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Taking the Digital Innovation Journey beyond Technology: A Human-Centered Design Approach

Rui Patricio[1], Pedro Gomide[2], and Luis Rocha[3]

[1]UNIDCOM/IADE - Unidade de Investigação em Design e Comunicação, Av. D. Carlos I, 4, 1200-649 Lisboa, Portugal | *rui.patricio@universidadeeuropeia.pt*
[2]UNIDCOM/IADE - Unidade de Investigação em Design e Comunicação | *pegomide@gmail.com*
[3]Independent Consultant | *rochalu64@gmail.com*

Abstract

The digital innovation era creates new company challenges and amplifies the gap between leaders and followers. This paper builds on a human-centered design (HCD) approach, arguing that companies can bridge this gap by mastering the human aspects of their digital journey. The research goal is to explore a practitioner-derived perspective on how their companies have approached digital innovation through the lens of human-centered design, i.e., putting humans at the center and looking at the more 'human' aspects of digital technologies. A study was conducted online with professional managers' views from the field of digital innovation. The findings were clustered using the Digital Transformation Framework. This approach allowed the development of four propositions that can be verified in future studies into how companies can use HCD approaches to engage customers and employees better and navigate the digital innovation journey.

Keywords: Digital Innovation, Digital Journey, Human-Centered Design.

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1 Introduction

As new digital technologies rapidly spread worldwide, companies must reshape business models and ways to engage customers. Digital innovation poses many tensions and challenges to companies undertaking the digital innovation journey, particularly in the internal processes and organization design (Kretschmer and Khashabi, 2020) and customer co-creation (Nadkarni and Prügl, 2021).

Several studies are already addressing these challenges using different perspectives. Some focus on leadership function, organizational culture, or human interaction with machines and technology (Cortellazzo et al., 2019). Others combine multi-level factors, e.g., skills and training at the individual level, workplace relationships at the group level, and organizational culture/climate at the organizational level (Trenerry et al., 2021).

This paper follows a distinctive path, arguing that the human-centered design (HCD) approach has the power to overcome the most critical challenges of the digital journey. Those related to people and the overall adoption of digital innovation solutions in the workplace. Front-runner companies are taking the digital innovation journey beyond technology, acknowledging that humans do not use digital applications or data but rather the products and services that serve their needs (Dell'Era et al., 2020).

Therefore, the paper advances the body of knowledge about the role of human-centered approaches in the digital journey and how digital innovation solutions can be designed and adopted

more humanly (Calabretta and Kleinsmann, 2017; Magistretti et al., 2021). The research goal is to explore a practitioner-derived perspective on how their companies have approached digital innovation through the lens of human-centered design, i.e., putting humans at the center and looking at the more 'human' aspects of digital technologies. Thus, it addresses the following research question: how can human-centered design approaches help companies navigate the digital innovation journey?

An exploratory study was conducted to address this question, using a sample of fifteen experienced professional managers with significant backgrounds and experience in digital innovation initiatives. The results were clustered using the Digital Transformation Framework, bringing up four propositions that can be verified in future studies. While there is a coincidence in the professional managers' views and current research studies on digital initiatives deployment, for example, showing quick results, training people, and collaborating with partners in the ecosystem, the paper systematizes and brings new insights into the role of people in digital innovation. The findings provide some pieces of evidence that HCD approaches can drive digital innovation forward by i) assisting companies in building empathy with people and gaining a proper understanding of customer and employee needs, desires, and pain points, and ii) developing a systemic environment that encourages companies to create a more agile organizational structure, optimize the user's experience and technology and facilitate the co-creation of digital solutions with customers and employees.

The propositions contribute to advancing the debate about the role of HCD on the digital innovation journey of organizations and expanding the body of knowledge in the fields of customer and employee digital experience and digital technology adoption. It acknowledges new research opportunities like adopting HCD approaches to create meaningful and personalized digital experiences for small businesses, omnichannel strategies, and digital collaboration processes and tools to support the future of work.

The following sections show the challenges of navigating the digital journey and why a user-centered design (HCD) approach is needed. Next, study-based viewpoints of professional managers about the digital innovation journey are analyzed and discussed with evidence from the literature. Finally, the paper provides testable propositions that advance this field of knowledge and serve as starting points for future studies.

2 Background

2.1 Navigating in the Digital Journey

The evolution of the digital journey in companies can be mapped into three phases: i) Digitization - when analog processes are transported to digital with little to no change being made; ii) Digitalization (also known as digital transition) - when digital technologies are introduced as part of services or products used to modify existing business processes; and iii) Digital transformation - when digital platforms and technologies reshape and stimulate the generation of new and disruptive business models (Verhoef et al., 2021).

Despite their digital maturity level, companies address complex issues throughout their journey, requiring more internal organizational design and strategic positioning than cleaner processes. The digital journey brings complex and diverse challenges to companies, even at the entry level, since new technologies are reshaping and transforming consumer dynamics by changing people's interaction and consumption of content, thus contributing to developing new products and services (Dell'Era et al., 2020).

The leading digital transition and transformation contributions from the literature can be

organized from the perspectives of the consumers and employees and the digital transformation aimed at the company's internal processes or output.

The digital journey is an excellent opportunity to drive innovation forward by changing the business internally (with employees) and externally (with partners and consumers). Still, technology is not the only driver of change since the digital journey profoundly affects the human aspects and daily lives of people, both privately as consumers and professionally as employees or in the form of evolving organizational cultures (Brunetti et al., 2020; Mergel et al., 2019). The organizations' culture and values must support change and enable employees to get out of their comfort zone and daily routines by adopting new platforms and processes. Technology should not be perceived as a threat or obstacle to employees' job security and personal development but as a driver of change and innovation (Albukhitan, 2020; Eden et al., 2018).

Companies develop a combination of digital and human capabilities to deliver solutions that solve real business and societal problems (Cortellazzo et al., 2019). Companies need to understand what the new technologies can provide in terms of human relationships to support their decision-making process and concentrate on the experiences they want to deliver. For instance, replacing a hospitality experience with a technology application or system is complicated. Companies should alternatively establish goals like simplifying employees' work to provide a better customer experience (Albukhitan, 2020; Solberg et al., 2020). Regarding the effectiveness and efficiency of customer interaction, a deeper analysis is needed regarding the type of services that can and should be digitalized, particularly when customers require or prefer human participation and support (Lindgren et al., 2019).

In line with the digital transition, human services that need creativity, persuasion, negotiation, or caring for others will probably show a lower probability of being replaced by technology (Matzner et al., 2018). Nevertheless, to perform well in this competitive and fast-changing context, a new set of non-technical skills is demanded. Cognitive and engagement skills like growth mindset and adaptive leadership promote critical thinking, collaboration, and building lasting relationships, which help companies navigate the digital journey (Efrat, 2017). Thus, mobilizing talent is one of the most critical issues since companies need skilled and trained people in technologies, e.g., AI, IoT, Machine Learning, and cybersecurity (Trenerry et al., 2021), with a digital mindset (Solberg et al., 2020).

However, a growing number of companies are using technology to pursue new opportunities to innovate, i.e., develop products, and services that improve both process efficiency and human productivity while delighting customers, introducing disruption and transformation into the digital adoption process (EIQ, 2018; Saarikko et al., 2020). Likewise, more balanced business models and ecosystems incorporating technologies and human interactions enable companies to co-create solutions based on new technological applications (Nadkarni and Prügl, 2021). The need to co-create is fully justified, as companies no longer control user needs and need to integrate a more significant business ecosystem of complex relationships with multiple tensions. The evolution of technology allows users to change and add functionalities based on their requirements (Calabretta and Kleinsmann, 2017).

A multifaceted set of strategic actions to respond to the challenges of the digital journey can be divided into the following building blocks: i) culture and skills that include digital education, talents and digital culture; ii) infrastructures and technologies that include the use of collaborative robots as helpers of the human work and artificial intelligence, and iii) ecosystems, encompassing the necessary partnerships to grasp the opportunities offered by digitalization and quality of life for people and communities (Brunetti et al., 2020). Companies mastering technology and human drivers, including culture, skills, and ecosystems, are well-positioned to succeed in their digital

journey.

2.2 The Role of Human-Centered Design in Digital Innovation

The debate about the relationship between human beings and technology is not recent (Cortellazzo, 2019). Related literature in human computer interface and service design also discusses the co-creation and involvement of users (Mager and de Leon, 2022) but not directly in the context of digital transformation. This paper focuses on the aspects needed to make digital innovation more human-centered.

People matter and play a crucial role in today's societal and business environment (Veling, 2014). There is a growing awareness of the importance of human factors in the digital journey and good examples of where human-centeredness can support an organization, e.g., employee experience and organizational culture change (Gao and Hands, 2021; Hargraves, 2018; Veling, 2014).

Digital advances, such as remote work and disruptive technologies, affect how employees work together and interact with key stakeholders such as customers and business partners. Even in service industries, where the human factor is critical, employees use digital tools to perform their tasks better without losing connection with other people. A perfect example is given by a bank institution that humanized customer service with the introduction of "digital journey managers," providing personalized advice through the journey with the help of data analytics (Solberg, 2020).

Hence, the human-centered design approach is well-positioned to close the digital gap by overcoming the challenges companies are facing during their digital journey, namely: the difficulty of managing the impact on firms' internal processes and organization design (Kretschmer and Khashabi, 2020), the development of agile structures with low levels of hierarchy (Verhoef et al., 2021), employees' beliefs and expectations about technological change (Solberg et al., 2020) and facilitation of customer co-creation (Nadkarni and Prügl, 2021).

Human-Centered Design has its historical roots in the concept created by Rob Kling in 1977 and disseminated by Don Norman, the author of the book "User-Centered System Design: New Perspectives on Human-Computer Interaction" in 1986 (Colina, 2021). More recently, Tim Brown introduced design thinking as a human-centered approach that goes beyond the human-machine interface and focuses on human behavior, needs, and preferences (Brown, 2008).

Human-centeredness helps companies to familiarize themselves with users by discovering, expressing, learning, adapting, and justifying opportunities that will facilitate the design of innovative digital solutions based on business requirements and human needs (Hargraves, 2018; Pokorni et al., 2020). Instead of just using a functional or engineering approach to features and technologies, human-centered design promotes change. It enables activities, processes, and interactions with employees, customers, suppliers, and partners, mainly by adopting a systematic, structured, and proven holistic approach that takes end-user perspective into the development process of desirable, feasible, and viable solutions (Magalhaes, 2018; Pokorni et al., 2020; Veling, 2014).

From the angle of digital innovation, companies create new solutions following the functional and technical requirements and, more deeply, the emotional, personal, and social needs. Digital innovation can be primarily achieved by a human-centered approach that facilitates and encourages critical human touchpoints between the customer and the company along the journey to an expected outcome, e.g., providing a seamless omnichannel experience (Calabretta and Kleinsmann, 2017; Doan, 2021).

The goal is to match the technology with the user's needs, and HCD plays a vital role in this alignment by using human-centered methods and tools. Empathy building with users through

observation and ethnography enables a "people first" mindset and approaches to come closer and discover people's needs, evolving behaviors, preferences, and pain points (Dell'Era et al., 2020; Gao and Hands, 2021; Macdonald et al., 2020). Human-centeredness supports the design of new digital solutions that fit user needs and create value for all parties, increasing user motivation and retention, and at the same time, employee engagement and productivity (Doan, 2021). Companies can accomplish digital innovation by clearly understanding users' needs and interests in combination with viable technologies and innovation and business strategies (Gao and Hands, 2021; Veling, 2014).

In the context of workplace system redesign, HCD aims to create meaningful experiences for people, considering the well-being of participants and the indirect impact on people involved post the implementation of the new digital solutions (Auernhammer, 2020; Kadir and Broberg, 2021). By motivating people to align with their vision and value proposition, companies mitigate the risks of organizational friction and failures in digital solutions that do not account for people's physical, cognitive, and sensorial capabilities (Kadir and Broberg, 2021).

3 Methodology

3.1 Sampling

A study was conducted to address the research question: how can human-centered design approaches help companies navigate the digital innovation journey? The study stimulated peer knowledge sharing in digital initiatives, which involved fifteen professional managers from an extensive range of sectors, e.g., Energy, Industry, Software, Telecommunications, Retail, Insurance, and Healthcare to stimulate peer knowledge sharing (see table 1). All these professional managers have a strong understanding of the research topic, have more than three years of experience in the digital transition, and are aware of the need to approach digital innovation, mainly through the lens of human-centered design. They were all based in a southern European country with the same culture and technology issues.

Table 1. Study Participants.

Job title	Type of company/sector
Product Innovation Director	A cloud-based contact center software provider with valuing at US$ 3 Billion+ and 1,500+ employees worldwide
Executive Director	A Tourism and Real Estate small company
Senior Head of Product - Consumer Products/ Selection & Purchase	An online marketplace of luxury fashion with revenue of US$2,3+ billion and 4500+ employees worldwide
Innovation Specialist	A subsidiary of a multinational Insurance Company with revenue of €35+ billion and 45,000+ employees worldwide
Commercial and Marketing Director	A subsidiary of an industrial corporation with revenue of €763+ million and 4431+ employees
Head of service design	An Engineering and Product Development Applied Research Centre with revenue of US$25 million and 200+ employees
Coordinator of the Digital Global Unit, DIGITAL HUB	Energy Company with revenue of €250 million+ and 35,000+ employees worldwide
Innovation and Process Manager	Automotive Industry Company with revenue of €150+ million and 1,400+ employees

Job title	Type of company/sector
Head of Patient Experience & Solutions	A subsidiary of a multinational pharmaceutical corporation with a revenue of US$49+ billion and 110,000 employees worldwide
Executive Board Member	A Public Hospital with 10,000+ employees
Responsible for the User Experience, Communication, and Product Promotion	A subsidiary of a multinational Telecommunication Company with revenue of €50+ billion and 47.000+ employees
CEO	A facility services technology platform Startup
Communication Manager	A subsidiary of an Engineering Multinational Corporation with revenue of €50 billion+ and 290,000+ employees worldwide
Executive Board Member	A subsidiary of a multinational pharmaceutical corporation with a revenue of US$49+ billion and 110,000 employees worldwide
Head of Operational Marketing	A subsidiary of a multinational retail chain selling cultural and electronic products with revenue of €3.8+ billion and 14,364+ employees worldwide

Research studies highlighted the importance of peer knowledge sharing within organizations and teams (Muhammed and Zaim, 2020; Zhuge, 2002). Peer knowledge sharing is a type of individual-level knowledge sharing that happens horizontally within organizations, different from the knowledge shared vertically in the organizational hierarchy with superiors or subordinates. These knowledge flows enable company managers to develop exploitative and explorative capabilities for innovation (Muhammed and Zaim, 2020). It can be applied in organizational contexts with knowledge work, close cognitive proximity of the parties involved, and less power distance, meaning that their peers work at the same level of the organization hierarchy and on the same type of tasks (Muhammed and Zaim, 2020). Peer knowledge is considered a way to be more innovative and effective in solving problems in a fast-changing work environment, e.g., impacted by technology changes (Muhammed and Zaim, 2020; Zhuge, 2002). Given its characteristics, it was considered relevant to apply peer knowledge sharing to understand better how companies have approached digital innovation, mainly through human-centered design. It is appropriate to develop relationships between company managers working in a hyper-competitive digital innovation context, facilitating knowledge flows, and developing essential capabilities to compete in the marketplace.

The results obtained from peer knowledge sharing were complemented with survey findings from PwC, Fujitsu, Gartner and TEKSystems (Fujitsu, 2021; Gartner, 2021; PwC, 2022; TEKSystems, 2020) to improve the quality of the research.

Table 2. Surveys.

Title, source, and date	Sample
1. Digital HR Transformation, PwC, 2022	PwC surveyed the digital HR transformation priorities of 67 senior HR leaders across five countries in Southeast Asia (Thailand, Malaysia, Indonesia, Singapore, and Vietnam).
2. Global Digital Transformation: Priorities in the post-pandemic world, Fujitsu, 2021	Fujitsu surveyed the business priorities in an uncertain future of 1,200 business leaders across 9 countries.

Title, source, and date	Sample
3. Digital Transformation Divergence Across Government Sectors, Gartner, 2021	Gartner surveyed the makeup of programs and success in scaling digital across government of 166 respondents from government organizations in North America, EMEA and Asia Pacific.
4. State of Digital Transformation: Building a Framework for Digital Success, TEKsystems, 2020	TEKsystems surveyed the organization's digital transformation efforts of 510 members of the C-suite, company executives, vice presidents, directors and managers who have final decision-making authority and/or influence.

3.2 Research Design

The study with company managers, conducted on an online communication platform, started with a plenary session composed of three short presentations about good practices of digital innovation to open minds and reflect, not to influence participants in any direction. It was then followed by a discussion in three working groups of five participants, allowing for a more agile and organized way to explore common interest themes and enrich the understanding of the critical aspects of digital innovation. These breakout discussions were moderated by researchers, balancing, and promoting consensus building. Finally, it was concluded with a final session to discuss the results achieved in the three groups.

The notes from the discussion and nearly 60 minutes of video and audio recordings were transcribed into written form for closer study (Bailey, 2008). The transcripts were analyzed following a three-step protocol to ensure rigor in the data analysis process i) Mapping the direct conversion of recorded audio to text; ii) Spot checking transcripts for accuracy and ensuring that the transcription document fulfills study expectations regarding relevant experience and participants' knowledge-sharing contributions (McMullin, 2021); iii) Building mind maps to systematize the data and find patterns in professional managers' contributions and combine them in meaningful categories, as shown in the next section of findings.

Designing the mind map helped to systematize and find patterns. The professional managers' insights were therefore grouped into the digital transformation framework (Brunetti et al., 2020): i) culture and skills; ii) infrastructures and technologies; and iii) ecosystems, helping to search for the match between the professional managers' insights and the essence and principles of HCD for each category. Consequently, two different relationships were found: One underlines specific conditions supporting the companies' digital innovation journey. The other highlights limitations or conflicts in the digital innovation journey. This approach helped visualize the professional managers' views and identify areas in the digital innovation journey where people play a crucial role in supporting, limiting, or mixing both.

The relevant survey findings, which were also clustered using the Digital Transformation Framework (Brunetti et al., 2020), supported the views expressed by professional managers. These survey findings were triangulated with the results obtained from peer knowledge sharing.

4 Results

4.1 Insights on Culture and Skills

All professional managers shared and discussed different points of view related to education, talents, and digital culture from an organizational change perspective (see figure 1).

It is well known how hard it is to create a culture of innovation. Many ideas die orphans because creating something meaningful and relevant takes time and effort. Equally, building a digital

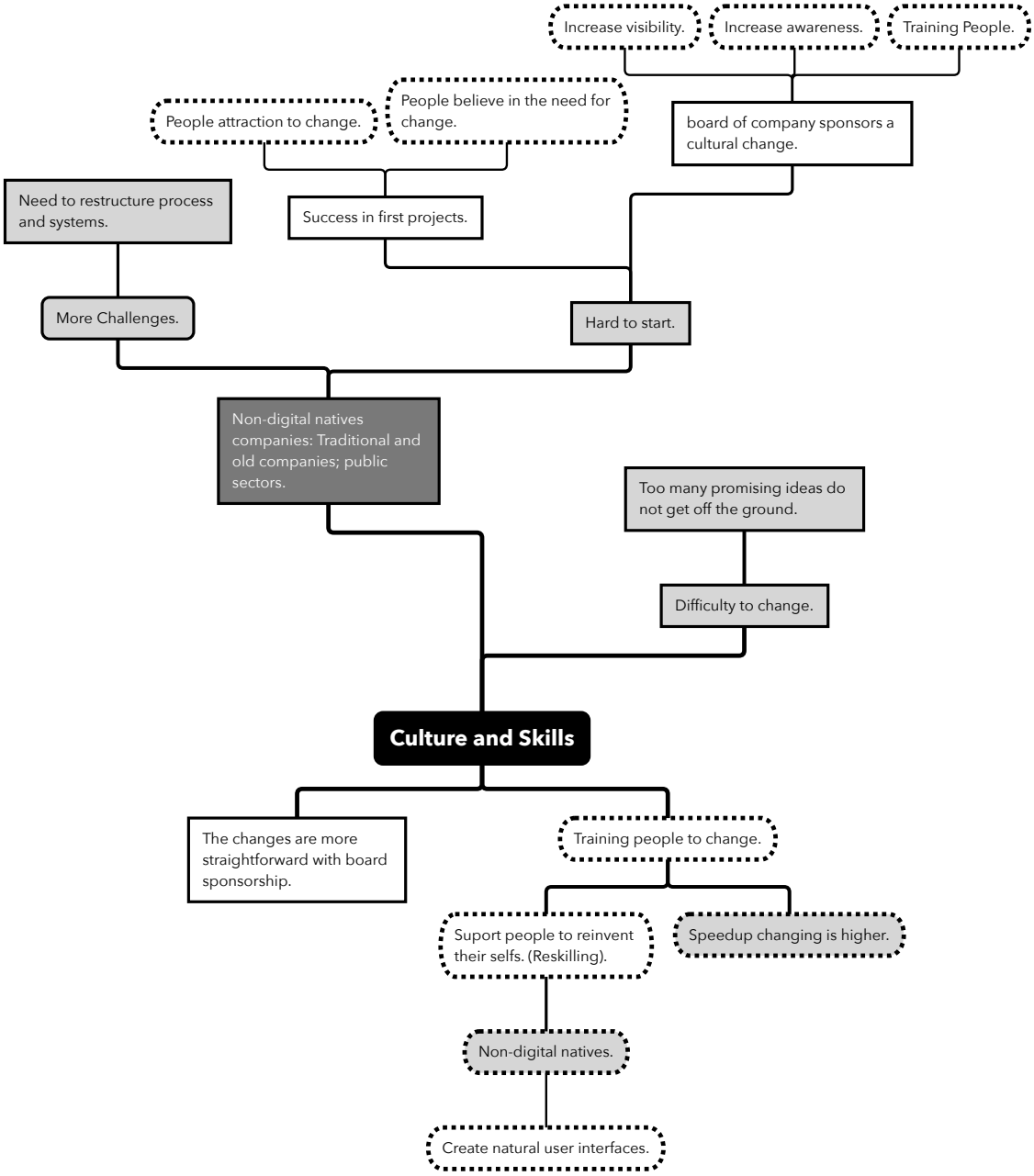

Figure 1. Culture and Skills Category.

culture turns out to be a fundamental challenge, which needs to be designed and experienced by companies during their digital journey.

One of the main challenges is educating people, that is, knowing how to provide the training and the skills necessary to embrace change. Digital acceleration is increasingly leading to new functions, with more need for additional training. Companies must encourage employees to reinvent themselves and learn throughout their lives to remain included in the labor market. A person's need for reskilling can range from an upgrade, a small change, or a new way of doing tasks. But for others, it may undergo a complete change of functions that have become obsolete.

As an illustrative case, an online platform was developed to connect professionals looking for opportunities to work from home and companies looking for professionals to assist their

customers through a contact center. During the pandemic, 40 million unemployed professionals with know-how in the United States could work as freelancers in contact centers, which were understaffed as many companies closed stores and redirected their business to online selling. This platform made it possible to quickly form efficient teams and provide excellent customer experiences by reconversion and training more professionals in new roles.

Unlike the new generations (born-digital) that use technology, e.g., a tablet or a mobile phone, to achieve what they want, most professionals cannot use digital devices proficiently. For example, in the case of healthcare with a patient target usually raging above 60 or 70 years of age, many will not have the necessary flexibility to use digital tools. The challenge is to ensure adequate training for users to use them naturally.

There are very different realities concerning the development of capabilities and the adaptation of companies to the digital world. The digital mindset comes from the ground up technology-driven or born out of technology. And these are the ones that hire the most profiles of people who already bring with them methodologies and ways of working that are more digitally oriented. Others will have difficulty leaping into digital because when they use the same systems as the people who already work in the company, they will have to put more effort into the organization to think differently and restructure its processes.

But, like most organizations, technology-based companies also face a lot of resistance in the digital transition process. Even though the mindset is technological and digital, there are many difficulties with people's attitudes and the methodologies adopted.

Organizational change encompasses several conditions. First, top management must have a good level of commitment to empower and communicate the importance of the digital transition to the entire organization. Immediately afterward, companies should increase digital topics' visibility, raise awareness, and train people. Finally, they should be successful in the first projects to attract more people and make them believe more in the change to digital. The organizational change to support the digital transition is more accessible via a top-down approach than a bottom-up one since it is more difficult to change the culture and working methods without solid leadership.

Navigating the digital journey is not accessible due to many other obstacles. The kickoff is particularly tough until it is possible to overcome the initial inertia in the organization and create a snowball effect, where things start rolling naturally. When the first projects go well, the company is no longer pressured to motivate people to participate. A good indicator is when several people ask to participate in new projects, which is a good indicator of the organization's engagement.

Digital adoption is also very complex in the case of older and more traditional companies, such as the pharmaceutical industry, which is usually very risk-averse and lagging. There is also a lot of resistance in public administration, particularly in the case of healthcare. It is mainly due to the complexity of the impacts of investments and the involvement of various stakeholders, such as government bodies, patients, and health professionals. When the focus is to make a difference in the digital training of public hospitals, there is more significant pressure and responsibility for these investments to have a clear purpose for society, ensuring investment sustainability.

The survey findings supported the views expressed by professional managers concerning culture and skills:

- The redefined digital HR Transformation agenda puts people at the heart of technology, creating a "human" digital experience. (Survey 1)
- HCD adoption takes time, 54% of respondents indicated deploying HCD and another 30% put their timelines within three years. To encourage the adoption of human-centered design for digital services, create cross-functional HCD teams so resources from throughout the organization can experience HCD in action. (Survey 3)

- 40% of company executives report that developing the workforce's talent and skills for the future allows them to transform their business and realize these benefits. (Survey 4)
- 44% of companies believe extensive talent structure changes are needed for their digital transformation efforts to succeed, against 37% in 2020. (Survey 4)

4.2 Insights on Infrastructure and Technologies

This category encompasses the need for information, interaction, and technology as a significant concern and priority of professional managers (see figure 2).

Companies can use technology well or poorly. It is beneficial for people when the technology is properly used, but it is crucial to be mindful of all its implications. Unexpected user needs and desires were particularly relevant in the new digital-based working models, heavily stress-tested during confinement. During this time, it was impossible to fully address the change brought about by confinement, where in most cases, a significant number of people we forced to work from home. It was a sudden and significant change, even for companies already used to working remotely, with teams and clients geographically dispersed worldwide. This period was the largest accelerator of the digital journey of all time.

The digital transition in healthcare, particularly in the public sector, clearly shows the strategic issues of the technological infrastructure, particularly in cases like some care providers and hospitals that lack a proper internet access network. The development of digital projects implies working with an infrastructure that is not always adequate and prepared to respond to these challenges. Therefore, it will be essential to take advantage of opportunities to make suitable investments in the digital journey of the public sector, which could also be a facilitator of business with companies.

The evolution brought about by Covid-19, with its pressing demands to adopt the digital, is vast. It reaches a point of no return in terms of investments in infrastructure and technologies. Many companies are starting to use digital tools to monitor or reach out to customers, as in the case of business travel. No doubt people will travel again to visit clients and partners. However, they will now significantly reduce the number of business trips because they can already use digital tools. Due to the confinement, there were almost no business trips (e.g., from Europe to Japan to meet with clients), presentations of collections, and visits to manufacturers (e.g., some industrial companies used to receive 1500 to 2000 visitors per year). Suppliers were forced to search for digital solutions (e.g., virtual showrooms, and 360 digital factory visits) quickly to continue addressing their customers' needs and requirements.

For these reasons, companies will continue to invest in digital solutions. And those that had started with digital processes before the confinement will be better prepared for the future. But if the value and importance of investments in infrastructure and technologies are unquestionable, their interaction with people will have to be conducted differently. Sometimes it is more difficult to change people's behavior and mentality than the technology itself.

Technology is misused when people are not the priority, often happening. Mainly where digital is considered as an end rather than a means, frequently forgetting the purpose of the evolution, i.e., realizing the problem we want to solve and whether the solution must be digital. Regrettably, in many digital transformation processes (rather than transition), companies suddenly decide that the future is digital and start doing everything they can to get there in the shortest possible time. Sometimes introduce several new digital tools and rapidly change their most critical processes.

The multiplication of digital projects causes a lot of entropy in the organization, particularly in people who will have difficulty selecting adequate tools to use. As much as they are intuitive, each has its way of functioning and integration needs. And sometimes, the abundance of features and sub-functionalities creates more complexity, making managing so many digital tools extremely

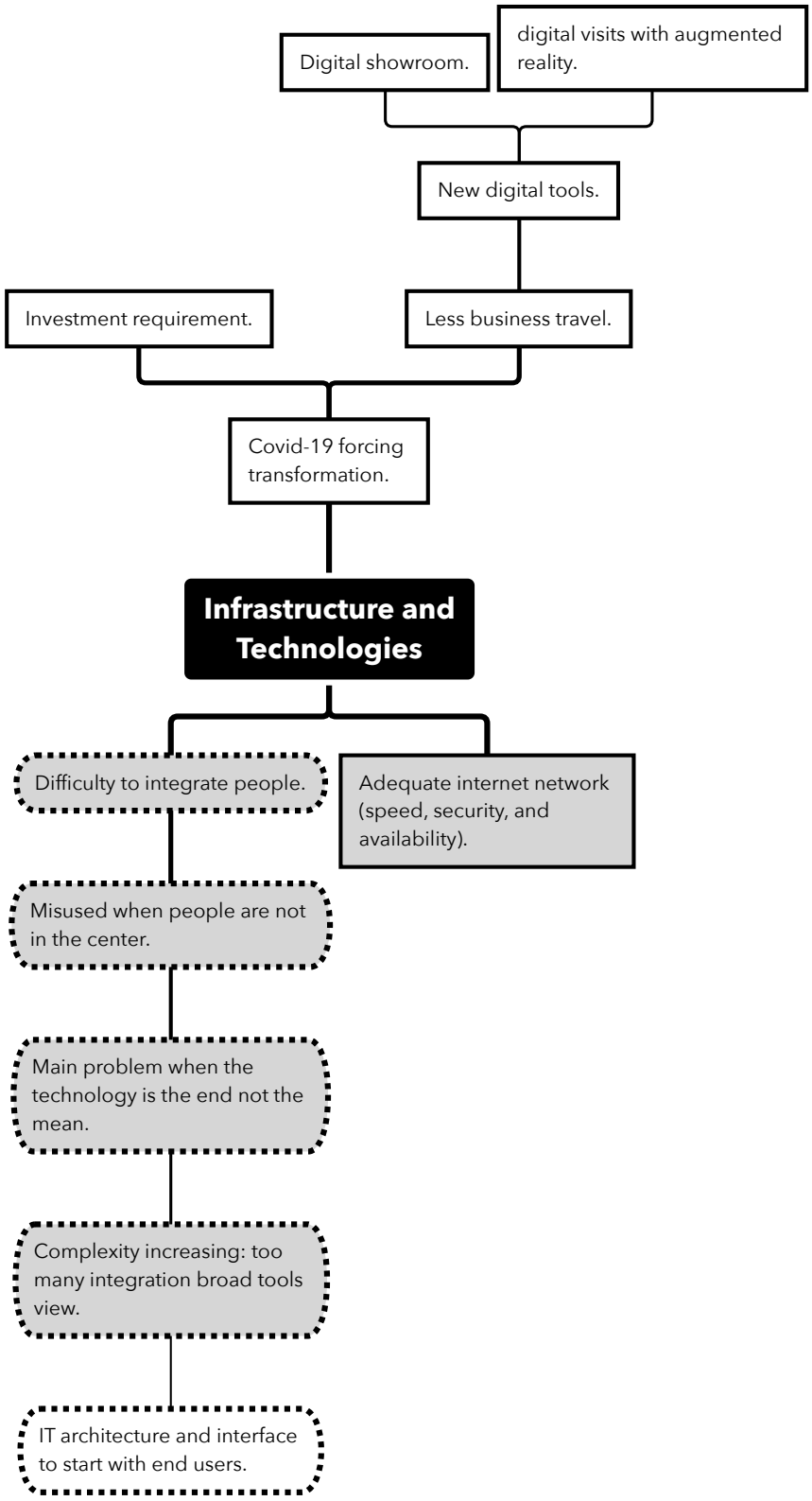

Figure 2. Infrastructure and Technologies Category.

complex. Companies no longer focus on people's needs by embarking on digital madness. It is necessary to have methodologies to incorporate digital into the company's thinking and work. Introducing another tool can be helpful at a particular time, but it doesn't always make sense for everyone and in all types of settings. Companies are often too focused on technology, tools, and interfaces when approaching the digital journey and forget that people must always be involved in these processes.

Fortunately, some good practices emerged to help people during the pandemic. A company operating in virtual assistants developed a process to provide first-rate assistance to people suspected of having Covid-19. The company successfully use this platform to help the healthcare system answer the spike of calls during the pandemic's peak. Another good practice was a pick-up system developed by a retailer to assist people working remotely in services related to tech equipment such as tablets, computers, and smartphones. These services included data recovery, memory and disk upgrade, malicious software removal, disk backup, cloning services, internal laptop cleaning, and parts replacement. The company collected, repaired, and delivered equipment wherever the customer wanted, under and out of warranty, even if they had not purchased it at company stores.

The survey findings supported the views expressed by professional managers concerning infrastructures and technologies:

- The relationship between people and technology is complicated, and organizations are still struggling to put people at the heart of their technology solutions. As a result, organizations (75%) are investing more in digital tools to manage employee engagement and sentiments throughout the transformation. (Survey 1)
- 93% of C-suite respondents believe digital technologies could fundamentally change how people work in their organizations. (Survey 4)

4.3 Insights on Ecosystems

The importance of developing the ecosystem to enhance the digital journey is highlighted in this section (see figure 3).

Organizations should invest in medium to long-term visions and partnerships to implement digital business models successfully and aligned with their strategy. And it is not only within the company but also in the environment where it operates. Unfortunately, many organizations are still convinced that building everything from scratch is the best strategy. The alternative is to understand who is already mastering the digital world and partner with them. By learning with partners, the digital journey can be accelerated.

Many large organizations where it is much more challenging to achieve a rapid cultural transformation may acquire native digital companies to absorb their digital mindset and agility. However, despite being a possible answer, it can bring other issues since it generates a cultural shock with significant people related implications. Therefore, partnerships between organizations have limits, not only in terms of organizational culture but also in terms of strategy and competitive positioning. Many years ago, there were discussions about how digital would impact worldwide competition. Still, some organizations don't realize that their direct competitors may no longer be their neighbors. In many cases, fierce competition may come from remote players in India and China.

Digitizing the company's ecosystem can also be an essential acceleration factor in customer relationships. Organizations from various business areas, such as energy and telecommunications, are eager to accelerate digitization to provide a better customer experience. Many of them are going further with the involvement of users in the design and creation of digital solutions. This

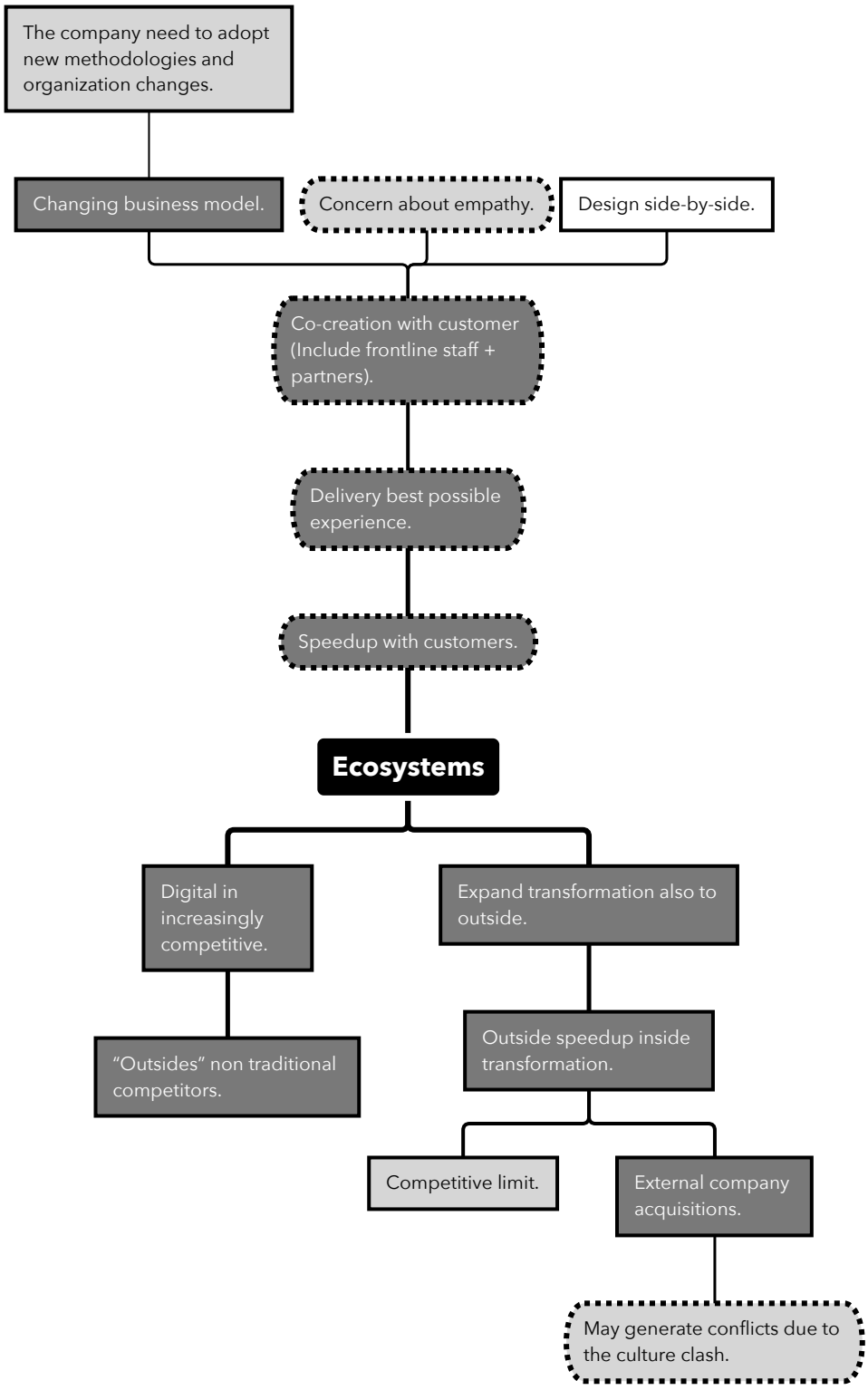

Figure 3. Ecosystem Category.

value co-creation with customers allows for new business models, so adopting new methodologies and organizational change is challenging. The role of users is vital in designing digital products

and services because people now need to have an active role in their conception and adoption. Nothing will happen as expected if people are not mobilized.

Working side-by-side with people who provide the service and the end-user in the co-creation process is critical. When designing this journey of co-creating the digital service, companies can create something that works well for them and is helpful for the customer. It is also imperative to co-create digital services with the companies' employees, for example, to reduce the redundancy of communication and the various technological platforms for internal communication. In this process, it's essential not to forget the need to build digital empathy because we are all human, not machines. And sometimes, digital evolution does not fully consider this need by not involving the user in creating digital solutions.

A good practice developed in the healthcare sector provides interesting inputs regarding user involvement. A digital journey mapping initiative was conducted to better understand the patients from the moment they start having their first symptoms until they arrive at a healthcare facility that can establish a proper diagnosis and provide them with the best possible treatment. The objective is to understand which obstacles patients face along this path and what solutions can be designed and developed to ultimately eliminate barriers and speed up this journey, ensuring each patient arrives as quickly as possible to the place and the proper health professional. This process was successfully applied to hospital capacity during the pandemic since canceled consultations and medical procedures created many difficulties for patients.

The survey findings supported the views expressed by professional managers concerning ecosystems:

- One of the top business priorities in an uncertain future is a seamless customer experience where online merges with offline and human-centric management. (Survey 2)
- Human-centered design (HCD), commonly referred to as the design approach that focuses on the user or stakeholder at the center, encourages the involvement of these stakeholders through the design process of services. (Survey 3)
- By 2023, 60% of governments will integrate HCD techniques into their digital service design process. "The use of agile and HCD processes for service design will become a standard combination of techniques for governments to improve service delivery". (Survey 3)
- Improving customer experience and engagement is the top goal fueling digital transformation efforts for more than seven out of 10 organizations. "We're implementing human-centered design and design thinking, infused innovation culture, performance-based mixed media modeling for marketing, data integration for personalization." (Survey 4)

5 Discussion

This section aims to provide meaning to data by comparing the study results with the background theory and developing a set of testable theoretical propositions that describe the fundamental relationships between HCD approaches and the digital innovation journey grounded in empirical evidence (Eisenhardt and Graebner, 2007).

Driving the digital journey forward is a boundless challenge for companies. The lack of a long-term strategy, difficulty establishing partnerships outside the organization's borders, changing the organization's culture, and understanding the consequences for people are well-known challenges of the digital journey.

From the three key building blocks of any digital transformation: people, business, and technology, findings show that leading companies focus their efforts on the user experience rather than technology-driven solutions that only serve business purposes. There is significant evidence

that people must be at the center of the digital journey, in line with "people first" approaches (Dell'Era et al., 2020; Gao and Hands, 2021; Macdonald et al., 2020). For the three digital journey categories, i.e., culture and skills (figure 1), infrastructures and technologies (figure 2), and ecosystems (figure 3), the driving and restraining forces of digital change are very much connected to people.

Digital technology can be misused when there is no concern for people, mainly when it is treated as the primary objective and not as a tool to help human beings do their job better. Despite technology being the tip of the iceberg, critical issues of the digital journey are people-related. Rather than digital technology's ability, reliability, and complexity, the main problem of digital adoption is the difficulty of building the proper interface between people and digital applications. This problem is more striking in the case of the inputs from the infrastructures and technologies category since it would be much more expected to have technology-related issues than employees' concerns and expectations about its implications (Solberg et al., 2020).

As such, the following proposition is formulated: Proposition 1 – By putting people at the center of the digital journey, companies overcome issues related to the lack of adoption of digital innovation, making applications more aligned with users' needs and motivations.

Results of the study confirm that adopting digital technologies creates significant internal challenges for company leaders and their employees. Cultural change is much more complicated than technological change. This view goes hand in hand with the existing body of knowledge. Technology deployment impacts the digital innovation journey and profoundly affects people and their daily lives, both privately as consumers and professionally as employees (Mergel et al., 2019; Solberg et al., 2020). Questioning the type of organizational structures (more agile or dependent on legacy systems) and the most effective management styles to promote organizational change stand as companies' significant priorities (Kretschmer and Khashabi, 2020; Verhoef et al., 2021).

As a result, the following proposition is advanced: Proposition 2 – By creating a more agile organizational structure and open leadership style, companies overcome user experience with digital innovation issues, facilitating the co-creation of solutions with customers and employees.

Creating a digital mindset and capability is a massive challenge that is becoming more difficult to address, given the fast change in technology and the marketplace (Efrat, 2017). This type of environment turns much more difficult for companies that operate in areas or sectors that are disappearing or becoming obsolete. Companies are preparing employees to adapt and acquire new skills for the digital world and restructuring their internal processes and organization design (Kretschmer and Khashabi, 2020; TEKSystems, 2020). The same problems happen in the public sector, usually having more difficulties dealing with the risk and uncertainty of a digital technology project. Process-based companies in healthcare, where safety is at stake and a mistake can cost people's lives, also have specific problems bridging the digital gap.

As such, the following proposition is formulated: Proposition 3 – By developing a digital mindset and skills in employees, companies overcome issues related to resistance to change, facilitating the redesign of internal processes.

Study findings also endorse that a company is part of an ecosystem formed by customers, competitors, business partners, and other actors (Brunetti et al., 2020). This understanding applies to the digital innovation journey, where change is accelerated from the outside (Mergel et al., 2019). The influence of the external environment can speed up the digital journey, particularly by placing customers not only in the center but also enabling them to participate in the co-creation of new digital products and services (Lindgren et al., 2019; Nadkarni & Prügl, 2021). Study participants underlined initiatives to co-create services and products with customers, bringing a better experience to the end-user. Nevertheless, company processes can also apply this approach,

encouraging employees to co-create their internal services because they are all humans.

As a result, the following and final proposition is advanced: Proposition 4 – By co-creating value with customers and employees, companies overcome issues related to developing new digital products and services, making them feel part of the process and ensuring effective adoption and support.

6 Conclusion

6.1 Contributions to theory and practice

Traditional companies are still trying to maintain the legacy systems and processes built over the years. However, the fast change environment forces them to adapt rapidly and change their inner practices and culture, significantly impacting employee engagement. It is all about people; employees must constantly adjust their mindset and reinvent themselves. Companies should adopt processes and business models to current and emergent challenges and empower employees to update their thinking and skills. Digital is bringing far-reaching and profound transformation to companies. To support their digital innovation journey, companies should learn how to engage with customers and employees by encouraging them to participate in the co-creation of digital solutions.

The paper explores the relationship between HCD approaches and the digital innovation journey. It demonstrates that human at the center is the fundamental condition for navigating in the digital innovation journey smoothly. Study findings from experienced professional managers involved in digital initiatives support the current research streams and contribute to understanding how human-centered design (HCD) can help the digital journey of companies.

The study's empirical findings support a set of propositions derived from the conceptualization of the role of HCD approaches in the context of the digital innovation journey. These propositions contribute to the theories of customer and employee digital experience and digital technology adoption and serve as starting points for future research about the role of people in digital innovation.

Besides identifying patterns of thought and insights that advance the debate about the role of human-centered design on the digital innovation journey of organizations, the paper contributes to expanding the body of knowledge in the fields of customer and employee digital experience and digital technology adoption. It acknowledges new research opportunities like adopting HCD approaches to create meaningful and personalized digital experiences for small businesses, omnichannel strategies, and digital collaboration processes and tools to support the future of work.

Results show company managers how HCD approaches can drive digital innovation forward. HCD approaches assist companies in building empathy with people by developing capabilities to understand customer needs, desires, and pain points, which will help them align technology and business goals and prioritize areas that will significantly impact customers' day-to-day lives across the entire company. Companies should focus their efforts on the user experience rather than technology-driven solutions that only serve business purposes. HCD approaches can also help develop a systemic environment that encourages companies to create a more agile organizational structure. A more holistic HCD deployment can optimize the user's experience with technology and facilitate the co-creation of digital solutions with customers and their employees.

6.2 Limitations and Future Research

The study suffers from some limitations and offers avenues for further research. Although the study findings are good indicators of the state of the digital innovation journey in organizations, the reality is far more complex than its propositions. This topic requires further research to ground the main argument that human-centered design (HCD) can drive digital innovation forward. Future studies could test the performance of human-centered design (HCD) in motivating people to embrace change and adopt digital solutions by comparing several types of organizations, including government and non-profit. It would also be relevant to study their cultural context, e.g., the country where the organization is located.

While the main contributions to the study mainly came from large companies with high digital maturity, it is possible to establish parallels with other companies that are now navigating the digital journey. Many changes and difficulties impacting large companies are amplified when the digital gap is higher. It would be relevant to study the impact of human-centered design (HCD) on the digital innovation journey of smaller and non-digital organizations and how it would contribute to increasing digital awareness. The problems resulting from the Covid-19 pandemic were more profound for micro and small companies, mainly those more dependent on physical stores (services, restaurants, and commerce).

Future research possibilities can also explore the critical issues introducing digital technologies within companies mentioned in the study results. Understanding how companies can make applications more aligned with users' needs and motivations seems very promising. Further investigation is needed on how to develop a digital mindset and skills in employees and engage with key stakeholders in the co-creation of solutions.

Although a human-centered design (HCD) approach could help them adopt digital solutions, the full range of implications on their competitiveness is still unclear, as the potential McDonaldization of digital initiatives (Mandviwalla & Flanagan, 2021). The digital innovation solutions generate value for these small companies, making their operations more efficient, predictable, and manageable, following the same logic applied by McDonald's in the case of fast food. However, they risk homogenizing their offerings by selling, distributing, and interacting with customers through the same digital platforms, thus losing their identity with consequent customer dissatisfaction. This topic is another exciting avenue for further research about the role of human-centered design (HCD) in creating meaningful and personalized customer digital experiences for small businesses and omnichannel strategies.

Future studies could also apply human-centered design (HCD) approaches to redesign the future of work. Despite the difficulty of predicting the real impact of digital on work, study findings can help companies navigate this uncertain journey by focusing on people's expectations and new lifestyles in the pos-Covid-19 new or never normal. Covid-19 has exponentially accelerated the digital journey of companies, with a significant impact on work relations and society in general. HCD can play a crucial role in digital collaboration processes and tools (synchronous and asynchronous) to support new ways of working inside and outside organizations. Nevertheless, despite a growing trend to adopt hybrid working approaches, companies must investigate these impacts on employee engagement and productivity.

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Biographies

Rui Patricio. Coordinator of the Strategic Design and Innovation Lab (SDI.Lab) and Coordinator of the Marketing and Innovation Master Program at IADE - Faculty of Design, Technology and Communication - Universidade Europeia, Lisbon. His research interests lie at the intersection between innovation management, gamification, and design thinking. He conducted research on design approaches to innovation in global firms, resulting in publications in journals like Creativity and Innovation Management and the European Journal of Innovation Management. He holds a PhD degree - European Doctorate - in Marketing and Strategy from the University of Aveiro with research mobility at the Design School of the Politecnico di Milano, an Msc in Management and an MBA from the University of Porto Business School with an Exchange Program with the University of California, Los Angeles, a R&D + I Program and a Kaplan Norton Balanced Scorecard Certified Graduate (Boston). Rui Patrício is also a creator of gamification tools like ideaChef®, which many firms and universities have applied. Before moving to the academic community, he held management roles in marketing/innovation at startups and leading companies and completed many consulting and training international projects.
CRediT Statement: Conceptualization, Methodology, Project administration, Supervision, Writing – original draft and Writing – review & editing.

Pedro Gomide. Pedro Gomide is a Ph.D. Candidate in Design at IADE. His Ph.D. research focuses on enhancing manufacturing management through design and human-centered approaches. His background counts with specialization in Leading Digital Transformation at MIT, an MBA in Digital Transformation and Business Future at Pontifícia Universidade Católica do Rio Grande do Sul, degrees in Electrical Engineer at Centro Universitário de Belo Horizonte and Industrial Business Management at Pontifícia Universidade Católica de Minas Gerais. In his professional career, he promotes innovation in multinational companies as a Design Leader on the Innovation teams and works on Digital and Cultural transformation.
CRediT Statement: Formal analysis, Visualization and Writing – review & editing.

Luis Rocha. Independent consultant in healthcare and Pharma and current commercial head of a digital services and e-learning company since 2021. Executive in top tier pharma companies NOVARTIS, PFIZER and MSD from 1988-2021, performing different roles in Marketing, Commercial operations, Market research, Public Affairs, Patient access, Health economics, government affairs and public policy. Experienced in commercial, public affairs and healthcare economics & financing, has deep understanding on how above country policies shape healthcare and patient access. As former member of the Novartis Portugal board and Executive Committee, had responsibility in corporate governance, risk management and setting the culture and governance overseeing business practices. Education: MsC Business Administration (INP, Lisbon, 1988), post graduation in Health Economics (ISEG, Lisbon, 1998), Leadership development program LDP (INSEAD, Fontainebleau, 2005), Healthcare administration/management (Nova SBE, Lisbon 2010). Publications: "Productivity Loss in NHS Hospitals" Value in Health, ISPOR Nov/2019, "Prevalence of Chronic Health Conditions in the Portuguese Population" Value in Health, ISPOR Nov/2017.
CRediT Statement: Project Administration and Writing – review & editing.