UNIVERSITAT DE BARCELONA

Strategic recovery for digitally underdeveloped sharing economy components: Coworking spaces' digitalization in time of pandemic

Tugce Nuray Saka

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PhD in Business

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Thesis title:

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UNIVERSITAT DE BARCELONA

To my family.

If there's a new way,
I'll be the first in line
But it better work this time.

Can you put a price on peace?

Mustaine, D. (1986). Peace Sells [Recorded by Megadeth]. On Peace Sells... but Who's Buying? [CD]. Capitol Records.

ACKNOWLEDGEMENTS

I dipped my hands into digital technology as a practitioner before I graduated from university, with a bachelor's in political science. My first career experience started in the first ISP of Turkey, in Istanbul, as an editor assistant (now you would call this a Content Creator). Then, in 1999, we used to publish a website weekly and tear it down at the end of every week, to restore it with the next week's content. This process of update was the only choice since the websites then were not built on databases, they were simply html files written over another with the same name. I then used to admire the guy who was coding the webpage, cropping the image files which we downloaded each in 5 minutes sometimes. In one year, I saw him replaced by a simple innocent software by which we ourselves as the content creators could build a website of our own. There was no need to know how to code if you believed in automation. In 6 months, the ISP laid off the members of our department and only 2 years later user-generated content became the norm. I was lucky to have left the *kingdom of content* creation by then, to start working for digital asset management in a private bank, which later paved my career path to strategy management.

The disruptions of those days now seem like mere pebbles on the road compared to the more advanced technologies of today. These days are fiercer; it takes only 3 months for a new technology to be outdated by another. Who would spend their precious time training themselves in a technology that is to be shelved soon? What is more, I am now in the academy, the bitter cold of not being able to keep up with the disruptions in front of practitioners-to-be whips us to learn more about them, which is good. But harder it is to catch up with

the state-of-the-art, especially if you are in the theoretical periphery, questioning for rigor. Consider this to the rightful speculations about the generative AI taking over content creation. Consider this to cognitive automation. Who will read these long papers in the next decade? Will the subject matter be relevant? Will the abundance of similar documents hinder its practicality? Will readers have enough time to enjoy it? Will reading papers be an old-fashioned habit in a few years?

In the degrading light and shadow of these turbulences, as an ex-practitioner who spent about two decades of life in digital technologies and as a proud lecturer of fin-tech and digital economy, I am penning this thesis concerning the digitalization on a cross section of pandemic era, some point in life that I find to be more tragically meaningful, in terms of its probable long lasting effect in the future of mankind. I am grateful for the sage support and encouragement I received from my advisors Esther Hormiga Pérez and Jaume Valls Pasola throughout this hard walk. Equivalently, I am thankful for the members of the University of Barcelona Business School, who have provided a cozy home for me since the days of my Master studies. Many reviewers I had through my thesis dissemination activities also deserve a huge credit for the perfection of my work. For sure, this research would not have been possible without the participation of coworking spaces which have shown their interest and full dedication to the study even within the overwhelming distress of their hard times, I am deeply indebted to them.

Lastly, I thank MY FAMILY who encouraged me to change lanes and strive for a new path in life, to become a doctor.

We will see if I can make a good one.

SUMMARY

COVID-19 crisis marked a milestone for all organizations to reconsider digitalization priorities. This study explores how under-digitalized components of sharing economy have coped with and adapted to the challenges of the pandemic, focusing the empirical setting on coworking spaces. Drawing on the Dynamic Capabilities (DC) view, we provide insights on methods that digitalization can help small businesses to survive turbulence and we offer practical advice to managers in this industry.

Key points of the thesis are as follows:

- Coworking spaces (CWSs) are part of the sharing economy, but with relatively less digitalized resources.
- COVID-19 pandemic period marked a milestone for CWSs to carry out a series of digital strategies to innovate their sharing model during the pandemic period.
- Main driver for change was managerial positive attitude to prioritize digitalization for coping pandemic adversities.
- Not all digital strategies lasted. The proximity sharing ideal for CWSs remained intact after the pandemic even against the increasing remote working practices. Digital technologies related to stakeholder communication were seized critically, based on the utility and efficiency in the aftermath of lockdowns and curfews.
- Following the outbreak of COVID-19, the research stream connecting the subjects of digitalization and dynamic capabilities have gained significant trend, due to the matching case of turbulent environment on the theory of DC and increasing use of digital technologies in that context.
- The majority of prior academic research has applied both themes of DC and DT in a hectic order, basically with careless use of directions when relating two concepts to each other. The analysis highlights a

multidirectional relationship which puts dynamic capabilities or digital technology adoption as an antecedent, enabler or a substitute to the other, based on the requirements of the specific research. This may cause misconceptions and erroneous formulations for future studies in literature.

- We define two major directions in the causality between dynamic capabilities and digital phenomena: First, the direction from digital phenomena towards dynamic capabilities by which digital phenomena serve as an environmental requirement or challenge that necessitates the adoption of dynamic capabilities to achieve organizational goals. Second, the direction from dynamic capabilities to digital capabilities: which highlights the role of dynamic capabilities in facilitating the adoption and effective use of digital technologies.
- In a crisis context, digitalization acts as a determinant for leveraging dynamic capabilities to survive turbulence. Companies can activate coping mechanisms of "digital sensing, seizing and reconfiguring" to sense crisis adversities and track strategic options for recovery, to ensure digital process management and alignment of these processes and finally to reconfigure them into the whole organization by digital transformation of the business and expansion of the digital ecosystem, respectively.
- Growth opportunities are available for small businesses, even if they have slow progress in digital transformation or dynamic capability leverage. Managers must have an open view of improving their resources and capabilities under any condition.
- Perceived digitalization plays a crucial role in motivating small businesses to embrace digital transformation, particularly in crisis. Strengthening connections and collaboration can help businesses with modest digital infrastructure to initiate the digitalization process and leverage dynamic capabilities for preserving operational continuity and maintain competitiveness.

LIST OF ABBREVIATIONS

AI……	Artificial Intelligence
COVID-19 …….	COronaVIrus Disease of 2019
CRM……	Customer Relationship Management
CWS...……..	Coworking space
DC……	Dynamic Capabilities
DCT…….	Dynamic Capabilities Theory
Dep……...	Dependent
DT……	Digital technologies
EU……	European Union
GDP…….	Gross Domestic Product
HTML……..	HyperText Markup Language
ICT……	Information and Communication Technologies
Indep……	Independent
ISP……	Internet Service Provider
IT……..	Information Technologies
Med……...	Mediator
Microf……...	micro-foundation
Mod……..	Moderator
OECD……	The Organization for Economic Cooperation and Development
OO……..	Organizational Outcome
PLS-SEM …….	Partial Least Squares-Structural Equation Modelling
RQ……	Research Question
SE……	Sharing economy
SEM …….	Structural Equations Modelling
SME……..	Small and Medium sized Enterprise
WFH…….	Work from home
WHO……	World Health Organization

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"It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is most adaptable to change."

— Charles Darwin

CHAPTER 1.
INTRODUCTION

This thesis is about strategy. It revolves around many topics; uncertainty, dynamic environment, entrepreneurship, innovation, technology adoption, sustainable development, and all the similar concepts that embrace strategy making in our era. It involves the adaptation to resist and survive turbulence.

In parallel, the main blocks that build up the thesis, i.e., COVID-19, sharing economy, digitalization, dynamic capabilities and coworking spaces should be regarded as proxies of fundamental elements to contextualize the strategy formulation.

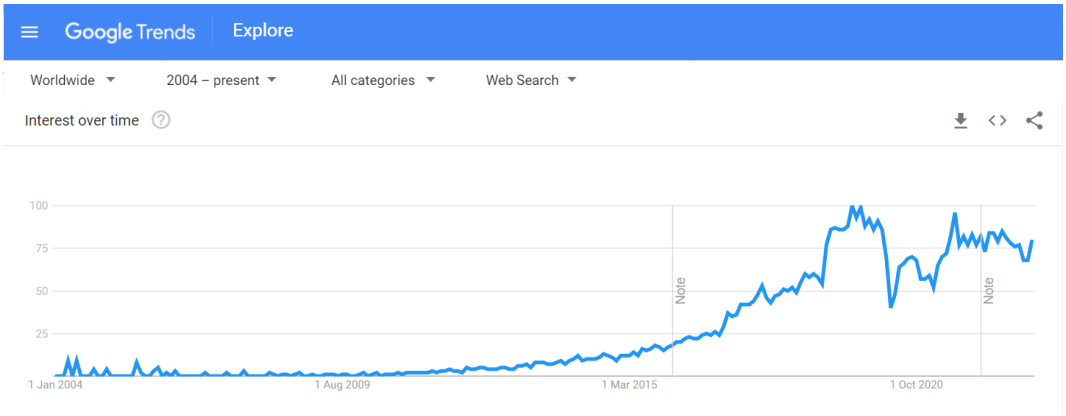
1.1. PERSONAL MOTIVATION

The subject matter of this manuscript could have been significantly different if it weren't for the pandemic. In the spring of 2020, as a Master student in Business Research, I had already narrowed down my thesis topic, which focused on the theoretical basis of entrepreneurship and its relation to coworking spaces within the sharing economy. My main motivation stemmed from the collaborative consumption principle of this system, and I found coworking spaces to be particularly interesting due to their existence predating the emergence of digital giants in the sharing economy.

However, as the pandemic dawned globally on all businesses in April, I also came to stand in the middle of a crossroads. I had to decide either on giving up with the topic of these social spaces which became idle in one day due to the sudden social restrictions or I would power through writing about them, embracing the uncertainty at all costs. I was lucky to keep on and wait to see that the future seemed brighter than expected for the coworking spaces, as a result of the changing dynamics in the world of business. Reviewing the industry articles and blogs of the period, I could see that as the remote work revolution

gained momentum thanks to the restrictions, coworking spaces were destined to become an integral part of the new professional landscape. I kept on writing, and handed in my Master thesis although these predictions were still on paper, then. It would take some more years to see retrospectively whether they would become a reality or not (Figure 1).

Figure 1: Google Trends chart showing the interest in coworking spaces over time and sharp downfall in 2020, with a retrospective view from 2023.



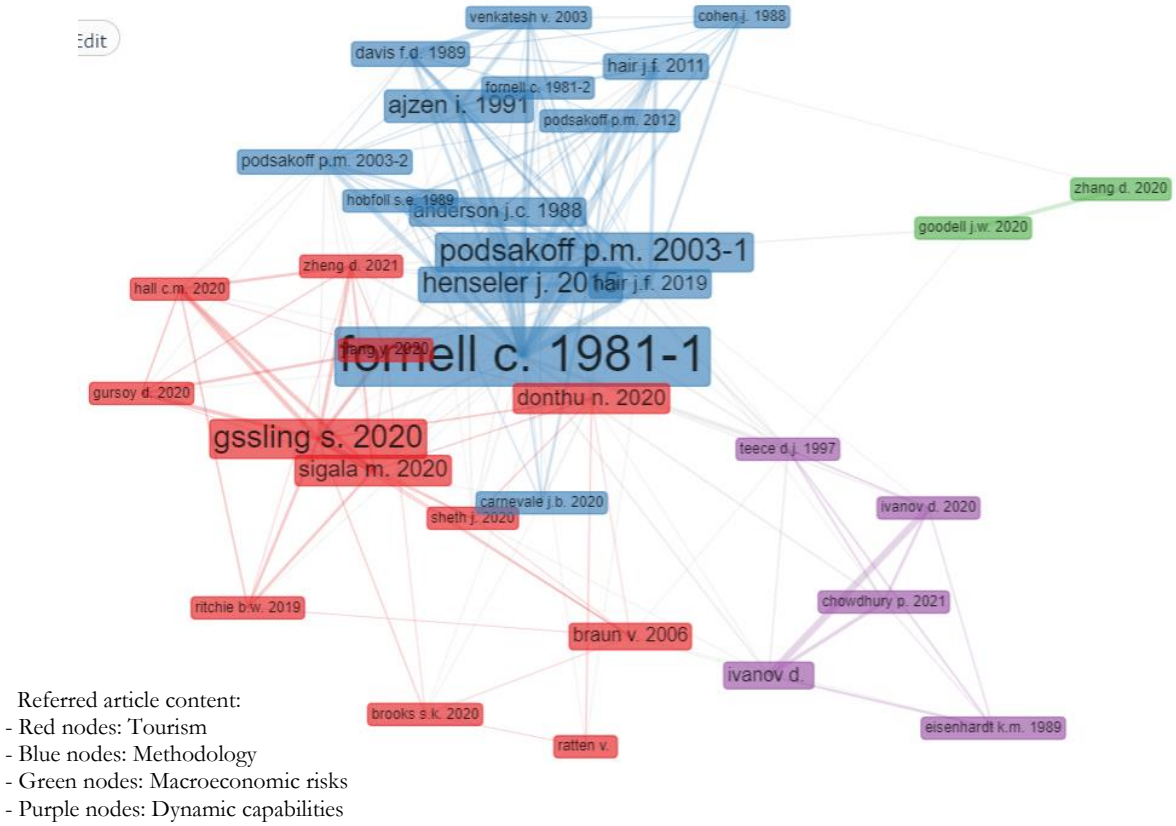
Source: Google Trends (2023). Search criteria: coworking space, worldwide, all times.

Creswell (2002) contends that it is crucial to utilize the opportunity at hand to cultivate expertise, particularly if you aspire to specialize in a specific subject area. Likely, this prior knowledge base of the coworking spaces and their resilient story during the pandemic forms the starting point of my PhD thesis. Focusing on the adaptation capabilities, I triangulate the reinvention methodologies of these members of the sharing economy around the topic of digitalization. Then, I seek to integrate these digitalization efforts to the dynamic capabilities of small businesses, which help them to survive crisis situations.

My main interest in contemplating the theory on the Dynamic Capability view has largely been stimulated by my personal career experience. Moving from the

industry to the academy, I feel the hardship to concentrate all symptoms on to one reason when doing the research. In the real world, the impact of unattended parameters is immense. For instance, even one employee's clumsiness may change the reputation of a company. In that vein, Dynamic Capabilities Theory, which does not overlook similar nuances, is a helping hand. It encompasses a vaguer frame, containing many parameters at the same time. It is not to my surprise that, especially during the COVID-19 period, it is the highest cited theory, looking into the articles published in business realm as noted in Figure 2 derived from Bibliometrix analysis (Aria and Cuccurullo, 2023).

Figure 2: Recent academic papers analyzing the pandemic (Thematic analysis)



Referred article content:
- Red nodes: Tourism
- Blue nodes: Methodology
- Green nodes: Macroeconomic risks
- Purple nodes: Dynamic capabilities

Source: Author's Bibliometrix supported co-citation network analysis of 7,072 business research articles related to Covid-19 pandemic. Data exported from Scopus with "Covid" keyword.

Numerous articles since the outbreak have argued about the COVID-19 as a

trigger for dynamic capability development in companies. Co-citation network analysis over 7,000 document results of "covid" related articles reveals the strength of Dynamic Capabilities theory in the scientific pandemic literature. During this period, no other theory had been referred to as much to tackle the process of strategy and decision making by business and management articles. This strength comes from the appropriateness of Dynamic Capabilities Theory to explain how companies respond when confronted with uncertainty and turbulence in their environment (Wielgos et al., 2021). The theory by nature, stands in the junction of basic issues of strategic renewal, adaptation, and growth within an organization, which may well be connected to fundamental mechanisms of knowledge management, sustainable innovation, and organizational learning to seize opportunities or neutralize threats.

Furthermore, the uncertainty surrounding how coworking spaces are adapting to the digital age is a fundamental motivator in this research. While many studies have explored digitalization in businesses during the pandemic (Verhoef et al., 2021), coworking spaces, as a distinct part of the sharing economy, remain relatively unexamined in business literature. Understanding coworking's role in shaping virtual work culture taking over the traditional work models, requires a focus on their digital infrastructure, which is currently lacking (Hossain, 2021). Despite discussions about coworking spaces becoming vital in a hybrid work world (Berbegal-Mirabent, 2021), research on how they can support this transition without sufficient digital infrastructure is scarce. This gap includes identifying necessary digital tools, community-building strategies, implementation challenges, and opportunities. My research aims to address this gap by highlighting the digitalization of an industry that is yet to meet the needs of a virtual community.

1.2. KEY CONCEPTS

1.2.1. Coworking Space as a sharing economy component

Coworking is a product of the social conditions accelerated by the advance of sharing economy (Gandini, 2015; Bouncken et al., 2020).
The global phenomenon of coworking spaces (CWSs) has been continuously growing since the late 2000's, actively adapting itself to the necessary conditions of time (Spinuzzi et al., 2019). They were originally formed as an alternative to working from a home office but in time they transformed into popular alternatives, fueled with steep prices of office infrastructure, the economic changes caused by the financial crisis and the subsequent rise of unemployment rates and self-employment (McRobbie, 2013). More significantly, community building and networking practices, along with the events, mentoring and training activities that are organized by the CWSs are functional sources of appealing user interest (Appel-Meulenbroek et al., 2020). This alone justifies how coworking has its roots in the sharing economy and is closely tied to the ideals of the knowledge industries, shaping contemporary economics (Gandini, 2015; Bouncken et al., 2020; Chua and Liew, 2022).

As physical spaces foster collaboration, resource sharing, and sustainable practices, coworking spaces contribute to the principles of circularity (Lundgren et al., 2022). They underline the principle of sharing the same space for the objective of working better together than alone, bringing professionals, freelancers, entrepreneurs, small business owners, and remote workers from any industry together under a collaborative roof (Spinuzzi, 2012). Nevertheless, their core physical essence that nurtures collaboration, simultaneously hinders them from inherent possession of digital capabilities, a virtue which would be apparent in major sharing economy actors today. In their playbook, digitalization can enhance the efficiency and connectivity, encourage

collaboration, innovation, and the creation of new business models but does not necessarily form their primary starting point, as it was in the case of Uber, AirBnB or TaskRabbit.

Eventually, the sharing in proximity principle backfired when the COVID-19 pandemic broke out. Alarmed with the rapid worldwide spread of the disease, the governments were forced to introduce social distancing norms which eventually led to economic restrictions (Delardas et al., 2022; Kraus et al., 2020). In many business models, working from home served as a remedy to mitigate the economic constraints after the introduction of preventive measures (Korsgaard et al., 2020). Conversely, the impact of decline in office work tendency on CWSs continued its severity, not only by the decreasing number of clients they could host during the pandemic, but also for the likelihood of continuation of the business model in the aftermath (Ceinar and Mariotti, 2021). To survive, these industries needed to formulate their response strategies by capitalizing on the resources, information distribution tools and novel spatial organizational patterns.

1.2.2. COVID-19 pandemic impact on Spanish small business and coworking spaces

The pandemic was a test for the continuity mechanisms of service industry, particularly for the CWSs (Cabral and van Winden, 2022).

The Gross Domestic Product (GDP) rates of Eurozone countries dropped severely during the outbreak, with a record level of -11.50 percent in the second quarter of 2020 (Eurostat, 2020). As reported by the IMF, the impact of the crisis on the Spanish business was severe, as the country lived through one of the sharpest economic contractions in Europe (Arregui et al, 2020). While the return to normality was continually delated with lockdowns and rigid restrictions

(Table 1), Spanish firms exhausted their financial reserves and faced rigid solvency problems (De La Fuente, 2021).

Table 1: Timeline of events in Spain during COVID-19 pandemic, 2020

31 January 2020	first COVID-19 case in Spain confirmed.
12 February	Barcelona's Mobile World Congress cancelled.
13 February	first death in Spain out of COVID-19 was recorded in Valencia.
25 February	first COVID-19 case from local people of Barcelona confirmed.
5 March	in Catalonia, number of positive cases of coronavirus increases to 32.
9 March	in Barcelona, a kindergarten is closed amid a worker testing positive. Catalan Ministry of Health reports two new deaths in Catalonia.
10 March	all direct flights between Spanish and Italian airports suspended until 25 March. gatherings of more than 1,000 people at closed venues in hardest-hit hit areas are cancelled.
12 March	the regional governments of Murcia, Galicia, Catalonia, the Basque Country, Asturias, Aragon, Canary Islands, Castile-La Mancha, Navarre, Extremadura, Balearic Islands, Cantabria and the city of Melilla announced the cancellation of classes at all educational levels in their respective regions.
15 March	the Spanish government imposes a nationwide lockdown. Lockdown restrictions mandate all residents to remain in their normal residences except to purchase food and medicines, work or attend emergencies and the temporary closure of non-essential shops and businesses, including bars, restaurants, cafes, cinemas and commercial and retail businesses.
20 March	number of deaths due to pandemic in Spain exceeds 1, 000.
23 March	Spain adds 4,000 cases in a single day, reaching 33,000 infected and 2,182 dead.
26 March	state of emergency extended until April 12
28 March	Spanish government halts all non-essential activity in Spain. All non-essential workers must stay at home for two weeks. The daily death toll surpasses 800, with 832 people dying in a single day.
3 April	950 dead on a single day, the highest number in the world recorded over 24 hours.
4 April	first day of overall decrease in data in a week.
21 April	government announces that starting on 26 April, children under 14 will be allowed to take a walk, with further conditions to be announced.

Source: Elaborated on Wikipedia Timeline (n.d.) and Reuters (2020).

The disruption hit hard the SMEs and contact-intensive service sectors like tourism, which accounts for about 12 percent of Spain's economy (Arregui et al, 2020). Unemployment figures, already doubling the EU average before the pandemic, rose up to 16 percent by year end. Compared to EU averages, already high fiscal deficit (3.1 percent of GDP) and public debt (95 percent of GDP) figures before the awakening of pandemic were other factors steering the country into a severe economic burden (Eurostat, 2020). SMEs especially faced a rapid deterioration in terms of sharp revenue drops which showed itself in a tremendous increase of indebtedness, rising from 6 percent to 37 percent between October 2019 and March 2020 (OECD, 2020).

For CWSs, governmental restrictions materialized very quickly in form of a dramatic fall in space utilization, cancellation of events, memberships, closures and loss of workforce due to sickness (Konya, 2020; Coworking Spain Conference, 2021). In the case of Barcelona, hardly two percent of the spaces were hired during the first pandemic year (Salvador, 2021) and the downfall continued after the reopening. Following the successful vaccination campaigns after the start of 2021, late but steady return to the new normal had tremendous effects in business, with a direct impact in the fundamental routines of CWSs as the usual type of coworkers began to transform in attributes. The COVID-19 pandemic intensified migration from the city, as the normalized mode of teleworking convinced thousands of Barcelonans to exile themselves from the big city to live in more relaxed with more affordable prices (Ortega, 2021). Attracting new members was the biggest problem for coworking space managers, followed far by financial constraints (Sans, 2022). The biggest impact in CWSs was coworkers preferring to stay at home instead of going to their workplace as usual, followed by cancellation of events (Calders, 2020).

As a result of the constant connectivity in modern workplaces, the CWSs were compelled to concentrate on cost-efficient methods due to the disruptions in work models. This necessitated their adaptation of new digital technologies in

order to reinvent their business (Cabral and van Winden, 2022; Coworking Spain Conference, 2021). While physical proximity left its place to virtual presence in business life, the new era required transformation practices including flexible virtual plans for online training sessions, member events, workshops, and collaborations via video conferencing in companies (Konya, 2020).

1.2.3. Digitalization and dynamic capabilities and as survival mechanisms in crisis

Digitalization capabilities pertain to a company's managerial ability in leveraging diverse digital technologies to facilitate the integration of data and processes, thereby facilitating the development of novel strategies (Bharadwaj, 2013; Sambamurthy et al., 2003). The pandemic marked a permanent trace on business considering the intense acceleration of digital adoption. On the practical side, trying to cope with limited social interaction, increasing use of adaptation methods in form of digital technologies became the rule for the organizations.

During the pandemic, interrupted business operations provoked three main challenges that were chained onto each other: problems of liquidity, jeopardized future business continuity, and loss of jobs and employees (Rodrigues et al., 2021). In correspondence, digital technologies supported companies to overcome these adversities by introducing new methods. The instant digital surge which was embraced as a life buoy for survival led to accelerated transformations in lifestyle, work patterns, and business strategies (Amankwah-Amoah et al., 2021; Seetharaman, 2020). For most industries, including the conventional ones, digitalization was the helping hand, to treat the wounds endured during the turmoil.

Adoption of digital technologies to cope with the devastative impact of pandemic has been a strong argument for numerous academic research

conducted during the pandemic. Evident in the number of papers published with reference to the context, this period made a perfect fit for the critical and constantly rejuvenating turbulent environment criteria of Dynamic Capabilities Theory. Several studies resting on the turbulency context, highlighted the strong links between adoption of novel technologies and capability to survive the crisis, with Dynamic Capabilities approach which underlines the organizations' ability to sense, seize, and reconfigure resources and capabilities to navigate turbulence and crises (Teece et al., 1997). From this point of view, we may contend that digitalization is a practical definition of survival mechanism against the COVID-19 pandemic, while Dynamic Capabilities view opens a broader window to contemplate the general adaptation strategies against crisis situations. For theorists, the appalling uncertainty stated a large gap for all disciplines to contribute to, and the scientists with increasing trends rested their studies on this theory, when they analyzed the adaptation practices.

1.3. RESEARCH AIMS AND OBJECTIVES

Under the light of the abovementioned trends, the objective of this study is to understand *how digitalization affects the response strategies of small businesses of sharing economy in a crisis*. To investigate this objective, we examine the implementation of digitalization and the execution of significant strategic changes by companies in the coworking industry throughout the transformative period of the pandemic, spanning from 2020 to 2022. Research aims are achieved by foregrounding the thesis in the Dynamic Capabilities perspective, a popular framework in investigating digitalization, but with a specific highlight on the coworking spaces and small businesses in sharing economy literature.

Since the alarming situation has led to global economic catastrophes, there is a reasonable amount of international and local industry surveys that reveal the

impact on the economic system and counterparts. For instance, McKinsey and Company (LaBerge et al., 2020) reviews how the companies during the COVID-19 pandemic period were tested with relation to their technological adaptability to the new norms. Their supervision of this capability by talent and resources added to their resilience in the aftermath of the grand shock, especially when considering that all the companies went through a similar line of turbulence.

Similar facts and figures were laid down by intergovernmental organizations like OECD (2020), underlining the new practice responses by the companies in form of telecommuting and digital sales channels. These informative analyses were followed by industrial research conducted to synthesize the inevitability of digital disruptions in all sectors, and the speed of digitalization as a response mechanism. Another McKinsey and Company report (Galvin and LaBerge, 2021) suggests that spending on digital and technology increased during the pandemic, at the expense of belt tightening in all other areas of business. The same report also underlines the importance of tech-savvy leadership as an asset to prepare companies for a more competitive future.

Adding to that information, the objective of this research is to direct these inferences more on the sharing economy model. From the sustainability perspective, the sharing economy is the future model (Zhu and Liu, 2021) and thus needs to be adapted to the pace of digitalization. The results of this research will expectedly shed light on the impact of the pandemic on collaborative work model and sharing economy, and more particularly contribute to the literature in portraying how virtual sharing may substitute the presential model with the touch of digitalization.

Coworking spaces, as an unfortunately less-digitalized sharing economy component, are the providers of the collaborative work model. In that vein, the thesis also encompasses a societal objective by assessing how the proximity principles will survive in the post-pandemic period, when the burden of using

digital communication methods is relieved.

By resting the thesis on Dynamic Capabilities view, the thesis opens up a new path by combining the abovementioned key themes for additional entrepreneurship research embedded in a crisis environment. With the case study and the systematic literature review methodology, we aim to identify potential areas of improvement in this theory and contribute to the literature by acknowledging about specific issues we encounter during research.

1.4. THESIS STRUCTURE

Three main papers form the body of this thesis, with regards to the specific research questions they seek to answer. Crucially, the knowledge they generate grows on top of the feedback gained from the previous one. Thereby, moving from the first to the last chapter, the thesis advances by means of yielded findings and contributions.

Chapter 2: *Not all sharing economy components are born-digital: Coworking spaces' strategic response to pandemic challenges*

This paper seeks to answer two main research questions, i.e.,

> RQ1. How does crisis affect digitally underdeveloped sharing economy industries?
>
> RQ2. How can these enterprises react to adapt to new conditions?

with an objective to explore the survival of coworking spaces during the pandemic and their response strategies. The study follows a mixed methods strategy, and by that means the findings are significantly practical, contending the process, requisites, and results of digital technology implementation in the given context.

Chapter 3: *Multidirectional relationship of dynamic capabilities and digitalization: A systematic review on COVID-19 literature*

This intermediary chapter aims to address the knowledge gaps identified in the previous paper by exploring two main questions:

> RQ1. What is the nature of the relationship between the leverage of dynamic capabilities and digitalization?
>
> RQ2. How was this relationship implemented by the academic literature examining the COVID-19 pandemic?

This paper encompasses how dynamic capabilities and digital phenomena have been portrayed in crisis literature that requires them to be operationalized together. Structured by a systematic literature review methodology, the findings of this study are essential since it lays down the foundations to continue into the next chapter which blends the dynamic capabilities to digitalization practices of the spaces.

Chapter 4: *Leveraging dynamic capabilities and digitalization in crisis: A two-wave strategy assessment of sharing economy's small businesses*

Drawing on the Dynamic Capabilities viewpoint of the firm, this chapter analyzes the process of digital capability adoption as a remedy to resist the adverse effects of pandemic and pursues to answer:

> RQ. How do small businesses in the sharing economy leverage digitalization and dynamic capabilities to recover from crisis adversities?

Results drawn from this study enlighten the two-year period of research in the context of coworking spaces as under-digitalized small businesses of sharing

economy and present a forward-looking theoretical framework to cope with similar crisis situations.

1.5. CONTRIBUTIONS

The thesis contributes to business literature in several theoretical and practical dimensions.

First, by taking an inductive approach, this study contributes to the existing literature on strategy and entrepreneurship, offering a conceptualization of the resilient response, adaptation, and survival process through the generation of Dynamic Capabilities view amidst rapid change and uncertainty. Thereby, we address the call made by Sharma et al. (2022) which asks for additional entrepreneurship research embedded in a crisis environment. We also contribute to the Dynamic Capabilities View by highlighting disorganized application of the theory in prior research and provide evidence of scholars repeatedly using certain construct roles in their theoretical frameworks.

Second, the research contributes to the sharing economy literature in portraying how virtual sharing practices can substitute the physical proximity-based model, thanks to the touch of digitalization. To our knowledge, this study is one of the first in the sharing economy area to scrutinize the sharing activity continuation in crisis conditions and the factors that maintained the endurance of the managers against adversities. So far, the impact of economic slowdown (Belitski et al., 2022; Kuckertz et al., 2020) and disruption (Galvin and LaBerge, 2021; Rodriguez Contreras, 2021) has been scrutinized with a reasonable amount of international and local industry studies and institutional surveys. Adding to that information, the results of this thesis shed light on the impact of the pandemic on collaborative work models within the coworking spaces. Focusing on the digitalization practice, we move the magnifying class to the coworking spaces and show that despite the assumption that they will be the nurturers of the new

era, their capability to digitally transform should also be scrutinized first. Also, considering the contextualization of entrepreneurship studies, the study answers the call by Welter et al. (2019) addressing the societal dimension of entrepreneurship into literature in a novel context (i.e., the COVID-19 pandemic crisis). We thereby acknowledge the dramatic impacts of pandemic on society, from a new perspective for investigating the previous models and generalizations.

Third theoretical contribution to business literature is methodological, stressing the longevity of the research and simultaneously answering the call by Kuckertz et al. (2020) which underlines the impact of short-, mid- or long-term implementation of strategies during the crisis. Our two-wave research design conducted in the years between 2020 and 2022, based on mixed methodologies lay a robust and profound view of strategy-making in small companies with limited resources, compared to the similar papers published in this interval.

From a practical standpoint, this research demonstrates the transformation processes, the challenges faced, and the methods employed to overcome them. By comparing managerial attitudes and capabilities inherent in small businesses, it provides insights into the dynamics of crises and offers a deeper understanding of the unique state of coworking spaces within the sharing economy. Termed 'digitally underdeveloped,' these spaces exhibit both dynamic potential and a simultaneous lack of adaptation to digital transformation. Therefore, the findings of this research are expected to be valuable for reflecting on small firms in various industries that face similar conditions.

"Any fool can know.
The point is to understand."

— Albert Einstein

CHAPTER 2:

NOT ALL SHARING ECONOMY COMPONENTS ARE BORN-DIGITAL: COWORKING SPACES' STRATEGIC RESPONSE TO PANDEMIC CHALLENGES

ABSTRACT

Objective: This study examines the adoption of digitalization and significant strategy changes to sharing activity. COVID-19 pandemic period marked a turning point for the coworking spaces, the digitally underdeveloped SMEs within the sharing economy, whose working procedure is normally based on physical proximity. Challenged by social restrictions and economic deprival, these workspaces innovated their mechanisms by developing digital strategies.

Methodology: Over a two-year period of mixed methods research (2020-2022) we analyze the challenges experienced by five coworking spaces in Barcelona by data collection through semi-structured interviews, observations and surveys. We highlight those digital strategies deployed to adapt to new conditions with an aim to end up with a grounded theory.

Findings: Meeting customer demand, finding new resources of customer development, maintaining internal control, and keeping the community vibrant are antecedents of managerial positive attitude to prioritize digitalization for coping pandemic adversities.

Contributions: This paper is one of the first in literature to argue the contradictory case of coworking spaces within sharing economy to be challenged by the pandemic teleworking practices. We contribute practically by stimulating the ways that the industry can be resilient to recover out of liquidity shortages and solvency problems.

Keywords: COVID-19, Coworking Spaces, Digitalization, Sharing Economy

2.1. INTRODUCTION

Sharing economy (SE) is based on coordination of the acquisition and distribution of a mainly underutilized resource (Belk, 2014; Chalmers and Matthews, 2019). In the midst of a crisis where governments were imposing restrictions on social practices, sharing economy models like accommodation and transport services, which relied on solely collaborative consumption without the digital platform base, dramatically began to lose power (Hossain, 2021). Exposing a drastic challenge for work models based on sharing, COVID-19 pandemic simultaneously offered them a disruptive innovation opportunity (Klein and Todesco, 2021; Thukral, 2021). Such workplace attempts to preserve the sharing objective paved the way for a disruption in working models for survival (De' et al., 2020).

Extant literature depicts digitalization as a tool to create value and competitive advantage to scale up (Gartner et al., 2022; Verhoef et al., 2021) and explores its efficiency under diverse managerial strategies (Horváth and Szerb; 2018). Under crisis conditions, digital technologies serve as leverage to counteract adversities caused by the losses in competition by maintaining the customer base, internal operability, and keeping the company moving (Klein and Todesco, 2021). Lundgren et al. (2022) very recently stated the changes in access-based consumption of sharing economy business models in the spatial context, thanks to technological enablement. Nevertheless, research on the digital technology adoption mechanisms of CWSs as a sharing economy component with lesser digital capabilities has been scarce.

Forming an important player in knowledge economy, coworking spaces (CWS) retain the potential to embrace the new digital technologies swiftly, particularly when their primary virtue of "sharing the same place" has been threatened by social restrictions. This paper examines the impact of the pandemic on CWSs in the smart city of Barcelona as a devoted case for sharing economy (Capdevila,

2015). We aim to analyze digitalization attempts and significant strategy changes in coworking business by following an explorative approach that inquires the effects of pandemic by the following research questions:

RQ1. How does crisis affect digitally underdeveloped sharing economy industries?

RQ2. How can these enterprises react to adapt to new conditions?

Derived from mentioned issues, the objective of this study is to examine the adoption of digitalization and significant strategy changes to sharing business activity by following explorative research that covers the early two years of the pandemic period. We take the CWSs as the unit of analysis, as a proxy for the underdeveloped sharing economy industry. Over an in-depth analysis involving five different coworking space managers, we incorporate the findings about their corresponding management strategies concerning challenges and adaptation to growing demands of the time.

We find that managers can prioritize both digital and non-digital strategies in their playbook, given the uncertainty condition of the era. The use of digital tools to tackle adversities of pandemic is associated with the type of key challenges and managerial attitude to prioritize digitalization. Motivations for keeping up with the competition by customer development, answering demands from clients, and internal engagement with employees and customers appear to be influential in degree of necessity perception to tackle new sources of digital enhancement. Our propositions concerning the correlation of the same construct with size and the level of adversities fall short of validating digitalization attempts. The general framework drawn from this learning is concluded into a model-supported grounded theory.

Contribution of this study is twofold: Theoretically, our work diverges from

previous studies on the COVID-19 impact, with a two-year research period, unveiling the high probability of changes and pivots in strategies, that should not be guaranteed in a short crisis time interval. As well, answering the call by Sharma et al. (2022) we contribute to the field with a study scrutinizing the strategy and learning dimension of entrepreneurship during crisis.

Practically, we suggest a set of relevant predictors to recover out of liquidity shortages and solvency problems more strongly. Such strategies include changes in organizational culture, customer retention by training employees, renewals in marketing mix with increased of emphasis on digital marketing, virtual customer interaction, strengthening brand identity, and similar practices that may be extracted from the empirical data.

The paper is organized as follows. First, we study the theoretical and practical aspects of digitalization and managerial case of coworking spaces in the context of pandemic, to come up with an integrative reformulation that captures the reinvention strategies. Then, we introduce the methods and analysis structure of our study in the methodology section. The next section covers the results of the study and evidence, before we conclude with the findings, limitations and future research lines.

2.2. LITERATURE REVIEW

Following the grounded theory approach, we first delve into the literature to find the details of the challenges confronted by CWSs and the exacerbation of crisis on them, with an intention to offer a comprehensive overview of the specific digital technologies harnessed by these spaces to effectively address the demands of the evolving landscape. By doing so, our aim is to present a holistic and detailed perspective that illuminates the profound impact of digitalization within this sector, as acknowledged by the extant literature.

2.2.1. Challenges faced by CWSs

Coworking spaces have widely been considered as preferential alternatives to home working or to semi-public "Third Spaces" (Oldenburg, 1989; Florida, 2002) by the independent professionals and those with workplace flexibility, who work better together than they do alone (Spinuzzi, 2012). Community activities underlining social proximity constitute a fundamental aspect that distinguishes CWSs from traditional offices with added services (Micek, 2020). In these local networks, coworkers may benefit from events and projects that are accessible to wider society and that create encounters for sharing information, ideas, and knowledge (Capdevila, 2015). Coworking spaces encourage creativity (Schmidt, 2019; Cheah and Ho, 2019), diversity (Avdikos and Merkel, 2019), and innovation (Wijngaarden et al., 2020; Barwinski et al., 2020), three main concepts which form the backbone of entrepreneurial activity (Lee et al., 2004). They also provide a strong and diverse knowledge base (Morisson, 2019), well-developed business and social networks (Lorne, 2019), and an ability to identify opportunities (Hicks and Faulk, 2018) which supports successful entrepreneurial behavior.

To maintain this fundamental asset, one of the primary challenges of CWSs is maintaining social proximity and engagement among members (Micek, 2020). Client success hinges on the diverse knowledge exchange within the coworking community, creating opportunities for members to interact and network, a challenge for CWS managers in maintaining a thriving space (Rese et al., 2022). The aim is far beyond combatting social isolation and stress which can be detrimental to the well-being of coworking community members (Bouncken et al., 2017). CWS managers are bound to offer mentoring, coaching, and social support programs within the space to strengthen the sense of community, and further learning opportunities (Gonzalez-Uribe and Leatherbee, 2018;

Bouncken et al., 2017). Active mediation or "curation" by CWS managers (Brown, 2017) and leveraging community management tools such as matchmaking platforms (Siegfried Kopplin, 2021) and bringing people from different backgrounds (Bouncken and Aslam, 2019), such as inviting digital nomads (Zerva et al., 2023) can facilitate connections between potential collaboration partners, thereby enhancing innovation within the coworking ecosystem if the managers are looking for some resources beyond serendipitous encounters (Jakonen et al., 2017).

On the operational front, coworking spaces must address several factors to ensure workplace performance and hence, sustainability. The geographic location and region in which a coworking space is situated is determinative on factors such as market size and potential, the availability of a skilled labor force, business opportunities, and transportation accessibility (Micek, 2020; Gandini and Cossu, 2019). Furthermore, the design, layout, and ambiance of the workspace play a critical role in attracting and retaining members securing their privacy and confidentiality (Kovacs and Zoltan, 2017). Coworking space managers must carefully evaluate these factors and align them with their strategic objectives.

Once these physical components are established, making alterations becomes challenging, as the balance is delicate and easily upset in the urban environment. A coworking space may find it easier to enlarge its network by transferring the practice into a virtual environment, so that they usher a larger community to feed the knowledge dynamism (Lundgren et al., 2022). Moving beyond the spatial constraints can be achieved by creating virtual collaborative teams, supported by adequate software infrastructure (Kopplin, 2023).

2.2.2. Exacerbation of challenges amid pandemic and triggers of change

Unlike most industries, where supply chain issues jeopardized the companies' positions, in the case of CWSs, the main challenge was the direct and imminent closure of spaces and the cancellation of events which swiftly resulted in minimized coworker participation (Calders, 2020). The pandemic acted as a stress test, evaluating the adaptability and sustainability of coworking spaces in the face of unforeseen disruptions and changes in their already challenging work patterns. (Cabral and van Winden, 2022). Thus, prominent concerns for CWS management during the initial phase of pandemic was related to member attraction, followed far by financial constraints (Sans, 2022).

The continuation of the pandemic underscored the disparities in digitalization adoption between large corporations and small and medium-sized enterprises (SMEs) (Klein and Todesco, 2021). These challenges were further intensified within the context of CWSs, for the upheaval of traditional work paradigms compelled CWSs to pivot beyond cost-effective strategies and embrace digital technologies to revitalize their operations (Cabral and van Winden, 2022; Lundgren et al., 2022). As pandemic-induced work models evolved, the competition that was once primarily between coworking spaces and remote work setups at homes transformed into a competition between coworking spaces in themselves, where more digitalized ones would have the upper ground.

A visible distinction emerged between modernized CWSs with corporate customers located mainly in the central districts and individually run traditional coworking spaces (Micek et al., 2023). The differences related to capital availability, and adaptation level of customers to pandemic realities marked the extent and sophistication of the resources the CWS managers provide to their clients (Micek et al., 2023). Surmounting the competition necessitated adaptation of new digital technologies in order to reinvent business (Cabral and van Winden, 2022; Coworking Spain Conference, 2021).

2.2.3. Specific digital technologies adopted by CWS during the pandemic

The primary effect of pandemic was observed in the inclination of corporate coworkers to opt for remote work from home instead of the nearest CWS due to health concerns, while some companies decided to provide tailored facilities like Wi-Fi support or home-office merchandise to support work from home for their corporate employees, especially in the earliest pandemic days (Ceinar and Mariotti, 2021). During the initial period marked by lockdowns and curfews, the CWS managers lost the comparative advantage to the work from home models and tried to attract the clientele by hybridizing the events via the use of fast spreading tools stressing on the proximity and community aspect of the coworking space which cannot be countered by an isolated home office (Ceinar and Mariotti, 2021). The declining vacancy rates ran in parallel with the increasing unutilized office spaces (Micek et al., 2023) which meant excess usage of utilities.

Throughout this period, aside from offering discounts and revising their cancellation policies, the CWS managers devised creative strategies to attract customers and maintain engagement to generate income. Those included introducing innovative subscription models centered around shared desk memberships and making meeting rooms available for single-person rentals, specifically tailored for virtual meetings, running the companies in a smaller area despite the social distancing restrictions (Konya, 2020). Parallel to the changing marketing strategies, they needed to add operational digital assets to keep their company intact by adopting virtual mail services, virtual office scheduling, virtual member events and online workshops in addition to the online systems used for their daily tasks and communication with the CWS staff (Konya, 2020).

The global spread of the Covid-19 virus prompted an intense remote work

experiment. According to the Eurofound study (Ahrendt et al., 2020), the pandemic prompted more than a third (39%) of employees in the EU to transition to remote work, in contrast to the 20 percent who reported working from home at least 'several times a month' before the COVID-19 outbreak. The ability to digitize operational processes and services became essential for engaging the community remotely. As many industrial companies decentralized their workplaces and forced remote workers to find alternative workspaces, the significance of coworking spaces rose amid the pandemic. As physical proximity gave way to virtual presence in the business world, the evolving era necessitated transformative measures. These included the adoption of adaptable virtual strategies for online training sessions, member events, workshops, and collaborative efforts through video conferencing within organizations (Konya, 2020). To survive, they needed to formulate their response strategies by capitalizing on the resources, information distribution tools and novel spatial organizational patterns.

2.2.4. Digitalization and its transformative impact for SMEs against challenges

Given the existing gaps in the literature regarding the factors driving the digitalization efforts of CWSs during the pandemic, we here outline a broad industry perspective with the aim of uncovering valuable insights that can illuminate the propositions we intend to develop for our grounded theory approach.

Digitalization refers to the application of information technology or digital technologies to modify and enhance business processes, whereas digital transformation involves the development and implementation of new digital business models that enable an organization to generate and capture additional value (Verhoef et al. 2021). By embracing digital transformation, firms aim to leverage technology to improve their efficiency, effectiveness, and overall

competitiveness in the marketplace. By that definition, the term digital transformation reaches a more strategic connotation while digitalization includes improving various aspects of business processes and operations to enhance efficiency and innovation (Nambisan et al. 2017).

Digitalization strengthens the ground for the companies to innovate on their business models through identification of new possibilities in the market to capture value (Priyono et al., 2020). Unbalanced adoption of digitalization by large and small companies became more obvious during the pandemic, as financial constraints limited and prevented the SMEs from accessing technological knowledge (Klein and Todesco, 2021). While digital preparedness had an impact on the large companies' resilience during the pandemic (Münch and Hartmann, 2022), absence of financial resources, skills and technological competency are among those barriers which hinder SMEs to adopt digital technologies during this time (Thukral, 2021; De Lucas Ancillo, 2022; Tamvada et al., 2022).

Knowledge-based strategies to incorporate firm sources (i.e., centralized leadership, resilience, flexibility, dynamic capabilities, ambidexterity, strategic alliances, inter and intra-organizational socialization) helped the SMEs to respond the crisis in a short-term basis (Klein and Todesco, 2021; Kuckertz et al., 2020). Among these tactics, the role of digitalization and digital transformation may go beyond the adaptation initiative, further to acceleration and capitalizing on superior market opportunities (Modgil et al. 2022; Amankwah-Amoah et al., 2021) in the aftermath of the grand shock.

Firm size matters, favoring large firms by giving them the opportunity to handle innovation and operations separately, whereas the small firms must transfer relevant skills into team members (Balakrishnan and Das, 2020). Large firms capitalize on digitalization for efficiency, competitiveness and economies of scale. SMEs, compared to large firms, are less digitalized and their drivers more

related to survival and (Eller et al., 2021). Absence of financial resources, skills and technological competency are among those barriers which hinder SMEs to adopt digital technologies during this time (De Lucas Ancillo, 2022; Tamvada et al., 2022; Winarsih, 2021).

Unbalanced adoption of digitalization by large and small companies became more obvious during the pandemic. In crisis economy, businesses of all sizes were affected by restricted mobility, reduced demand, rising financial uncertainty and disruptions on services, but smaller firms were hit much harder (Worldbank, 2021). During the pandemic, financial constraints limited and prevented the SMEs from accessing technological knowledge (Klein and Todesco, 2021). To cope with such barriers, several firms pursued funding from public institutions to transform their digital base (Bai et al., 2021).

Fitzgerald et al. (2014) contend the vitality of organizational management and strategy making in digital transformation process. According to industrial reports, 70 percent of all digital transformation programs fail due to employee resistance and lack of support from management (Bucy et al., 2016). Decision making and execution of strategies in the uncertainty environment is even more complex, with higher demand for managerial competencies in digitalization (Rodrigues et al., 2021). Strong leadership skills including entrepreneurial abilities, organization and IT skills, motivational capabilities, flexibility, commitment, and creativity are necessary to cope with several digitalization-related challenges (Klus and Muller, 2021). In a crisis, SMEs are disposed to find affordable technology incentives and support in their macro-level environment to fund the company so that they can deliver the necessary services for business continuity and maintain their relationship with the stakeholders (Ratten, 2021). This process may be entangled as negative feedback jeopardizing employer welfare and workplace productivity encourage organizational resistance to change (Amankwah-Amoah et al., 2021; Thukral, 2021).

2.3. METHODOLOGY

The aim of this research is to analyze the impact of the pandemic and subsequent restrictions on the CWSs and unpack the processes of digitalization as a remedy among other strategical decisions implemented by the managers. Guided by the initial results of a preliminary analysis on the CWSs during the pandemic, we followed a procedure as recommended by Stuart et al. (2002) for a two-wave study. Accordingly, we formulated the research questions and objectives by problematizing the implications of the imminent crisis and developed a research plan which incorporates long term analysis on a certain group of CWS, between 2020 and 2022.

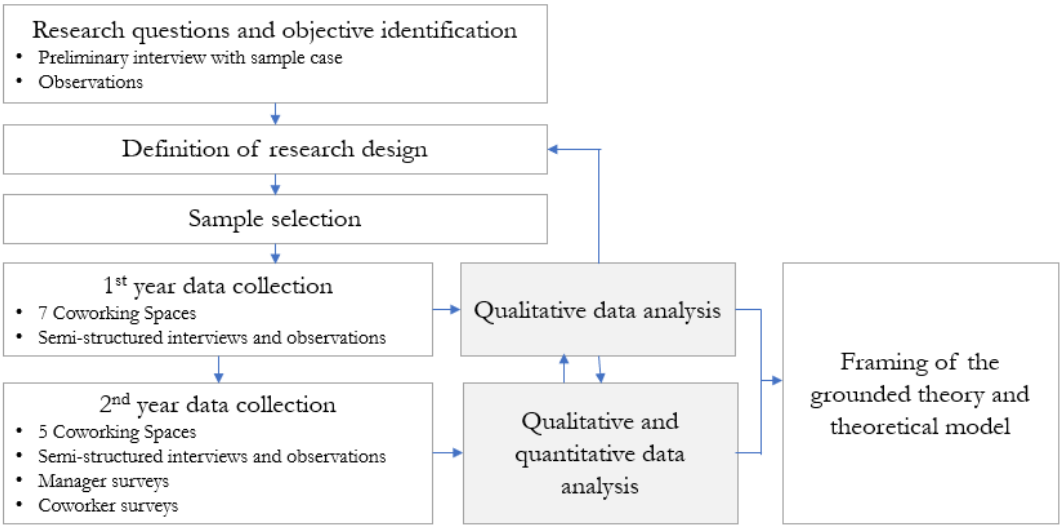
Considering that the impact of COVID-19 disease reflects in the strategy making processes in a continuous mode, the study is based on a mixed methods approach, integrating both qualitative and quantitative data (Tashakkori and Creswell, 2007) over a two-year period (Figure 3). Epistemologically, the main reason for selection of this approach combines the fact the findings on the COVID-19 impact are still immature in the selected area, and the condition of documented academic knowledge requisite a research based on "how" and "why" questions. Additionally, by selection of this approach, we aimed to add quantitative metrics to our data in order to deliver triangulation to our findings, while extending the breath of inquiry obtained from the variant datasets (Greene, 2007).

2.3.1. Sample selection

Our exploratory research sample is composed of five CWSs selected by an operational construct sampling method (Patton, 1990). To construct the list of representative cases we chose to direct our research on spaces having a

minimum of three years' history after foundation of the company with continuous customers. This limitation is crucial to understand the strong influence of unretainable earnings during pandemic and its effect on already established strategies. Based on this selection criteria, we collected the contact information of CWS in the area and contacted them through e-mail, inviting them to our research. In the first round we selected 10 companies that fit the selection criteria and received 2 responses of acceptance to enter the research. In the second round, we added more spaces to the contact list to increase probability of acceptance and added 2 more responses. The rest of the participants were added by convenience sampling method.

Figure 3. Research Process



Source: Own elaboration

2.3.2. Qualitative data collection

The interested companies were asked to authorize the use of their input as data, by filling in a form for participation in the project, provided that their privacy would be fully protected. In order to stimulate the number of interviews and

boost the depth of gathered information, we asked for at least 2 manager interviews from one space, where available. The first-year interviews were conducted with seven coworking spaces of various sizes, mostly small companies with sole proprietorship. In the second year, one of the largest participants with a broad network of international subsidies abstained, since they decided not to continue their coworking activity in Barcelona. The seventh company, which was a small coworking space with only one manager, was not convinced to proceed. As a result of this process, the research ended up with a sample size of 5 participants, and the two abstaining company interviews were excluded from qualitative data analysis. Table 2 describes the participants with pseudonyms given with no relevance to their specific characteristics.

Table 2: Company case descriptions: size, age, number and customer profile before pandemic

CWS	TOPAZ	JADE	RUBY	ONYX	AZURE
Number of employees	2	2	40	8	2
Number of locations	1	1	7	3	1
Company age	4	6	5	13	10
Number of customers	50	75	4000	300	70
Customer profile	Entrepreneurs, freelancers and small firm professionals	Entrepreneurs, freelancers and small firm professionals	Entrepreneurs freelancers, small firm professionals, large firms	Entrepreneurs freelancers and small firm professionals	Entrepreneurs, freelancers and small firm professionals

Source: Own elaboration

At the end of 2 years of research (Figure 3) with 5 companies and 6 interviewees, we conducted 11 semi-structured interviews with CWSs managers that comprised of about 411 minutes. The average duration of interviews was about 46 minutes, and 18 minutes for the first and second year, respectively. Length of interviews varied in duration depending on the number of strategic actions engaged by the coworking space managers. As the research started, the

informants were interviewed at regular periods (Table 3). The target informants were selected from the strategy builder positions for at least 2 years in the companies so that their responses revealed the continuity of actions before, during and after the pandemic. The interviews comprised of open-ended questions about experiences over time (Creswell et al., 2007).

The first-year data collection took place between February and June 2021. In the first year, the participants were asked to explain what type of strategies they engaged with, how their reaction was, under which conditions. Second year data collection was carried out between April and June 2022. This phase of research corresponds to a period in which uncertainty lost its pressure over the companies. Although the average duration of second year interviews was shorter, they revealed as much information, since the informants were more able to center around the capabilities and the impact of pandemic on developing new ones.

Simultaneously, further information was collected to support the interviews, i.e., observations on the routine in-company meetings, documents, providing anecdotal support for empirical findings (Table 3). We employed external information from various resources, such as the observations within CWS. Likewise, public presentations and communication materials (social media posts, webinars, blogs) with the external stakeholders were helpful to manage the partiality of informants.

2.3.3. Quantitative data collection

In order to triangulate (Yin, 2009) two basic questionnaires were used in the second year, i.e., the manager surveys and coworker surveys (Table 3).

Table 3: Data collection details

Case	Qualitative Data Collection (1st and 2nd years)	Qualitative Research Respondents	Quantitative Data Collection (2nd year)	Quantitative Research Respondents	Managerial and digital setup
TOPAZ	-Preliminary interview with company founder - Semi-structured interviews with founder -Documentation and observation of company relations with coworkers	1 Founder	Manager survey-Coworker surveys	1 Manager 2 Coworkers	- Small company - Open to transformation but lack of resources - Collaborating with similar spaces to adopt new technology and trends
JADE	-Semi-structured interviews with founder -Documentation and observation of company relations with coworkers	1 Founder	Manager survey-Coworker surveys	1 Manager 1 Coworker	- Small company - Open to transformation - Collaborating with third parties and self-training for digital strategy development
RUBY	- Semi-structured interviews with founder -Documentation and observation of company relations with coworkers	2 Managers (One of them abstained in the 2nd year)	Manager survey-Coworker surveys	1 Manager 15 Coworkers	- Large company - A group of executives controlling transformation process - Digitally mature but open to transformation in next level
ONYX	- Semi-structured interviews with community manager -Documentation and observation of company relations with coworkers	1 Manager	Manager survey-Coworker surveys	1 Manager 2 Coworkers	- Medium sized company - A group of executives controlling transformation process - Digitally mature
AZURE	- Semi-structured interviews with founder -Documentation and observation of company relations with coworkers	1 Manager	Manager survey-	1 Manager	- Small company - Open to transformation but lack of initiatives - Is not willing to adapt new processes unless becomes a necessity

Source: Own elaboration

First, to check the reliability of the qualitative analysis and the data attained from the interviews, the selected company managers (research interviewees of the second year) were asked to fill in a form which incorporated operational and digital features. The responses were recorded on a 5 items scale, adopted from a similar study (Guo et al., 2020). This additional information that we contained out of 12 main categories of questions in the questionnaire helped us to reliably measure the degree of digital technology maturity level and see the correlative nature of digital capabilities with factors like company size and shifting management tendencies into process optimization, development of value-added services and transformation of the business models.

Second, triangulation of the data was provided with questionnaires obtained from the coworkers that were using the participant companies during and before the pandemic. This tool contained basic questions about the digitalization intensity of the coworking space and how the CWS have developed their level of digitalization during the pandemic. Also, we checked the participants attendance in the CWS during and before the pandemic by additional questions. To obtain data, the email method was used for this survey. The survey link was sent to the CWS manager first, asking them to reach their coworkers themselves by sending the link. Thus, the informants in this stage were determined by the manager of the coworking space. The results were contained in a datasheet after collection and were also shared with the manager. Only those coworkers' responses who were actively continuing their activity during the pandemic period were contained in the data analysis. The reliability of the surveys were checked by correlating the participant number to the capacity of the CWS, while one CWS abstained from reaching their coworkers

2.3.4. Qualitative content analysis

Onsite interviews were audio-recorded, while online interviews were directly recorded on video. Later, the recordings were transcribed verbatim to preserve the original responses and ensure data integrity. For interviews conducted in Spanish, a translation tool in MS Word was used, and any inaccuracies or gaps caused by filler words were

improved through manual interpretations. This approach aimed to maintain the richness of the data while ensuring accurate translations.

We carried out the qualitative content analysis based on the unit of analysis, i.e., the coworking space managers and their strategies to cope with the impact of pandemic. Particularly, exploring and experimenting with the new ways of using digital tools and technologies during the pandemic constituted the main focus (Table 4). We used Atlas.ti computer-assisted qualitative data analysis software as the main coding tool, since it enabled an overall view on the data gathered from the in-depth interviews, while also simplified iterative actions to reassess the content and reach a definite grounded theory (Strauss and Corbin, 1990).

Content analysis contained 3 main steps i.e., open coding, axial coding and selective coding, until we generated general propositions and a theory about how the strategies were related to digitalization and had an impact on the CWS' survival during pandemic. (Creswell et al., 2007). In the open coding step, we read all the content and tagged the suggestions and opinions of managers with relevance to their actions in pre-pandemic, pandemic and post-pandemic periods. Having this sequential format enabled us to track similar actions and protocol implementations and as well, to better pinpoint unique strategies where they differed among managers.

Atlas.ti software provides a word cloud analysis based on the quotations identified during the open coding step (Figure 4). The cloud shows the words from the coded quotations, and not the whole interview documents. This provides a more efficient analysis on the basic themes, promoting the research topics. The size of the codes in the cloud is related to its frequency. According to the research code cloud, the most frequent word used was "work" with 149 tokens, followed by "change" with 80 tokens.

These distinct actions and strategies formed the basis of axial coding phase. Strauss and Corbin (1990) contend that axial coding enables scientists to put the data back together in new ways by making connections between categories. As such, rereading the data, we chained specific capabilities adopted by the managers into certain

Table 4: Descriptions of the participants interviewed for data collection.

CWS	Position	Years in management	Representative quotes	Date of interview	Duration	Modality	Language
TOPAZ	Founder and manager	4	"In terms of 'platforms technology', adding to what we already had it was not like that we changed a business model, or we changed another business line."	March 16, 2021 May 22, 2022	67 mins 25 mins	Onsite Onsite	English
JADE	Founder and manager	5	"I am on the outskirts of Barcelona and… to me people that some person has passed by is worthy... to me for that only place that they find me is online."	May 19, 2021 May 24, 2022	68 mins 31 mins	Online Online	Spanish
RUBY	Director / Manager	5	"With our co-workers we tried to promote all the activities or the events and even just conversation with members on slack."	March 30, 2021	57 mins	Onsite	English
RUBY	Business Developer of Innovation, Partnerships Manager	3	"In our company we are not in the same building...So, good communication between us it's like the key thing in order to have the same processes in all the buildings to provide the same experiences the clients."	April 20, 2021 May 10, 2022	52 mins 17 mins	Onsite Online	English
ONYX	Community Manager	5	"We have all our system is digitalized since the beginning. So, for us…. the pandemic… not represent an opportunity to add new features or whatever."	July 2, 2021 May 3, 2022	18 mins 10 mins	Online Onsite	English
AZURE	Co-Founder and manager	10	"In a more or less large company, which has its employees working from their homes, they will have to do an important digitalization job. But in a small one like ours, we don't have to implement any digitalization."	April 12, 2021 May 19, 2022	20 mins 9 mins	Onsite Onsite	Spanish

Source: Own elaboration

contexts, depending on the size, loss and digital maturity level of the spaces. These emerging categories and subcategories formed the foundations of selective coding phase in which we structured research propositions.

Figure 4: Word cloud analysis of quotations related to open codes.

Source: Atlas.ti software code word cloud analysis on 11 coded coworking space manager interviews.

2.4.5. Quantitative content analysis

Additionally, in the second year we attached a questionnaire to be delivered to managers as we carried out the interviews. In this final step, we defined the principal category centered around managerial attitude on digitalization and adopted a further mixed method approach to triangulate our design, as recommended by Creswell and Plano Clark (2006). This extra source of information provided us to safely evaluate their perspectives on adoption of digital technologies during the pandemic to continue business activities, as well as the state and management of technology adoption in the spaces.

Together, collected information was utilized to formulate a theory, reinforced with a

visual model about how the adoption of digitalization to coworking business activity during the pandemic period has affected the survival of coworking spaces during pandemic.

2.3.4. Description of participant characteristics

2.3.4.1. TOPAZ

Located in the center of the town, this space was hit hard by the pandemic, losing more than 90 percent of its coworkers during the first wave. In the first year of the study, the impact of loss presided to change the daily routine of the manager for pivoting attempts. During the second wave those measures helped the company to relevel the revenues, however the growth figures of earlier period were far from being likely. This led the manager to experiment with any strategy that would have an impact to attract the coworkers again to the space. She reconfigured the business model by opening up new lines including co-living and consultancy, apart from others.

2.3.4.2. JADE

In contrast to all other spaces, this coworking space is located outside the city center. Hard loss of 84 percent coworkers in the lockdown period led JADE coworking to undergo a series of strategical change. Basically, the manager decided to increase investment and concentration on digital marketing activities, especially following the departure of the largest company with a great number of employees they were servicing. The main objective was to increase the reach to potential clients and convert as much as possible during the hard times when the number of people passing from the street is significantly low, compared to earlier.

2.3.4.3. RUBY

Despite the intense organizational background of this giant coworking space, the pandemic outbreak resulted in a serious loss. The company gradually lost about 75

percent of its 4,000 coworkers. Essentially, the attrition of large companies in one day had a dramatic impact in the loss and rising uncertainty for company's overextended capacity. The managerial team utilized the silent period during lockdowns to develop an organizational perspective, restructuring the company to the very roots, including introduction of new technologies to facilitate workflow and profit maximization.

2.3.4.4. ONYX

This space differentiates itself from competitors by providing an active participation environment in projects that promote development. With regards to other participants in our study, the pandemic experience of ONYX was relatively soft. The company employees and coworkers spent the lockdown period at home and clearly defined protocols helped the crew to stay informed and adaptive. The company did not need to pivot on new strategies since there was only about 13 percent of customer loss for the infancy period of the pandemic, which was recovered with practical changes in payment packages. During lockdowns of April and May 2020, community activities were carried out through digital channels.

2.3.4.5. AZURE

Servicing on two floors of an ample building before the pandemic, AZURE was hit critically during the lockdown because they lost their all of their coworkers at 94 percent in very short time. In addition, the managers suffered from the high rent that had to be paid monthly, while the space was totally left empty. Main attempt was to alleviate the burden by vacating the upper floor, before adding some flexibility measures on rates. Besides, the managers did believe that no distinct technology would be influential in mitigating the adverse effects of the pandemic, if not carried out by the companies who would come and reside in the space.

2.4. RESULTS

All coworking spaces went through a similar chain of events during the first week of the lockdowns, in which a general order was issued to close the workplaces of companies that do not provide essential services (i.e., food and beverage services, pharmacy, financial and communication services, etc.) until 9 April 2020 (Generalitat de Catalunya, 2020). While most commercial activity was given a halt for safety reasons, the companies quickly recovered from the panic mode and some of them preferred alternative methods of teleworking, as recommended by the government. As mentioned by the CWS informants and their uninterrupted blogs during the lockdown, the spaces were closed, but the managers carried on working from home during these weeks (Coworking Spain Conference, 2021).

The analysis concerning the process of strategy making in the early stage of pandemic indicates that none of the CWSs was prepared to counter the effects of the crisis. Regarding the contagion related difficulties of the first shock of lockdown, the CWS managers first had to create and implement a new protocol to keep up with the sanitary regulations prescribed by the state (Cabral and van Winden, 2022; Delardas et al., 2022). These included the obligatory use of masks, regular sanitation and disinfection in workplace areas, and social distancing which allowed a proportionate number of clients or coworkers to enter the space in social proximity. The early protocols were similar, largely based on the government measures imposed on all similar workplaces. In time, as the spaces gradually began to suffer the loss of their clientele, the managers were encouraged and compelled to follow divergent strategies and adopt alternative techniques.

Some spaces were kept closed for weeks and there was no activity by the employees, while in other spaces the employees started working from home, even though the physical workplace remained closed. In this latter group, the managers sought to the keep the engagement between the employees and coworkers high, while maintaining their collaborative networks with other spaces that experienced similar conditions, in order to learn from their experiences while uncertainty was prevailing throughout the

globe.

Our study makes a distinction between non-digital and digital practices carried out by the CWS managers to survive the adversities of the pandemic period. By non-digital, we consider all those responses that did not necessarily require adoption of a new technology. The latter, we define by use of data dependent operations such as social media, mobile, analytics or embedded devices (Fitzgerald, 2014). These digital practices could be simple, such as development of new web pages or blogs to accelerate coworker engagement while physical connection is restricted, as well as continuance of extant advanced software utilization already installed in the local workspaces. However, more complex methodologies could also be carried out, such as establishment of a knowledge management system or synthesizing the customer relationship through all service providers in the CWS. For them, we deep dive into the measures through which new digital tools or improvement on extant technologies were necessary.

2.4.1. Surviving the adversities of pandemic by implementing non-digital strategies

The type of responses administered by the CWS, immediately after the restrictions started, indicated the dawning of unanticipated coworkers and revenue loss. Shortly, cost-related factors moved in, restraining the already tightened balances against the diminishing number of guests. Such drivers are continuation of fixed costs like electricity supply and monthly rents to landlords who were also threatened with insolvency until the government bodies relieved effects of the catastrophe. Those considerations psychologically pushed the CWS managers to discover new sources of value and amend the administrative policies.

All five informant companies in our study addressed their responses with relevance to the problems they went through. At the earliest stage, the CWS managers developed immediate responses to cover resource problems by optimizing the utilization of space, staff and kitchen services. As the coworkers started leaving the spaces dramatically, this backdrop was balanced by evacuating those non-utilized

offices and rooms to save from rents and related fixed costs. When the managers fall into solvency problems, the number of new decisions taken also increases.

Our informants reflect how they are open to testing their all learnings and put new methodologies into practice to deliver their customers new services at lesser cost of time and money while maximizing utility. Such strategies include the addition of new packages to the pricing of tables and offices within the space, to help coworkers pay in a less stressful manner at a longer duration of stay up to months, until they also can resolve their own liquidity problems. These new packages also introduced discounts to ensure higher conversion, as well as cost driven coworker clients would not leave the space in search of other alternatives.

Also, we observe increased perceptiveness of the CWS managers to new information sources in order to adapt and transfer all accessible techniques and practices that they could acquire new clients and expand on the available portfolio. We observe innovative intentions that go further to business model innovations, inspired by the personal and organizational capabilities inherent in the company's expertise. Such transformations include the addition of consultancy services and matchmaking of existent coworkers so that they cultivate new ties for their business needs at a lower or no cost within the coworking community in the space (Akpan et al., 2020). This finding falls into the first-year responses of our study, when the CWS managers were rather struggling the attrition of their prolonged coworkers and long before work-from-home model was discovered as a long-lasting component of the new normality by larger companies. In the light of further developments, the second-year findings reveal the shift of coworker type in the spaces, welcoming the new widespread teleworker mode. The CWS responses then change in parallel to address the needs of these new wave of coworker profile which is more likely to be an employee of larger firms and not a self-employed professional.

2.4.2. Surviving the adversities of pandemic by implementing digital strategies

Contrary to the previous section which maintains consistency in terms of participants'

practices, we find that variations occur in terms of the digital strategies they maintained. We describe the adoption of digital methodologies by the lens of certain diverging factors extracted through qualitative data analysis. The variations which we extracted through selective coding process provides constructive perspectives for three propositions concerning the coworking space size, level of adversities endured during the pandemic and managerial attitude to prioritize digitalization affecting the digitalization processes of CWS during the pandemic.

2.4.2.1. Coworking space size

The size and hence the number of coworkers in the spaces had a significant impact in new technology adoption. Going back to the early days of lockdowns, all companies were keeping their activity in work from home model (WFH), while their spaces were totally closed. After parrying the first shock of the lockdown in March, the larger companies had restarted their activity at least by keeping a minimum number of workers in the spaces, continuing internal communication with the rest who were working from home. On the other hand, breakdown of internal communication was not as seriously experienced by the smaller CWS. Consequently, we contend that in the first phase of the lockdowns, the size had an effect in terms of creating the necessity of maintaining information flow within the larger companies, and this gap was fulfilled by operationalization or intensification of digital communication methods. Slack, WhatsApp and similar intranet software are examples of this category.

The introduction of digital techniques in the aftermath of the first wave is rather centered around strategical and practical tools to compensate loss of revenues and control deficits. When the panic atmosphere moderated into this decisive period, the managers began to reactivate the spaces by migrating into virtual mode or hybridizing by omni-channel strategies. Events previously held in presence of many coworkers were all virtualized and new online versions of engagement were added to the daily schedule of the CWS. This version of online adoption was implemented in almost all

spaces, due to its operational easiness to control and purchase at zero level costs (Akpan et al., 2020). Utilized technologies in this category included web blogs, social media channels, teleconferencing on zoom and other alternative streaming methods.

These findings lead us to suggest that:

P1. The size of a coworking space positively correlates with a company's openness to actively seek out new technologies, as well as their resourcefulness in implementing them once discovered.

However, especially after the second wave the findings diverge from a certain pattern resting on the size and hence, financial capabilities. In this period, other strategic tools were adopted. They were widely characterized as being expensive, complex and long-term effective. These included CRM and knowledge management tools that facilitate the organizational and customer management of the spaces. Software packages of Holded, Salesforce and Notion are among the examples of this category. Apart from being expensive, these tools necessitated recruitment of a talented employee group and internal education, which made them a target that could be seized merely by larger companies. The size of the company correlates with the number of digital response strategies they developed, a critique which is also related to the complexity of the executive bodies in the spaces. For greater size of spaces, more employees are hired, and their management requires superior discipline.

But still among the informants, we observed that JADE, being a small company, was controlling this technology adoption by working with a group of collaborators to migrate daily tasks into this group of software, while another similar small space Topaz was out to search for government incentives to purchase them. In relation, we contend that this group of management software were perceived to be of paramount effectiveness for the companies during the pandemic and a tendency to own them existed despite the resource defects. Thus, we cannot conclude that the size and financial superiority would prove a significant factor to differentiate in the digitalization attempts of the companies during both years.

Changing dynamics of the coworker types also meant shifts starting from the sub-scale digitalization patterns of the CWS. In the second year, the conflict in northeast

Europe and its economic effects dawned on the coworking spaces which previously enjoyed multinational small companies or digital nomads. Managers were forced to find new domestic sources of coworkers, via digital channels, as echoed in manager of JADE's words:

> *"…Our biggest challenge today is to reach companies that want to refer their worker to coworking so they can do a hybrid job. That they can do flexible work. So, this is our biggest challenge today: to get companies to know us to refer their workers to our coworking space. So, the strategy that we are doing now is focused on the website."*

2.4.2.2. Level of adversities endured during the pandemic

The data unveiled significant variations in the extent of adversities experienced during the pandemic. It encompassed substantial figures regarding customer loss, both in terms of percentages and actual numbers, shedding light on the challenges faced concerning liquidity and managing uncertainty Additionally, the data highlighted that the main aim of countering strategies was to address the key challenges they were facing, either bearing the monthly payments while no revenues were generated, finding new sources of marketing, preventing the attrition of extant clients, and regaining new customers(Table 5). Such findings push us to propose that:

P2. The intention to explore digital techniques is accelerated by the challenges posed by the pandemic.

Nevertheless, after we collected survey results in the second year, we saw that none of the respondents claimed that adoption of digital technologies has a priority during the pandemic to continue business activities. Rather, new digital technology adoption was utilized in secondary order, in the form of tools to enable more generic strategies i.e., promoting engagement within the client groups or fostering internal communication between employees during social restrictions. We also found out that marketing activities intensified as the managers started posting blogs and stories from the space through social media channels and owned media. These attempts were

Table 5: Case companies, challenges, readiness levels and their reactive digital and non-digital strategies during pandemic

CWS	TOPAZ	JADE	RUBY	ONYX	AZURE
Customer loss	90%	84%	75%	13%	94%
Primary challenge in pandemic	Scarcity of financial and human resources	Reaching potential customer	Attrition of large companies	Some customers with payment inabilities	Paying rent
Digital tools adoption	Moderate	Moderate	Moderate	Moderate	Moderate
Digitalization during pandemic	Moderately important	Important	Slightly Important	Moderately important	Not important
Readiness for pandemic	Not prepared but must cope	Not prepared but must cope	Not prepared but must cope	Prepared enough, no need to add anything	Not prepared but must cope
Major trigger of strategic change	Demand from coworkers	Obtaining visibility and reaching more coworkers to convert Change of coworker type in the spaces	Being competitive Change of coworker type in the spaces	Change of coworker type in the spaces Creative solution model of management team Social responsibility	Disbelief that new technologies would result in a solution for recovery. No demands from coworkers.

Table 5: Case companies, challenges, readiness levels and their reactive digital and non-digital strategies during pandemic (Continued)

CWS	TOPAZ	JADE	RUBY	ONYX	AZURE
Key non-digital strategies to tackle pandemic impacts	Business model innovation: expanded services with co-living and consultancy Flexible and new payment alternatives:	Changing marketing funnel: target group changes Optimizing resources: Compensate increasing costs with not paying rents	Marketing mix adaptation: Innovation in product portfolio. Flexible new payment alternatives like discounts for longer stays. Organizational Change: Multidisciplinary teams Optimizing resources: Transferring the services between locations	Marketing mix adaptation: Flexible new payment alternatives like bonus pack, new customer plan, lower rates.	Optimizing resources: Negotiated the rent with the landlord
Key digital strategies to tackle pandemic impacts	Create virtual community: Launch Online Coworking Channel	Strengthen brand identity: Develop a digital strategy plan. Enroll in online courses during confinement period. Target true customer via digital marketing	Employ knowledge management: Restructure account management system. Develop internal communication: implement Intranet and Slack tools. Create virtual community: Hybridize events (Pitching contests and similar)	Did not implement new technology: Already developed enough	Did not implement new technology other than social media posts.

Source: Own elaboration.

continuous during all waves of the pandemic and worked well to attract customers by evidencing that the life continued in a new-normal manner against all odds in these spaces. Hence, our findings show the dependence of digital tools allocation correlated with the type of key challenges the CWSs had to endure (Table 5 and Table 6).

Yet, the utilization of digital tools during pandemic did not significantly correlate with the **level** of adversities the CWSs had to live through, a factor we measure by the percentage of client coworkers lost during the initial year (Table 5). Hypothetically, we had expected that as the percentage of coworkers leaving the space would be higher, the solvency problems would lead the managers to search for new remedies. This hypothesis was corroborated for 3 cases of RUBY, TOPAZ and JADE, also by ONYX but in the reverse manner, since this space suggested that they did not have serious financial problems which would alleviate them to adopt new technologies other than those they were already using. However, the outlier example of this hypothetical case was AZURE, which lost about 94 percent of their customers and still did not seek reorganizational change, while saving costs by non-digital methods (i.e., evacuating the whole floor of offices immediately). Their explanation for less dynamic adaptation relates to expectations from the changing customer profile, as the large companies which convert to work-from-home model register their employees into the CWS.

Therefore, we conclude that not the level of adversities, but the managerial perspective might rather be a critical factor in deciding to go for a strategic change, independent of the costs endured. The manager of the coworking space, in that sense, defended her stance by stating that her clientele was composed of small professionals who were performing their business individually by using the rooms for teleconferencing with their own clients. Even if she had larger companies within the clientele, then it would be a task for this company to implement digital technologies to the workflow of its employees, and digitalization would not be the mission of the CWS.

2.4.2.3. Managerial attitude to prioritize digitalization

The rejection of previous propositions by the data prompts us to delve into a more detailed argumentation, particularly regarding the attitude of managers. In order to collect objective indicators of managerial attitude to prioritize digitalization, we asked them their views on the importance on digital technologies adoption during the pandemic to continue business activities and correlated the result with the adoption level of digital infrastructures within the CWS. This validation revealed that priority of digitalization during the pandemic had an impact on the levels of digital technology introduction. Therefore, we contend that;

P3: Digital technology adoption attempts highly depended on the managers' openness and orientation to digitalization.

This finding was corroborated with triangulation surveys collected from coworkers in the spaces. Data also validates several contingencies about managers choice to accelerate digitalization during the pandemic. The use of digital tools acted as an opportunity to continue CWSs' recurrent tasks in the same pace, when the restrictions prevented coworkers to come and share the small offices:

> *"So, the online is, is like an opportunity. There were these two reasons: The first one is like… all these activities that we were doing at the CWS, because you cannot make more than six people anymore. So, we could not do it offline. So, we said, 'okay, let's, let's try to keep these dynamics online'."* (Founder of Topaz)

Leveraging the communitarian spirit of the spaces, these adoptions were useful to keep the companies erect and vibrant during the hardest times. Such managerial tendency was also reinforced with the incoming demands from users of the CWS, both employees and coworkers:

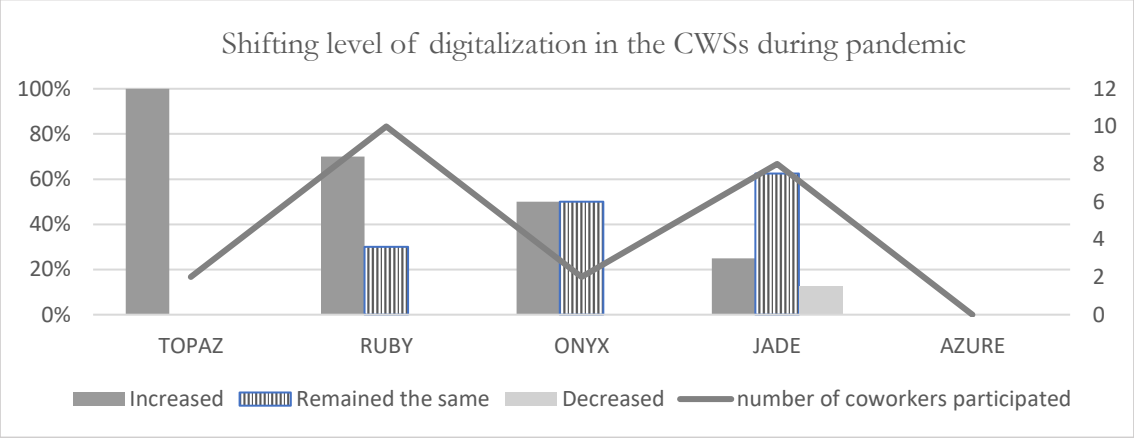
> *"…Some other people are doing it, let's just take what Slack is doing" and incorporating it in our in our platform. So, what we did is now we use Slack, not only as Ruby team of course, but also, we created a space for our community. So, with our coworkers we tried to, you know, promote all the activities or the events and even just conversation with members*

on Slack. And before the pandemic this was not really happening. Like we were using it internally, but we were not using it with the community." (Manager from Ruby)

Significantly, not all CWS management would favor the digitalization attempt. Our data encompasses those critical arguments against the exaltation of digital adoptions during the pandemic as a useful tool to survive the adversities. Either it is not seen as a solution to carry out for unravelling any difficulty, or it is not foreseen by the managers as useful to heal the pains of a crisis. In both cases, we find that the managerial look would be significantly definitive for the CWSs to prioritize undergoing a series of change or not.

This finding was also documented by the client coworker insights for 4 CWS from which we attained quantitative triangulation data. For TOPAZ and RUBY, which have mobilized all resources to new technology adoption, the clients have voted for a positive image in the level of digitalization indicators. In JADE, those who favored the increase in level was 25% while there was 13% voting for the decreasing level, probably due to malfunctioning of the web site under attacks. In the case of ONYX, half of the respondents said that digitalization level increased, while the other half saw it as not changed at all (Figure 5).

Figure 5: Triangulation from customer coworkers of the case CWSs



Source: Customer coworkers triangulation survey.

A significant finding that rolls from the second-year data is that those adoptions which

were deemed as influential for the first year of uncertainty, were likely to be abandoned if they did not receive any customer demand or cost relief. We see hybrid events and webinars are not dealt with the same level of frequency as before, underlining their utilization during the lockdowns and curfews as a community vibe booster that strengthens the brand identity and continuation of loyalty to the spaces. The reasons for this disposal may be found in the way CWSs felt like spinning wheels for the amount of time and training energy invested with no rewarding results in observable metrics. However, other digital adoptions that supported the company objectives like ensuring CWS's visibility and coworker acquisition were maintained with intense priority and kept the managers to explore possible resources to seize disruptive opportunities.

2.5. DISCUSSION AND CONCLUSIONS

During the pandemic, transformation paths in the business models of the firms shifted with relevance to their maturity in employing digitalization (Priyono et al., 2020; Ragazou et al., 2022). Such efforts could either cover the implementation of digital pivoting mechanisms to recover from the isolation situation when the number of people using collaborative workspaces physically were diminishing, such as beginning to use teleconferences instead of face-to-face meetings or installing chatbots to compensate for the loss of staff (Cabral and van Winden, 2022). As well, coworking companies canceled all sorts of events because face-to-face interaction was inevitable otherwise, and meanwhile, they were forced to take strategical measures against the threat of ceasing operations due to client loss (Ceinar and Mariotti, 2021)

The purpose of our research is to explore the strategy changes deployed to adapt to new conditions of pandemic challenges experienced by CWS. Covering a two-year time period after the first strike of the pandemic, our data structure covered 5 CWSs managerial predispositions. We analysed the strategies of these cases in pre and post lockdown periods of the pandemic in terms of digitalization attempts, the motivations and barriers behind strategy changes and ultimate practices (Table 6). Using a mixed. methods approach over the responses articulated from the interview's observations,

Table 6: Leverage of digital technologies throughout pandemic periods

CWS	TOPAZ		JADE		RUBY		ONYX		AZURE	
	LOCK-DOWN	NEW NORMAL	LOCK-DOWN	NEW NORMAL	LOCK-DOWN	NEW NORMAL	LOCK-DOWN	NEW NORMAL	LOCK-DOWN	NEW NORMAL
Internal communication by email and instant messaging	√	√	√	√	√	√	√	√	√	√
Videoconferencing		√			√	Added cubic rooms	√	√		√
Website	√	Relaunched	√	Redesigned and relaunched	√	√	√	√	√	√
Online Blogs	√	√		√	√	√	√	√	√	√
Social media	√	√	√	√	√	√	√	√	√	√
Online advertising	√	Increased	√	Persona of target groups redefined	√	√	√	√	√	Minimized due to lack of demand
Project management software built for teams				√		√	√	√		
Customer management software		Record birthdays on platform				Diffuse the information among employees and partners	√	√		

Table 6: Leverage of digital technologies throughout pandemic periods (Continued)

CWS	TOPAZ		JADE		RUBY		ONYX		AZURE	
	LOCK-DOWN	NEW NORMAL	LOCK-DOWN	NEW NORMAL	LOCK-DOWN	NEW NORMAL	LOCK-DOWN	NEW NORMAL	LOCK-DOWN	NEW NORMAL
Online Events		Management training videos				Workplace events migrated to virtual (Hybrid pitch contests)		Workplace events migrated to virtual (Webinars)		
Digital strategy management		Defined with network of CWS managers		Started to work with an agency to organize digital strategy		Company manager meetings				Managers posted on social media related to pandemic issues
Digital distancing measures									Smart touchless locks on office doors	

Source: Own elaboration on CWS data

short surveys, and secondary data, we found that the digitalization techniques were useful in mitigating the negative restriction effects and kept their efficiency in the aftermath of the lockdown period. The prospective look of our study enlightens the pathway to several SMEs and entrepreneurs who embed the long-term response strategy to cope the crisis (Kuckertz et al., 2020, Rodrigues et al., 2021).

Our axial coding did not indicate a significant behavioral pattern among the CWSs for non-digital strategies. All managers suggested that they were unprepared for a crisis situation, however the perception and tactics of coping with the impact were diverse. Each of the five companies that participated in our study provided insights directly related to the challenges they encountered. Additionally, during the later stages of the pandemic, these companies adapted and modified their strategies to effectively navigate the evolving circumstances.

The theory proposed in this research therefore focuses on the deployment of new digital technologies and their transformation into routines, under the uncertainty and fierce competition influence. Research data incorporates the key factors which would lead to the divergencies in adoption of such methods (Table 7).

We found significant relationships between the nature of key challenges the CWSs had to endure in that period and relevant use of digital tools to tackle those adversities (Klein and Todesco, 2021) but that link did not imply a definite causality between the level of adversities endured and their intention to implement new technologies. Our data rejects a significant relationship between the size and the level of adversities that the CWSs had to live through during the pandemic, that is, the percentage of coworker base lost during state of alarm periods. Nevertheless, apart from the digital maturity or size of a coworking space, attitude to prioritize new digital technology implementation may act as a

Table 7: Grounded theory cross tabulation by propositions and strategy validation

Propositions / Case CWSs validation	**Coworking space size**	VALIDATION	**Level of adversities endured during the pandemic**	VALIDATION	**Managerial attitude to prioritize digitalization**	VALIDATION
TOPAZ	Small company thriving for digitalization within limited resources	√	Losing more than 90 percent of its coworkers, they decided to change their daily routines based on online engagement.	√	Open to transformation under the condition of availability and accessibility of resources	√
JADE	Small company thriving for defining a new digital strategy after failed attempts	√	Hard loss of 84 percent coworkers leaded them to strive for digital channels to develop customers.	√	Open to transformation mobilizing available resources	√
RUBY	Large company open to utilize capital and human resources, at the expense of restructuring the company for digital adoptions	√	Gradually lost about 75 percent of its 4,000 coworkers and wants to recover them by implementing new managerial solutions	√	Open to transformation based on management team's strategy	√
ONYX	Medium sized company not willing to adopt new digital technologies because they are digitally mature	×	Not need to pivot on new strategies since there was only about 13 percent of customer loss which was not hard felt.	√	Open to transformation based on management team's strategy	√
AZURE	Small company not willing to adopt new digital technologies because it is not their obligation	×	Lost their coworkers at 94 percent, considers non-digital strategies to recover.	×	Is not willing to adapt new processes unless becomes a necessity	√
Validation result	Adopted strategies **cannot be validated** by coworking space size.	×	Adopted strategies **cannot be validated** by the level of adversities.	×	Positive managerial attitude to digitalization **corroborates** digital technology adoptions.	√

Source: Own elaboration based on case company strategy data.

significant factor which motivates the managers to explore for extra budget, technological talent and tools to meet customer demand, competition objectives and survive environmental drawbacks (Bai et al., 2021).

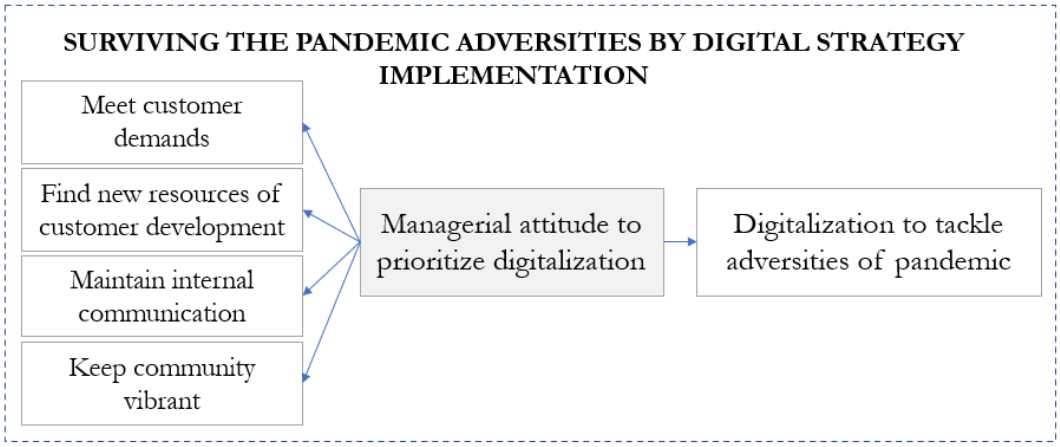
We saw that the main drivers that increase the managers' tendency to utilize digitalization are meeting customer demands, finding new sources to develop new customers while maintaining internal communication with the employees and keeping the community vibrant for the continuity of the space (Klus and Muller, 2021). The size of the company and the number of managers in the workspace are determinant for the introduction of more complex technologies, to address more complex issues of the business. But still, companies owned by one manager are representative of an open-minded attitude favoring digitalization, albeit at a subscale level, selectively adopting the technologies to refrain from probable challenges (Priyono et al., 2020; Rodrigues et al., 2021; Tamvada et al., 2022). Our data also reflects those cases where digitalization has not been referred by CWS managers as a method to counter the adversities of the restrictions, due to organizational decisions and excuse of being a small company (Rupeika-Apoga et al. 2022; Eller et al., 2021).

We contain all extracted information from our findings into a model that represents how these factors may affect the company's strategies that include digital technologies (Figure 6).

Recently, the status of environment and context in entrepreneurial research has been a critical issue of argumentation in literature (Welter et al., 2019). In a theoretical perspective, the new era of pandemic world has shaped a new environment for observation of the ecosystem in a holistic context. This study helps to fill in the academic gap opened after the outbreak to explore new adaptation techniques to stand against the isolationist approaches in sharing economy and to underline the importance of digital transformation for coworking spaces in the new era. In addition to the practical measures taken to

overcome challenges, acknowledging the hardships experienced by managers during the crisis contribute to the ethical dimension of our study and establish its social implication by reflecting their short and long-time strategy management under shifting stress conditions.

Figure 6: Proposed research model



Source: Own elaboration

To our knowledge, this paper is one of the first in the sharing economy area of knowledge to argue the conditionality of sharing practice continuation. Doing so, we further advance the proposition of Lundgren et al. (2022) who underlined that virtual and hybrid solutions are gradually replacing the tangible act of sharing, even within shared spaces. After a two-year inspection and analysis of CWS, we find the behavior patterns of coworkers and managers to maintain their communitarian relationship either by online methods or in physical proximity, with the ultimate objective of business continuity (Cabral and van Winden, 2022).

In the highest stringency, activities were sustained remotely online digital channels, which also inspired and encouraged the CWS managers to reinvent new methods of proximity. As the obstacles are removed, managers opened the

doors of the spaces to physical gatherings as before refraining from negative side-effects of transformation (Amankwah-Amoah et al., 2021). Thus, prevalence of teleworking in the society after the pandemic should not be taken as the absolute substitution of spatial proximity by online mode, but only a condition dependent practice that may shift through disruptive socio-economic transformations.

This finding advances the anticipation of how CWSs may continue as an inclusive component for the continuity of small businesses in the circular world, furthering the emphasis on self-sufficient communities (Korsgaard et al., 2020). Their development may not be only traced to provision of technical internet connection and free office spaces that can innovate on their business model with digitalization (Rachinger et al., 2019), but also the maintenance of strong ties with similar business community in form of cooperation and customer engagement are crucial drivers to keep them continue innovation to survive.

Practically, the findings of the research reveal the need for the SMEs to open up to new digital technologies with a broader expectation to tackle the problems arising from solvency and as well to keep up with the competitors and customers' demands which are gaining complexity persistently. Our study represents a formation model to show how the implementation of digitalization techniques will have an ideal impact on similar SME sized businesses in sharing economy for development into more resilient corporations. We reveal that having an open mindset to keep up with the digital requirements of time may have inspiring effects at low cost (Akpan et al., 2020). The incorporation of new digital technologies does not require to be state of the art, but those ones which are compatible with the SME's requirements for survival and continuity (Bai et al., 2021).

In either case, the companies that have taken the road to digitalization during the pandemic through a process of learning by doing, have arrived at a point

where they could identify the company's basic needs to compete the hard times and also developed new practices to overcome problems addressed. This not only facilitated them to counter the likelihood of insolvency but also inspired them for a new path out of isolation and dependence on institutional and governmental endowments. In this sense, this paper contributes to the knowledge already extracted out of similar practical studies by Ratten (2021), Bai et al. (2021), Cabral and van Winden (2022) and Kuckertz et al. (2020) for sustainable development of the SMEs in the aftermath of the pandemic.

Our research is not exempt from limitations. Basically, the small number of cases taking part in the study drives us far from generalizations. Having studied the concept in one geography adds to this limitation. Likely, technology adoption by the CWSs were below the expectations. In different settings, these examples will be more variant.

Nonetheless, we believe that further research in the same line covering variant geographies, also going into those places where technical capabilities are at different levels may feed the gaps which we leave open as a result of these limits. Also, complementary research questions may be raised to follow this study, concerning what the impact of these strategies would be for only non-digital measures and their compatibility to remove barriers. Likely, the methodologies carried out by the SMEs to bend the learning curve during the implementation of new strategies will contribute to the knowledge, by indication of new practices to reduce the error rate in technology adoption and transfer.

The research also unveils a number of common digital technology software usage by the participant CWS, which we believe will form a practical example for similar industries. Future quantitative studies may go deep into the use cases of these basic tools to understand the major factors leading to trends in their adoption and search for similarities in the remedies they address.

2.6. APPENDIX

2.6.1. Manager Survey Questions

A. Digitalization

1.	**What is your firm's overall degree of digitalization?**	Totally disagree	Partially disagree	Not sure	Partially agree	Totally agree
1	We fully adopt digital artifacts (products or services)					
2	We fully adopt digital platforms that support digital products and services					
3	We fully adopt digital infrastructures, such as technology tools and systems					
4	We fully adopt digital business models					
5	We fully adopt digital management models					
6	Firm digitalization relies on internal R&D					
7	Firm digitalization relies on external purchases					

2.	**What is your firm's degree of digital technology adoption?**	Very low	Low	Not sure	High	Very high
8	Big data technology (such as big database, data analysis technology)					
9	AI technology (such as machine learning)					
10	Mobile technology (such as mobile Internet, wireless communications)					
11	Cloud computing technology (such as cloud computing)					
12	IoT technology (such as network distribution technology)					
13	Social technology (such as online commerce, instant messaging)					
14	Platform development technology (such as network platforms)					

3.	**Your firm's business is mainly:**
A	Changed from offline to online
B	Changed from online to offline
C	Did not change at all, still offline
D	Did not change at all, still online

4.	How important was it to have adopted digital technologies during the pandemic to continue business activities?
A	Not important
B	Slightly important
C	Moderately important
D	Important
E	Very important

B. Public crisis response strategy

1.	In face of the pandemic, your firm has taken the following strategies to resume production:	Totally disagree	Partially disagree	Not sure	Partially agree	Totally agree
1	Reduce production and operating costs					
2	Divest loss-making/less profitable business units					
3	Adopt online telecommuting					
4	Optimize business models to capture new customer needs					
5	Develop marketing channels and remove dependence on offline transactions					
6	Actively invest in technological innovation					
7	Diversify into new business areas					
8	Integrate supply chain					

2.	In the face of the pandemic, your firm has taken the following strategies to protect employees' rights:	Totally disagree	Partially disagree	Not sure	Partially agree	Totally agree
9	Pay wages in accordance with contracts in one pay cycle					
10	Pay basic subsistence allowance in excess of one pay cycle					
11	Retain employees' jobs					
12	Negotiate with employees or unions to defer payment					
13	Pay wages to employees who are quarantined					
14	Arrange compensatory leave or overtime pay for employees who cannot take time off					

4.	Will your firm change in the following aspects after the pandemic?	Totally disagree	Partially disagree	Not sure	Partially agree	Totally agree
15	Change existing product lines					
16	Change regional market coverage					
17	Change external cooperative relations					

5.	Will your firm accelerate its digital transformation after the pandemic?	Totally disagree	Partially disagree	Not sure	Partially agree	Totally agree
18	Improve the digitalization of supply chain channels					
19	Adopt digital artifacts, such as digital products or services					
20	Adopt digital platforms, such as digital communication platforms					
21	Adopt digital infrastructures, such as digital technology systems					

C. Public crisis response performance

1.	Compared with its performance in 2019, how will your firm's performance change in the future?
A	Decrease more than 50%
B	Decrease by 30%–50%
C	Decrease less than 30%
D	No change
E	Increase less than 30%
F	Increase by 30%–50%
G	Increase more than 50%

2.	How long could you maintain the cash flow of your firm during the pandemic?
A	1 month
B	3 months
C	About half a year
D	About 1 year
E	More than 1 year

3.	How did your firm's revenue change in the first year of the pandemic?
A	Decrease more than 90%
B	Decrease by 50%–90%
C	Decrease by 10%–50%
D	Decrease less than 10%
E	No change
F	Increase

4.	How did the costs of your firm change in the first year of the pandemic?
A	Increase more than 100%
B	Increase by 50%–100%
C	Increase by 10%–50%
D	Increase less than 10%
E	No change
F	Decrease

2.6.2. Coworker Survey

Welcome

Thank you for agreeing to consider participating in this research project. Before you decide whether to participate, it is important that you understand the reasons why we are carrying out the research and what your participation will involve. We would be grateful if you read the information below carefully. Please feel welcome to contact us if anything is unclear, and to take as much time as you need to decide whether or not to take part.

What is the purpose of the study?

As part of the research project, we will be examining the advancements made in the coworking spaces in Barcelona throughout the Covid - 19 pandemic period to overcome the problems that could arise. The research will discover the different types of digitalisation technologies and the adaptability of coworking spaces to them. The study covers the management teams of various sizes of coworking spaces in the city, as well as those entrepreneurs or business employees that work in these spaces as their customers.

Who is running this study?

The project is being carried out by PhD candidate Tugce Saka (tugcesaka@ub.edu) who is supervised by Esther Hormiga and Jaume Valls, professors at University of Barcelona Business School.

What will I be asked to do in this study?

We would like you to complete a questionnaire comprising of 7 questions. As this is an online questionnaire, you will be able to answer with no time limit.

Once starting the questionnaire, you are free to decline answering any questions at any time if you would prefer not to. No reason will need to be provided for this.

How long will it take me to do this?

This questionnaire should take a maximum of 5 minutes to complete.

Do I have to take part?

Your participation is entirely voluntary. Answering the questions below will indicate that you decide to take part.

What will happen to the information I give in my questionnaire?

Questionnaires will be collected, and the results will be analysed. The conclusions drawn from these results, will be included in the final report, which is designed to be published as an article in scientific journals. All questionnaires will be destroyed afterwards.

Questionnaire Consent

Clicking on the "Submit" button indicates that:

• You have been provided with information about the project

• You have been told who to contact if you have questions before, during or after your participation.

• You understand what participation in this project involves

• You are 18 years of age or older

• You voluntarily agree to participate

Please answer the questions by considering this coworking space you are working in:

Q1. During the Covid-19 pandemic, the level of digitalization in this coworking space has:

Increased

Stayed the same

Decreased

Q2. How would you rate the digitalization intensity of this coworking space?

Very good

Good

Neither good nor poor

Poor

Very poor

Q3. Would you name some digital technologies of this coworking space that are useful for your business?

Your answer

Q4. Which new digital technologies would you add to this coworking space to improve its business capacity?

Your answer

Q5. When was the first time you started using this coworking space for your business activities?

Before 2020

In year 2020

Last year, in 2021

A few months ago, in year 2022

I am very new here, about 1 month

Q6. How do you define the reason for selecting this coworking space?

My company decided on this place

My client decided on this place

It is my own decision

Other

Q7. What is your relation to the company you are working for?

I am the owner / founder

I work as a manager / employee

SUBMIT>>

"People who think they know everything are a great annoyance to those of us who do."

- Isaac Asimov

CHAPTER 3.

MULTIDIRECTIONAL RELATIONSHIP OF DYNAMIC CAPABILITIES AND DIGITALIZATION: A SYSTEMATIC REVIEW ON COVID-19 LITERATURE

ABSTRACT

Objective: Dynamic Capabilities Theory (DCT) explains how firms react and adapt to rapid change. The COVID-19 crisis delivered an environmental fit for the theory to be tested. During this period, DCT was the most visited theory in business literature, for its wide capture on turbulent change. Likely, digitalization received a similar attention, for its practical implications on the shifting nature of work and consumption culture of society.

Methodology: To tackle the connection of these two themes within the crisis situation, this study follows a bibliometric literature analysis methodology to find how digitalization and dynamic capabilities are related, covering 46 articles from academic journals.

Findings: The paper finds that the pandemic literature has made a shift towards consideration of digital technologies as an enabler of dynamic capabilities, manifesting in organizational outcomes which help to survive the crisis.

Contributions: The contributions of this study are twofold: theoretically, we extend the theory of Dynamic Capabilities by analyzing into the micro-foundations, enablers, and technology substitutes of dynamic capabilities, in a common ground of COVID-19 crisis environment. Practically, we define three exemplary models for business scholars to follow when similar constructs are built in their studies.

Keywords: Dynamic Capabilities, Digitalization, Digital Transformation, Information Technology, Technology adoption

3.1. INTRODUCTION

Dynamic Capabilities (DC) view explains how firms react to rapid technological change (Eisenhardt and Martin, 2000). A quarter century old theory explores those higher-level competencies that determine the firm's "ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997, p. 516). Numerous articles since the pandemic outbreak have argued about the COVID-19 as a trigger for dynamic capability development in companies. During this period, no other theory was referred to as much to tackle the process of strategy and decision making in business and management discipline. This strength comes from the appropriateness of DC view to explain how companies respond when confronted with uncertainty and turbulence in their environment (Wielgos et al., 2021). The theory by nature, stands in the junction of basic issues of strategic renewal, adaptation, and growth within an organization, which may well be connected to fundamental mechanisms of knowledge management, sustainable innovation, and organizational learning (Witschel et al., 2019) to seize opportunities or neutralize threats.

Pervasiveness of digital technologies (DT) manifests itself in business literature theoretical frameworks in the form of a growing number of operational constructs (Dittes and Smolnik, 2019; Usai et al., 2021; Chaterjee and Chaudhuri, 2022). Accordingly, the pandemic fueled the debate on necessity of digital technology adoption, digitalization and digital transformation as a remedy for those companies who were struggling the unprecedented shock of uncertainty and rapid change (Priyono, 2020; Bai et al., 2021). The arguments were centered around the flexible approaches provoking change and innovation in business models, the opportunities and barriers to reach that transformation in order to stay competitive (Akpan et al., 2020; Guo et al., 2020; Heredia et al., 2022).

As a result of their remedial characteristic during the COVID-19 crisis, both themes, DT and DC were exploited in numerous perceptions in business literature (Li et al., 2022; Forliano et al., 2022; Zahoor and Lew, 2023). This intense use in varying frameworks triggers an unmanageable fit, especially to replicate the contested theories for further research. Studies about coping the crisis situations may take dynamic capabilities in a variety of schemes functioning to achieve organizational outcomes e.g., performance or resilience. Similarly, digitalization, digital technology adoption or digital transformation are existent items in almost all models, with divergent roles. As such, the direction of relationship between these main themes takes many shapes, all proving reasonably right when tested over the intended empirical ground. However, this "confirmed" tag granted from the publication of particular articles -which adopt distinct views- jeopardizes academic research by pushing researchers into obscurity. Joint use of these two themes so far, herald the future research lines. The uncertainty of the relationship between digital phenomena and the dynamic capabilities endangers the researchers to fall into a trap of not covering the probable dimensions in one clear perspective.

Moreover, several arguments have been raised concerning the inclusive relationship between digitalization and dynamic capabilities. Basically, with an aim to acknowledge the penetration of digital technologies into all organizational change practices, terminologies naming the origins (IT based dynamic capabilities, IT capability), processes (Digital business capability, Dynamic capability of IT project management) or objectives (Dynamic Capabilities for digital transformation) partake a wide usage within the business literature (Wielgos et al., 2021; Warner and Wäger, 2019; Cannas, 2021). In some studies, orchestrating traits of digital technology adoption capabilities take the name of Digital Dynamic Capabilities. Recently, two studies attempted to tackle this increasing trend of uniting digital capabilities with dynamic capabilities, in a literature review discipline, discussing the concept by naming it "digitalization

capability" (Annarelli et al., 2021) and "Dynamic Information Technology Capability" (Li and Chan, 2019). These studies are framed around the acknowledgement of the abovementioned connection and definition of micro-foundations consolidating the construct.

If the post-pandemic era will stimulate similar arguments to be contested in the academic realms, a methodology for those researchers who are demanded to operationalize these two compatible themes is technically necessary. Thus, we bring into light the extant nature of relationship in between these terms, by asking the research questions of;

> RQ1. What is the nature of the relationship between the leverage of dynamic capabilities and digitalization?
>
> RQ2. How was this relationship implemented by the academic literature examining the COVID-19 pandemic?

With an aim to investigate the foundation of these questions, we see that it is critical to understand how dynamic capabilities and digital phenomena have been portrayed in crisis literature that requires them to be operationalized together. To achieve this objective, our study materializes on a systematic literature review methodology, incorporating 46 recently published articles during the critical COVID-19 era. Our findings are centered around two basic delusive areas: multi-direction in relationship and shifting order of capabilities. After diagnosing the recent trends in highlighting DCs and DTs, we analyze the reasons behind this coinciding operationalization in business articles. Finally, we suggest a common framework for future use in a chaotic ubiquity of digital technologies infiltrating into dynamic capabilities.

Within all extant attempts to formulate the relationship between DCs and DTs, this study, to the knowledge of the authors, is one of the first attempts to reduce the analysis into a common COVID-19 environment. By this manner, we aim

to level all the differentiating factors with a *Ceteris Paribus* ideal to find the real nuances if they exist. As well, this research takes a large step in extending the DC framework, with a retrospective look on how it shifted from previous era, when it was launched in a freshly digitalizing world. We believe that business literature should go one step ahead of making definitions of digitally equipped dynamic capabilities, after experiencing a prevalent interchangeable use of the term. Besides, this study aims at exposing the misconceptions of treating all similar constructs as equal. Practically, our paper serves the scholars: it explores how the future of pervasiveness in digital technologies will change the nature of dynamic capabilities and enlighten the researchers for their future projects in the discipline.

The rest of the paper is structured as follows: First, we illustrate the basics of DC theory and digitalization with regards to their underlying interactions associated in this study. Then, we define the methodology that forms the basis of our research to tackle settled research questions. Later, we disclose the findings, with reference to the main questions, to clarify the misleading schemes in academic works. The discussion section explores the reasons for those nuances in theoretical understandings. We conclude with a summary of our contributions to theory and practice, defining the limitations of research and future research lines.

3.2. BACKGROUND

3.2.1. Dynamic Capabilities Theory

Field of strategic management analyses how a firm can deliver its own reason for presence: to be competitive in the market and sustain continuity of progress (Rumelt et al., 1994). Among the various theories that emerged in the field during the past decades, the Resource Based View (Penrose, 1959; Wernerfelt, 1984) made a powerful contribution by proposing that valuable, rare, inimitable,

and non-substitutable attributes of the firm (Barney, 1991) as the necessary capabilities to attain business continuity. The unique organizational capabilities and resources owned by the firm stimulated the differentiation, thereby, the competitive advantage (Helfat and Winter, 2011).

DC theory flavored these arguments by aggregation of the environmental change factor which embraced all organizations (Wang and Ahmed, 2007). The framework has been modelled into several arguments, since it covers a full body of organizational strategy by pinning distinct skills, processes, procedures, organizational structures, decision rules, and disciplines (Teece, 2007). These competencies enable organizations to change their operations by improving existing capabilities or creating new ones (Winter, 2003) and in that logic, are separate from ordinary capabilities, which simply represent a set of patterned and repetitious routines operated for functioning of a firm (Winter, 2003; Zollo and Winter, 2002).

While the ordinary capabilities are technically aligned with the framework of the related industry or company department, dynamic capabilities are integrated to the company through sensing, seizing, and re-configuration. This is a step-by-step process of assessing identified opportunities by mobilizing the resources and deploying them into the structure, by analyzing if these new resources are necessary or not (Teece, 2007). Diverting from the Resource Based View, which relies on the human capital as the crucial unit of analysis, Dynamic Capabilities Theory underlines learning-to-learn capabilities of the organization (Schilke, 2014). They rather have a transforming effect on the ordinary capabilities and ensure that they adapt to the change over time (Winter, 2003).

3.2.2. Digital transformation, digitalization, and digital technology adoption

Verhoef et al., (2021, p.889) define digital transformation as the *change in how a firm employs digital technologies, to develop a new digital business model that helps to create*

and appropriate more value for the firm. Meanwhile. digitalization is defined as the exploitation of digital opportunities to transform business models to improve both the performance and the scope of the business (Verhoef et al., 2021; Rachinger et al., 2019). The interactive use of digital technologies (e.g., e-mail, chat, social media, cloud technologies, sensors, big data, 3D printing, etc.) form its basis, with the pursuit of creating new products, services, and business models (Brennen and Kreiss, 2016). Digitalization is a source of digital transformation for organizations apt for an organizational change (Fitzgerald et al., 2014). But more importantly, in the competitive environment of today, digitalization has become an obligatory step for firms to fulfil, rather than an opportunity (Sheth et al., 2021; Brynjolfsson and McAfee 2014).

Digital transformation has become a major assignment in business agendas of today's Schumpeterian world (Belhadi et al., 2021). The ever-growing necessity for creative destruction is triggered by the constantly volatile markets, highly dynamic environments, and complexity of sustaining competitive advantage (Eisenhardt and Martin, 2000). Ubiquity of digital technologies changes the game from top to toe, forcing every organization to be absorbed into the new rules of the game (Wielgos et al., 2021).

3.2.3. The juxtaposition of digital and dynamic capabilities prior to COVID-19 pandemic

The mediating effect of dynamic capabilities on the relationship between ordinary capabilities and organizational outcomes is widely accepted (Wang and Ahmed, 2007; Xiao et al., 2020). Warner and Wäger (2019), in their seminal work, underline how firms need new digital sensing, digital seizing and digital transforming dynamic capabilities to compete in a digital economy. Therefore, digitalization and dynamic capabilities have general applicability to firms to stay competitive even in unstable high-velocity environments, which is the

preeminent feature of digital era (Peteraf et al., 2013; Teece 2014). Digitalization efforts involve change and integration within an organization and skillful manipulation of digital technologies and digital information (Nambisan et al., 2017), and this relationship makes dynamic capabilities relevant and important to a successful digitalization effort. (Antonucci et al., 2020).

Looking back into the literature prior to COVID-19, coherent understanding was also lacking on the direction of relationship impact between dynamic capabilities and digitalization. A large group of scholars proposed integrative views on how and under what conditions firms implement dynamic capabilities to achieve digital transformation (Cannas, 2021; Warner and Wäger, 2019).

In the earlier dates, a large group of scholars explained the development of dynamic capabilities as a product of increasing digitalization and evolution of organizational resources to be able to adapt to the rapidly changing environment of digital age (Teece, 2014; Vial, 2019). The researchers in this group mainly looked at the dynamic capabilities needed to survive the rapid technological changes of the fourth industrial revolution and digital transformation in the industrial context which include media, construction, public, imagery and creative industries. Digitalization in the firm organization is an irresistible result of this change and managers are required to develop dynamic capabilities to respond strategically to drive success.

As well as digital attributes, the role of managerial learning is important for organizational development of dynamic capabilities, as in the Kodak example (Wang et al., 2018). Karimi and Walter (2015) clarify the role of first-order dynamic capabilities in responding to digital disruption, by depicting a second-order capability of digital platform management. Day and Schoemaker (2016) show the contingency factors that matter most in case of rapid deployment of digital technologies. Similarly, focusing merely firm objectives, rather than an environmental change to adapt, several authors contemplated digitalization as a

main strategic driver for the companies to exploit the technological changes for competitive advantages in the market (Knobbe and Proof, 2020). Antonucci et al. (2020) introduced "business process management capabilities" which include process strategy, process execution, governance, methods of improvement and culture/people enablement to reap digitalization benefits.

Meanwhile, another group investigated the reasons and methods behind the adoption of industry 4.0 technologies and pointed out dynamic capabilities as an antecedent framework to adhere to the capability allocation. Such technologies enabled thanks to DC allocation can lead to digital business model innovations (Soluk et al., 2021; Witschel et al., 2019) or digitalization of industrial processes (Wamba and Queiroz, 2020). A large group of contributors focus on the term digital transformation as a holistic cultural process that needs to be taken for granted (Warner and Wäger, 2019; Sousa-Zomer et al., 2020; Lin et al., 2020; Coreynen et al., 2020; Gupta et al., 2020) in a selected industry.

Within this second direction, increasing body of research considered the role of dynamic capabilities composed of digital and technological competencies leading to digital transformation. For example, digital transforming capability is defined as a firm's ability to execute a digital strategy (Warner and Wäger, 2019). Scholars in this group elucidated methods of digitally transforming industry conditions, capacities, and processes through exploitation and exploration of the available sources in the market (Gupta et al., 2020). As well as methods, scholars also explored the barriers to digital transformation the development of the necessary dynamic capabilities (Soluk and Kammerlander, 2021) and made comparisons over the most influential configuration of capabilities (Soluk et al., 2021; Mazumder and Garg, 2021). They analyzed the micro-foundations of effective dynamic capabilities, like digital-savvy skills, organizational conditions for agile actions and digital intensity (Sousa-Zomer et al., 2020; Hsu et al., 2018).

3.3. METHODOLOGY

3.3.1. Literature search strategy

This study is based on a systematic literature review performed to understand how dynamic capabilities have been portrayed in the literature in the COVID-19 pandemic context with regards to digital technology adoption and digitalization.

With regards to the research questions, the aim of the search methodology definition was to collect an exhaustive pool of studies that build on the DC framework analyzing digitalization and related phenomena. Before embarking on our research process, we conducted a preliminary research into systematic literature reviews pertaining to the digital transformation, digitalization, dynamic capabilities, and COVID-19 literature. Our focus was particularly on the keywords they employed and how these keywords influenced the data pools they accessed. This task provided valuable insights into the adequacy and availability of keywords for our own study. Ultimately, we selected our five primary keywords based on this informed analysis, adopted from the works of Li and Chan (2019), Vial (2019), Verhoef et al. (2021), Annarelli (2021) and Khlystova et al. (2022).

Given the scope of our research objective, we chose a straightforward yet comprehensive set of keywords containing "digitalization", "dynamic capabilities" and "covid". Given the relevant use of "digital transformation" and "technology adoption" terms in the literature for digitalization, we added them into our keyword set to channel the term and boost the inclusion of more articles in the related concept and limit systematic bias. As mentioned by Verhoef et al. (2021, p. 898) these added terms stand for the "specific keywords for the topic but also general keywords to account for similar constructs that are similar but use a different name".

We then constructed the expression as required by the selected literature search engine, Scopus. Search string was constructed following the database interface suggestions, including the use of special characters of asterisk and quotation marks. The asterisk acts as a wildcard character, representing one or more unspecified characters which broadens the dataset retrieval (e.g., for plural or variant English use cases), while quotation marks permit the together use of given word sequence in it.

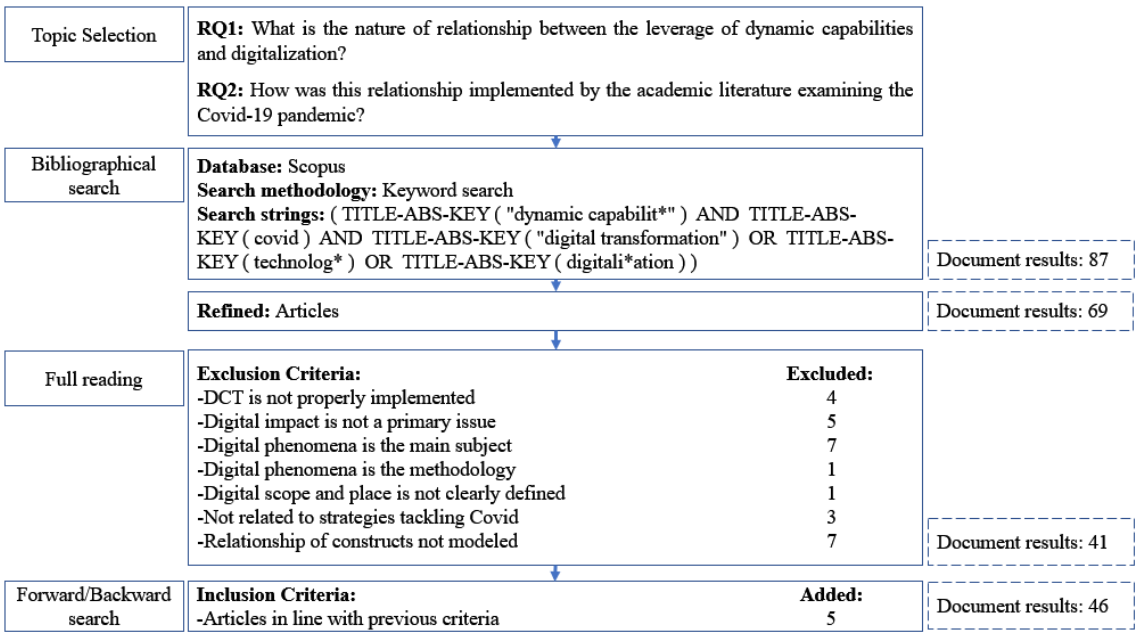
Thus, we submitted search on Scopus with Boolean expression of (TITLE-ABS-KEY ("dynamic capabilit*") AND TITLE-ABS-KEY (covid) AND TITLE-ABS-KEY ("digital transformation") OR TITLE-ABS-KEY (technolog*) OR TITLE-ABS-KEY (digitali*ation)) *Article Title, Abstract and Keywords*. This research retrieved 87 document results. Considering the rapid expansion of the literature on DC and DT, we opted to articles published in academic journals and international conference proceedings, in alignment with the recommendation of by Saunders et al. (2016) as the most useful and reliable sources for conducting comprehensive literature reviews. Article refinement ended in a pool of 69 documents. No restrictions were applied on the time period, nor on the scope of journals. The search was done on 26.01.2023 (Figure 7).

3.3.2. Selection of papers for review

In this step, we read the articles in-depth to analyze the formation of models and inherent reasoning. We set the selection criteria by defining inclusion and exclusion principles based on full-text reading.

We excluded those papers in which DC view was not properly implemented, digital impact was not a primary issue, digital phenomenon was the main subject or part of the methodology. Also, papers in which the digital scope and place was not clearly defined and those which were not related to strategies tackling COVID-19 pandemic were discarded.

Figure 7: Systematic literature review protocol



Source: Own elaboration.

As the last step of eligibility for assessment, the pool was refined by elimination of articles which did not include a clear model which reveals the relationships between constructs and variables. This final operation concluded with a pool of 41 empirical articles from several academic journals.

During the reading phase, we carried out an additional forward/backward search as recommended by a majority of literature frameworks (Webster and Watson, 2002; Wolfswinkel et al., 2013). After subjecting the eligible sources to the same exclusion and inclusion criteria, this practice enabled us to broaden the sample with 5 more articles across the relevant topics. This final aggregation carried our study to a final pool of 46 empirical articles (Figure 7).

3.3.3. Assessment of relationships

Finally, the studies selected in the pool were coded based on the research objectives. The review coding scheme included assessments of:

- Paper identification (e.g., author, year)
- Digital technology constructs and dynamic capability constructs identification
- Role of digital technology constructs and dynamic capability constructs in the model (i.e., dependent, independent, moderator, mediator)
- Nature of relationship between digital technology constructs and dynamic capability constructs (e.g., direction of impact)

In the coding process, we adopted a qualitative approach, testing our findings by peer reviewing the materials. The identification of dynamic capability constructs was conducted by reading the articles in-depth in order to detect accurate dynamic adherence set to them by the relevant authors. Segmentation was conducted by deep diving into how the constructs were related to data, i.e., the hypothesis building explanations, the questionary items that control the constructs in quantitative works, and detailed discussions in qualitative papers. The interpretation was based on the open identification of constructs as dynamic or ordinary, as well as implied statements in the form of references to DC theory citations.

3.4. RESULTS

3.4.1. Description of final article set

The final set was composed of articles from a variety of academic sources which combined both business and information systems management disciplines. Journal of Business Research presented the highest frequency of publication with 3 articles, followed by Frontiers in Psychology, Information Systems Frontiers, International Journal of Logistics Management, Journal of Business and Industrial Marketing, Sustainability (Switzerland), and Technological Forecasting and Social Change (Table 8).

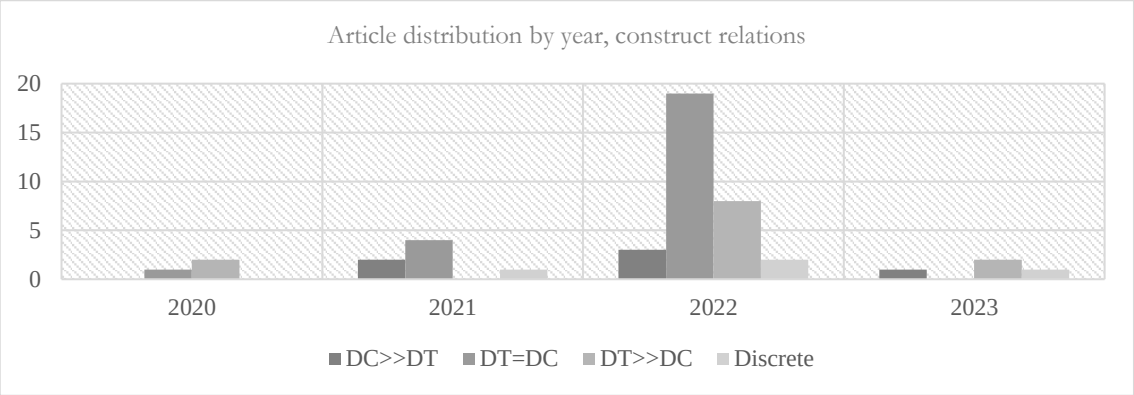
Table 8: Distribution of publishing journals

Source title	Count
Journal of Business Research	3
Frontiers in Psychology	2
Information Systems Frontiers	2
International Journal of Logistics Management	2
Journal of Business and Industrial Marketing	2
Sustainability (Switzerland)	2
Technological Forecasting and Social Change	2
Annals of Operations Research	1
Asian Journal of Business Research	1
Asia-Pacific Journal of Business Administration	1
Cogent Business and Management	1
Computers and Industrial Engineering	1
Electronic Journal of Information Systems in Developing Countries	1
Environmental Science and Pollution Research	1
European Journal of Innovation Management	1
Frontiers in Environmental Science	1
Frontiers of Business Research in China	1
Heliyon	1
Industrial Marketing Management	1
Information and Management	1
International Journal of Contemporary Hospitality Management	1
International Journal of Emerging Markets	1
International Journal of Hospitality Management	1
International Journal of Production Economics	1
International Marketing Review	1
Iranian Journal of Public Health	1
Journal of Asia Business Studies	1
Journal of Enterprise Information Management	1
Journal of Family Business Management	1
Journal of Global Operations and Strategic Sourcing	1
Journal of Hospitality and Tourism Insights	1
Journal of Innovation and Knowledge	1
Journal of Open Innovation: Technology, Market, and Complexity	1
Journal of Personal Selling and Sales Management	1
Managerial and Decision Economics	1
Operations Management Research	1
Total Quality Management and Business Excellence	1
TQM Journal	1
Total	**46**

Source: Own elaboration.

Referring to the COVID-19 disease relation, years of publications varied in the interval between 2020 and 2023, capturing the highest frequency from 2022 (Figure 8). This imbalance also reflects on the directional relation findings which we study in the next section.

Figure 8: Number of studies published per year with relevance to construct relations.



DT: Digital technology DC: Dynamic Capability.

Source: Own elaboration.

3.4.2. Multidirectional relationship

Drawing on the pool of articles, an evident multidirectional link between the dynamic capabilities and the digital technology adoption occurs swiftly. The term "multidirectional" suggests that the relationship between these two factors is not unidirectional or one-sided. Further, in this relationship a potential for an endogeneity exists and there is a possibility that the interplay between these constructs can lead to self-reinforcing loops, where improvements or changes in one construct contribute to enhancements or adjustments in the other. In other words, dynamic capabilities can impact the adoption and utilization of digital technologies, and conversely, the adoption and utilization of digital technologies can also influence a firm's dynamic capabilities. In detail, as a

company develops stronger dynamic capabilities in response to changing market conditions, it may become more adept at identifying and implementing digital technologies effectively. Simultaneously, the adoption of digital technologies can provide the organization with real-time data and insights, which in turn can inform and refine its dynamic capabilities.

What makes this finding interesting for this research is not the fact that this multidirectional relationship highlights the complex and reciprocal nature of how firms adapt and leverage digital technologies to enhance their capabilities. Rather, despite the inherent symbiotic nature of this relationship, numerous articles in the research dataset tend to prioritize only one direction in their causal models.

The causal relationship between dynamic capabilities and digitalization was controlled by coding these variables into antecedents and outcomes. For each paper, we analyzed this relationship by in-depth reading to discover where they were located in each model and what type of attributes they carried. Our codification shows that the digital phenomena (digital technology adoption, digitalization, digital transformation) were discussed as an outcome of dynamic capability (indicated with DC>>DT) in 6 papers. The reverse relation (indicated with DT>>DC) was subjected in 12 papers. In 4 papers the constructs did not have a direct impact onto each other, or they had a moderating effect in neighboring relations. Departing from this point, in the remainder of the pool, digitalization and related capabilities are depicted in a name of dynamic capabilities (indicated with DT=DC) in either by micro-founding them (9 papers) enabling them (6 papers) or just being adhered to as a dynamic capability by the author (9 papers). This group covers the 52% majority of the selected articles (Table 9). The codifications and article denotations to the COVID-19 crisis explorations will be analyzed below, under subheadings that reveal the differences of assessments by authors of the articles in the pool, i.e.:

i) dynamic capabilities as antecedents of digitalization (DC>>DT)

ii) digital resource and capabilities in the form of dynamic capabilities (DT=DC)

iii) digitalization as antecedent of dynamic capabilities (DT>>DC)

iv) discrete constructs

Table 9: Distribution of directions in relation

Direction of relationship	Article Count	Percentage
DC>>DT	6	13%
DT=DC	24	52%
DT enabled DC	6	
DT capability is a DC	9	
DT is a micro-foundation of DC	9	
DT>>DC	12	26%
Discrete Constructs	4	9%
Grand Total	46	100%

DT: Digital technology DC: Dynamic Capability.

Source: Own elaboration.

With an attempt to capture the variation of trends between the years, we stratified the publication years by the directional dimensions. This analysis provided a more transparent view of how digital resource adoptions and capabilities are gaining attention as a dynamic capability construct within the COVID-19 pandemic literature (Figure 8).

3.4.2.1. Dynamic capabilities as antecedent for digitalization (DC>>DT)

The first group represents the dynamic capabilities leveraged by the companies as an instrument to respond digitally to the rapid change in the purchasing patterns of consumers and fix the flaws in supply chains during the COVID-19 crisis (Table 10). DCs here are learned and implemented for smoothening the challenges in digital adoption process and steering the company in its path to

Table 10: Nature of relationship between DC and DT constructs: DC>>DT

PAPER	Method	Data type	Unit of analysis	Digital Constructs (DT)	Dynamic Constructs (DC)	Measurement of DT	Measurement of DC	DT role in model	DC role in model
Forliano et al. (2023)	Covariance-based SEM	Cross sectional	186 firms in Italy and Germany	Digital maturity of strategy	Technological orientation	4 item subjective construct	3 item subjective construct	Med	Indep
Zahoor et al. (2022)	Qualitative content analysis y	Cross sectional	5 Finnish high-technology SMEs	Response strategies to COVID-19	Firm capabilities relevant to external changes	4 item subjective construct	3 item subjective construct	Dep	Indep
Chatterje e et al. (2022c)	PLS-SEM	Cross sectional	312 respondents in Indian participant companies	Behavioral intention and actual use of Industry 4.0 technology	Dynamic Capabilities (sensing, seizing, transforming)	2 constructs, 3 subjective items for each	3 constructs, 4 subjective items for each	Dep	Indep
Jatmiko et al. (2022)	PLS-SEM	Cross sectional	129 higher education institutions	IT Application orchestration capability, IT Governance, Process Agility, Business-IT Alignment	IT Application orchestration capability	4 constructs, 19 subjective items in total	2 item subjective construct	Dep	Indep
Liu and Yang (2021)	Thematic analysis	Cross sectional	14 hotel managers in China	Self-service technology implementation	Sensing, learning, integration, coordinating capabilities	1 dummy objective construct	4 subjective constructs	Dep	Indep
Pilevari and Shiva (2021)	Soft System Methodology and total interpretive structural modeling	Cross sectional	13 participants from Ministry of Health and major health service providers in Iran	Health technology assessment, comprehensive health system communication system	Crisis sensing, opportunity seizing, reconfiguration	2 constructs, 1 subjective item for each	3 constructs, 1 subjective item for each	Med	Indep

DT: Digital technology DC: Dynamic Capability, OO: Organizational outcome, microf: micro-foundation, Dep: Dependent Indep; Independent, Mod: Moderator, Med: Mediator

Source: Own elaboration.

remain competitive in the market. These capabilities refer to sensing environmental changes, customer needs, competitor moves and technology developments implementing the knowledge and integrating them to the organization by orchestrating human and technology capabilities (Liu and Yang, 2021). They also may be utilized to adapt into the new conditions by changing or innovating the business models (Zahoor et al., 2022).

The digital transformation process which companies have been going through for some time has been accelerated after the COVID-19 pandemic (Chatterjee et al., 2022c). This period marked an intensification of digital technology adoptions in all industries. Although most of these technologies were available to the end users for a long time, changing conditions on people's lives, i.e., governmental sanctions to leave homes, meet in public, keep social distance, directed the consumers to migrate into wireless channels like e-wallets, chatbots, online conferences, self-service technologies (Liu and Yang, 2021). Increasing demand from the public intensified the need for the organizations to embrace these technologies, to be able to stand in the competition race. In this cynical task, technology adoption per se is not sufficient, unless accompanied by a group of digitally oriented managers with the capabilities to adapt to changes and reap the benefits of a successful transformation (Forliano et al., 2023).

Also, the importance given to the health systems was magnified during the period. Dynamic capabilities to sense crisis, sensing opportunities, and reconfiguring health systems are the cornerstones of health system resilience which encompass the practices of empowering the integrated health information system for smart monitoring and overall control that oversees equal financing (Pilevari and Shiva, 2021).

As a crucial finding of our data structure, all of the Dynamic Capability constructs in this group were located in the models in the independent variable

stage. As a result, their micro-foundations were dealt with less importance, a theoretical pattern unique to this group. They represent IT opportunities to be sensed, seized, and transformed into routines by managers, as captured in the exemplar labels of Technological Orientation (Forliano et al., 2023), IT Application Orchestration Capability (Jatmiko et al., 2022) and dynamic capabilities for technology implementation (Liu and Yang, 2021). As a differentiating factor, they are not considered within DT=DC (DT capability is a DC) group, since they trigger digitalization and digital technology adoption related constructs in the next step.

3.4.2.2. Digital resource and capabilities in the form of dynamic capabilities (DT = DC)

In the second category, we explore those dynamic capabilities which are explained with their digital technology connotations. We analyze them in three groups depending on their attributes as highlighted in the studies by the researchers.

3.4.2.2.1. DT capability is a DC

This model group considers digital technology adoption process and capacities necessary to carry it out as a second order -and hence a- dynamic capability (Table 11). Such capabilities frequently include specific technologies. Chen et al. (2021) suggest that big data capabilities had an effect on financial performance over the mediation of strategic flexibility during environmental turbulence, by feeding insight and helping enterprises create greater business value to perform better. A similar study employs "big data analytics capabilities" as moderators on the relationship between supply chain management and organizational performance (Shahzad et al., 2022).

Table 11: Nature of relationship between DC and DT constructs: DT=DC (DT capability is a DC)

PAPER	Method	Data type	Unit of analysis	Digital Constructs (DT)	Dynamic Constructs (DC)	Measurement of DT	Measurement of DC	DT role in model	DC role in model
Shahzad et al. (2022)	SEM	Cross sectional	347 supply chain personnel in Pakistan.	Big data analytics capabilities	Big data analytics capabilities	4 item subjective construct	4 item subjective construct	Mod	Mod
Rahman et al. (2022)	SEM	Cross sectional	241 executives	Information system management capability, Multi-sensory technology stimulus capability	Information system management capability, Multi-sensory technology stimulus capability	2 constructs, 6 subjective items each	2 constructs, 6 subjective items each	Indep	Indep
Siahaan and Tan (2022)	PLS-SEM	Cross sectional	262 SME managers in Indonesia	Digital IT Capability	Digital IT Capability, Adaptive Capability	3 item subjective construct	2 constructs, 3 subjective items each	Med	Dep
Badrinarayanan et al. (2022)	SEM	Cross sectional	224 business-to-business sales managers	Technology-sensing capability	Dynamic organizational capabilities	Subjective construct	3 constructs of subjective items each	Indep	Indep
Gani et al. (2022)	PLS-SEM	Cross sectional	310 SME managers in Bangladesh	IT capability	IT Capability, Collaboration Capability, Leadership capability, Supply Chain capability	4 item subjective construct	3 constructs, 20 subjective items in total	Med	Med
Nisar et al., (2022)	PLS-SEM	Cross sectional	374 executives of multinational organizations working itself in Pakistan	Big data analytics (BDA) management capabilities, BDA Talent Capabilities, BDA technological capabilities	Big data analytics (BDA) management capabilities, BDA Talent Capabilities, BDA technological capabilities	3 constructs, 18 subjective items in total	9 item subjective construct	Indep	Indep
Savastano et al. (2022)	SEM	Cross sectional	162 SME managers in tourism	Digital business model maturity	Digital business model maturity	3 item subjective construct	3 item subjective construct	Indep	Indep

Table 11: Nature of relationship between DC and DT constructs: DT=DC (DT capability is a DC) (Continued)

PAPER	Method	Data type	Unit of analysis	Digital Constructs (DT)	Dynamic Constructs (DC)	Measurement of DT	Measurement of DC	DT role in model	DC role in model
Heredia et al. (2022)	PLS-SEM	Cross sectional	999 firms from 27 countries	Digital Capabilities, Technological Capabilities	Digital Capabilities, Technological Capabilities	2 constructs, 5 subjective items in total	2 constructs, 5 subjective items in total	Med	Med
Chen et al. (2021)	Regression test for Converse-U relationship	Cross sectional	274 questionnaires paired to big data and financial department executives	Big data capability	Big data capability, strategic flexibility	12 item subjective construct	2 constructs, 18 subjective items in total	Indep	Indep

DT: Digital technology DC: Dynamic Capability, OO: Organizational outcome, microf: micro-foundation, Dep: Dependent Indep; Independent, Mod: Moderator, Med: Mediator

Source: Own elaboration.

Other examples include generic labeling of capabilities. Nisar et al. (2022) assess these DCs in three verticals, i.e., management, talent and technological considerations, operationalized in supply chain management to recognize risks and develop new products. Badrinarayanan et al. (2022) relates to technology by function of sensing sales channels, while Gani et al. (2022) consider it from a technology adoption experience which supports sustainability in the organization. Digital capabilities which are related to the online activities, delivery and remote work during the COVID-19 crisis positively influence firm performance only through technological capabilities, according to Heredia et al. (2022) who also use the term "Digital Dynamic Capabilities" to address this group. "Information system management capabilities" is in the DC context to achieve competitive performance (Rahman et al., 2022) and "Digital IT Capability" addressed by Siahaan and Tan (2022) is a dynamic capability which is gained by collecting the perceptions of the uncertainty environment, (e.g., reduced cost of data search, storage, computation, transmission) and used for adaptation (e.g., redesigning business models).

3.4.2.2.2. DT enabled DCs

This group of dynamic capabilities are enabled by digital technologies (Table 12). Although anteceded by digital technologies we do not include this group in the previous DT>>DC category since the theoretical model figures demonstrate no significant links, while the relation is described in the manuscripts of articles. As an example, Modgil et al. (2022) define "AI enabled supply chain resilience capabilities" by drawing a clear framework of several technologies like AI, chatbots, predictive analysis, systems and solutions, helping to define risk and opportunities under crisis environment exacerbated with workforce shortage and disabled supply chains. In the papers by Owoseni et al. (2022) technology adoption is an enabler of dynamic capabilities in a low-

Table 12: Nature of relationship between DC and DT constructs: DT=DC (DT enabled DC)

PAPER	Method	Data type	Unit of analysis	Digital Constructs (DT)	Dynamic Constructs (DC)	Measurement of DT	Measurement of DC	DT role in model	DC role in model
Modgil et al. (2022)	Thematic coding on interview data	Cross sectional	35 experts from the e-commerce supply chain and AI	Digital systems and solutions	AI enabled supply chain resilience capabilities	Subjective construct	5 item subjective construct	Indep	Indep
Zamani et al. (2022)	Narrative analysis	Cross sectional	13 experts from single case study in Greece	Business Analytics	Dynamic Capabilities (sensing, seizing, transforming)	3 item subjective construct	3 item subjective construct	Indep	Indep
Owoseni et al. (2022)	Mixed methods	Cross sectional	30 Medium and Small Business managers in Ghana	Shift in resources	Adaptive, Innovative, Absorptive Capability	4 item subjective construct	3 constructs, 21 subjective items in total	Indep	Indep
Cherrafi et al. (2022)	Thematic coding on interview data	Cross sectional	15 practitioners from supply chain companies in	Digital dynamic capabilities	Digital dynamic capabilities: (Digital sensing, digital seizing, digital transforming)	3 item subjective construct	3 item subjective construct	Indep	Indep
Chi et al (2022)	Systematic review	Cross sectional	231 online articles	Dynamic capabilities (Sensing, seizing, transforming)	Dynamic capabilities (Sensing, seizing, transforming)	3 item subjective construct	3 item subjective construct	Indep	Indep
Yadav et al. (2021)	Fuzzy based approach	Cross sectional	5 experts in one case study	IoT based governance mechanisms	IoT based governance mechanisms (Direct supplier collaboration, Direct supplier assessment, direct multi-stakeholder initiatives, Indirect Assessment training and certification)	4 item subjective construct	4 item subjective construct	Med	Med

DT: Digital technology DC: Dynamic Capability, OO: Organizational outcome, microf: micro-foundation, Dep: Dependent Indep; Independent, Mod: Moderator, Med: Mediator

Source: Own elaboration.

income country context, highlighting "obtaining information from the internet" as a prominent capability that intensified due to restrictions, lockdown, and the need to do business remotely. Chi et al. (2022) recognizes technological innovations as advancers of dynamic capabilities which help to develop new businesses for the sharing economy platforms which were among the critical assets that developed with the changing consumer behavior patterns during the crisis period. Cherrafi et al. (2022) also define digital dynamic capabilities: Digital sensing, digital seizing, digital transforming is enabled by technologies for a given organization to recognize threats and opportunities, to mobilize required resources to address sensed threats and transforming them into tangible and intangible assets.

Similar descriptions reveal that IoT based governance mechanisms necessary to manage a food supply crisis (Yadav et al., 2021) which are namely direct supplier collaboration, direct supplier assessment direct multi-stakeholder initiatives, indirect assessment training and certification. Likely, business analytics (Zamani et al., 2022) are enabling technologies for this group of DC that are converted into a strategy to fight the anomalies of the crisis in the hands of the skilled strategy makers for rapid business model adaptation and innovation. Dynamic Capabilities (Sensing, Seizing, Innovation) as well, have an impact on customer satisfaction through digital transformation (de Miguel et al., 2022).

3.4.2.2.3. DT is a micro-foundation of DC (DC is proxied by DTs)

Universally, no standard scale exists for measuring dynamic capabilities. Correspondingly, the following studies were conducted on measurement of dynamic capabilities as operationalized over digital factors, where models critically depict those proxies in the form of latent variables or items (Table 13).

From a general view, alongside innovation and modulization, "digitalization" is an element of interfirm dynamic capabilities to enhance supply chain performance (Song et al., 2022), depicting "connected system, timely response, real-time tracking, visibility" as sources of digitalization. Akter et al. (2021) capture analytics culture, technological sophistication, data-driven insights, decision making autonomy, knowledge and skills, and training and development as micro-foundation s of "humanitarian analytics empowerment capability", which helps to attain correct or adequate insights in crisis situations. In the same vein, Motamarri et al. (2022) take two digital constructs: "digital technology and tools" and "information access" along with other managerial ones such as "training and development", and "decision making" as a latent variable for remote analytics empowerment capability. These capabilities exert an effect on converting the traditional work processes into robust decision-making mechanisms that frictionlessly function during the work-from-home practices of crisis and in the aftermath.

For this period, dealing with their major stakeholders, namely staff, customers and suppliers became a major concern. In relation, Otengai and Changha (2021) take "openness to technology adoption" as a micro-foundation of adaptive capabilities, indicating modern technology adoption, i.e., websites, e-mail services and social media for information sharing. Ibarra et al. (2020) provide evidence for "sensing technological options" as a part of their "business model innovation capability".

In their conceptual model both Muneeb et al. (2022) and Chatterjee and Chaudhuri (2022) introduce "technology capability" as a proxy for dynamic firm capabilities. "IT capability" (including big data analytics capability, IoT capability, cloud computing) is depicted as a part of core innovation and technology capability, which is a second order DC (Chatterjee et al., 2022b). This researcher group employ a similar framework including technological

Table 13: Nature of relationship between DC and DT constructs: DT=DC (DT is a micro-foundation of DC)

PAPER	Method	Data type	Unit of analysis	Digital Constructs (DT)	Dynamic Constructs (DC)	Measurement of DT	Measurement of DC	DT role in model	DC role in model
Chatterjee and Chaudhuri (2022)	PLS-SEM	Cross sectional	315 responses from employees of different firms in India	Technology Capability	Technology Capability, Relationship Management Capability, Innovation Capability	4 item subjective construct	3 constructs, 14 subjective items in total	Indep	Indep
Song et al. (2022)	Single-case study	Cross sectional	Single-case company in China	Digitalization	Digitalization, Innovativeness, Modulization	1 item subjective construct	3 item subjective construct	Med	Med
Chatterjee et al. (2022b)	PLS-SEM	Cross sectional	327 responses from SMEs in India	IT capability, Remote Work capability, CRM technology capability, Core innovation and technology capability, techno functional capability	Core innovation and technology capability, techno functional capability	4 constructs, 6 subjective items each	4 constructs, 6 subjective items each	Indep	Indep
Motamarri et al. (2022)	PLS-SEM	Cross sectional	250 analytics experience remote workers	Digital technology and tools, Remote analytics empowerment capability	Remote analytics empowerment capability	2 constructs, 1 subjective item each	1 item subjective construct	Med	Med
Chatterjee et al. (2022a)	PLS-SEM	Cross sectional	412 responses which include frontline employees	technological capability	technological capability	6 item subjective construct	6 item subjective construct	Indep	Indep

Table 13: Nature of relationship between DC and DT constructs: DT=DC (DT is a micro-foundation of DC) (Continued)

PAPER	Method	Data type	Unit of analysis	Digital Constructs (DT)	Dynamic Constructs (DC)	Measurement of DT	Measurement of DC	DT role in model	DC role in model
Muneeb et al. (2022)	Thematic coding on interview data	Cross sectional	15 interviews with heads of departments of higher education institutions in the United Arab Emirates	Technological Capabilities	Core Dynamic Capabilities	3 item subjective construct	1 item subjective construct	Med	Med
Akter et al. (2021)	Systematic Literature Review	Theoretical	35 articles	Humanitarian analytics empowerment capability, Analytics culture, technological sophistication, data-driven insights, decision making autonomy, knowledge and skills, and training and development	Humanitarian analytics empowerment capability	N/A	N/A	Indep	Indep
Otengei & Changha (2021)	Thematic coding on interview data	Cross sectional	8 owner-managers African-ethnic restaurants in East Africa.	Openness of technology adoption	Adaptive capacity	1 item subjective construct	1 item subjective construct	Indep	Indep
Ibarra et al. (2020)	Fuzzy set qualitative comparative analysis	Cross sectional	78 Spanish SMEs	Sensing technological options	BMI Capabilities (sensing customer needs, sensing technological options, conceptualizing and experimenting, collaborating, BMI strategy)	1 item subjective construct	5 item subjective construct	Indep	Indep

DT: Digital technology DC: Dynamic Capability, OO: Organizational outcome, microf: micro-foundation, Dep: Dependent Indep; Independent, Mod: Moderator, Med: Mediator Source: Own elaboration.

capability construct as a part of dynamic capabilities and engineering management abilities of frontline employees (Chatterjee et al., 2022a) which influences the adaptation to the challenging era shaded by lockdowns.

3.4.2.3. Digital capabilities as antecedent of dynamic capabilities (DT>>DC)

This group of articles assess digital technology adoptions and capabilities solemnly transcribed as antecedents of dynamic capabilities by authors (Table 14). This group constructs differ from the previous groups by the fact that they do not mention digital technology related capabilities as dynamic, but rather, attach them to technology adoptions and resource utilizations. According to this group researchers, technological and digital challenges, as well as opportunities in the environment fueled variant levels of dynamic capability adoptions.

This group of researchers highlight the impact of both easily accessible digital technology adoptions such as payments, apps (Khurana et al., 2022), social media (Hu et al., 2023) and additive manufacturing (Belhadi et al., 2022) and more enhanced alternatives of internet of things, mobile computing, electronic commerce, business intelligence, artificial intelligence, cloud computing, big data analytics, social media and digital platforms (Drydakis, 2022; Zahoor and Lew, 2023; Bansal et al., 2023; Chaudhuri et al., 2022). Digital system quality, digital information quality and digital service quality form the basis of dynamic digital marketing capabilities for real estate industry which suffered during the crisis (Low et al., 2020). Taken as a whole, the implementations on the business architecture influence how companies take decisions, manage their supply chains and stakeholder relations to compete the struggles of COVID-19 period.

Another group considers digital orientation and the management capabilities to achieve a certain degree within the digitalization of the business architecture. Notable studies come from Li et al. (2022) who measure the degree to which companies could access customer-related, order-related, production-related,

Table 14: Nature of relationship between DC and DT constructs: DT>>DC

PAPER	Method	Data type	Unit of analysis	Digital Constructs (DT)	Dynamic Constructs (DC)	Measurement of DT	Measurement of DC	DT role in model	DC role in model
Li et al. (2022)	Hierarchical regression	Cross sectional	165 Chinese manufacturing company managers	Digitalization capabilities	Market capitalizing agility & Operational adjustment agility	5 item subjective construct	2 constructs, 3 subjective items each	Indep	Med
Hu et al. (2023)	Thematic coding on interview data	Cross sectional	19 key informants from 18 Italian SMEs	Digitalization of the environment	Macro-Level and MicroLevel dynamic Capabilities (Sensing, Seizing, reconfiguration)	1 item subjective construct	3 constructs, 18 subjective items in total	Indep	Indep
Low et al. (2020)	Pearson's, Independent sample t-test, and the Chi-square test	Cross sectional	279 Malaysian property development sector representatives	Property digitization	Property digitization	1 item subjective construct	1 item subjective construct	Dep	Dep
Van de Wetering (2022)	PLS-SEM	Cross sectional	414 senior practitioners	Digital dynamic capability, operational digital ambidexterity	Digital Dynamic Capability, EA driven dynamic capabilities	2 constructs, 19 subjective items in total	2 constructs, 19 subjective items in total	Indep	Indep
Khurana et al. (2022)	Thematic coding on interview data	Cross sectional	8 entrepreneurs managing SMEs in india	Digital transformation	Resilience capability	1 item subjective construct	3 constructs, 3 subjective for each	Indep, Dep	Med
Bansal et al (2023)	Quasi-grounded theory coding	Cross sectional	20 senior HR professionals in multinational organizations	Digital infrastructure adoption, Digital architecture adoption	Innovation capability and creativity	2 constructs, 6 subjective items in total	2 item subjective construct	Indep	Med, Dep

Table 14: Nature of relationship between DC and DT constructs: DT>>DC (Continued)

PAPER	Method	Data type	Unit of analysis	Digital Constructs (DT)	Dynamic Constructs (DC)	Measurement of DT	Measurement of DC	DT role in model	DC role in model
Drydakis (2022)	Random-effects models	Longitudunal	Panel data of 317 SME managers in UK	SME's digital transformation strategies	Dynamic Capabilities (Enhanced sensing, seizing and transforming)	10 item subjective construct	3 item subjective construct	Indep	Med
Belhadi et al. (2022)	Hybrid methods of focus group and multiple case study	Cross sectional	African supply chain	Additive Manufacturing technology	Dynamic Capabilities (sensing, seizing, reconfiguring)	3 constructs, 11 subjective items in total	3 item subjective construct	Indep	Med
Bai et al. (2022)	SEM	Cross sectional	296 Chinese retail firms	IT capability	IT capability, Firm agility	2 constructs, 5 subjective items each	2 constructs, 13 subjective items in total	Indep	Med
Chaudhuri et al. (2022)	SEM	Cross sectional	332 responses from 8 Indian family businesses	AI-CRM technology adoption	Dynamic capabilities (sensing, seizing and transforming)	6 item subjective construct	3 constructs, 6 subjective items each	Indep	Med
Yuniarty et al. (2022)	PLS-SEM	Cross sectional	313 business actors in the creative industry in Indonesia	IT ambidexterity	Dynamic capabilities	2 constructs, 4 subjective items each	2 constructs, 4 subjective items each	Indep	Med
Guo et al. (2020)	Regression analysis	Cross sectional	518 Chinese SMEs	Digitalization	Sensing the spread of crisis, seizing opportunities in crisis, reconfiguring resources for crisis	5 item subjective construct	3 constructs (items not mentioned)	Indep	Med

DT: Digital technology DC: Dynamic Capability, OO: Organizational outcome, microf: micro-foundation, Dep: Dependent Indep; Independent, Mod: Moderator, Med: Mediator.

Source: Own elaboration

and market-related data and Guo et al. (2020) for their early pandemic study estimating overall digitalization degree, digitalization methods (internal or external), and level of digital technology adoption. The orchestrating capability to manage information technology in alignment with business objectives is addressed by IT advancement, IT alignment (Bai et al., 2022), and IT ambidexterity (Yuniarty et al., 2022) constructs. This approach in general represents a connection with IT resources to efficiently mastering them into productivity for organizational performance.

In some cases, several types of digital and dynamic capabilities are dependent on each other through a cyclic relationship. Khurana et al. (2022) captures this type of circular feed, discussing that digital technology adoption (payments, apps, etc.) fosters the development of resilience capability which leads towards digital transformation. Similar relations exist in Van de Wetering's (2022) model, identifying Digital Dynamic Capabilities, driven by dynamically fed enterprise architecture capabilities. Later these constructs are compiled into business value, meaning that in crisis situations, firms fostering digital ambidexterity can lower costs, improve delivery speed, reliability, and customization of services.

3.4.2.4. Discrete constructs

In some models, dynamic capability and digitalization constructs are not related directly to each other, either since they are impacting separately on another construct, or they have a moderator role (Table 15).

Within this category, Aldianto et al. (2021) discuss that technology capability and dynamic capabilities are two separate types of capabilities, where the latter denotes response to changing market needs. Zahoor and Lew (2023) contend that adoption of digital technologies including Internet of Things, mobile computing, electronic commerce, business intelligence, cloud computing, big data analytics, social media and digital platforms moderates the relationship

Table 15: Nature of relationship between DC and DT constructs: Discrete constructs

	PAPER	Method	Data type	Unit of analysis	Digital Constructs (DT)	Dynamic Constructs (DC)	Measurement of DT	Measurement of DC	DT role in model	DC role in model
DT moderates DC > OO	Martins (2022)	Hierarchical regression	Cross sectional	400 SME managers and supervisors in Ghana	Digitalization	Dynamic capabilities (sensing seizing and transforming)	5 item subjective construct	3 constructs, 5 subjective items for each	Mod	Indep
DT moderates DC>OO	Hussain and Malik (2022)	Covariance-based structural equation modeling	Cross sectional	268 managers of various hotels in the United Arab Emirates	Digital orientation	Dynamic capabilities (sensing, seizing, transformation)	3 item subjective construct	3 constructs, 15 subjective items in total	Indep	Mod
DT moderates to OC>DC	Zahoor and Lew (2023)	Hierarchical moderated regression analysis.	Cross sectional	128 emerging market small and medium-sized enterprises in Pakistan	Adoption of digital technologies	International marketing capability	1 dummy item subjective construct	5 item subjective construct	Mod	Dep
Not connected	Aldianto et al. (2021)	Case Study interpretation	Cross sectional	3 startup owners in Indonesia	Technology capability	Dynamic capability	1 item subjective construct	1 item subjective construct	Indep	Indep

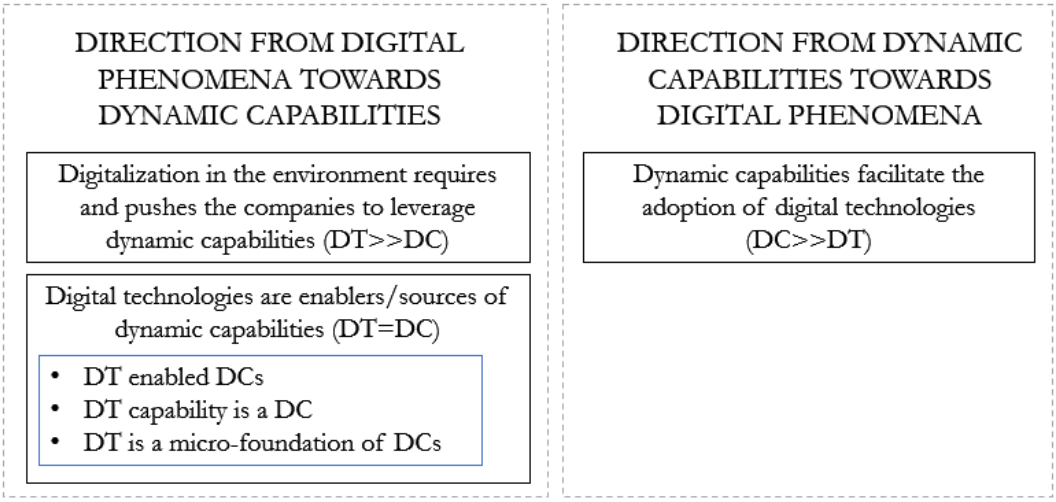
DT: Digital technology DC: Dynamic Capability, OO: Organizational outcome, microf: micro-foundation, Dep: Dependent Indep; Independent, Mod: Moderator, Med: Mediator

Source: Own elaboration.

between strategic flexibility and international marketing capability. Martins (2022) maintains that digitalization has a moderating impact on the relationship between dynamic capabilities and firm performance. In this framework, the digitalization construct captures constant inclusion of digital analytics, digital operations, digital marketing and sales, digital ecosystem, digital products and services. In a similar frame, Hussain and Malik (2022) consider digital orientation with its moderating impact on the relation from supply chain agility to firm resilience.

The summary of the literature review performed on the nature of relationships is depicted in Figure 9.

Figure 9: Conceptual research model on the nature of relationship



DT: Digital technology DC: Dynamic Capability.

Source: Own elaboration

3.4.3. Shifting order of dynamic capabilities

Data structure achieved in the analysis presents a review of digitalization and digital technology related resources and capabilities do take roles parsed in both

high order and low order framework. Within the selected pool of articles, their roles in the models are coded either functioning as an independent, mediator, moderator, or dependent variable (Table 16).

Table 16: Roles played by Dynamic Capabilities constructs in the models.

Nature of relationship	DC>>DT	DT=DC	DT>>DC	Discrete	Total
Dependent		1	1	1	3
Independent	6	16	2	2	26
Mediator		6	8		14
Mediator & dependent			1		1
Moderator		1		1	2
Total	6	24	12	4	**46**

DT: Digital technology DC: Dynamic Capability.

Source: Own elaboration

This coding reveals that authors very frequently assigned independent roles to the DC constructs. The reason for this occurrence can be explained by authors' sufficient descriptions for their dynamic virtues. When in the second order, they take the mediator role, so that they do have a final impact on the organizational outcome dealt within the paper structure.

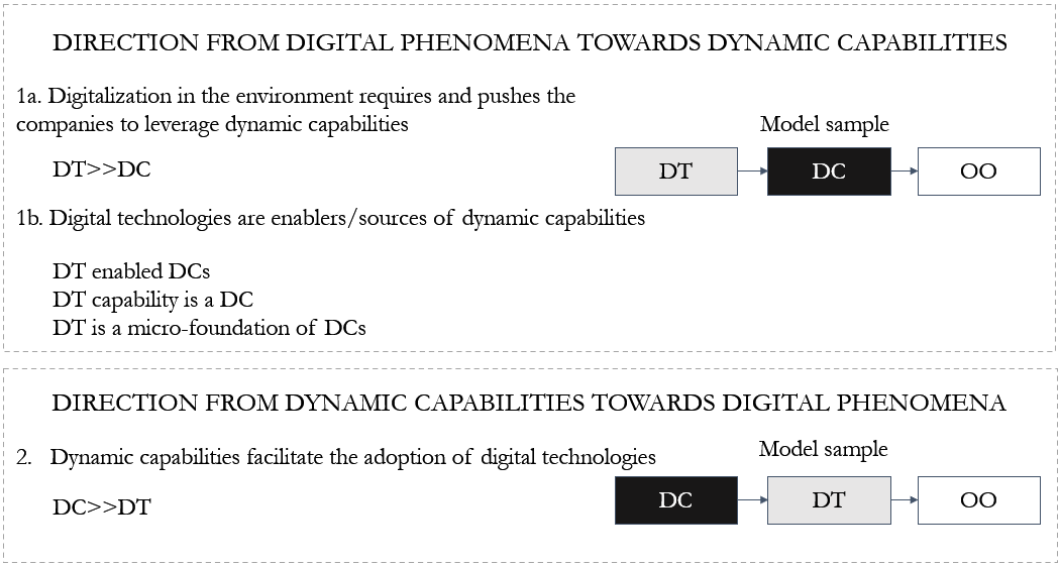
3.5. DISCUSSION

Digital technologies are among the factors that facilitate strategic change (Helfat and Peteraf, 2015). Today's high velocity markets accelerated by ubiquity of digital technologies require firms to cling onto their dynamic capabilities more than ever (Warner and Wäger, 2019). The digital economy requires firms to build strong capabilities to exploit and manage new digital technologies, to achieve technological progress and implement it in the business model for continuous innovation (Teece, 2018; Vial, 2019; Warner and Wäger, 2019). On this conjuncture, we find DC theory as a perfect match for digital transformation, both embracing the whole strategy of the organization in the

contemporary business agenda. This relationship is best confirmed by the growing body of research connecting both themes. Especially, following the outbreak of COVID-19, the research stream joining the subjects of digitalization and dynamic capabilities have gained significant trend. This is due to the matching case of turbulent environment on the theory of dynamic capabilities and increasing use of digital technologies under the influence of isolationist policies exerted by governments.

In parallel to the code structure and the discussion of COVID-19 conditions which channeled the organizations to act in a set of patterns, we suggest a bi-directional relationship with two mentioned constructs (Figure 10).

Figure 10: Suggested empirical model patterns.



DT: Digital technology DC: Dynamic Capability, OO: Organizational outcome.

Source: Own elaboration

3.5.1. The direction from digital phenomena towards dynamic capabilities

This direction expresses two options: first, an environmental requirement, a challenge, calling for dynamic capabilities to be adopted for achieving an

organizational goal (Guo et al., 2020); second, the nature of dynamic capabilities fed by the opportunities found in digital technologies (Bai et al., 2021). This scenario is relevant to those articles which encapsulated specific digital technologies with functional use to cope with the adversities of the COVID-19 pandemic (Li et al., 2022; Chatterjee and Chaudhuri, 2022).

3.5.2. The direction from dynamic capabilities towards digital phenomena

The reverse direction of the previous controls for those instances where dynamic capabilities are needed for digital technologies to be adopted. The companies that have taken the road to digitalization during the pandemic through a process of learning by doing, have arrived at a point where they could identify the company's basic needs to compete the hard times and developed new practices to overcome problems addressed in achieving resilience (Forliano et al., 2023)

Therefore, our research supports the notion that digital phenomena can drive the development of dynamic capabilities, while dynamic capabilities can, in turn, facilitate the acquisition and utilization of digital phenomena. This reciprocal relationship emphasizes the importance of both dynamic and digital capabilities for organizations seeking to thrive in the digital era.

From this point, our study underlines a new trend in changing the direction of this correlation, by the weighing realities of COVID-19 pandemic era. The intense trend for describing dynamic capabilities as a source of digital transformation, has left its place to a new phenomenon where digital phenomena like technology adoption, digital maturity, digital orientation are considered as a group of business capabilities expected to be equipped by the organizations. The ubiquity of digital technologies is a major factor for this U-turn in literature trends.

This finding has conclusive implications for many articles used as reference for the debates taking place in academic literature. For example, iconic and seminal

writings of Warner and Wäger (2019), Vial (2019), Karimi and Walter (2015) should be treated with care, when referring the analysis results to the findings of these well-known sources, which could in fact indicate the opposite direction.

Our analysis also reveals how the exhaustive labels of "Digital Dynamic Capabilities", "IT Capabilities", "Digital Capabilities" are equipped with diverse meanings when analyzed in depth. A similar cautious care should be exercised on these multidirectional constructs and their relevant stories which may only be understood within the roots of articles.

3.6. CONCLUSION

Digitalization is an effort which covers skillful manipulation of digital technologies and digital information by an organization (Nambisan et al., 2017) and is a potential tool for exploiting new value in the market (Verhoef et al., 2021). As a result of the crisis, most digital technologies transformed by virtue, from a "nice to have" to a "must have" (Akpan et al., 2020). Among these tactics, the role of digitalization and digital transformation may go beyond the adaptation initiative, further to acceleration and capitalizing on superior market opportunities in the aftermath of the grand shock (Modgil et al., 2022).

The aim of this study is not to find the true version of labeling the constructs, nor recommend a predetermined setting for their roles in the models. Our paper mainly contributes to the literature by showing how the majority of prior research has applied both themes of DC and DT in a hectic order. Stressing why exactly this gap needs to be addressed, unearthing this disorganization will awaken in the minds of researchers the necessary acknowledgement that not all models can be treated as a substitution for the other. As such, we aim to prevent confusion, erroneous formulations, miscalculations, and misjudgments. For example, our article data reflects how scholars have contributed to the literature

with recurring designs of construct roles. We regard this as a tested argumentation in their own theoretical framework.

On the other hand, several other researchers have adopted a different way of modelling their hypothesis, since there is not a truly tested and confirmed model. Misconducts may occur, when the items from two separate patterns are combined, assuming that they represent similar objectives. However, as emphasized by the findings of our study, the interpretation and role of dynamic capability and digital technology constructs are highly contingent on how they have been selected by the group of scholars to operate within a specific set of variables.

This study also opens a new and more consistent page for the literature reviews analyzing the DC. The differentiating feature of DC theory from its predecessors is how it takes the turbulent context into its coverage. Until this period, the operationalization of dynamism in context was diverse in the business literature, ranging from organizational change to disaster recovery. Among these themes, several articles investigated "digitalization" and "digital disruption" and its effects on the industries (Karimi and Walter, 2015; Gupta et al., 2020) with a bias exerted over the universal implications of dynamism. The impact of the digital wave compelled companies to leverage dynamic capabilities in order to gain a competitive advantage. Whereas, in our study, the turbulent factor is not digitalization per se, but the COVID-19 pandemic impact. This enables this research to take digitalization as a construct other than the environment itself, which would be unlikely in previous literature reviews.

In this paper, the COVID-19 period was taken as the experimental setting deliberately, due to its niche and microenvironmental status. With no industrial limitations, examples of all DC and DT combinations may be observed simultaneously with the details and depth in their natural order, but under the same type of environmental turbulence. Therefore, this study introduces a novel

theoretical perspective in the literature on dynamic capabilities by equalizing the environmental impact on the same level. The same trait also calls for the transferability of this research into variant disciplines or themes. For example, taking out the COVID-19 keyword from the research methodology, would end up in a more generalized review of the literature. Such research design may form a compatible option to transfer knowledge to Annarelli et al. (2021) study which aims to form a capability-based conceptual model for digitalization capability.

Our research is not exempt from limitations. Basically, the small number of articles constrains the relatable knowledge we can extract from readings and implications. As the conduct of bibliographic research includes only one source (Scopus), several items and pain points may be left out of the universe we build for achieving conclusive results. Second is the potential for researcher bias or subjectivity to influence the data. The interpretive nature of this research may have led to a generalized conclusion or contradictive results. Due to these reasons, some ideas may have gone unrepresented within the methodological course of the study.

A large variety of relationships was embraced by the empirical base of the literature, but also future research lines are open for configuring how ubiquity of digital technologies will change the nature of dynamic capabilities. As an essential outcome of this paper, we discovered that the timing of publications plays a crucial role in determining the direction of succession in the models. Since the earlier research corresponds to the dawn of digital transformation in industries, a significant group of early researchers have contended that dynamic capabilities are essential for the firm to adapt to change caused by compulsory technology adoption through creating, extending and modifying their resource base. This finding also is an important step in laying the steppingstones for future line of research. While the study on digital dynamic capabilities or dynamic capabilities in digital arena matures, robust and complete results can be

driven from the collection of studies on the topic. Still, the literature is open for cross sectional studies based on the basic industries and how the trends change in terms of DT and DC operationalizations in time.

"Strategy without tactics is the slowest route to victory.
Tactics without strategy is the noise before defeat."

-Sun Tzu

CHAPTER 4:

LEVERAGING DYNAMIC CAPABILITIES AND DIGITALIZATION IN CRISIS: A TWO-WAVE STRATEGY ASSESSMENT OF SHARING ECONOMY'S SMALL BUSINESSES

ABSTRACT

Objective: This paper empirically examines the coping mechanisms employed by coworking spaces in response to the effects of the COVID-19 pandemic. These spaces, as a part of the sharing economy, have faced significant challenges during the crisis.

Methodology: In a qualitative study conducted through a Dynamic Capability (DC) lens between 2020 and 2022, we incorporate the findings from variant sizes of four coworking spaces in a theoretical model assessing digitalization as a determinant for DCs to cope with crisis. The data analysis is based upon the collection of different sources of data: two-way semi-structured interviews with managers from each coworking space and direct observation on company and industry blogs and documents, analyzing the managerial strategies in pre and post lockdown periods of the pandemic.

Findings: In small businesses, the utilization of digital sensing, digital seizing, and digital reconfiguring capabilities can effectively coordinate the process of surviving a crisis and position the organization for a resilient future. Our conclusion involves mapping out the pertinent strategies for attaining business outcomes across four distinct levels of leveraging digitalization and dynamic capabilities within small businesses.

Contributions: With a theoretical contribution to the dynamic capabilities and crisis management literature, our study provides a better understanding of the digital coping mechanisms grouped around digital sensing, seizing and reconfiguring pillars. As well, this study makes one of the first contributions to the sharing economy literature with specific concern on the managers' digital appraisal. Practically, we analyze the managerial viewpoints and pathways to adopt digital technologies for survival within crisis disruptions, against liquidity and solvency threat.

Keywords: Dynamic Capabilities, Digitalization, Sharing Economy, Coworking Spaces

4.1. INTRODUCTION

Having survived one of the most catastrophic pandemics of world history, digitalization is far from being a desired option for businesses anymore, but rather it is an obligation to survive in the game (WHO, 2022; Sharma et al., 2022). During this challenging period, adoption of digital technologies not only mitigated the adversities of insolvency and client loss for many firms during the pandemic but as well, contributed to immediate resolution strategies and pivoting mechanisms to be followed in the aftermath (Galvin and LaBerge, 2021; Almeida et al., 2020). Digital transformation paths in the business models of the firms varied with relevance to their experience in employing digitalization (Forliano et al., 2023; Münch and Hartmann; 2022; Guo et al., 2020). While clinging to digitalization techniques would pay off in short scale in service and information intensive industries, the same treatment is not effective for all (Seetharaman, 2020).

Sharing economy, in that sense acted as an experimental case to see how the pandemic could have diverse impacts in various types of small businesses by changing community attitudes (Buheji et al., 2020; Farmaki et al., 2020; Gerwe, 2021). In some sectors of sharing economy, i.e., hospitality and tourism, dependence on physical proximity is the rough barrier, and digital channels for transforming the business are limited to surmount it (Hossain, 2021). As an archetype of such SMEs where proximity is more than a "nice to have" component, our empirical motivation for this study is focused on the coworking spaces (CWSs), the office-like workplaces where independent professionals of various businesses prefer not only for basic business activities but also for supplementary values like knowledge sharing, collaboration, co-creating and socializing (Gandini, 2015; Capdevila, 2015; Garrett et al., 2017). Given the crisis circumstances, like all other industries under threat of economic downfall, communities in CWSs had to abandon their physical attachment with

coworkers, since all sorts of face-to-face interaction were canceled by governmental restrictions. In relation, the managers of these workplaces had to reinvent defense mechanisms against the threat of insolvency due to client loss (Ceinar and Mariotti, 2021).

The fundamental factors behind this transformation in crisis situations lie in the adaptability competencies of the businesses, which can be studied within the conceptual framework of Dynamic Capabilities (Teece et al., 1997; Eisenhardt and Martin 2000). The continuous evolving environment conditions in the technology and business models, toppling with the uncertainty situation of COVID-19 pandemic have recently led this approach to be blessed as the criterion of adaptability and survival in the market, to experiment with the deployment of digitalization and digital transformation (Vial, 2019). Dynamic capabilities (DC) represent a firm's capacity to "integrate, build and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997, p. 510). They indicate the capacity to create, extend, and modify a firm's resource base (Helfat et al., 2007). As the theoretical framework contends, companies can be successful over time if they can adapt to their environment by operationalizing their "sensing", "seizing" and "reconfiguring" mechanisms (Teece, 2007). Substantial reflections of DC nurtured with technological adoptions during the COVID-19 crisis have intensified the debate on digital enablement of DC overweighing the other attributes (Li et al., 2022; Forliano et al., 2023; Hu et al. 2023; Priyono et al., 2020; Guo et al., 2020).

Recent studies assessed how digitalization capabilities were implemented as innovative response strategies in various industries during the crisis which represented an extraordinary shock for the world's economy (Amankwah-Amoah et al., 2021; Kuckertz et al., 2020; Akpan et al., 2020; Lee and Trimi, 2021) and how small businesses harnessed their DC to cope with change (Khurana et al., 2022; Bai et al., 2021; Rashid and Ratten, 2021). For this period,

the academic literature narrated a delineation of the digitalization process to face COVID-19 adversities within the dynamic capability principles reflected in early studies of the period (Guo et al., 2020; Leu and Masri, 2020) and several recent studies (Forliano et al., 2023; Hu et al., 2023; Zahoor et al, 2022; Oliveira et al., 2022; Martins, 2022; Li et al., 2022).

Still, a hollow space remains regarding the research that entails the area of shared economy during the crisis. Unlike digital born shared economy leaders like UBER or AirBnB, small companies in this group which were facing it with dramatic attrition rates, challenged by liquidity problems (Hossain, 2021). The narrative for the CWSs, against the crisis conditions was written more severely. In these less digitally developed structures of shared economy, the number of professionals using collaborative workspaces were diminishing. In reaction, implementation of digital pivoting mechanisms to recover from the mandatory isolation relied on teleconferences or installation of communication software to keep engagement between the employees and clients who were still working from home (Brodeur et al., 2021; Grieco, 2022). Yet, how exactly firms accommodate these technology adoption mechanisms into their dynamic capabilities to survive crisis adversities remains underexplored.

In this study, we go forward to take into consideration that during the times of crisis and uncertainty, DC are in charge for all industries, and these capabilities as well have indistinct digital roots. It is this paucity of information which motivates the conduct of this research, with the aim of filling in the gap that has been opened after the outbreak of COVID-19. To understand the factors lying behind their formidable success, we explore the strategic implementations of CWS managers in uncertainty situation of pandemic and analyze how they have leveraged digitalization and implementation of digital technologies for overcoming the adversities of the pandemic. This conduct is translated into the basic research question of:

RQ. How do small businesses in the sharing economy leverage digitalization and dynamic capabilities to recover from crisis adversities?

In an attempt to answer this question, the objective of this study is to analyze the process of digitalization and dynamic capability adoption as a remedy to recover from the adverse effects of pandemic. Drawing on the DC viewpoint of the firm, we aim to examine the digital technology adoptions and significant strategy changes in coworking spaces by following an explorative approach that inquiries about the effects of pandemic. Smart city example of Barcelona as a devoted case for coworking (Capdevila, 2015) proves a perfect environment to investigate the impact of the crisis on this sector of sharing economy, which has not taken any attention so far, among extant attempts to analyze digital capabilities within a DC framework.

We illustrate the process of dynamic capability implementation by small businesses deprived of advanced digital infrastructure. As an outcome of our qualitative research design, we identify three dynamic factors capturing how firms adapted to the uncertainty condition and wrestled the adversities of the long-term pandemic period, starting from the first shock up to the post-pandemic era. We contribute to a better understanding of the mechanism behind DCs for managers' appraisal and openness to digital adoptions in the digital age and show that firms' leverage of dynamic capabilities and digitalization has an impact on their orientation to adapt to the crisis conditions.

As our theoretical contribution, first, DC research benefits from engaging with this perspective in the new context of CWSs agents of sharing economy. The results to be gained from this long-term study shed light on the types of DC that led to advances in operational activities and the competitive advantages created during the pandemic, if not saved the businesses from closing. This paper, as well, contributes to the literature on strategy and entrepreneurship with an inductive look to conceptualize the resilient response, adaptation, and

survival process through generating DC in situations of rapid change and uncertainty, answering the call from Sharma et al. (2022).

Furthermore, this study offers an original contribution to the existing body of literature on the sharing economy by specifically focusing on the digital assessment of managers. In practical terms, our research underlines the manager perspectives which are crucial in strategizing to adopt digital technologies as a means of navigating through crisis disruptions and addressing challenges related to liquidity and solvency. Strengthened with a roadmap for practitioners, this study sheds light on how small business managers can utilize digital solutions to ensure their survival and sustainability in times of crisis, regardless of their digital maturity levels.

The remainder of the article will be structured as follows: We begin by analyzing the theoretical and practical aspects of reinvention strategies and their transformation into dynamic digital capabilities during the pandemic. In the methodology section, we explain the methods and analysis structure of our study. The following section covers the results of the study and evidence, before we conclude with discussing our findings, practical recommendations, limitations and future research lines.

4.2. LITERATURE REVIEW

In this section, we develop a common understanding of how DC and digitalization are interconnected in eliminating the adverse effects of pandemic and review the state of CWSs in the same light.

4.2.1. Dynamic Capabilities and environmental turbulence during pandemic

Firm-specific capabilities are tied to the firm's business processes, market

positions, and expansion paths (Teece et al., 1997, p. 515). Teece, Pisano and Shuen (1997) argue that durable attributes of a firm alone fall short of explaining the sources and methods of wealth creation and capture, unless the environmental factor completes the theory. As an evolutionary outcome of Resource Based View (Penrose, 1959; Wernerfelt, 1984) on the maintenance of competitive advantage over time, DC framework is built on the acceptance of change as a strong factor that effects the business activity (Helfat and Winter, 2011). Teece and colleagues note that dynamism in the environment reflects on the capabilities of the firm as a whole: on how they renew their competences, the resources, processes, products, strategies, and business models to respond (Teece, 2007). In that sense, dynamic capabilities are inherently transformative higher-level competencies that determine firms' "ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997, p. 516).

Within the DC field, a consensus is achieved among scholars to implement the three overarching clusters framework of Sensing, Seizing, Reconfiguration/Transforming (Teece et al. 1997; Teece, 2007) as patterned practices to meet the increasing level of demand uncertainties in the market. Sensing capabilities involve the ability to capture external knowledge and realize change in opportunities before rivals (de Oliviera et al. 2020; Schoemaker et al., 2018). The organizations must seize these opportunities and respond to change in the market by innovating and implementing new systems of processes, products or services (Teece 2007; Schoemaker et al., 2018; Helfat and Raubitschek, 2018). Lastly, these strategic decisions come into the process cycle to integrate, reconfigure and build new capabilities (Teece et al., 1997). In the crisis context, main mechanisms of DC refer to the capabilities of "sensing the crisis", "seizing new opportunities in the crisis", and "reconfiguring resources to cope with the crisis". (Teece 2007; Guo et al., 2020).

Elaborating on the digitalization actions to mitigate the loss during pandemic, this taxonomy would be prescribed as "sensing" by identification, development and assessment of technological opportunities to predict the arrival of the outbreak and its potential disruption in the ecosystem, "seizing" by mobilization of digital resources to address needs and opportunities in the changing environment, and to capture value, and "reconfiguring" the continued renewal to strategically seize opportunities and respond to threats (Warner and Wäger, 2019, Vial, 2019; Teece, 2007).

4.2.2. CWSs as sharing economy components under the pandemic impact

The sharing economy is built on collaborative consumption (Belk, 2014; de Rivera et al. 2017) and energized with the transactions through digital born platforms (Sutherland and Jarrahi, 2018) although less digitalized representations exist (Hossain, 2021). Loss of trust in the community focused business models during the pandemic, culminated in one of greatest challenges for the sharing models (Buheji, 2020). In the early days of the pandemic, maintenance of sanitary measures by governments to reduce the unbridled contagion and propagation risk could not help to solve the loss of trust, and the accommodation sector of the sharing business models was affected tremendously with the addition of extra inter-governmental measures i.e., border closures, flight cancellations and lockdowns (Farmaki et al., 2020; Gerwe, 2021).

Coworking spaces are collaborative workspaces thriving on the work efficiency based on interaction opportunities of the skilled professionals exploiting knowledge spillovers in a communitarian atmosphere (Nakano et al., 2020; Spinuzzi et al., 2019; Jakonen et al., 2017). Although they are part of the sharing economy, frequently being one manager owned small companies they have not received as much of a digitalization as others. (Hossain, 2021; Bouncken, and

Reuschl; 2018). Their inspirations for digitalization are more reliant on the tasks of the internal coworkers or the communication activities between them and the workplace staff (Bouncken et al., 2020). Their success in cities is path dependent, defined by the economic context of the area where they are located in (Nakano et al., 2020; Mariotti et al., 2021). As in the case of all industries, pandemic period for CWSs was a hard challenge to find sources to survive in the rapidly hitting waves. The earlier deteriorative effects of the pandemic over these models later turned into a practice of reconfiguration, due to its societal impact over all business models with the introduction of work from home practices in the new normality (Brodeur et al., 2021; Grieco, 2022).

Schumpeter (1934) contends that innovation could be regarded as a creative destruction of the old economic system. Likely, as the pandemic has exploded the adoption of digital technologies, this shift resulted in a robust growth for the online working and tele-working models which meant a new group of employees who would choose the work from anywhere but their own company offices (Lee and Trimi, 2021; Ceinar and Mariotti, 2021). Such changes in the competitive environment stimulated a new form of rivalry between the spaces to reach new types of consumers relieved from office gatherings. This time, the degenerative impact of lessening global travel was balanced with a trust generated over compliance with health and safety measures and a new model of CWSs was acclimated for the new type of inland professionals. Disruptions in work models dramatized by remote work and fluctuating customer demand forced the CWSs to be more focused on cost effective mechanisms, pushing them to reinvent their business by adopting new digital technologies (Cabral and van Winden, 2022).

The future trends for CWSs indicate a change in the hiring models of the clients into more established companies (Mariotti et al., 2021). Increased reliance on remote models of teleworking boosts the performance of job-related tasks away

from the traditional office space thanks to the expanding use of digital tools and technologies to enable communication and collaboration between employees and their coworker customers (Cabral and van Winden, 2022).

4.2.3. Digitalization and its transformative impact on SMEs during pandemic

Acting as a bridge between digitization and digital transformation, digitalization is an appropriate tool for exploiting new value in the market (Verhoef et al., 2021). The ever-growing necessity for creative destruction is triggered by the constantly volatile markets, highly dynamic environments, and complexity of sustaining competitive advantage (Eisenhardt and Martin 2000). Leveraging digital technologies, companies save costs, improve efficiency, and reduce risks (Nayal et al., 2021). By improving organizational flexibility and resilience, these technologies drive them to gain and sustain competitive advantage (Zahoor et al., 2022; Priyono et al., 2020; Guo et al., 2020). Linking digital strategies to the company's core business and focusing on a longer game of organizational change, digital maturity and preparedness are indicators of ability to leverage technology for adapting to continuous disruption (Kane et al., 2021; Forliano et al., 2023; Münch and Hartmann, 2022).

Digitalization capabilities address a company's management ability to enable the integration of data and processes with the help of different digital technologies to craft new strategies (Bharadwaj, 2013; Sambamurthy et al., 2003). During COVID-19 crisis information technology capabilities were decisive in predicting the path to keep business mechanisms intact (Forliano et al., 2023; Münch and Hartmann; 2022; Khlystova et al., 2022). The impact of digitalization to cope with those adverse outcomes is reflected in the Worldbank report which indicates that more than a third of companies have increased the use of digital technology to adapt to the crisis (Blake and Wadha, 2020).

Table 17: Recent academic papers analyzing SME coping strategies on pandemic effects from the view of both the dynamic capabilities and digitalization.

Study	Objective	Method	Data Source	Findings	Digital Constructs/Measures
Hu et al. (2023)	Investigate adoption and integration of social media platforms within marketing strategies during the outbreak.	Qualitative	19 key informants from 18 Italian SMEs	Challenges in the environment result in variant levels of social media adoption	Digitalization of the environment, customers' quest for digital communication, absence of digital skills, lack of organizational support.
Zahoor & Lew (2023)	Investigate to what extent strategic flexibility of international alliances affects export performance of SMEs via international marketing capability in crises.	Quantitative	128 emerging market SMEs in Pakistan	Adoption of digital technologies significantly moderates the relationship between strategic flexibility and international marketing capability.	Adoption of digital technologies (IoT, mobile computing, electronic commerce, business intelligence, cloud computing, big data analytics, social media and digital platforms)
Drydakis (2022)	To determine whether Artificial Intelligence (AI) applications are associated with reduced business risks for SMEs.	Quantitative	Panel data of 317 SME managers in UK	AI enables boost dynamic capabilities by leveraging technology to meet new types of demand, move at speed to pivot business operations, boost efficiency and thus, reduce their business risks.	Use and Number of Artificial Intelligence applications
Khurana et al. (2022)	Examine how small and medium enterprises (SMEs) build their resilience capability during a crisis, through the adoption of digital technologies	Qualitative	8 entrepreneurs managing SMEs in India	By affording SMEs an opportunity to transform themselves by embracing digital technologies, the crisis leads to the emergence of resilience capability as a second-order dynamic capability	Digital technology adoption (payments, apps, etc.) to foster the development of resilience capability and achieve digital transformation
Zahoor et al. (2022)	Focus on the critical role of business-to-business (B2B) high-tech SMEs dynamic capabilities and strategic agility during the pandemic.	Qualitative	5 Finnish high-technology SMEs	B2B SMEs seized the identified threats and opportunities by reconfiguring their business models and face-to-face and online operations.	Digital technology adoption to support opportunity identification, adaptation, and modifications to foster business growth.

Table 17: Continued

Study	Objective	Method	Data Source	Findings	Digital Constructs/Measures
Martins (2022)	Investigate how dynamic capabilities could influence SME performance through digitalization as a moderator in an emerging market.	Quantitative	400 SMEs in Ghana	Digitalization strategies must be part of the transforming process to enhance the impact of the dynamic capabilities on SMEs performance.	Constant inclusion of digital analytics, digital operations, digital marketing and sales, digital ecosystem, and digital products and services.
Rodrigues et al. (2021)	Determine how SMEs coped with the disruption caused by the closure, in terms of population and their daily lives to carry out their economic activities.	Quantitative	254 Portuguese SMEs	Weaknesses in SMEs are the principal obstacle to a resilient response to the crisis, such as their limited liquidity, human resources, digitalization, and use of information technology.	Digital competences to satisfy requirements of COVID-19 era.
Rashid & Ratten (2021)	Study how small business entrepreneurs are trying to survive and grow in an entrepreneurial ecosystem affected by coronavirus	Qualitative	20 Pakistani entrepreneurs	Small businesses utilize emergent humanitarian crisis, carte blanche agile business models and effectual business functions to cope with crisis.	Increasing visibility through digitalization, growing wide networks.
Priyono et al. (2020)	Analyze how SMEs cope with environmental changes due to the pandemic by pursuing the business model transformation with the support of digital technologies.	Qualitative	7 manufacturing SMEs in Indonesia	SMEs adopt a different degree of digital transformations, which can be summarized into three paths, depending on the firms' contextual factors and level of digital maturity.	Digital technologies adopted (Firm's website, social media, online trading platform, etc.)
Guo et al. (2020)	Examine the relationship between SMEs' digitalization and their public crisis responses.	Quantitative	518 Chinese SMEs	Digitalization has enabled SMEs to respond effectively to the public crisis by making use of their dynamic capabilities. In addition, digitalization can help improve performance.	Overall digitalization degree, digitalization method (internal or external), digital technology adoption

Source: Own elaboration.

Improved digital usage adhered to both companies and consumers, culminating in deeper penetration of technologies like blockchain, digital payments, and workplace monitoring that would change the business landscape forever (Khurana et al., 2022).

The social distancing norms and nationwide lockdowns during the pandemic caused a sharp economic downturn in global view, and their effects materialized in form of liquidity problems for the service industry due to loss of clients and staff, while the operating costs were mounting in the uncertainty environment (Rodrigues et al., 2021; Kuckertz et al., 2020). Several studies resting on the pandemic context, highlighted the strong links between small business adoption of novel technologies and capability to survive the crisis, with DC approach (Table 17).

The earliest survival mechanisms, for simplicity and urgency, were related to provision of remote communication to restore interorganizational coordination that was hampered by the lockdowns and curfews (Hu et al., 2023; Zahoor et al., 2022; Priyono et al., 2020). Business owners and managers who had not previously prepared hardware and software infrastructure had to establish quickly new channels to maintain employee productivity by adapting legacy systems and increasing visibility (Rashid and Ratten, 2021). Internally, digital tools such as Asana, Slack, or Microsoft Teams gained significance over traditional connection procedures. Externally, social media and reorientating to digital marketing saved the engagement with the customers in the disruptive environment (Hu et al., 2023).

After facilitating the remote work model, the next step was to launch new channels to maintain business continuity. Multi-channel business models strengthened with servitization mechanisms not only responded to financial liquidity problems but also accelerated the omni-channel commerce solution

adoption for many business models, adding to their competitive advantage (Zahoor et al., 2022; Hu et al., 2023). Personal contact began to lose its necessity in customer relations and especially in sales, also embittering the rush to professionalize in new digitalization trends to reach more customers and leads (Martins, 2022). Streaming models, for those workplaces that traditionally operated with proximity principle, became indispensable for continuity, seen in the examples of increasing online education patterns and intensified use of digital platforms and apps of gig economy (Zahoor et al., 2022; Hu et al., 2023). As more institutions adapted themselves to the digital systems, interaction between all recently installed technologies paved the way from a forced experiment to permanency of use for further hybrid models and reclaimed the delivery of online services (e.g., online concerts, performances, exhibitions) from the dominance of creative industries (Priyono et al., 2020; Hu et al., 2023; Khlystova et al., 2022).

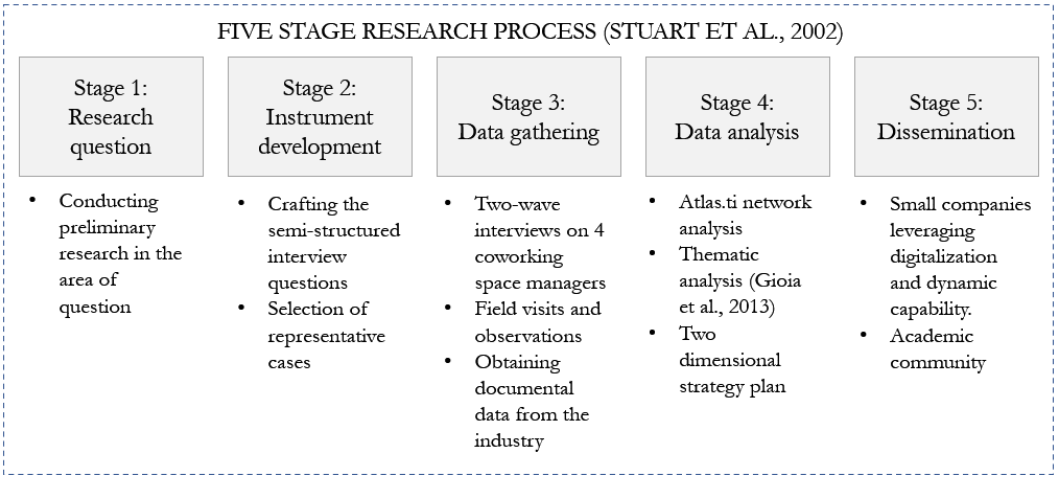
Advanced methods like automation served the demands of social distancing norms with the safe use of contactless sanitizing appliances or door openers, but also accelerated use of transversal digital solutions like mobile payments, e-wallets calling for a more secure and seamless customer experience (Khurana et al., 2022). Chatbots, virtual assistants and artificial intelligence (AI) enabled devices widened their reach and boosted efficiency in SMEs, facilitating shaping of reliable strategies by predicting consumer and competitor behavior (Martins, 2022; Drydakis, 2022). The accessibility and assessment of market and customer data is underlying factor of these knowledge-based models which facilitates agile decision making to identify appropriate market action and innovation opportunities within unexpectedly thriving technological trends (Zahoor and Lew, 2023).

4.3. METHODOLOGY

This research is structured on a qualitative multiple case study methodology over small businesses in the sharing economy space. Case study strategy allows for in-depth investigation of a phenomenon whose boundaries are not clearly evident in advance (Eisenhardt and Graebner, 2007; Langley, 1999). Especially, the pandemic is a novel situation and unexplored area which requires to ask particularly 'how' and 'why' questions to reach rich descriptions and deep insights to develop and extend existing theory (Creswell 1998; Yin 2009). The two-wave method of data collection over three years was selected due to the cumulative nature of the DC (Laaksonen and Peltoniemi, 2018). Unit of analysis is the CWS managers, and we study their strategies.

To structure our multiple case study research, we followed Stuart et al. (2002) with their five-stage approach (Figure 11). We started with developing the research questions by conducting preliminary research in the area of question.

Figure 11: Research process



Source: Adapted from Stuart et al. (2002)

In the second stage, we selected our representative cases and developed the research instrument. By considering the replication approach we formulated a

semi-structured interview questionnaire that follows the learnings of process-based research of Yeow et al. (2018). The third stage is a compound of the conduction of interviews, analysis of documents and collection of the data from these sources. Later, in the fourth stage, we examined all of this information through a qualitative content analysis by using Atlas.ti software. The final stage of the research focuses on targeting practitioners within small businesses who are undergoing similar stages of leveraging digitalization and dynamic capability. The aim is to ensure that the research findings are accessible and applicable to practitioners in real-world contexts.

4.3.1. Sample selection and case study companies

Focusing on the CWS industry, we selected Barcelona as the empirical research design setting for this study. The universe of CWSs in this are consists of nearly 300 spaces of various sizes (Coworking Spain, 2020), with a majority of spaces which only offer office space service. From this universe, we constructed a list of representative cases having a minimum of 3 years history after foundation of the company. This limitation is crucial to understand the strong influence of unretainable earnings during pandemic and its effect on already established strategies. The invitations were sent via email, assuring the recipients that their confidentiality would be upheld by the ethical norms of the university. During the two initial rounds, we received four affirmative responses to participate in the research. In the last round we included three participants through convenience sampling. In the second year, two of the CWSs abstained from the semi-structured interviews, leaving the research with five cases data.

From these five CWSs, we continued to collect data between 2020 and 2022 via the two-wave research model. Within them, we selected four companies drawing on the operational construct sampling method (Patton, 1990). In line with this method, we differentiated between the coworking spaces based on

their size, taking the number of employees as a metric. Among the five cases, a small company that demonstrated less willingness to confirm any substantial strategy for the pandemic period was excluded from the research. This decision was made because no data was obtained from this particular company to feed the findings. As a result, the research design continued with four companies with descriptions given in Table 18. Overall, the analysis contained the data of 9 interviews with 5 different managers from these four spaces.

Table 18: Participant company descriptions

CWS	TOPAZ	JADE	ONYX	RUBY
Number of employees	2	2	8	40
Number of locations	1	1	3	7
Company age	4	6	13	5
Number of customers at normal	50	75	300	4,000
Customer loss in pandemic	90%	84%	13%	75%
Primary challenge in pandemic	Scarcity of resources	Reaching potential customer	Some customers with payment inabilities	Attrition of large companies

Source: Own elaboration on coworking spaces interview data

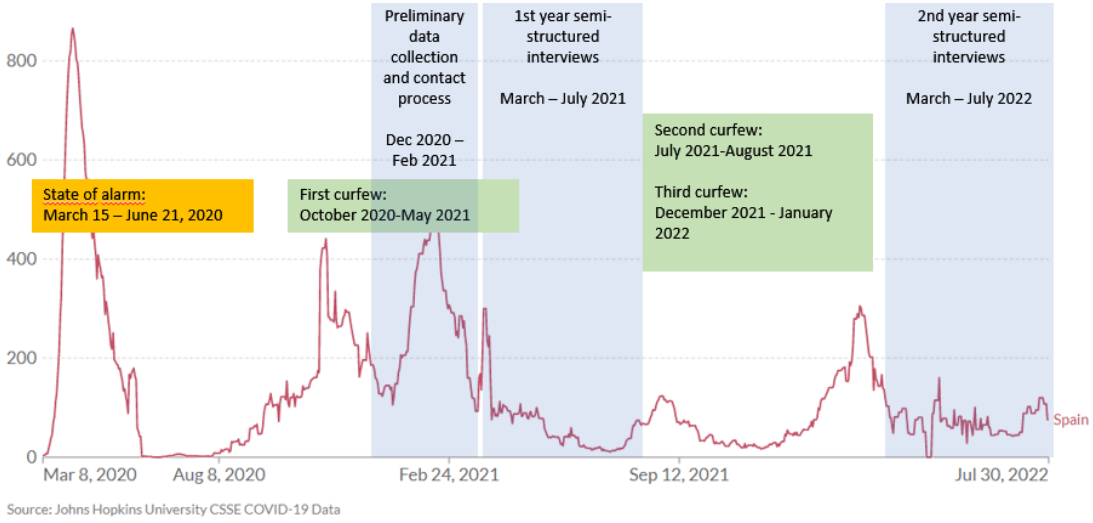
4.3.2. Data collection

Data collection method was designed in parallel to the research question "How do small businesses in the sharing economy leverage digitalization and dynamic capabilities to recover from crisis adversities?" In addition to the two-wave research approach chosen to capture the participants' evolving perspectives and

adaptations over time, the interview questions were crafted to align with relevant theoretical framework and the process of digitalization.

The first-year interview data collection took place between March and July 2021. Second-year interviews were carried out between March and July 2022 (Figure 12). The outline of the interviews represented a micro foundational view on how the spaces operationalized their sensing, seizing and transforming capabilities during and after the pandemic. The questions were designed to revolve around the sensing, seizing, and reconfiguring dimensions of Teece et al. (1997), by simultaneously addressing the COVID-19 repercussions following the process model of Yeow et al. (2018) (Table 19).

Figure 12: Data collection timespan compared with COVID-19 lockdowns and curfews



Source: Own elaboration on number of COVID-19 deaths in Spain distribution chart (OurWorldinData, 2022) and CatalanNews (2021a; 2021b).

The second year in research corresponds to a period in which uncertainty lost its pressure over the companies. The aim of data collection in this consecutive year was to detect incorporation level of the DC developed in the previous year, highlighting the points not discussed previously.

Table 19: Key questions about dynamic capabilities obtained during pandemic crisis management.

MAIN THEME	FIRST YEAR QUESTIONS
Identifying strategies	How did you recover from the crisis?
Sensing	How did you realize that alternative? Why was it appealing?
Seizing	How did you implement that change? How did you adapt your company to new procedures and processes? How did you overcome the challenges during implementation?
Reconfiguring	Tell us about your experience after this strategy change? How impactful was this action for company performance? How did your clients/employees adapt to this new state? How would you improve this feature in the future?

MAIN THEME	SECOND YEAR QUESTIONS
Recalling general framework about strategy and outcomes:	What was your strategy? (What was in your mind / your objective when you planned it) How did you implement it? (Expectations vs implementation) How effectful were these measures? (Why it worked? / not worked?) Did you run across any challenges? Which challenges (examples)
Seizing	Which factors were the most influential driving force in adopting digitalization measures?
Reconfiguring	At what level did your CWS internalize the acquired capabilities into the standard procedures and routines? Why?
Reconfiguring	Will you continue using the adopted digital capabilities after the pandemic? Why?

Source: Own elaboration.

The research required a continuous surveillance of COVID-19 impact on the people and specifically the target groups of knowledge industries. Observations were made regarding changes in governmental policies, the number of people infected, and specific areas where containment and lockdown measures were implemented. Document review as well included companies' communication materials used to contact with stakeholders (blogs, social media posts, digital ads, press releases, published/ broadcasted interviews with managers, conference recordings, client communication, e-bulletins, etc.). Also, secondary data obtained through industry blogs, conference materials, survey results were continuously kept under surveillance to understand managerial responses to the ever-changing conditions.

4.3.3. Description of participant cases

From each company, we interviewed at least one manager that continued their position in management during the two years of pandemic.

4.3.3.1. TOPAZ

The CWS is located in the center of the town, very close to the commercial and touristic area. The coworkers include international as well as local professionals. This space was hit hard by the pandemic, losing more than 90 percent of its coworkers during the first wave. In the first year of the study, the impact of loss presided to change the daily routine of the manager for pivoting attempts. During the second wave those measures helped the company to relevel the revenues, however the growth figures of pre-pandemic period were far from being likely. This led the manager to experiment with any strategy that would have an impact in attracting the leads to the space. She reconfigured the business model by introducing new lines including co-living and consultancy, apart from others.

4.3.3.2. JADE

In contrast to other cases, this CWS is located outside the city center, in the closest municipality bordering Barcelona, where a predominantly industrial zone is nowadays transforming into a neighborhood of residency with increasing immigrants. Successfully running the company with growth rates in 6 years, the manager's key issue is keeping the visibility high by online marketing, since the space is not located on people's concentration area. Hard loss of 84 percent coworkers in the lockdown period led JADE to undergo a series of strategical change. Basically, the manager decided to increase investment and concentration on digital marketing activities, especially following the departure of the largest company with a great number of employees they were servicing. The main objective was to increase the reach to potential clients and convert as much as possible during the hard times when the number of people passing on the street is significantly low, compared to earlier.

4.3.3.3. ONYX

The company was founded with a communitarian approach in 2012, attracting freelancers and self-employed professionals of both small and large companies. In a short time, the company extended its locations into 3 different neighborhoods around the Barcelona center, servicing a wide portfolio of workspaces where people can socialize. The company pursues a differentiation strategy, where more than 300 professionals actively participate in projects that promote the development of their immediate environment. With regards to other participants in our study, the pandemic experience of ONYX was relatively soft. The company employees and coworkers spent the lockdown period at home and clearly defined protocols helped the crew to stay informed and adaptive. The company did not need to pivot on new strategies since there was only about 13 percent of customer loss for the infancy period of the

pandemic, which was recovered with practical changes in payment packages.

4.3.3.4. RUBY

RUBY is the largest company within the study, with 6 workplaces attracting freelancers, technology professionals, as well as large companies. Services are provided in large buildings with massive space to move in for team activities and events. The company registered huge and visible growth in a very short time, with regard to competitors within the city, thanks to a strong managerial acumen. Despite the intense organizational background of this giant CWS, the pandemic outbreak resulted in a serious loss. The company gradually lost about 75 percent of its 4,000 coworkers. Essentially, the attrition of large companies in one day had a dramatic impact, intensifying the uncertainty factor for company's overextended capacity. The managerial team utilized the silent period during lockdowns to develop an organizational perspective, restructuring the company to the very roots, including introduction of new technologies to facilitate workflow and profit maximization.

4.3.4. Qualitative content analysis

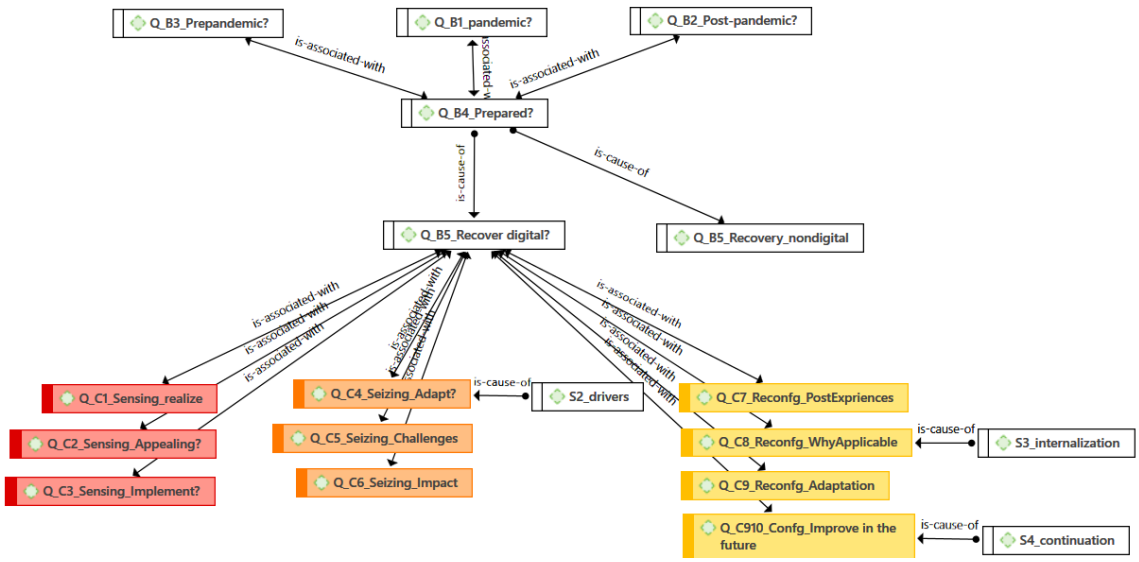
As we spoke to the executives and learned about their actions and insights, we simultaneously recorded the interviews using online streaming and mobile phone voice recording applications, depending on the mode of sessions, either online or face-to-face, respectively. The recordings were later transcribed verbatim, capturing the interviewees' responses in their original form to maintain the integrity and richness of the data. Translations from Spanish language were done using MS Word translation tool, improving them with interpretations where the software was inefficient due to use of filler words.

The collected data is securely stored and organized in a format compatible with

Atlas.ti software. Each data source is properly labeled and documented for easy reference during analysis, anonymizing the names of the companies and managers for data sources' confidentiality. The coding scheme consisted of 250 open codes over 225 quotations.

The open codes were first categorized on the themes relevant to the research topics, basically moving through the interview plot. Key coding elements were organized with an objective to form the nodes of a network analysis. The relationships between the nodes were done by linking codes to each other. This phase especially was helpful to merge the two years' different interview question set. The visualization of the network (Figure 13) enabled a deeper understanding of the patterns of connections present in the qualitative data and facilitated the process of understanding the results of research which will be explained below.

Figure 13: Atlas.ti network analysis on two-wave semi-structured interviews



Source: Atlas.ti software network analysis on 9 semi-structured interview data

This analysis was also helpful to understand the missing themes which could not be corroborated by interviews. Such information was collected from

company online documents, basically web sites, online interviews with other sources and social media interactions. This framework enabled us to define the key digital processes for developing dynamic capabilities in seizing, sensing and reconfiguring dimensions, which will be explained in detail in the next section.

The network analysis of the existent themes in the study also enabled us to understand the data so that we could raise this information into an abstract level to formulate a more rigorous analysis. In this next level we re-clustered the category system to form a list of first order codes that would show the digital strategies adopted during the process for developing dynamic capabilities. For this aim, we adhered to the rigorous qualitative research method recommended by Gioia et al. (2013). This categorization ended up with 39 first-order categories. The determination of these first-order categories was based on a comprehensive examination of primary data, which encompassed interviews, observations, and a triangulation with the literature review that encompassed companies' digital response mechanisms and dynamic capabilities in the COVID-19 crisis. Next, we used axial second cycle coding to generate 9 second-order themes. Third, we contained the second-order themes in the relevant aggregate dimensions. This procedure formed up our data structure of digital technology enabled dynamic capabilities leveraged during the crisis.

As a final analysis, our research methodology took a step further to incorporate a more practical lens. In this final lap, we reviewed four types of companies by their level of leveraging digitalization and dynamic capabilities, determined by their advancement in the code structure themes. This analysis corresponds these dimensions to the future steps companies need to take. By this means, we aimed to conduct a forward-looking analysis by which similar small company managers could relate themselves to the stories of the companies included in our study and identify actionable insights.

4.4. RESULTS

Aiming to identify and support the underlying themes of sub-concepts which play a role in leveraging DC during the adverse conditions, we tackled the research question by analyzing the process management of digital technology adoption which converts into a strategy to align the company into the emerging conditions and regain strength to overcome challenges. Exploring through the axial codes generated from the two-year data during pandemic, we diagnosed four managerial cases using digital strategies to leverage their DC (Table 20).

Table 20: Digital strategies adopted during the process for developing dynamic capabilities.

Smaller participants		**Larger participants**	
TOPAZ	**JADE**	**ONYX**	**RUBY**
			Employ knowledge management: Restructure account management system.
Create virtual community: Launch Online Coworking Channel	Develop a digital strategy plan. Enroll in online courses during confinement period. Target true customer via digital marketing	Deploy previously installed technologies like internet platforms, blogs, Slack and webinars.	Develop internal communication: implement Intranet & Slack tools. Create virtual community: Hybridize events: Pitching contests and similar online events.

Source: Own elaboration

Two of the participants, TOPAZ and JADE retained a smaller number of employees managed by the only founder and were localized on one spot. The other two spaces, RUBY and ONYX on the other hand, are larger firms hosting thousands of coworkers in multiple localizations, qualifying a higher capability

of strategy-making nurtured with better financial and managerial resources.

Driving from the literature, we would expect that these companies with a higher degree of digital maturity and preparedness to access market data would be more effective in leveraging DCs (Forliano et al., 2023; Münch and Hartmann; 2022; Khlystova et al., 2022; Guo et al., 2020). However, regardless of their sizes, we found that both small and large CWSs went through a similar sequence of processes when they were sensing, seizing, and reconfiguring new capabilities for surviving the crisis (Tables 21-23). The rest of this section will explain the results of this analysis.

4.4.1. Digital Sensing

During pandemic all spaces were exceptionally open to discoveries about the available online technologies to cope with the first shock and the following disruption. The spaces had to deploy new digital strategies not only since it was only option to continue basic coworking engagement activity, but also to restructure the organization so that they could keep up with competition and further customer demands to adapt the challenges of the period (Table 21).

While the pool of potential customers in town was severely shrinking, they were obliged to find new sources of leads through any means, to cope with competition. Our data reveals that the channels used for sensing were more variant than simple social media inquiries. Small CWSs expended collaborative efforts from the external sources to minimize the impact of the crisis. TOPAZ relied on her group meetings with fellow CWS managers:

> *"We just allocate some of my hours on, on having meetings with, the girls… or coworkers. So, we just allocate these hours on defining what we want to do. When do we want to be and everything. And then made a small landing page. We started mainly with webinars. So, every month we are doing a webinar. That way we can get*

like also new contacts and this people can participate. We're starting like this. And then we went to launch, some… like small courses or tutorials, skill shares, workings and stuff like that. But yeah, for now, for now, it's everything for free. "

Table 21: Key digital processes for developing dynamic capabilities: DIGITAL SENSING PROCESS

	Smaller participants		Larger participants	
	TOPAZ	JADE	TOPAZ	JADE
Awareness	Evolved proactively as a product of group meetings.	In-company analyzing, as well as trial and error practices helped to realize the need.	N/A	Became an obligation due to pandemic, growth and evolution. Competition and customer demand were tempting. Internally, in-company analyses, and strategic committee meetings gave clues.
Appealing	As a new source of income. Obliged to make services online due to proximity restrictions.	To get visibility to the space.	N/A	For improved process efficiency, keeping community close and grasping customer needs.

Source: Own elaboration on coworking space manager interviews

Challenged by lack of organizational support JADE hired collaborators to help her in defining a totally structured new digital strategy:

"The conversion and recruitment part comes to me online… [But,] Okay, not everything social networks work the same for companies. So, through testing campaigns, I wanted to select social networks that for my post or objective and for my pocket the level of money can work better… This campaign, I have done it with

Facebook… Landing page ads, lead capture, payment of the Facebook ad… [Yet,] Invested enough money and it has not worked for me. Instead, the Google Ads campaign would worth it…. Because it is measured… I found a person who is dedicated to Google Ads campaigns. So, we have done a segmentation, a keyword search, there has been all the analysis of Google Ads, with a person who is a specialist, to be able to define and segment and search for the words by which can be searched. "

RUBY, the giant company, counted on internal information flow retained from both customers and managerial staff to foster the development of new technologies like payment systems or knowledge management tools.

"… I was asked by the direction to develop the services department which offer more services to our customers so when I started analyzing which services I could offer to our customers, I realized that we don't know our customers enough so I couldn't know what they want… So, we started … this project of building a system to be able to get to know every account and customer so that we can identify what are they needs and where we can help them. "

The pandemic period served as a time of reconstruction for the companies. Since the managers could not meet the coworkers in proximity, they were open to new ideas and solutions that could shift the coping mechanisms of the organization.

4.4.2. Digital Seizing

Those strategies that were perceived as appealing for the company were immediately adopted by the spaces, regardless of size. In the first month, all spaces had completed configurations of their web sites and social media channels in order to stay in the game for interacting with their clients. More complex technologies were demanding in terms of budget and recruitment of intellectual talent, as well as penetration into the daily activities of workspace management (Table 22). This process significantly required dedication of time

Table 22: Key digital processes for developing dynamic capabilities DIGITAL SEIZING PROCESS

	Smaller participants		Larger participants	
	TOPAZ	**JADE**	**ONYX**	**RUBY**
Implementation	Allocated some extra hours to learn and implement.	Found an agency to formulize the digital strategy.	Digital communication was mandatory during lockdowns.	Had to change the team mindset, was complicated and hard. Used new digital tools (Salesforce) to facilitate work across departments.
Adaptation	Did all personally, thus, easily adapted.	Introduced technologies for sharing the knowledge base (Notion) and digitalizing the previous templates (Holded).	Continued extant technologies, i.e., webinars, Zoom workshops, Hangout, Slack, e-payment, e-invoicing, etc.	Centralized decision making, sharing the knowledge base (Notion).
Challenges	Used lean startup methodology, learning on the fly (redoing many times) which was difficult.	The website was hacked anyhow. The clients did not see the impact at all. The small size of space is a barrier to test new technologies.	None.	Difficult to empathize in the group, listening to each other's opinions, explaining every detail. Technical incapabilities and lack of skilled users was a challenge. Had to learn on the fly (redoing many times).
Appraisal	Pros: Adds value to brand image. Cons: not monetized yet and learning takes time.	Cons: Not enough time has passed to see the impact.	Pros: Pandemic didn't affect the company much because it was already very digitalized.	Pros: See the customer's pains and solve them get good feedback. Cons: Too much time invested, not observable in key figures (does not reflect on customer preference to choose a CWS).

Source: Own elaboration on coworking space manager interviews

and energy from the managers, if they are handling the tasks themselves; or enhanced team organization capabilities to ensure that team members would follow the new directives that sometimes would fail. Informant from RUBY indicates the challenges when they were deploying the Salesforce first time in the company as:

> *"…It was very difficult. Main challenge was like, since we have never done it before we had to change, to set the process a few times. And it was hard for the team because it for them was like 'okay you asked me first' one thing, then we change it, and I have to do it again. So, basically, we try to really explain that we were like building and learning at the same time… and trying to make the team empathize with us, with the leaders, just to understand. "*

As a primary challenge, the hours and effort dedicated to seizing new capabilities were not observable in key figures. According to first- and second-year data, the motivation of the managers to keep on trying new models can be explained by the fact that they were trying to appraise every new activity they could, to see if it would have an impact in the balances. Some of these activities that did not have an observable impact and required too much dedication of time (e.g., online education channels), were later dismissed, as the influence of pandemic diminished with widespread vaccination all around the country. As reflects in the RUBY manager's words:

> *"It was necessary to do it and, because of the challenge we were pushed to do things that were not in our day, that we didn't imagine we could do."*

Likely, manager of JADE was training themselves for handling automation processes via digital platforms:

> *"… For example, we also do many maintenance tasks because it is a very large building, we're in. Well, you have to come and do the air conditioning check, the elevator check, the water source check, and so on. Because here in the Notion, you can go placing or indicating what day and what has happened with such a review. And if*

one day you have to do a search directly to maintenance and read what has happened with the water, or what has happened with the light, it is a way to have information instead of having an excel or a calendar, or a list. All your tasks, you can have it here and on your mobile, or on any computer."

The same company manager defined their process of recovery slower with regards to other greater CWSs in town:

"… But of course, I am a small coworking. Also, … I must have references. … I look at coworkings that are large companies, such as [company name A], or [company name B]. They have a process, and a much faster team, because they are the first. Then, it is as if you compare a Mercedes or BMW with a Citroën. Mercedes and BMW will first bring out a technology, then Citroën will implement it in another way. Well, it is as if some are Citroën, and the others are Mercedes and BMW. We always go a bit differentiating ourselves. But always the little ones go in tow of those who are bigger."

Meanwhile, ONYX, taking advantage of previous installations in the technological infrastructure and strategy making launched new channels of communication with no difficulties. Even the digitalization of the competitors for this space was not an issue:

"We have a web page … and we focus everything through this platform our co-workers can get their invoices they can chat with themselves, they can chat with us, they can check the profiles of new co-workers. We send newsletters. I mean, but that worked before the pandemic. So, that has not been the problem for us, or we didn't find any other opportunity to improve anything."

4.4.3. Digital Reconfiguring

Companies very quickly transformed the simple tools that provided obvious benefits and flexibility to their daily routines, i.e., informative blogging, intensified digital marketing and online events (Table 23). Digital reconfiguring

Table 23: Key digital processes for developing dynamic capabilities DIGITAL RECONFIGURING PROCESS

	Smaller participants		Larger participants	
	TOPAZ	**JADE**	**ONYX**	**RUBY**
Experiences	Grown professionally as a manager and survived the pandemic. But the project stopped afterwards.	Learned from previous errors and restarted with new collaborators. Started a new project since the first did not work. Survived the pandemic.	Converted the challenge into opportunity: Started a series of talks in the online channel.	Learned to think and act strategically as a team. Administered change in company that will live forever, achieved consistency, democratizing the knowledge, hybridizing working teams. Used evaluation and implementation techniques.
Applicability	Easily implemented. The tools were flexible.	Techniques implemented were up to date.	Applied techniques were already in use.	Easily implemented and fast adapted. Tools were flexible and useful.
Adaptation	It didn't require too much adaptation since the work was done individually.	Coworkers in space didn't adapt at all since they are not digitally oriented.	Main theme of CWS is creating social bonds, so it was aligned with it.	Was easy by participating together. Organizational changes required to exclude some staff who could not adapt and mixing the teams.
Future plans	Increase engagement by giving voice to entrepreneurs and promote user generated online events. Process optimization and segmentation of communication groups	Improve the programs reach by adding marketing and CRM techniques	Continue the same way.	Foster engagement by creating content to online channels, giving voice to entrepreneurs and boosting user generated online events. Automatize and simplify. Reorganize the internal use as bottom up, from coworkers to managers.

Source: Own elaboration on coworking space manager interviews

of activities that were inherent in the company's pre-pandemic portfolio was much more straightforward, compared to those that required "trial and error" learning in the early steps. RUBY manager narrates development of new engagement channels based on previous installations:

> *"…So, with our coworkers we tried to, you know, promote all the activities or the events and even just conversation with members on Slack. And before the pandemic this was not really happening. Like we were using it internally, but we were not using it with the community. So, this is something that we did then we with the few events that were the online professional blind dates. So, we would basically sign up and we would set up a person with another person for an online blind date, you know, like for professional reasons of course whenever… "*

In contrast, implementation of complex software packages required organizational changes, and even elimination of some staff who could not adapt and mixing the teams. Especially, when the impact would reflect a failure, like in the case of JADE. The company manager in the second year explained how the previous year's attempts failed, as the newly developed site was hacked, and they had to generate a new system from the beginning and find a new group of collaborators.

Nevertheless, all cases suggested that the process was very enriching in the sense that they grew up professionally. They could identify the necessary strategies to be done with better insight. Some methods were laid off when conditions changed, and more effective options emerged. TOPAZ manager explains in the second year:

> *"Talking about the other the co-working online. It's a project that stopped completely. We don't do webinars anymore. We don't try to create a community online. We were for people working on this project. We were spending so much time and when we got the time to do like training videos, and this we were busy with other stuff. And so, we just stopped doing this project. It's true that we make changes in the co-working itself,*

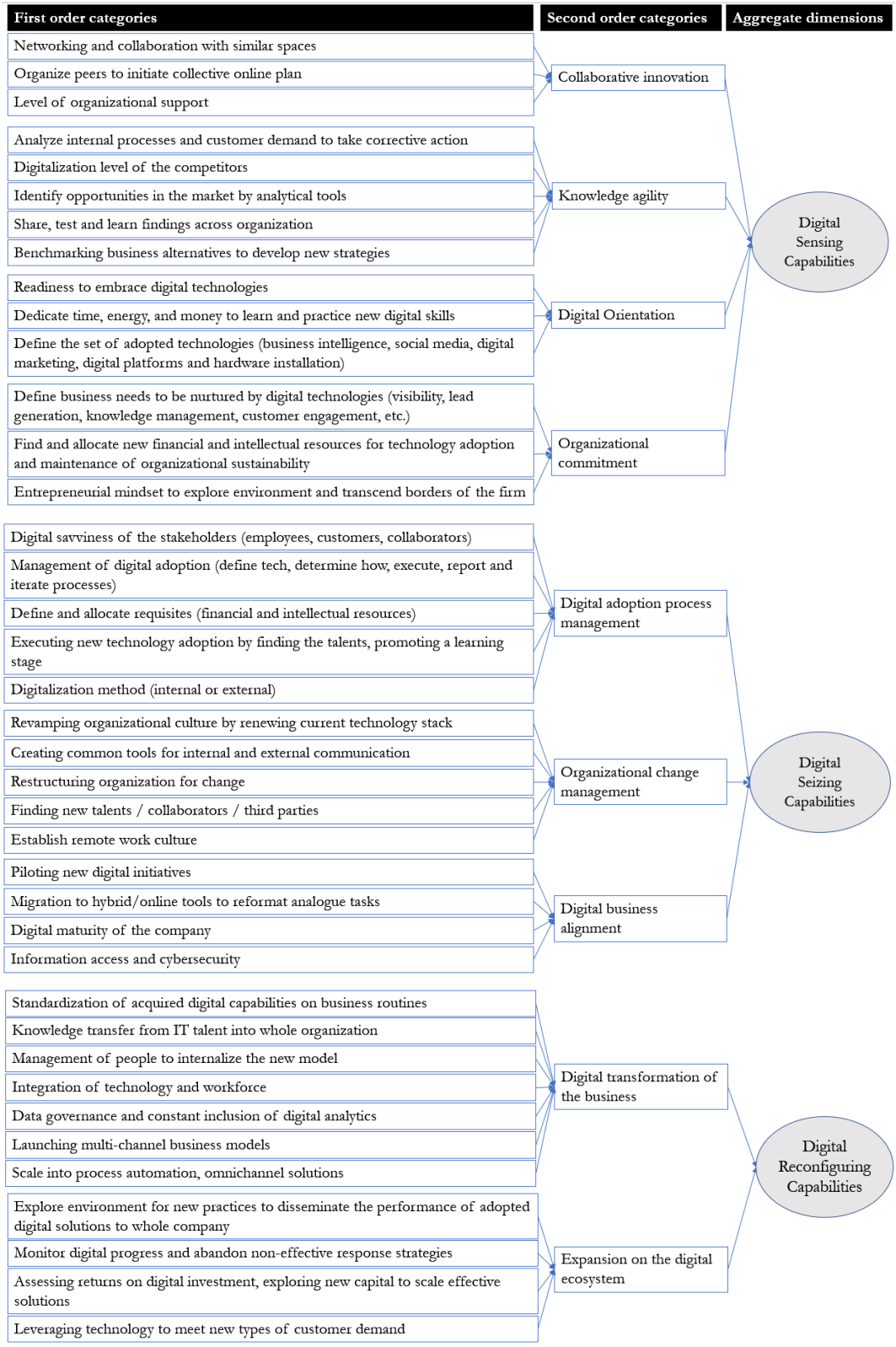
in terms of pricing, packs, and all this and seeing the competition, and it (reflects) in the co-working space in the [occupied] tables… and it had a positive impact. But the rest it's quite the same."

Crucially, second-year data reveals the managers' reaping the fruits from adopted digital strategies. Witnessing an increase in the number of supplies for technological tools, as the competition fiercely increased, allocation of new financial resources for technology adoption regained importance and maintenance. High performance tools that reflected on working mechanisms were prioritized instead of early handy but ineffective processes. In small CWSs, as leads began increasing, daily tasks amounted and investing time in research activity became a heavy burden with comparatively lesser yield.

When the output of digitalization did not reflect on numbers, the manager's decision on prioritization was shaped according to cost, applicability, implementation rapidness and learning challenges. Increasing competition necessitated enhancing virtual components of office and meeting room designs and aggregation of new procedures like e-invoicing or online agenda scheduling to daily routines. Customers' demand for advancements in the CWS were determined by the type of coworkers and their digital savviness, and mainly their business model dependency on virtual activities.

In the final round of the study, we analyzed how the coding scheme of our data corresponded to the extant literature. Starting on our codes, we formulated a list of first order categories that represented the strategical micro foundations of digitalization efforts. Figure 14 provides an overview of the analysis of digital capabilities obtained during pandemic data structure, by aggregating the first-order codes, second-order themes. We discuss and classify the findings in a strategizing perspective in the next section.

Figure 14: Thematic analysis data structure of digital technology enabled dynamic capabilities leveraged during the crisis.



Source: Own elaboration

4.5. DISCUSSION

Driving on the findings and the extant literature, we identified three dynamic factors capturing how CWSs adapted to the uncertainty condition and wrestled the adversities of the period. Our analysis is rooted on the DC view, as we aim to discover those relevant capabilities to accomplish business continuity. Warner and Wäger (2019), in their seminal work, underline how firms need new digital sensing, digital seizing and digital transforming DC to compete in a digital economy. The pathway of the selected cases of CWSs coincided with the theory, with variations in conduct.

The digital adoption strategy rests on a sound process, constrained by the managerial capabilities of the executives, which we capture in collaborative innovation, knowledge agility, digital orientation and organizational commitment in the sensing capability. Digital adoption process necessitates a series of events if they are deployed to predict innovative performance, networking, strategic planning and other organizational abilities to orchestrate the success factors in the environment. These include networking activities with peer organizations or networks, to collaborate for a shared benefit (Rashid and Ratten, 2021). Lack of organizational support may predict a higher likelihood in this solution (Hu et al., 2023).

We assume that organizations have a wide perspective when making serious investment decisions, analyzing internal processes, customer demand, competitors and environmental technology. Knowledge agility mechanism not only operationalized these functions, but they also are used to identify opportunities in the market by analytical tools, and to share, test and learn findings across organization (Martins; 2022). Nevertheless, to convert findings into action requires to be decisive with a digitally oriented management strategy (Zahoor et al., 2022; Khurana et al., 2022; Forliano et al., 2023). Companies must be ready to embrace digital technologies, so that they do not hesitate to

dedicate time, energy, and money to learn and practice new digital skills they define (Zahoor and Lew, 2023; Khurana et al., 2022). Decisiveness also requires organizational commitment to internally define business needs, like visibility, lead generation, knowledge management, customer engagement, etc. to be nurtured by digital technologies. This is needed for finding and allocating new financial and intellectual resources for technology adoption and maintenance of organizational sustainability. Possession of an entrepreneurial mindset will intensify the prospect to explore environment and transcend firm borders.

The lockdowns and curfews during the pandemic had a dramatic impact on managers' decisions. Mobilizing resources to capture value from quick but smart learnings was harder in the uncertainty environment. As part of our participant cases, we observed a series of actions which signaled digital business alignment, process management and change management as necessary actions to be taken during this seizing phase. Piloting new digital initiatives and migration to hybrid/online tools were steps taken within our informants, to the extent that they had information access and cybersecurity excellence. Digital maturity of the company served as a milestone in taking further action: if the decisionmakers believed that their digital base was sufficient, they would continue their previous path with no further risks taken (Münch and Hartmann, 2022; Khlystova et al., 2022).

On the other hand, these criteria when considered with knowledge agility in the sensing pillar may anticipate a new round of digitalization campaign within the whole organization. The reason behind this hard decision lies in the fact that digital adoption process management is very complex and requires investment into digital savviness of stakeholders, digital adoption execution (Martins, 2022). These cannot be accomplished without a successful organizational change management, requiring common tools for internal and external communication, training, recruiting new talent, and revamping organizational culture by

renewing current technology stack (Hu et al., 2023).

Companies reconfigure their seized capabilities into routines and keep subjected to continuous renewal through digital transformation and expansion on the digital ecosystem if they indicate business continuity and growth. Digital transformation in business contends standardization of acquired digital capabilities on business routines and knowledge transfer from IT talent into whole organization by management of people to internalize the new model to provide integration of technology and workforce (Khurana et al., 2022). Data governance and constant inclusion of digital analytics will provide the information to make further decisions for changing the scope and launching multi-channel resilient business models (Khurana et al., 2022; Drydakis, 2022). Successful coordination of strategy change will level the potentials up for leveraging new technology to meet alternative types of customer demand and renovate further plans such process automation, omnichannel solutions or exploring environment for new practices (Zahoor et al., 2022; Leu and Masri, 2021).

Larger steps will follow with dissemination of the performance from adopted digital solutions to whole company for expansion on the digital ecosystem (Martins, 2022). Diagnosing the returns on digital investment by analytic capabilities, ineffective response strategies should be discarded, while searching for new capital to scale effective solutions (Zahoor et al., 2022; Drydakis, 2022). Yet, all these processes may be affirmed under the condition that they lead to business continuity and growth as the company has adapted to the crisis. In the new era, coping strategies concern further steps by adoption of advanced digital technologies such as internet of things, mobile computing, cloud computing, big data analytics (Zahoor and Jew, 2021).

Our study underlines the strategic importance of perceived digitalization as a measure to decide on taking further steps into digital transformation, especially

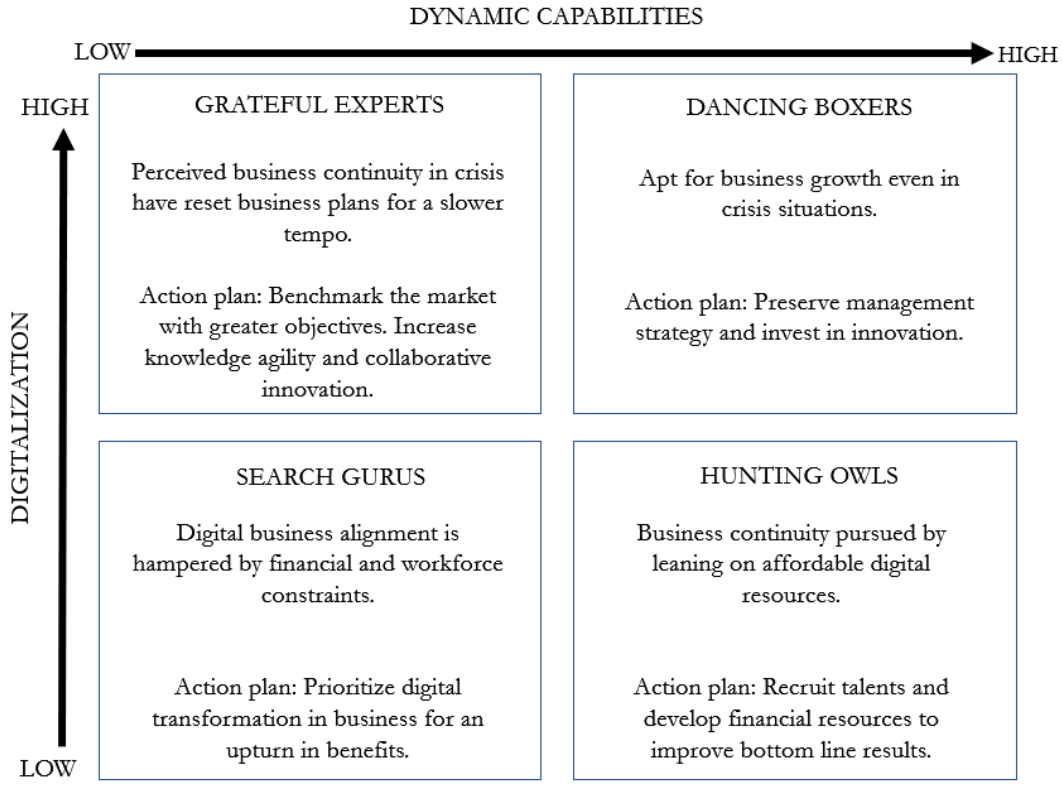
for those SMEs who are less digital oriented with regards to their ecosystem. CWSs normally do not possess advanced technological infrastructure; as in many digitally underdeveloped SMEs, their universe is limited with no apparent signs of Big Data, AI or cloud technologies (Keller et al., 2022; Hossain, 2021). Intrinsically, their capabilities on dominating complex systems are limited, particularly since they lack the human talent to control and capitalize on emerging technologies.

Nevertheless, the innate theme of CWSs, the maintenance of communitarian proximity served as the pushing factor to introduce digitalization during the pandemic as an alternative mechanism of service delivery (Seetharaman, 2020). Riding the global waves of clinging onto digital technologies in the period as a life saver, they too commenced the foremost steps. Practically, under the threat of insolvency, they searched for any solution that would mean a marginal benefit in the uncertainty environment. Some of those habits eventually played lucratively, which they kept leveraging reconfiguring them to the routines. Decision of adoption was taken according to cost, applicability, implementation rapidness and learning challenges. Renewing the competencies of the company and managerial decision-making, those technologies which supported business continuity and reflected on the numbers were kept in the knowledge base. The abandoned digital strategies, however, are already learned and taken for granted to be reworked as previous muscles in case of potential crisis.

Incorporating the findings from the previous theoretical framework, we designed a model for small businesses to contribute their ability to cope pandemic situations and anticipate strategy formulations for future crises management (Figure 15). The underlying strategy in the model considers growth opportunities are available for all types of companies, even if they have slow progress in digital transformation or DC leverage. The matrix defines areas of concentration for improvement points, and guide companies to decide where

to invest, to continue, or develop new organizational strategies. It has two axes: level of "digitalization" to be determined by comparison to strong actors in the selected business and "DC" as dominance level in the given factors of the previous analysis. The matrix classifies 4 areas with defined status and action plan to take on.

Figure 15: Strategy plan by leveraging digitally enabled dynamic capabilities during crisis.



Source: Own elaboration.

SEARCH GURUS: Digitally underdeveloped companies which are looking constantly for digital options with hesitant character to fully implement them to their routines fall into this group. Their limitations are derived from financial and human talent constraints, which position them to digitally transform their business for an upturn in benefits.

HUNTING OWLS: Differentiating from other birds, owls have two eyes on

the front, an anatomy which leads to a lack of vision with regards to other birds. Simultaneously, owls are one scarce type of animals who can have a 360 sight, turning their heads about 270 in each side, as a compensation for the loss. Companies in this group, likely, acknowledge their differences and formulate their own approach based on affordable resources. Their strategy should be directed on developing effective networks, financial capital, and human talent for a significant leap.

GRATEFUL EXPERTS: These are experts with a good management acumen while self-limiting their strategy. Benchmarking will help this group of companies to learn from comparatives and set a clearer strategy. Collaborative sources that reach partner organizations, customers, and even governments will provide open platforms to pursue sustainable techniques that transcends into all layers of the organization.

DANCING BOXERS: Best practice companies which redefine their business goals as they achieve them fall into this group. For achieving better outcomes, they should preserve their strategy and make innovation investments to foster new business line introduction and efficiency. Hurdles on the road may be cleared by communicating clear expectations to all employees, customers and partners to achieve success.

4.6. CONCLUSION

In our era, the constancy of uncertainty is the new rule, and reinvention of business models and work practices with substantial aid from omni-present digital technologies has now become routine. Hence, business literature must assess DC's relevance for survival through digitalization.

The theory proposed in this research focuses on the deployment of new digitalization techniques and their enablement into DC, under the influence of

uncertainty and competition. Covering a two-year time period after the first strike of the pandemic, the data structure includes four CWS company data gathered from explorative research based on semi-structural interviews and observations. We analyze the managerial strategies of these cases in pre and post lockdown periods of the pandemic, in terms of digitalization attempts, and how they leveraged them into their DC. The data structure we gain from the findings of the research is then modeled into a strategy map and reinterpreted for disposal of a larger cluster of firms within or beyond sharing economy context, which similarly are digitalizing to keep up with hard waves of competition and turmoil caused by crisis adversities and disruption.

Extending the knowledge about DC theory by providing empirical support from sharing economy components, we find that firms adapt into crisis environment by adopting digital technologies which lever them to strategic goals of visibility, customer engagement, organizational integration and change management. We also discover that in this process, perceived level of digitalization may act as a barrier in companies' further attempts and the managers need to be open to constant reconfiguration of their capabilities to rebuild assets and translate gained opportunities into their ability to sustain competitive advantage (Teece, 2007; Vial, 2019). A more comprehensive policy for all levels of companies on track would be to build their path toward digital maturity in a disciplined and systematic way, embraced with commitment, investment, and leadership (Forliano et al., 2023; Kane et al., 2021).

Our research is not exempt from limitations. First, while CWSs are among the key contexts for examining sharing economy industries' strategic decision-making during the crisis, the findings are generalized over similar small firms at the low ends of digital transformation. Technology adoption by the case CWSs below the expectations have also led to an early saturation in our findings. Basically, the small number of cases taking part in one geography drives us far

from generalizations. In different settings, these examples will be more variant.

This article targets practitioners who can relate to either dimension of leveraging digitalization and dynamic capabilities. However, it is important to note that our research specifically focuses on Coworking Spaces themselves and not small companies operating in coworking spaces. Therefore, managers may encounter limitations transferring the knowledge and findings to their companies, as a result of unmatching sectors or financial schemes. This question also reflects in the ad-hoc nature of the strategy model we develop in this paper, in effectively addressing the issues or goals of general industries, particularly in contrast to the thematic analysis presented in Figure 14, which covers as a more valuable contribution to the DC approach.

Also, for one case companies in which more than one manager existed, the information was reliant only to those managers partaking in semi-structured interviews. The likelihood of selection biased information has been generally attempted by researchers to be alleviated by including the information on company's blogs where more than one manager revealed their views. In either case, including more managers from a larger variety of companies reflecting a broader range of experiences and approaches would overcome such hurdles.

Nonetheless, we believe that further research in the same line covering variant geographies, also going into those places where technical capabilities are at different levels may feed the gaps which we leave open as a result of these limits. Also, complementary research questions may be raised to follow this study, concerning how digital maturity is related to size and managerial capabilities of the small businesses in sharing economy, and how the barriers should be broken to unleash better options. As well, the methodologies carried out by the small businesses to bend the learning curve during the implementation of new strategies will contribute to the literature, by indication of new practices to reduce the error rate in technology adoption and transfer.

"Life can only be understood backwards, but it must be lived forwards."

— Søren Kierkegaard

CHAPTER 5: CONCLUSION

This study focuses on the response mechanisms of small businesses to the pandemic's uncertainties and difficulties within the sharing economy framework, highlighting the leverage of dynamic capabilities and digital technologies, within the empirical setting of coworking spaces industry.

The main objective of the thesis is to answer the research question of *how digitalization affects the response strategies of small businesses of sharing economy in a crisis*. To this end, this study incorporates three main papers respectively:

> Chapter 2: A description of the strategy making and digitalization process of the under digitalized sharing economy companies during the COVID-19 period.
>
> Chapter 3: A broad definition of Dynamic Capabilities and Digitalization within the COVID-19 era, by a Systematic Literature Review methodology
>
> Chapter 4 A long term assessment on the impact of leveraging dynamic capabilities and digitalization supported with a roadmap for small businesses in the time of crisis.

Conglomeration of learnings is the principal asset of this study. The research implications have grown and matured throughout the rollercoaster-like chart of deaths and incidents of the pandemic. Throughout the years, two main methodological pillars of the analysis, the participant strategies and the academic literature trends reflected truly the unstable condition in the market and future expectations. This organic growth of knowledge within the research triggered both drawbacks and advantages. First, the uncertainty spilled its influence on every source of information, which could have steered the study in derailed directions. With that regard, the findings of the research required to be tested and retested throughout iterations until a saturated result was achieved. Likely, the academic literature was as slippery as the real-life experiment in the field. It

was very complicated to triangulate the findings within an extant body of knowledge. Some early published articles of the pandemic, mainly in 2020, celebrated very high citations, because they tackled the issues of the time trend. But it took years for scholars to supply more rigorous and universal findings to contribute with calmness to the body of knowledge.

This research also took both the advantage and the disadvantage of this live-and-learn psychology. This complication enabled us to find gaps in the knowledge base, by the experience of stumbling and falling over the hurdles. One outstanding example of those stumbles may be found in the research question for the systematic literature review (Chapter 3) of the thesis, which unexpectedly follows the descriptive analysis chapter (2). This literature review chapter was reviewed and rewritten three times. Each revision signaled new complications, with welcomed reviews from several research journals, until we complied with the final version.

In the very beginning, the research was designed to be built on the "Digital Dynamic Capabilities" factor, which is nowadays increasingly being used by scholars contributing to business literature (Heredia et al., 2022; Cherrafi et al., 2022; Van de Wetering, 2022). Remarkably, as we started the reading process, we saw the contradictory use of the digital and dynamic constructs in the articles of the pool, misleading by direction of relationship. This was an absolute problem which strongly affected the main Dynamic Capability analysis of the participant digitalization processes. That is, a deeper look to define the nature of relationship between these concepts was necessary, since the abundance of information in the literature was destructively unorganized. Hence, the Literature Review chapter's research question was revised so that it would address the way the final study should treat the direction and pave a safer way for future studies. In simple words, in the final paper should we claim: "Thanks to the dynamic capabilities, the small businesses could digitalize during the

pandemic and stay resilient?" Or, should we formulate the propositions as: "Digitalization helped the small businesses to leverage dynamic capabilities and stay resilient?"

Given this natural cognitive link in between, three papers follow each other by clearing any confusion or misleading information discovered during the sequence of analyses. Each is also linked to the next by generating new questions to be answered. In the remaining sections of this chapter, the main conclusions that can be drawn from each paper are discussed, comparing them with prior research in this area, together with the implications and contributions to business literature and practice. Last, some future insights to be derived from the thesis are proposed.

5.1. DISCUSSION ON THESIS FINDINGS IN COMPARISON TO PRIOR RESEARCH

The findings in our research revolve around the dynamic factors that characterized how coworking spaces adapted to uncertainty and challenges during a specific period (Table 23). The study draws on the Digital Capabilities (DC) view, particularly focusing on digital sensing, seizing, and transforming capabilities, as highlighted by Warner and Wäger (2019). The selected cases of CWSs aligned with this theory, although variations in conduct were observed. The main findings of the study are explained below (Table 24).

5.1.1. Crisis impact on digitally underdeveloped sharing economy industries

Initial impact started with government-imposed restrictions on health and social interactions, preventing customers from accessing coworking spaces. As a result, these spaces experienced a decline in customer visits and a subsequent decrease in revenue. The uncertainty surrounding the situation further added to the challenges faced.

Table 24: Thesis findings for research questions

Thesis Chapter	Research Question	Major Findings
Chapter 2	RQ1. How does crisis affect digitally underdeveloped sharing economy industries?	They are affected by customer and talent loss, increasing solvency risk, diminishing liquidity and resources. Lack of preparedness
	RQ2. How can these enterprises react to adapt to new conditions?	Meeting customer demand, finding new resources of customer development, maintaining internal control, and keeping the community vibrant are antecedents of managerial positive attitude to prioritize digitalization for coping pandemic adversities.
Chapter 3	RQ1. What is the nature of the relationship between the leverage of dynamic capabilities and digitalization?	A multidirectional relationship which puts dynamic capabilities or digital technology adoption as an antecedent, enabler or a substitute to the other, based on the requirements of the specific research.
	RQ2. How was this relationship implemented by the academic literature examining the COVID-19 pandemic?	Pandemic literature has made a shift towards consideration of digital technologies as an enabler of dynamic capabilities, manifesting in organizational outcomes which help to survive the crisis.
Chapter 4	RQ. How do small businesses in the sharing economy leverage digitalization and dynamic capabilities to recover from crisis adversities?	Collaborative innovation, knowledge agility, digital orientation, and organizational commitment in the digital adoption strategy of small businesses help them sense crisis adversities and strategic options for recovery. Orchestration in the organizational change, digital process management and alignment of these processes are vital for strategy to gain momentum. Such capabilities will be reconfigured into the whole organization by digital transformation of the business and expansion of the digital ecosystem. Perceived digitalization plays a crucial role in motivating small businesses to embrace an improvement path to leverage digital technology adoption and dynamic capabilities.

Source: Own elaboration

Furthermore, there was a shift in the customer profile as new work-from-home habits emerged. This necessitated regulatory changes for coworking spaces to create an environment conducive to attracting and retaining customers, aiming to recover from the previous losses. However, this also posed a challenge as they had to compete with digitally advanced coworking spaces, which had a larger presence in the market.

5.1.2. Reaction to crisis

As the pandemic progressed, particularly larger CWSs with greater financial capabilities, adopted more strategic and long-term effective digital tools. Changes in coworker types, such as the influx of domestic workers via digital channels, led coworking spaces to adjust their digitalization strategies. Additionally, even smaller spaces demonstrated efforts to control technology adoption through collaboration or seeking government incentives to acquire management software, highlighting the perceived importance of these tools despite resource constraints.

Based on the information generated in the qualitative analysis, it can be concluded that meeting customer demand, finding new resources for customer development, maintaining internal control, and keeping the coworking community vibrant are factors that contribute to a positive managerial attitude towards prioritizing digitalization as a strategy to cope with the adversities of the pandemic. These factors serve as antecedents that influence the mindset and decision-making of managers when it comes to embracing digital strategies. By prioritizing digitalization, coworking spaces aim to address customer needs, explore new avenues for growth, ensure effective internal operations, and foster a thriving community environment during challenging times. On the reverse case, if managers are hesitant to digitalization, they are unlikely to take any action towards new adoptions, or any strategies that require technology adoptions, but solely focus on bypassing the needs in the competitive landscape.

5.1.3. Nature of the relationship between the leverage of dynamic capabilities and digitalization

We build upon existing knowledge and theories to offer a comprehensive understanding of the distinctive nature of digitalization and dynamic capabilities in the context of our study. Our research emphasizes the unique roles and implications of both factors, highlighting their individual contributions to business strategies and resilience. In that vein, we propose a bi-directional relationship model between digital phenomena and dynamic capabilities.

The direction from digital phenomena towards dynamic capabilities: In the first direction, digital phenomena serve as an environmental requirement or challenge that necessitates the adoption of dynamic capabilities to achieve organizational goals. This is supported by previous studies highlighting the need for dynamic capabilities in response to the challenges posed by digital technologies. Specifically, during the COVID-19 pandemic, certain articles have discussed the use of specific digital technologies to address the adversities faced (Li et al., 2022; Chatterjee and Chaudhuri, 2022).

The direction from dynamic capabilities towards digital phenomena: On the other hand, the second direction highlights how dynamic capabilities enable the adoption of digital technologies and contribute to it. In this case, companies that have embarked on the digitalization journey during the pandemic have engaged in a process of learning by doing. Through this process, they have identified their fundamental needs to navigate challenging times and developed new practices to enhance resilience. This highlights the role of dynamic capabilities in facilitating the adoption and effective use of digital technologies (Forliano et al., 2023).

5.1.4. Impact of COVID-19 era on academic writing concerning dynamic capabilities and digital technology adoption.

Correlating this finding by quantity of papers in the research pool, we outstandingly detected a shift in the direction of the correlation between dynamic capabilities and digital phenomena due to the realities of the COVID-19 pandemic era. Previously, dynamic capabilities were described as a source of digital transformation, some capacities needed to be fostered so that companies could reach a digital maturity level. However, today's ubiquity of digital technologies has led to a new trend, intensified with the pandemic realities, where digital phenomena, such as technology adoption, digital maturity, and digital orientation, are not the end but the means to leverage dynamic capabilities.

5.1.5. Crisis recovery by adopting digital technologies to leverage dynamic capabilities.

Our finalizing study incorporates the preliminary findings of the previous chapters by highlighting the importance of strategy-making in the time of crisis.

Our findings may be summarized under the overarching dimensions of Digital Sensing, Seizing and Reconfiguring Capabilities, as nurtured by extant theorists (Warner and Wäger, 2019, Teece et al., 1997).

Digital sensing capabilities underline the importance of collaborative innovation, knowledge agility, digital orientation, and organizational commitment as essential components for the initiation of a change management approach. It emphasizes the significance of networking with peer organizations, understanding market prospects, and sharing information throughout the firm.

Digital seizing capabilities involve effective organizational change management in the digital adoption process and highlights the role of digital analytics, data governance, and robust business models in facilitating decision-making. They

emphasize the need to spread digital solutions and assess the return on investment of digital investments for growth.

Digital reconfiguring capabilities enable achievement of business continuity and growth by reconfiguring firm capabilities into routines and continuously renewing them through digital transformation and expansion in the digital ecosystem. The process requires standardization of acquired digital capabilities into business routines and transferring knowledge from IT talent to the entire organization. Data governance and the inclusion of digital analytics provide valuable information for making informed decisions, changing business scopes, and launching resilient multi-channel business models.

5.1.6. Impact of perceived digitalization

The concept of perceived digitalization refers to how small businesses perceive and understand the process of adopting digital technology and its potential benefits. Our research indicates that this perception plays a crucial role in motivating small businesses to embark on a path of improvement and embrace digital technology adoption, under the stress of environmental turbulence.

Small businesses are inclined to foster and employ dynamic capabilities, enabling them to adapt and innovate amidst shifting market dynamics, when they acknowledge their vulnerability resulting from insufficient digitalization. Conversely, if they perceive their digital capacity as satisfactory, it can impede their pursuit of alternative options that could potentially offer a competitive advantage. Accepting the need for further digitalization opens up opportunities for small businesses to explore new avenues and gain an edge over their competitors.

Table 25 visually demonstrates the distinct paths our research has taken compared to prior studies.

Table 25: Comparison table on thesis findings' advancements of prior studies

Reference papers*	Prior research knowledge	Thesis advancements on prior knowledge
Klein & Todesco (2021)	Pandemic crisis impact on small businesses, basically digital.	Crisis impact on coworking spaces, diversified by their level of digital maturity and resources
Grieco (2022)	Pandemic crisis impact on sharing economy.	Diversifying crisis impact on sharing economy components based on their digital development level.
Ceinar & Mariotti (2021)	Coworking spaces' reaction to pandemic crisis.	Coworking spaces' reaction to crisis by digital technology adoption, diversifying by their managerial resources.
Forliano et al. (2023)	Dynamic capabilities promoting digital technology adoptions in reaction to crisis.	Multidirectional relationship between dynamic capabilities and digitalization themes, potential fallacies that can occur by unaware use of previous models in academic research.
Guo et al. (2020)	Digital technologies and digitalization enabling and provoking dynamic capabilities to react to crisis.	Changing views on the direction of the relationship between two themes, towards taking digital technologies as an enabler.
Warner & Wäger (2019)	Micro foundations and impact of digital sensing, seizing and reconfiguring capabilities in environmental change.	Process and impact of digital sensing, seizing and reconfiguring capabilities leverage for small businesses in the pandemic and post-pandemic era.
Cabral & van Winden (2022)	Coworking spaces' reaction to pandemic crisis from the lens of DC theory.	Thematic analysis of digital technology enabled dynamic capabilities leveraged by coworking spaces during the crisis
Forliano et al. (2023)	Digital maturity and digital readiness as factors of organizational change in crisis.	Perceived digitalization as an impact of digital technology adoption.

* Among others incorporated in the manuscript.

Source: Own elaboration.

5.2. IMPLICATIONS

The research has several implications, reaching academics and practitioners.

The research is grounded in the theoretical framework of Digital Capabilities and aims to identify the specific capabilities that are essential for business continuity. In the face of uncertainties, businesses are required to embrace digital technologies, allocate resources for talent development, invest in technology adoption, and ensure organizational sustainability. The utilization of dynamic capabilities can accelerate these activities and enable businesses to navigate through challenges more effectively. By leveraging dynamic capabilities, organizations can enhance their ability to adapt, innovate, and seize opportunities in the digital landscape, thus facilitating their overall resilience and long-term success. We encapsulate these findings into a model which will enlighten the paths of practitioners. The model we have developed provides a framework for small businesses to enhance their ability to cope with pandemic situations and develop strategies for future crisis management. The model in Figure 15 classifies companies into four categories, each with a defined status and action plan. By understanding their categorization within this model, small businesses can identify their strengths and weaknesses, prioritize their actions, and strategically allocate resources to adapt, innovate, and thrive in crises.

Theoretically, the outbreak of the COVID-19 pandemic has led to a significant increase in research interest and publications that explore the relationship between digitalization and dynamic capabilities. The turbulent environment created by the pandemic, along with the isolationist policies implemented by governments, has provided a matching case for studying the impact of digital technologies on dynamic capabilities. While acknowledging that our research is not the first to recognize the relationship between digitalization and dynamic capabilities, our thesis contributes by providing a clear and explicit articulation of the difference between the two concepts.

5.3. CONTRIBUTIONS

This thesis empirically acts to fill in the gaps opened by the introduction of a new rhetoric of COVID-19 era, which has reflections both in crisis and strategy management literature yielding the following contributions:

Our research makes one of its largest contributions to the Dynamic Capabilities Theory, focusing specifically on managers' digital appraisal by mentioning managerial attitude to prioritize digitalization and impact of perceived digitalization, in different chapters. Theoretically, this shift of focus from resources to decision-makers acknowledges that even with similar resources, different managerial approaches can yield different outcomes, settling the distinction between Barney's (1991) Resource Based View which emphasizes the importance of resource heterogeneity (i.e., differences in resources among firms) as a source of competitive advantage. We, contributing to the Dynamic Capabilities Theory, introduce the concept of managerial heterogeneity - the idea that even when firms possess similar resources, they can achieve different outcomes based on how their managers assess and leverage these resources in digital technology adoption.

This study, as well, contributes to the theoretical development of Dynamic Capabilities by examining its micro-foundations, enablers, and technology substitutes within the context of the COVID-19 crisis. By doing so, we expand the understanding of Dynamic Capabilities (Teece, 2007, Teece et al., 1997; (Eisenhardt and Martin, 2000) in light of the challenges posed by the pandemic, contributing to better understanding the dynamic capabilities and crisis management, with a light shed on the digital coping mechanisms that revolve around the pillars of digital sensing, seizing, and reconfiguring.

To the best of our knowledge, this thesis is one of the first to argue neglected and misleading multidirectional causality of dynamic capability and digital technology terminologies in the literature by scholars. Our study stresses that

both propositions have the potential to be reliable, but they remain distinct from each other. These propositions suggest opposite directions, and our study provides robust evidence supporting these divergent findings. Having emphasized this distinction, this work is one of the first to bring into discussion the changing discourse in the way that these two constructs are being functionalized in the growing literature under the COVID-19 impact. In this way, we build upon the earlier studies regarding related topics such as "digitalization capability" (Annarelli et al., 2021), "Dynamic Information Technology Capability" (Li and Chan, 2019), and "dynamic capabilities for digital transformation" (Wielgos et al., 2021; Warner and Wäger, 2019; Cannas, 2021).

This is one of the first studies to pinpoint the coworking spaces as a digitally underdeveloped SME within the sharing economy. Sharing economy literature often revolves around the large companies like UBER and AirBnb, whose strategical attempts may easily convert into opportunities, especially in this kind of an extensive crisis (Gerwe, 2021; Grieco, 2022). Limited attention has been given to investigating the mechanisms of digital technology adoption in the context of CWSs as a component of the sharing economy, particularly among those with lower digital capabilities (Hossain, 2021).

Our study also depicts coworking spaces with their natural working procedure based on physical proximity and correlates this case to the new work-from-home and hybrid models introduced by the COVID-19 era, advancing the views of Lundgren et al. (2022). In many studies, the sharing economy components have been portrayed from an opportunistic view as a communitarian collaborative proximity for this period (Buheji, 2020; Ceinar &Mariotti, 2021; Micek, 2023). In that sense, this paper is one of the first in literature to argue the contradictory case of coworking spaces within sharing economy to be

challenged by the pandemic teleworking practices with special emphasis put into the adversities.

The impact of the pandemic on society has opened a new avenue for research, allowing for an investigation of previous models and generalizations in a novel context. This research aligns with the call made by Sharma et al. (2022) for additional entrepreneurship research that is embedded in a crisis environment. By that means, we contribute to the existing literature by incorporating the societal dimension of entrepreneurship into the analysis, a perspective that has been relatively unexplored.

Likely, in response to the call made by Kuckertz et al. (2020), we make a valuable contribution to the field by methodology, through our study that utilizes mixed methods. The most frequently referenced studies during the COVID-19 era primarily originate from the first year, which can be attributed to the limited availability of sources during that period. Consequently, these studies tend to be short-term in nature, providing a snapshot of a few months' duration. Our study, by that means, opens a wide perspective to see the long-term results of the strategies and decisions taken during the shock and uncertainty biased conditions of the era, as also recommended by Laaksonen and Peltoniemi (2018) due to the cumulative nature of the DC.

Starting from the first shocking year of pandemic, numerous articles were published. Scholars were put in a position to rely on instant studies to support their arguments, leading to a proliferation of studies conducted within a short timeframe. The abundance of cross-sectional studies in Chapter 3 data pool produces elusive evidence for this fact. Within this context, this study adopts a rigorous approach, ensuring a comprehensive and thorough examination of the subject matter. As such, one of the main contributions of this thesis is the valuable insight reflected on the business strategies of the era by a long-term

methodology of diligent and in-depth research avoiding potential errors that could otherwise arise from hastily conduct.

From a practical standpoint, we analyze the perspectives and approaches of managers in adopting digital technologies to navigate crisis disruptions, mitigate liquidity and solvency risks, and ensure survival. Practical contributions are achieved by stimulating the ways that the industry can be resilient to recover out of liquidity shortages and solvency problems, from the framework of small businesses. In this vein, the thesis puts forward a paradigm that offers guidance to small enterprises in navigating pandemics and devising effective crisis management plans. By that means, we answer the call by Belitski et al. (2022) which emphasizes the need for more studies in the context of COVID-19 crisis, analyzing the role of digitization and financial mechanisms supporting small businesses during crises.

Our paradigm takes into account the categorization of businesses according to their degree of digitalization and dynamic capabilities. In line with this, the research provides insights into the survival mechanisms employed by sharing economy companies in a disruptive environment, complementing the findings of Hu et al. (2023), Priyono et al. (2020), and Khlystova et al. (2022). The thesis as well builds upon Hossain's (2021) study by examining the digitalization practices within sharing economy companies, with a specific emphasis on those that have faced challenges or setbacks in their digital adoption efforts. We also contribute to the literature with identification of exemplary models for business scholars to follow when similar constructs are built in their studies.

Moreover, the study recognizes the significance of perceived digitalization in the decision to transition into a digital business and suggests that small enterprises with modest digital infrastructure can leverage their proximity to the community to initiate the digitalization process during an epidemic.

5.5. LIMITATIONS

Like any research, our study has certain limitations that should be acknowledged. Firstly, the qualitative and theoretical weight of the thesis necessitates a candid acknowledgment of its inherent limitations, restricting the ability to establish causal relationships definitively.

Expanding the number of cases analyzed could enhance the richness and depth of the obtained results. By including more cases, the study would have a broader representation of experiences and perspectives, potentially leading to more robust and comprehensive findings. The focus on a specific geographic location further restricts the applicability of the results to other contexts. Additionally, the lower-than-expected level of technology adoption by the cases may have influenced the saturation of our findings.

The use of convenience sampling, although practical for this study, may have introduced a degree of selection bias. Thus, the findings should be cautiously generalized beyond the sampled population.

The limitations of the study are also evident in the limited number of articles available for review, which may have restricted the breadth of knowledge extracted. This is parallel to the limited availability of diligent research specifically focused on the sharing economy business during the COVID-19 era.

In the systematic review paper, the reliance on a single source, Scopus, for bibliographic research further narrows the scope of the study and may have overlooked important insights from other sources. The interpretive nature of the research introduces the possibility of generalized conclusions based on subjective bias.

5.4. FUTURE RESEARCH LINES

For theorists and academics, our research implies a new perspective that highlights the strength of combining digital technologies and dynamic capabilities in research. The prevailing trend in literature to explore the interconnectedness of these two themes has taken a different direction during the pandemic, revealing discernible patterns in adoption. This offers an exciting avenue for further theoretical exploration and academic inquiry.

The main accomplishment of the systematic literature review is to effectively highlight and justify the difference between two different patterns in business literature involving a relation between digital technologies and dynamic capabilities. By clearly delineating their distinctiveness, we provide a valuable contribution that will influence future research on this extensively studied topic. This clarification is expected to guide and shape the direction of future studies, ensuring that similar cases are approached with a more nuanced understanding of the relationship between digital technologies and dynamic capabilities.

The thesis concludes by highlighting the need for further research to examine strategic decision-making in sharing economy businesses across different circumstances and regions. It suggests reviewing managerial skills, size, and digital maturity of small enterprises in the sharing economy and exploring methodologies to reduce technology adoption and transfer mistake rates. Overall, this thesis provides valuable insights into the digital adoption process and offers avenues for future research to enhance understanding and practices in the digital economy. For example, the role of digital technologies in maintaining the knowledge base and ensuring business continuity could be contextualized in an empirical setting to investigate their impact on organizational outcomes such as firm performance. Researchers could delve into levels of perceived digitalization and their negative and positive impact in selected organizational outcomes.

Conducting research in different geographical locations with varying levels of technical capabilities would help fill the gaps left open by our study. This would provide a more comprehensive understanding of the strategies employed by small businesses in different contexts. Additionally, the research need not root basically on the digital aspects: exploring the impact of non-digital measures and their compatibility in removing barriers could shed light on the effectiveness of different strategies. Studying the methodologies used by small businesses to expedite the learning curve during the implementation of new strategies would also contribute valuable insights to the field.

Furthermore, future research could delve into the evolving nature of dynamic capabilities in the context of the ubiquity of digital technologies. Examining how digital transformation impacts nature and characteristics of dynamic capabilities would be a fruitful area for exploration. The timing of publications was found to be an important factor in determining the direction of succession in the models, highlighting the need for longitudinal studies to capture the evolution of dynamic capabilities over time.

In addition, cross-sectional studies focusing on specific industries other than sharing economy and analyzing how trends in digital transformation and dynamic capabilities operationalize over time would enhance our understanding of these constructs. Exploring the relationship between digital maturity, the size of small businesses, and managerial capabilities within the sharing economy would provide valuable insights into the dynamics of digital adoption.

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As a spiritual inheritance, I leave behind no rigid texts, dogmas, or frozen and ossified rules. My spiritual legacy is science and reason.

Those who wish to embrace me as their own after I am gone will become my spiritual heirs if they accept the guidance of reason and knowledge on this fundamental axis.

— Mustafa Kemal ATATÜRK

Founder of the Turkish Republic

1881-193∞