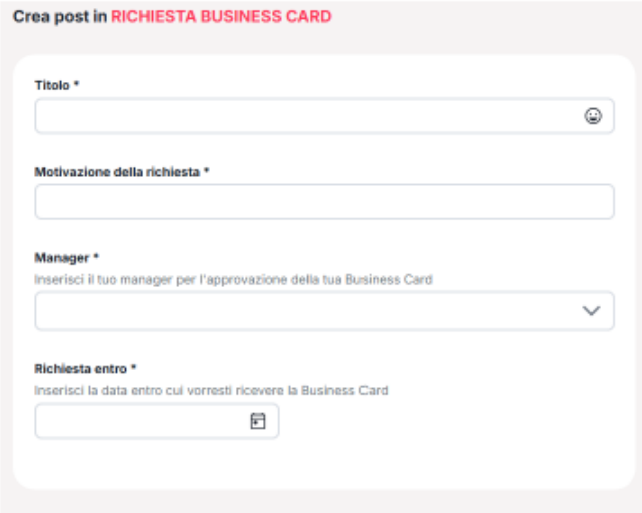

Figure 6.5: Community Richiesta Business card: post creation window

Figure 6.6: Community Richiesta Business Card: structure of the process

Figure 6.7: Community Assistenza IT: structure of the process

(Delivered), "Rifiutato" (Rejected), "Stand-by," and "Archiviato" (Archived). The HR team evaluates each request and determines its future status by acting on the post using options such as "Rifiuta Richiesta" (Reject Request), "Approva" (Approve), or "Stand-by."

IT: ticketing system

For the IT and Digital Transformation unit, the requirement was to establish a community to support the implementation of external software. This community was intended to map any vulnerabilities that could arise from using external software and functioned as a ticketing system to address these vulnerabilities. We developed a straightforward process that was easy and fast for both users and the team responsible for resolving the vulnerabilities.

As illustrated in Figure 6.7, a user creates a post by filling out the mandatory fields. The user must specify the title of the issue, the software where the issue arose, the type of issue, and optionally, attach a screenshot. The community administrators receive notifications and act on the post by changing the request for assistance from "Aperto" (Open) to "In Lavorazione" (In Progress) until it is marked as "Completata" (Completed), adding comments as necessary to keep the user informed about the status of their request for assistance.

Normal Trade: improving communication within branches

For the Normal Trade channel, the requirement was to centralize communication among branches. Each branch is led by a district chief, with zone chiefs managing agents under them. Amadori has branches throughout Italy. Before I joined the project, the digital team had already initiated a pilot program, testing Interacta with three branches. Once we began, we introduced Interacta to all branches all over Italy through workshops and manuals. The primary tasks involved preparing manuals, coordinating efforts, and teaching users how to utilize the two communities: "Collaboration Filiale" and "Comunicazioni e Attività Commerciali" within the "Community Commerciali" space.

As one can see from one page of the manual in figure 6.8, it provides an overview of the purpose of the "Community Commerciali" space, as well as detailed information on how to create a post, the fields that need to be filled out, and additional features such as creating filters to retrieve specific categories of communication, visibility from smartphones, and how to insert comments. This

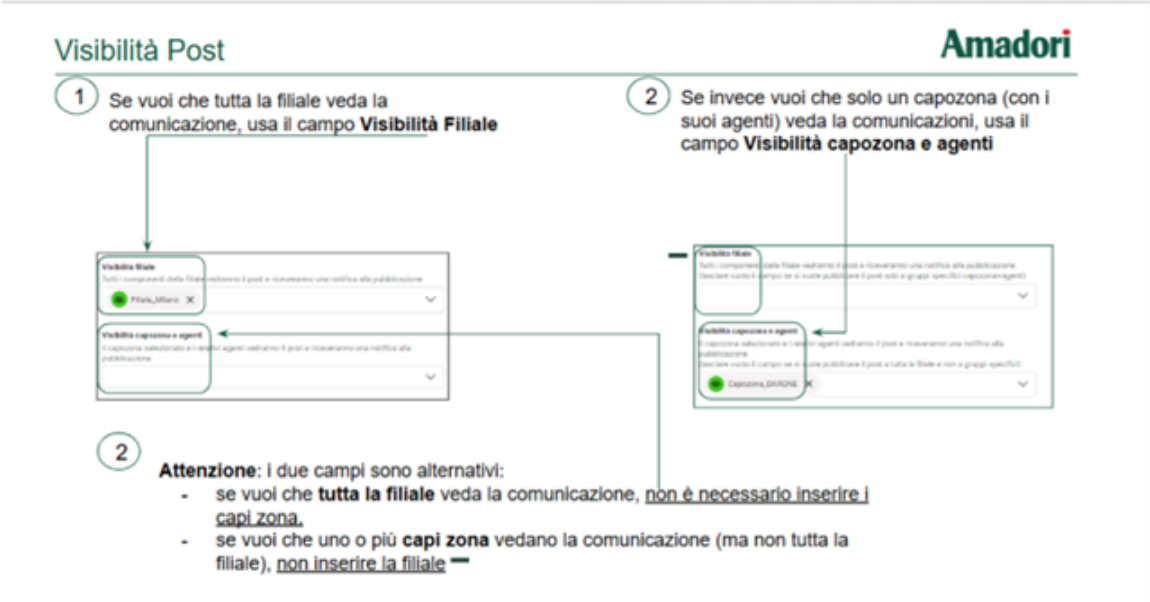

Figure 6.8: Part of the manual Community Commerciali: section related to "post visibility

manual serves as support for both individual study on how to use the communities and during workshops held with district chiefs to expand the project across all branches in Italy. The workshops were conducted using a digital workplace tool, and after the initial introduction of the software, we invited district chiefs who had already been using Interacta to act as ambassadors for their colleagues. Some of them were invited to share their screens and collaboratively create posts and insert communications.

Trade Marketing: improving collaboration within areas

For the Trade marketing channel, the requirement was to coordinate the completion of questionnaires delivered by Amadori's customers in the B2B sector, which required input from several functional areas. Previously, the Trade marketing channel compiled these questionnaires via email; however, they reported frequent confusion and dispersion of emails, indicating that a more structured approach was necessary. During our first meeting, we gathered all their requirements and converted those needs into software solutions by modeling two different processes. The first process was well-structured, as shown in Figure 6.9, while the second process was straightforward and easy to manage, as illustrated in Figure 6.10. The goal was to provide them with options to compare both solutions based on their requirements and their proficiency with learning a new tool in a short period. Ultimately, they chose the second solution, the simpler one, because they did not want to allocate resources toward understanding a more complex approach and desired a solution that was easy for other functional areas to grasp as well. This decision also benefited us since it is easier to modify a

Figure 6.9: Community Questionari clienti: the structure of the workflow

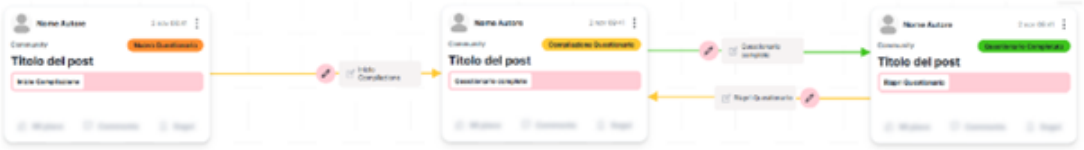

Figure 6.10: Community Questionari Clienti: the structure of the fine-tuned version of the workflow

simple process compared to a structured one in case adjustments are needed.

6.5.3 Data analysis

To examine the evolution of each community inside Interacta, we used Looker, a business intelligence application that belongs to the Google Cloud suite of tools. With Looker, it was possible to create interactive reports connected to the data marts from BigQuery. This connection allows us to have updated data every time the report is consulted and to decide which type of granularity we want to see in the report, such as how the community created for Normal trade was used with respect to the last month, how many users accessed a community or space every day, what the most common actions performed are, and which communities were most used or not used. The report included line charts to understand usage behavior, histograms to retrieve information about actions performed on Interacta (such as post creation, comments, and visualizations), pie charts to understand which areas used the tool most, and two filters to select communities and areas of the company for investigation. Overall, during the internship experience, the perception of Interacta was mostly positive from the areas we engaged with. During the four live streaming sessions we held with Dinova representatives and all company employees, we emphasized the usefulness and ease of use of the software, stressing that the tool represented a dedicated space for employees to be

more involved in the company. A space for informal interaction has been created, managed by the People and organization area, with the aim of creating a unique space where individuals can find new ways to connect with colleagues.

6.6 Consideration

The activities conducted at Amadori highlighted the role users played in supporting the implementation of software within their respective business areas. Specifically, in the Normal trade and Trade marketing areas, district chiefs were willing to act as ambassadors for the digital workplace tools, assisting the digital office in conveying the necessary information to their colleagues. This made the overall process of digital transformation more straightforward for the organization. In the second case, the need to solve a problem arose from a bottom-up approach, where representatives from the business areas demonstrated enthusiasm and willingness to be actively involved in the creation process of the dedicated space in Interacta, proactively testing and refining the solution. These behaviors align with the main theme of this thesis, promoting a different perspective from which to initiate a digital transformation process using a digital workplace tool to streamline operations within the organization. Consequently, the main theoretical questions that can be derived from this experience and further developed are: Are individuals willing to actively contribute to digitalization? What factors positively contribute to individuals' participation during the process? What factors negatively impact individuals' participation during the process?

7 Data analysis

To analyze the data, we used the Technology Acceptance Model (TAM). The TAM framework focuses on three key constructs: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Intention to Use (IU), which are derived from participants' responses regarding their experience with Interacta, through a survey. Interacta was implemented in March 2023 using a pilot group of areas and employees, then in March 2024 it was extended to more areas and eventually from september 2024, it was implemented in all the company areas as the new digital workplace of Amadori (Intranet) and the survey was delivered in February 2025 (after almost 2 years that employees used the new tool, considering that most employees knew about the new tool from September 2024) . In this thesis, an additional construct, Digital Transformation Competence (DTC), was introduced (figure 7.1). This construct evaluates employees' perceptions of their digital skills and how these skills can be utilized by the company. Each item contains a Likert scale from 1 to 7, where 1 means the user is unlikely to agree with the statement, while 7 means the user is likely to agree with the statement. To support the development of these digital skills, the company can implement training programs, provide access to relevant tools and resources, and create a supportive environment that encourages continuous learning and adaptation to new technologies. Therefore, the following hypotheses were tested:

- There is a significant relationship between DTC and PU, PEOU, and IU.
- There is a significant relationship between DTC and IU when controlling for PU and PEOU.
- There is a significant difference in IU across different age groups.

Participants answer specific questions (items) that, when aggregated, form the three constructs of PU, PEOU, and IU. Additionally, we included two more questions related to digital transformation processes (DTC).

7.1 Descriptive analysis of the survey

The survey collected 179 responses and was organized into the following sections:

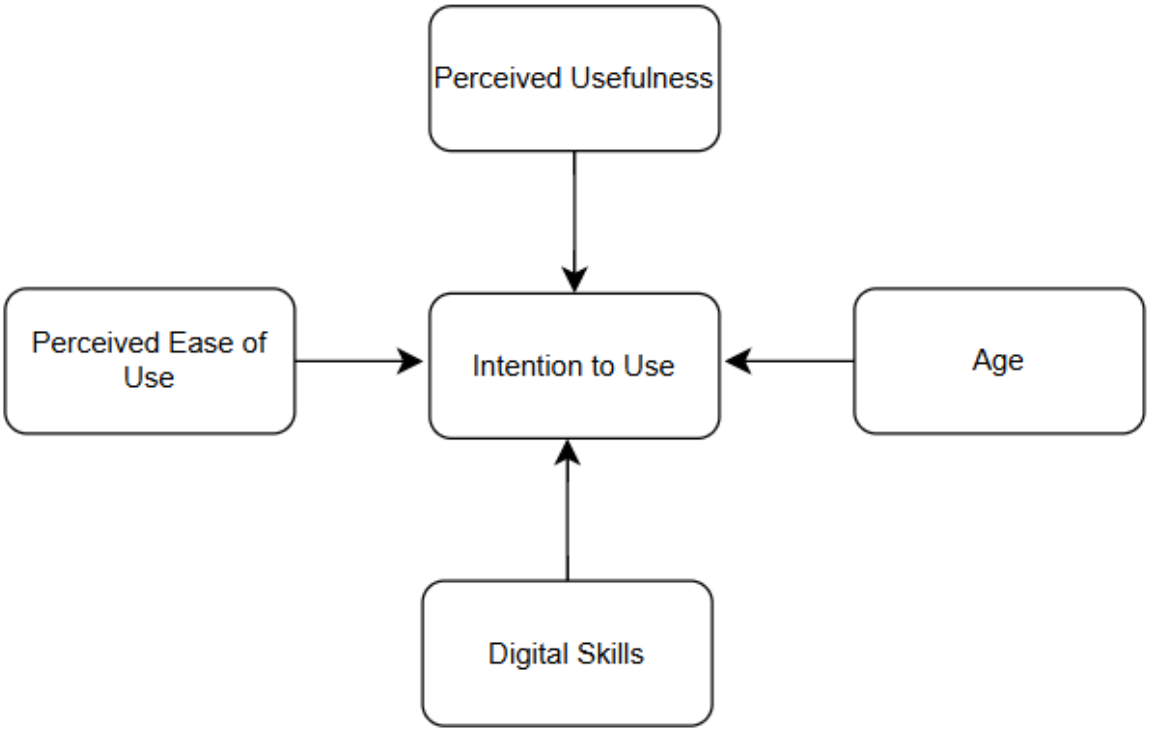

Figure 7.1: Variation of the TAM with the DTC construct, elaboration made by the author

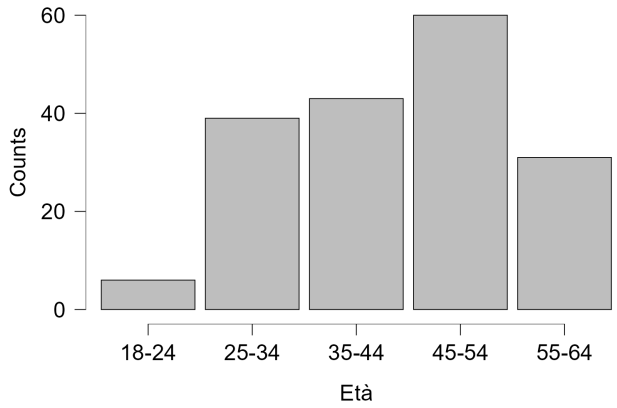

Figure 7.2: Age distribution of employees

The General Information section containing age and company area of the employees. The PU (Perceived Usefulness) with 6 questions (items) to assess the perceived usefulness of Interacta. The PEOU (Perceived Ease of Use) with 6 questions (items) to evaluate the perceived ease of use of Interacta. The IU (Intention to Use) with 4 questions (items) to assess the future intention to use Interacta. Eventually, Digital Transformation Competences with 2 questions (items). One to determine whether employees believe their competencies in digital transformation can contribute to the transition, and an open-ended question aimed at understanding the type of support the company could provide to employees to facilitate the transition. At the end of the thesis, there is a copy of the survey created for this case study.

7.1.1 Employee age distribution at Amadori

The analysis started describing the age distribution of employees who answered the survey:

Based on the figure 7.2 and table 7.1, most employees fall into the 45-54 age range (60 out of 179), while the smallest group is in the 18-24 range (6 out of 179). On average, there is a small difference between employees aged 25-34 (39 out of 179) and those aged 35-44 (43 out of 179). In contrast, there is a significant difference between employees in the 45-54 range and those in the 18-24 range. The 55-64 age range (31 out of 179) represents a notable group as well. If we approximate the numbers, the average age is 44, the minimum age is 21, the maximum age is 60 or older, and the 75th percentile is 50. Amadori has a heterogeneous age range, although younger employees are rare or may not have responded to the survey.

7.1.2 Distribution of employees by company area

An analysis of the distribution of employees by company area was conducted to gather information on which areas were more willing to adopt the software. Based on the figure 7.2, most employees

	Age
Valid	179
Missing	0
Median	50
Mean	44
Minimum	21
Maximum	60

Table 7.1: Age: Descriptive Statistics

indicated 'Other' (41.3 percent) as the area to which they belong. Unfortunately, this data does not provide insights into how the software is perceived in specific areas of the company, as the occurrences in other areas are too low to extract meaningful conclusions. However, we can observe that Strategic Marketing Management has the lowest number of respondents (5.6 percent), while Sales Management has the highest (22.3 percent). Corporate (16.2 percent) and Operations (14.5 percent) fall in between.

7.2 Analysis of the TAM constructs and digital transformation competencies

	PU	PEOU	IU	DTC
Valid	179	179	179	179
Missing	0	0	0	0
Mode	3.667	6.000	6.000	6.000
Median	4.167	5.167	5.000	5.000
Mean	4.050	5.027	4.716	4.603
Std. Deviation	1.542	1.398	1.603	1.707
Minimum	1.000	1.000	1.000	1.000
Maximum	7.000	7.000	7.000	7.000

Table 7.2: Descriptive Statistics of the test

All the resources used to evaluate the survey responses are open-source. JASP software was utilized to perform correlation, regression, and ANOVA analyses, while Python, along with the NLTK, pandas, matplotlib and seaborn libraries, was employed for word cloud analysis and plotting.

Based on the comparison of the different boxplots (figure 7.3), we can conclude that the perceived usefulness of Interacta is, on average, neither low nor high (average value of 4). However, the software is perceived as easy to use, with a high average of 5, and the same can be said for

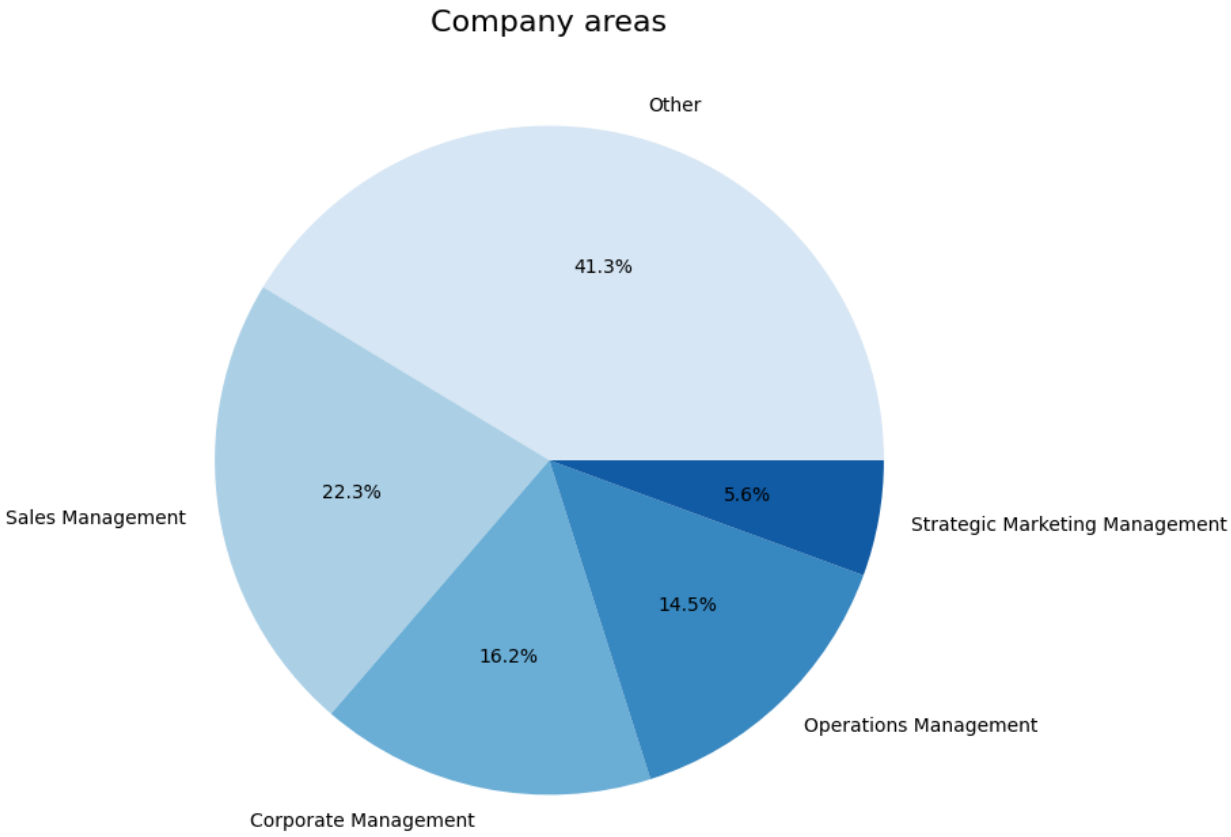

Figure 7.3: Distribution of Amadori areas

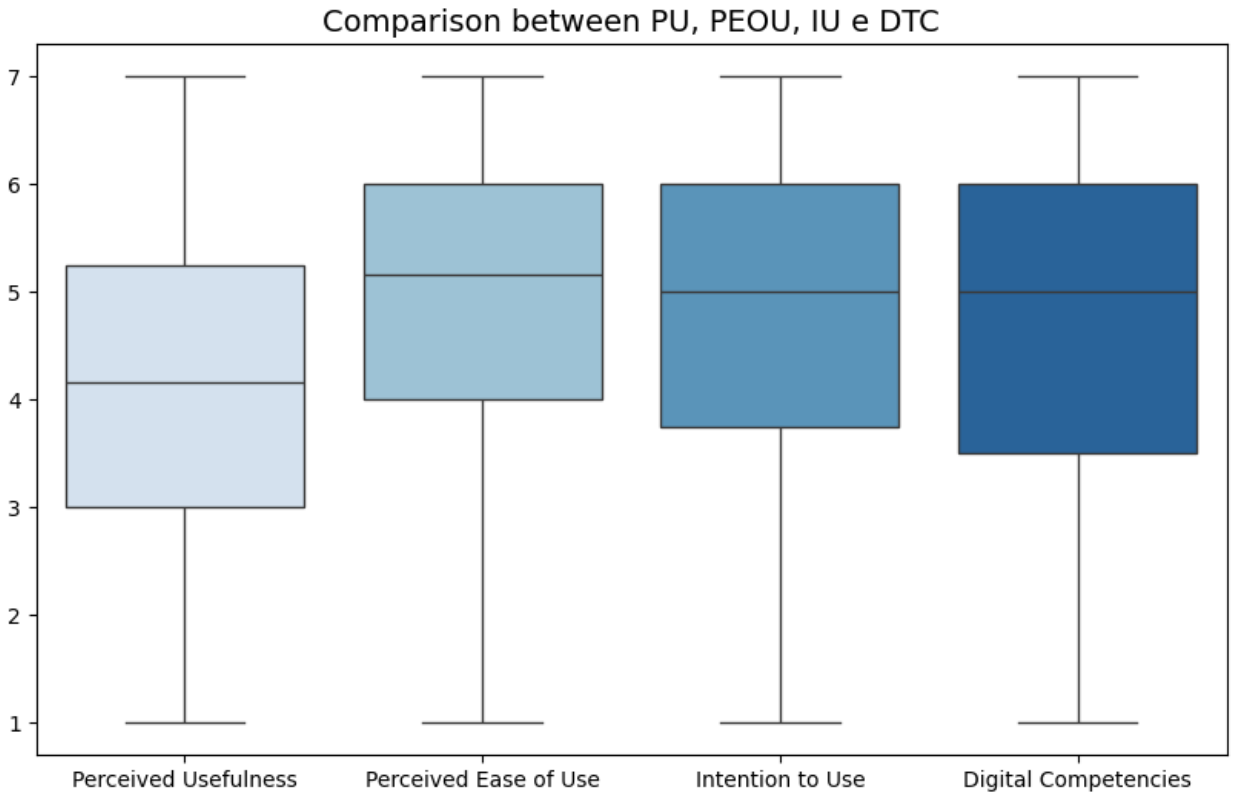

Figure 7.4: Boxplots of PU, PEOU, IU and DTC

the intention to use (5). Regarding employees' digital competencies, most employees believe their skills can contribute to the digital transformation (5). All values were approximated upwards in reference to Table 7.2.

7.2.1 Correlation analysis of PU, PEOU, IU, and DTC: exploring relationships between key constructs

Variable		PU	IU	PEOU	DTC
1. PU	Pearson's r	–			
	p-value	–			
2. IU	Pearson's r	0.826	–		
	p-value	$< .001$	–		
3. PEOU	Pearson's r	0.608	0.772	–	
	p-value	$< .001$	$< .001$	–	
4. DTC	Pearson's r	0.454	0.512	0.463	–
	p-value	$< .001$	$< .001$	$< .001$	–

Table 7.3: Pearson's Correlations between key constructs

The results of the Pearson correlation analysis between the variables PU (Perceived Usefulness), IU (Intention to Use), PEOU (Perceived Ease of Use), and DTC (Digital Transformation Competences) show several significant relationships and in hypothesis testing, we calculate the p-value to assess the strength of the evidence against the null hypothesis. The p-value measures the probability of obtaining the observed results, or more extreme results, assuming that the null hypothesis is true. A small p-value (typically less than 0.05) indicates that the observed relationship between variables is statistically significant, meaning that it is unlikely to have occurred by chance.

For this analysis, we are testing the relationship between Digital Transformation Competences (DTC) and the other variables—Perceived Usefulness (PU), Intention to Use (IU), and Perceived Ease of Use (PEOU). Specifically, we want to test whether employees' perceived digital competences influence their perception of the software in terms of usefulness, ease of use, and intention to use. To do this, we establish the following hypotheses:

Hypothesis H0 (null hypothesis) There is no significant relationship between Digital Transformation Competences (DTC) and each of the variables PU, PEOU, and IU. DTC does not significantly correlate with PU, PEOU, or IU.

Hypothesis H1 (Alternative hypothesis) There is a significant relationship between Digital Transformation Competences (DTC) and each of the variables PU, PEOU, and IU. DTC significantly correlates with PU, PEOU, or IU.

Based on the results of the Pearson correlation analysis, we see the following significant relationships:

- PU and IU: There is a strong positive correlation ($r = 0.826$, $p < 0.001$), indicating that as perceived usefulness increases, the intention to use the software also increases.
- PEOU and PU: A moderate positive correlation ($r = 0.608$, $p < 0.001$) suggests that users who find the software easy to use also perceive it as useful.
- PEOU and IU: A strong positive correlation ($r = 0.772$, $p < 0.001$) shows that the ease of use is strongly related to the intention to use the software.
- DTC and PU: A moderate positive correlation ($r = 0.454$, $p < 0.001$) indicates that employees who believe their digital skills are important for the transformation tend to perceive the software as useful.
- DTC and IU: A moderate positive correlation ($r = 0.512$, $p < 0.001$) suggests that employees who feel competent in driving digital transformation are more likely to intend to use the software.
- DTC and PEOU: A moderate positive correlation ($r = 0.463$, $p < 0.001$) shows that employees who believe in their digital competences also tend to find the software easy to use.

The p-values for all these correlations are less than 0.001, which provides strong evidence against the null hypothesis, supporting the alternative hypothesis that DTC is significantly related to PU, PEOU, and IU. In Amadori, the perceived usefulness of Interacta correlates with the intention to use it more than the perceived ease of use. This means that, rather than introducing a simple software that is easy to use but does not provide significant perceived utility, employees perceived intention to use may be more influenced if the software is less easy to use but offers relevant benefits in terms of workflow improvements. These findings suggest that employees' perceptions of their digital competences play an important role in how they view the software's usefulness, ease of use, and their intention to use it.

7.2.2 Regression and ANOVA analysis of PU, PEOU, IU, and DTC: evaluating predictors and group differences

A linear regression was conducted to examine the relationship between Intention to Use (IU) and the predictors Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Digital Transformation Competences (DTC). The hypothesis under consideration in this case are:

Model	R	R^2	Adjusted R^2	RMSE
M_0	0.000	0.000	0.000	1.603
M_1	0.896	0.802	0.799	0.719

Table 7.4: Regression Analysis: IU as the Dependent Variable and PU, PEOU, and DTC as Independent Variables

Model		Sum of Squares	df	Mean Square	F	p
M_1	Regression	366.923	3	122.308	236.503	$< .001$
	Residual	90.501	175	0.517		
	Total	457.424	178			

Table 7.5: ANOVA: M1 includes PU, PEOU and DTC

Hypothesis H2 (null hypothesis) There is no significant relationship between DTC and IU when controlling for PU and PEOU. DTC does not significantly predict IU after accounting for PU and PEOU.

Hypothesis H3 (Alternative hypothesis) There is a significant relationship between DTC and IU when controlling for PU and PEOU. DTC significantly predicts IU after accounting for PU and PEOU.

Based on the results, Model 1 explains a substantial proportion of the variance in IU, with an R value of 0.896 and $R^2 = 0.802$. This indicates that approximately 80.2 percent of the variance in the intention to use the software is explained by the predictors. The RMSE = 0.719 suggests a good fit for the model with a relatively low average error between observed and predicted values.

PU (Perceived Usefulness): The coefficient for PU is 0.565 ($p < .001$), indicating that PU is a strong and significant predictor of IU. As perceived usefulness increases, so does the intention to use the software. This result confirms the strong positive relationship we observed in the earlier Pearson correlation analysis ($r = 0.826$, $p < .001$), where we saw a high correlation between PU and IU.

PEOU (Perceived Ease of Use): The coefficient for PEOU is 0.466 ($p < .001$), showing that PEOU is also a significant and positive predictor of IU. This means that the easier employees perceive the software to be, the more likely they are to intend to use it. This aligns with the earlier correlation analysis ($r = 0.772$, $p < .001$) that showed a strong positive relationship between PEOU and IU.

DTC (Digital Transformation Competences): The coefficient for DTC is 0.073 ($p = 0.050$), indicating a marginally significant, though weaker, relationship with IU. Employees who feel more competent in digital transformation are slightly more likely to intend to use the software. However, the effect of DTC on IU is weaker compared to PU and PEOU, reflecting the moderate correlation

Model		Unstandardized	Standard Error	Standardized	t	p
M_0	(Intercept)	4.716	0.120		39.364	$< .001$
M_1	(Intercept)	−0.248	0.211		−1.176	0.241
	PU	0.565	0.045	0.544	12.451	$< .001$
	PEOU	0.466	0.050	0.406	9.251	$< .001$
	DTC	0.073	0.037	0.077	1.976	0.050

Table 7.6: ANOVA: Coefficients of PU, PEOU, and DTC

observed in the earlier analysis (r = 0.512, p < .001). The p-value of 0.050 suggests that DTC has a borderline effect, which is less pronounced than the stronger predictors of PU and PEOU.

The regression analysis support the alternative hypothesis for PU and PEOU (since both have significant p-values), but for DTC, we are on the threshold of the null hypothesis being true, and shows that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are strong, significant predictors of Intention to Use (IU), with their relationships confirming earlier findings from the correlation analysis. However, Digital Transformation Competences (DTC) has a weaker, marginal effect on IU, indicating that while employees' digital competences might influence their intention to use the software, the effect is less pronounced than the influence of PU and PEOU. These results reinforce the importance of PU and PEOU in shaping employees' intention to adopt the software, with DTC playing a more limited role. It is proved that the perceived usefulness and perceived ease of use positively influence the intention to use Interacta. Leaders may work on better coordination and communication to implement a new software, specifically addressing the usefulness and application of the software in business use cases to let employees see the operational and functional benefits that can be retrieved from the tool.

7.2.3 ANOVA analysis of IU and age distribution: group differences in intention to use by age

An ANOVA analysis was conducted to examine the differences in Intention to Use (IU) across different age groups. The age variable was treated as a fixed factor with the following age categories: 18-24, 25-34, 35-44, 45-54, and 55-64.

Cases	Sum of Squares	df	Mean Square	F	p
Età	28.248	4	7.062	2.863	0.025
Residuals	429.175	174	2.467		

Table 7.7: ANOVA: group differences in Intention to Use by age

Età	N	Mean	SD	SE	Coefficient of variation
18-24	6	5.042	1.269	0.518	0.252
25-34	39	4.276	1.851	0.296	0.433
35-44	43	4.308	1.593	0.243	0.370
45-54	60	5.000	1.494	0.193	0.299
55-64	31	5.226	1.323	0.238	0.253

Table 7.8: Descriptives of age groups

The p-value of 0.025 indicates a statistically significant effect of age on Intention to Use (IU). This suggests that age plays a role in how likely employees are to use the software. However, it is important to note that the sample size for the 18-24 age group was relatively small (only 6 respondents), which may affect the robustness of the results.

The Coefficient of Variation (CV) helps us understand the relative variability in responses within each age group. The 25-34 age group exhibits the highest CV (0.433), indicating that there is greater variability in the intention to use the software among this group. This suggests mixed opinions, with some employees highly motivated to adopt the software and others less inclined to do so.

The 18-24 and 55-64 age groups show lower CVs (0.252 and 0.253, respectively), meaning that responses within these groups are more consistent, and employees tend to have more similar views on using the software. However, again, the small sample size in the 18-24 group makes it less reliable as a representation of the broader employee population.

Hypothesis H4 (null hypothesis) There is no significant difference in Intention to Use (IU) across the different age groups. The mean Intention to Use (IU) is the same across all age groups. **Hypothesis H5** (Alternative hypothesis) There is a significant difference in Intention to Use (IU) across the different age groups. The mean Intention to Use (IU) differs significantly across at least two age groups.

Given the p-value of 0.025, we reject the null hypothesis and accept the alternative hypothesis. This indicates that there are significant differences in Intention to Use (IU) across the age groups.

The ANOVA analysis confirms that age is a significant factor influencing Intention to Use (IU), with the 55-64 year-olds showing the highest mean for IU (5.226), suggesting that employees in this age group are the most inclined to use the software. The 18-24 group has a mean of 5.042, also showing a relatively high intention to use the software, but again, the small sample size in this group makes this result less reliable. The 25-34 and 35-44 age groups demonstrate the lowest levels of IU, while the 45-54 group shows moderate intention to use. The variability in responses within the 25-34 group, as indicated by the high CV, suggests that opinions within this group are more diverse. On the other hand, the 18-24 and 55-64 age groups show more consistent views. The company shows that older employees are more willing to try new software compared to those in middle age.

However, we cannot fully conclude that this contradicts the common barrier to digitalization, which suggests that replacing traditional methods is challenging. This thesis does not allow us to assess whether older employees in this survey are also senior (i.e., with more than 5-10 years of experience at the company), so they get used to traditional method and even though, it may be possible that this type of employees prefer to approach new innovative approaches. Nevertheless, we can say that the company's heterogeneous workforce reflects a positive attitude toward adopting new software solutions. Employees recognize their ability to face digitalization and are eager to use their skills to drive it forward. This could serve as a signal for leaders to capitalize on this valuable insight, encouraging more digitalization projects to be initiated.

7.3 Analyzing open-ended responses

7.3.1 Using NLTK for word cloud generatino to extract relevant keywords

In this thesis, the NLTK library (Natural Language Toolkit) was employed to analyze the open-ended responses from the survey, specifically targeting keywords related to how the company can support employees during the digital transformation process. The goal of this analysis was to visually represent the most frequently mentioned terms or themes in the responses, providing insights into the employees' perspectives.

To achieve this, a word cloud was generated. A word cloud is a powerful visualization tool that displays the most frequent words in a given text, with the size of each word proportional to its frequency. In this case, the word cloud highlights the key concepts and areas that employees consider important for support during the transition to digitalization. By removing common stopwords (e.g., "per", "la", "un" etc) and focusing on the significant words, the word cloud effectively uncovers patterns in the data.

The word cloud revealed frequently mentioned terms, with the most prominent being:

- Formazione (Education)
- Comunicazione chiara (Clear Communication)
- Risorse tecniche (Technical Resources)

These elements are critical for supporting employees in navigating the challenges of digital transformation. This visualization not only provided a clear understanding of employees' concerns but also highlighted key areas where the company can focus its efforts to ensure a smooth transition. It serves as a valuable roadmap for leadership, guiding them toward actionable steps, including providing programs, courses, and training materials to help employees learn how to use digital

Figure 7.5: Word cloud generated from the open-ended question regarding the support the company can provide to facilitate digitalization for employees.

workplaces and new technologies. Ensuring clear and direct communication regarding the digital transformation processes within the company and among stakeholders. Allocating technical resources to create an environment that enables smooth learning, free from barriers caused by inadequate infrastructure.

7.3.2 Employee opinions on digital transformation support

In analyzing the open-ended responses from employees, several key themes emerged as we saw with the word cloud, here we want to leave space for employees to share their opinions about digital transformation support.

> *Credo sia necessario un invito maggiore all'utilizzo di Interacta. È una risorsa molto importante, ma che al momento forse non ha ancora ricevuto quella spinta che ne possa incentivare l'utilizzo (almeno per mia esperienza personale all'interno della mia unità operativa).*
> (I believe that there needs to be a stronger push to encourage the use of Interacta. It is a very important resource, but at the moment, it may not have received the push needed to encourage its use, at least based on my personal experience within my operational unit.)

> *Formazione su casi d'uso specifici realmente applicabili nelle attività aziendali (al-*

trimenti Interacta, per quanto ben strutturata, rischia di essere un portale di sola consultazione).
(Training on specific use cases that are actually applicable to business activities (otherwise, Interacta, no matter how well-structured, risks becoming just a portal for consultation).)

Ambiente di lavoro in cui i colleghi si supportano a vicenda e collaborano per raggiungere gli obiettivi comuni.
(A work environment where colleagues support each other and collaborate to achieve common goals.)

Maggiori risorse ICT per seguire i progetti.
(More ICT resources to support project follow-up.)

Dovrebbero fare applicazioni realmente utili al lavoro, non solo all'interazione.
(They should develop applications that are truly useful for work, not just for interaction.)

Riunioni per migliorare l'uso degli strumenti digitali e apportare migliorie alle procedure, grazie anche alle opportunità di condivisione di info e schede di lavoro; fare briefing per ammodernare le procedure, coinvolgendo anche altri attori interessati (collaboratori, fornitori, spedizionieri, magazzini, ecc.).
(Meetings to improve the use of digital tools and improve procedures, also thanks to opportunities to share information and work sheets; holding briefings to modernize procedures, involving other relevant stakeholders (collaborators, suppliers, shippers, warehouses, etc.).)

Raccolta delle attività onerose in termini di tempo e che sono gestite in modo non armonizzato nel gruppo.
(Collecting time-consuming activities that are managed in a non-harmonized way within the group.)

Miglior organizzazione per avere il tempo di partecipare alla trasformazione digitale.
(Better organization to allow time for participating in the digital transformation.)

Assessment per capire quali skill sono già presenti in azienda e incentivi per far diventare le risorse già presenti in azienda dei formatori e diffusori di cultura.
(An assessment to understand which skills are already present within the company and incentives to turn existing resources into trainers and cultural disseminators.)

Formazione più specifica degli strumenti che abbiamo a disposizione e che semplificano il lavoro se utilizzati in maniera più costante.
(More specific training on the tools available to us that can simplify work if used more consistently.)

Ritengo che una trasformazione digitale completa sia possibile solo in presenza di infrastrutture adeguate, server efficienti, abilitazione all'utilizzo di varie funzioni che non necessiti il passaggio di più persone, supporti digitali in linea con quanto offre il mercato, non dover necessariamente passare per l'ufficio IT per "problematiche" che potrebbero essere tranquillamente risolte dall'operatore, se solo fosse abilitato a farlo.
(I believe that a complete digital transformation is only possible with adequate infrastructure, efficient servers, enabling the use of various functions that do not require the intervention of multiple people, digital support in line with what the market offers, and not having to go through the IT department for "issues" that could easily be solved by the operator if they were simply enabled to do so.)

Formazione e partecipazione a gruppi di progetto per il miglioramento, con il supporto di personale tecnico "digital".
(Training and participation in project groups for improvement, with the support of "digital" technical staff.)

Attraverso una comunicazione chiara, semplice e immediata in quanto non tutti siamo digital.
(Through clear, simple, and immediate communication, as not all of us are digitally savvy.)

Aspects to improve were identified through open-ended questions regarding the tool's usability. Some employees were unaware of Interacta's purpose, even though several live sessions were held to introduce the software to the organization. This could be a common issue in large organizations, and it affects not only long-term employees but also newcomers. Leadership must carefully communicate the objectives of a new tool, particularly by mapping out where the software can be applied and which employees may benefit from it. A clear roadmap of use cases should be developed through negotiations with stakeholders, allowing employees to express their opinions and suggestions about the software, while enabling leaders to guide the implementation based on these feedbacks.

8 Findings

The data analysis obtained from the TAM model, aimed to examine the relationships between various constructs related to digital transformation, including Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Intention to Use (IU), and Digital Transformation Competences (DTC). Several hypotheses were tested using correlation, regression, and ANOVA analyses to evaluate the significance of these relationships and to uncover patterns in employees' perceptions of Interacta and their role in driving digital transformation in the company.

8.1 Hypothesis evaluation

Analysis Type	**Hypothesis**	**Result**
Correlation Analysis	H1: There is a significant relationship between DTC and PU, PEOU, IU.	Accepted
Regression Analysis	H3: Significant relationship between DTC and IU when controlling for PU and PEOU.	Accepted (with caution)
ANOVA Analysis	H5: Significant difference in IU across different age groups.	Accepted

Table 8.1: Summary of Hypotheses and Results

In the Correlation Analysis between key constructs, the null hypothesis (H0) was rejected, indicating significant correlations between Digital Transformation Competences (DTC) and Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Intention to Use (IU) (H1). This supports the notion that employees' digital competences are closely linked to their perceptions of the software's usefulness and ease of use, as well as their intention to use it.

In the Regression Analysis PU and PEOU were confirmed as strong predictors of IU, DTC showed a borderline effect. Despite this, the null hypothesis (H2) was rejected, indicating that DTC does have some impact on IU when controlling for PU and PEOU, though this effect is less significant (H3). This suggests that while DTC is relevant, its role in predicting IU is weaker compared to PU and PEOU.

The ANOVA results indicated significant differences in IU across age groups, leading to the rejection of the null hypothesis (H4). However, the interpretation of results for the younger age group (18-24) should be done with caution due to the small sample size, which may affect the reliability of the findings.

These findings collectively suggest that digital competences and perceptions of software usability are critical factors in shaping employees' attitudes toward adopting new digital tools within the company. The open-ended question analysis highlighted the need for better training, clearer communication, and more resources to support employees in adapting to the digital transformation process. The feedback also emphasizes the importance of providing tools and infrastructure that align with market standards to ensure a smooth transition.

8.2 Practical implications

Regarding the first two hypotheses, which focus on employees' digital skills and their intention to use new technology, being aware of their digital skills and understanding that these skills can contribute to the company's digital transformation has a positive impact on using new technology, as well as on perceptions of its usefulness and ease of use. This means that, in a company where employees have the right tools and knowledge to keep up with current trends in digitalization, like using AI and data analysis tools, the time needed to implement new technologies could be reduced. Additionally, this could lower the risk of failure when introducing new software or tools.

Regarding the hypothesis that an employee's age affects their use of new technology, the study shows that, at least in the case of Amadori, both older and younger employees are willing to use new technologies. This challenges the common idea in digital transformation research that older employees are more likely to stick to traditional habits and conservative systems, rather than adopting new technologies. The thesis shows that even in a company with a wide age range, age doesn't negatively affect the implementation of new software. In fact, it creates a desire among employees to learn how to best use the software in their work context. This is confirmed by the open-ended responses, where employees point out the need for more training on digital tools, a better understanding of how Interacta can be used in their specific work areas, more involvement in the digital transformation process, more time for developing new digital skills, clear and simple communication of the company's goals for digital transformation, and the need for employees to be able to fix problems on their own when using digital tools, without having to go through the ICT or digital departments.

This thesis also highlights the challenges that arise in large organizations when implementing new technology. In this case study, Interacta is presented as a user-friendly digital workplace tool that provides access to Amadori's intranet and offers a personalized approach depending on the specific use case. Due to the portal's integration with several applications, which support areas such as coordination and knowledge sharing, it is crucial that employees have the right tools to understand how to use the new system. Additionally, mapping employees' digital skills is essential to identify any gaps that may exist.

The results from the thesis show that involvement of employees in the digital transformation process represents a key step to consider and cultivate in order to take advantage of a smooth transition. The creation of monthly focus groups to gather employees' needs, opinions, and ideas related to new digital solutions can be adopted as a routine mechanism to improve the digitalization strategy. In this way, it may be possible to understand criticalities from each area, employees willing to become ambassadors of digital changes, and what resources may be necessary to improve areas' functional and operational workflows. Projects related to digitalization can start using a pre-defined canvas where the following information may be collected to start a new innovation:

- Project outline that, in a few sentences, describes the idea and the technologies to use.
- Areas and people involved so that it is possible to organize weekly or monthly meetings to align the teams.
- Resources needed so that employees can have the right tools to operate according to their goals.
- Budget that estimates the cost of the solution.
- Gantt diagram to map the timeline of the project.
- PERT diagram to map the critical path.
- Benefits derived from developing a prototype that can be finalized for a better overall implementation.

These mechanisms may depend on clear and direct communication that leadership has to provide, hence, a common methodology to propose new digital projects. In this way, active employee engagement can be reached, as well as ensuring that people have space for autonomy in proposing new ideas and developing new innovative solutions, identifying and resolving barriers to actual digital tools, and identifying areas for development necessary for skill improvements.

Although these insights come from a short internship experience and a survey that may not have covered all aspects involved in implementing new software, they offer valuable points for both leaders and employees. These points can help in planning a digital transformation process that takes a bottom-up approach, giving employees more control over using these tools and ensuring they have a strong voice when implementing new technologies

8.3 Future improvements

This thesis addresses the role of digital workplace tools, emphasizing their impact on enhancing social culture within a company and considering user requirements and agile methodologies in their

design. However, the thesis does not discuss the impact of Artificial Intelligence or the integration of additional digital workplace tools, nor does it explore the practical limitations of these tools in terms of cost and resource management.

In the case study, the focus was on the impact of the digital workplace tool on employees during the internship period, as well as how other tools intersected with the implementation of Interacta. One of the use cases, specifically the IT and digital transformation case for creating a process for the ticketing system, focused on using Interacta to support the introduction of another software. An interesting point to consider is how closely two digital workplace tools may be connected, and how employees can learn to leverage the functionalities of multiple software applications when they can be integrated and which factors may contribute to a smooth integration.

The thesis highlights factors contributing to digital transformation processes, focusing not only on internal and external drivers but also on the role of leadership style in enhancing the degree of digitalization within a company. A further area for exploration in this thesis could be the comparison between a digitalization approach driven internally by the company versus one led externally by consultancy firms. There is potential to investigate the consequences of choosing one approach over the other, or even combining them. Developing digitalization and digital skills internally could have long-term benefits, not only by equipping employees with versatile skills but also by fostering a stable, self-sufficient environment from which new functions can evolve within the company, rather than outsourcing these capabilities. Concerns about outsourcing analytics and digital skills may result in companies losing control over the results, relying too heavily on external consultancy firms. Of course, this is just a hypothesis that could be explored in future studies.

Regarding the methodology used in the case study, the TAM model showed limitations in terms of the constructs it maps and the conclusions that can be drawn. Although its original version has been expanded to include additional constructs, it remains up to leaders to determine whether other models might be more effective for capturing employees' requirements and feedback. This thesis does not deeply discuss the limitations of the TAM model or evaluate the differences between TAM and other models. A possible next step could be to first explore which model might best apply to the company and create specific constructs to map its needs. A useful approach might be to conduct a preliminary investigation to identify the issues and needs employees wish to address, thus allowing the selection of a more suitable model. An important area for future exploration could be the introduction of focus groups before conducting a survey, to better understand the problems and requirements from employees, with input from leaders.

9 Conclusion

9.1 Relevance of digital transformation

From a subjective perspective, I am very grateful for the opportunity to work with Amadori, particularly with the team during my internship and the various functional areas we collaborated with. From the outset, I was responsible for coordinating the project and designing processes, with valuable assistance and brainstorming from my two colleagues. Objectively, I was able to leverage my knowledge of data analysis to derive insights from the data within the platform. This analysis provided us with an alternative perspective on how users were engaging with the software and highlighted areas where we could assist the People and organization team and the head of IT and digital transformation in adopting a methodology to guide users in effectively utilizing the collaborative tool and understanding the software's performance.

What I appreciated most during this period was the direct contact I had with my colleagues at Amadori. This included physical meetings, brainstorming sessions, gathering requirements and feedback, as well as the ideation process. I recognize the importance of digital transformation and the efficiencies it can create within a company. Therefore, it is essential to implement these changes while guiding individuals to familiarize themselves with new tools. However, I believe it is crucial not to overlook the value of physical meetings for the well-being of a company. This is a personal observation that extends beyond the objectives of my internship and academic path. Physical meetings foster an environment conducive to collaboration, allowing us to read non-verbal cues that are often difficult to detect through screens. They enable us to visualize our thoughts on a board rather than merely extracting requirements from digital interfaces. Digitalization should not replace traditional interactions; instead, it should enhance our collaborative efforts. Real collaboration stems from genuine human interaction. While software can facilitate and accelerate workflows, true collaboration arises from face-to-face engagement. Interacta is an excellent tool that I thoroughly enjoyed using; it possesses great potential due to its user-friendly design compared to other platforms. In today's environment, users seek tools that are easy to learn quickly. As students of digital transformation management, our role is to bridge the gap between software and people by integrating the complexities of digital workflows into our lifestyles while considering users'

needs. Another significant insight from my internship was that once people became aware of the software's existence, many proposed creating new communities for specific purposes or moving routine workflows into Interacta. This suggests that when tools are intuitive and creative, curious users are motivated to learn and digitalize processes independently. By establishing an environment where digital transformation is driven not only by competitive necessity but also by individuals' enthusiasm to leverage these tools, we can significantly alter perceptions of work and enhance the benefits derived from it.

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11 Survey: Interacta as a digital workplace tool and the role of users in digital transformation

Here you can find the TAM version with the DTC construct submitted to the company:

1. Età *

Dropdown

Age

Contrassegna solo un ovale.

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 64+

2. Area aziendale *

Company area

Contrassegna solo un ovale.

- Corporate Management
- Sales Management
- Operations Management
- Strategic Marketing Management
- Other

Perceived Usefulness (Utilità Percepita)

Utilità Generale

General Usefulness

3. Ritengo che l'uso di Interacta migliori la mia produttività lavorativa *

I believe that using Interacta improves my work productivity

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

4. Credo che Interacta mi aiuti a completare i miei compiti più rapidamente *

I believe that using Interacta helps me complete my tasks more quickly

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

Benefici Specifici

Benefits

5. Penso che Interacta migliori la comunicazione con i miei colleghi *

I think that Interacta improves communication with my colleagues.

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

6. Ritengo che l'uso di Interacta contribuisca a una migliore collaborazione all'interno del mio team *

I believe that using Interacta contributes to better collaboration within my team.

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

Impatto sul Lavoro

Impact on Work

7. Credo che l'uso di Interacta mi permetta di prendere decisioni più informate *

I believe that using Interacta allows me to make more informed decisions.

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

8. Ritengo che Interacta aggiunga valore alle mie attività quotidiane *

I think that Interacta adds value to my daily activities.

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

Perceived Ease of Use (Facilità d'uso percepita)

Facilità d'uso Generale

General Ease of Use

9. Ritengo che sia facile utilizzare Interacta *

I believe that it is easy to use Interacta.

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

10. L'interfaccia di Interacta è intuitiva e comprensibile *

The Interacta interface is intuitive and understandable

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

Apprendimento e Formazione

Learning and Training

11. Ho trovato facile imparare a utilizzare Interacta *

I found it easy to learn how to use Interacta.

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

12. La formazione ricevuta sull'uso di Interacta è stata adeguata e utile *

The training I received on using Interacta was adequate and helpful.

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

Supporto Tecnico

Technical Support

13. Quando ho avuto problemi con Interacta, ho trovato facilmente supporto per risolverli *

When I encountered problems with Interacta, I found support to resolve them easily.

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

14. Ritengo che le risorse disponibili per l'assistenza su Interacta siano sufficienti *

I believe that the available resources for support on Interacta are sufficient.

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

Intention to Use (Intenzione d'uso)

Future Intention

15. Ho intenzione di continuare a utilizzare Interacta nel mio lavoro quotidiano *

I intend to continue using Interacta in my daily work.

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

16. Consiglierei ad altri colleghi di utilizzare Interacta *

I would recommend using Interacta to other colleagues.

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

Soddisfazione Generale

General Satisfaction

17. Sono soddisfatto dell'esperienza complessiva con Interacta *

I am satisfied with my overall experience with Interacta.

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

18. Se dovessi valutare la mia esperienza con Interacta, darei un punteggio alto *

If I had to rate my experience with Interacta, I would give it a high score.

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

Final Consideration (Considerazioni finali)

Digital Transformation

19. Ritengo che le mie competenze e conoscenze possano contribuire attivamente al successo della trasformazione digitale in azienda *

I believe that my skills and knowledge can actively contribute to the success of the digital transformation in the company.

Contrassegna solo un ovale.

	1	2	3	4	5	6	7	
Unlil	◯	◯	◯	◯	◯	◯	◯	Likely

20. Quale tipo di supporto ritengo sia necessario da parte dell'azienda per facilitare la mia partecipazione alla trasformazione digitale? (ad esempio, attraverso formazione, risorse tecniche, comunicazione chiara, ecc.) *

What type of support do I believe is necessary from the company to facilitate my participation in the digital transformation? (e.g., through training, technical resources, clear communication, etc.)