Studies on Entrepreneurship, Structural Change and Industrial Dynamics

Bruno F. Abrantes
Jesper Lind Madsen *Editors*

Essentials on Dynamic Capabilities for a Contemporary World

Recent Advances and Case Studies

Springer

Studies on Entrepreneurship, Structural Change and Industrial Dynamics

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Editors

Essentials on Dynamic Capabilities for a Contemporary World

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To all the curious minds, relentless dreamers, and future shapers. This book is dedicated to you and your families.

In the realm of ever-evolving challenges and opportunities, you have shown an insatiable hunger for knowledge and a boundless passion for growth. Your unwavering determination and relentless pursuit of excellence have ignited the sparks of curiosity and reshaped the perspectives of dynamic capabilities.

To the students who have delved into the depths of dynamic capabilities, this dedication is a testament to your brilliance, resilience, and audacity to explore uncharted territories. Through tireless hours of research, countless late nights, and endless discussions, you have embraced the complexity of this captivating field and uncovered its hidden treasures. Your dedication to understanding how organizations can adapt, learn, and thrive in an ever-changing world is an inspiration to us all. The insights you have unearthed, the theories you have questioned, and the new frontiers you have discovered have pushed the

boundaries of our collective understanding of dynamic capabilities.

May this book serve as a beacon of knowledge, lighting the path for future generations of curious minds. May it foster a spirit of continuous learning, innovation, and adaptability within the hearts of those who seek its wisdom. To the students who dared to challenge the status quo, who embraced uncertainty as an opportunity, and who dared to dream beyond the confines of tradition, we dedicate this book to you. Your commitment to shaping a brighter future fills us with hope, for it is through your unwavering dedication and indomitable spirit that we glimpse the boundless possibilities that lie ahead. This dedication stands as a tribute to your brilliance, your resilience, and your relentless pursuit of greatness.

In the pursuit of knowledge and the exploration of dynamic capabilities, you have not walked this path alone. It is with the unwavering support, love, and understanding of your families that you have been able to embark on this remarkable journey. To the parents, siblings, spouses, and children who have stood by your side, lending an ear, offering encouragement, and providing the comfort needed during moments of doubt or exhaustion, this dedication extends to you. Your unwavering belief in the power of education, growth, and intellectual curiosity has nurtured the spark within these students and allowed it to flourish. Your sacrifices and commitment to creating an environment that fosters learning have played an integral role in their success. Your unwavering faith in their abilities and the strength of your family

bonds have propelled them forward, enabling them to reach new heights and embrace the challenges that lie ahead.

To the families who have supported, loved, and encouraged these students and the editors throughout their pursuit of understanding dynamic capabilities, we offer our deepest gratitude. Your presence has been an anchor amidst the storm, a source of inspiration, and a reminder of the importance of human connection and support. May this dedication serve as a tribute to the time, energy, and love you have poured into shaping these remarkable individuals. Your unwavering commitment to their growth has not gone unnoticed, and we acknowledge the profound impact you have had on their journey.

May your journey be forever blessed with the wisdom of dynamic capabilities, propelling you toward a future where innovation knows no bounds.

Foreword

It is with great pleasure and enthusiasm that I introduce this remarkable book on dynamic capabilities, authored by my esteemed colleagues in collaboration with their former students. As the Pro Vice-Chancellor of Niels Brock Copenhagen Business College, it is my pleasure two work with these two authors and thus experience in first-hand their unique approach to teaching and learning, by bringing real-life into the classroom.

The concept of *dynamic capabilities* has garnered substantial attention in recent years as organizations strive to thrive and excel in an ever-evolving and unpredictable business landscape. Through the lens of their collective expertise and experiences, this book offers invaluable insights into the intricacies of dynamic capabilities and their significance in today's dynamic world.

In the face of rapid technological advancements, globalization, and market disruptions, organizations need to possess the ability to adapt, innovate, and transform in order to stay competitive. The authors of this book have dedicated their careers to bridging theory and practice by not only teaching coming generations of business leaders but also studying and understanding the dynamics of organizations, helping to uncover the key elements that enable firms to navigate uncertainty and seize new opportunities successfully. Their collaborative effort, bringing together the wisdom of seasoned academics and the fresh perspectives of their former students, adds a unique richness to this exploration of dynamic capabilities.

What sets this book apart is its comprehensive and multi-faceted approach. It encompasses a wide array of perspectives, drawing on interdisciplinary research, practical case studies, and real-world examples. By bridging theory and practice, the authors have crafted a resource that not only deepens our theoretical understanding but also equips practitioners with actionable insights to cultivate and leverage dynamic capabilities within their own organizations.

The chapters contained within this volume delve into various facets of dynamic capabilities, addressing crucial topics such as sensing, seizing, and transforming opportunities, building organizational agility, fostering a culture of innovation, and developing strategic resilience. Each chapter is meticulously crafted, providing

theoretical foundations, empirical evidence, and practical frameworks to guide readers in their quest to enhance their organization's ability to adapt and flourish amidst uncertainty.

Moreover, the collaborative nature of this endeavor is truly commendable. The collaboration between esteemed academics and their former students serves as a testament to the enduring impact of mentorship and knowledge transfer. The exchange of ideas showcased in this book not only enriches the content but also highlights the power of fostering intellectual curiosity and nurturing the next generation of scholars and practitioners. As an educational institution, Niels Brock Copenhagen Business College takes great pride in being the connector between the authors and their former students, thus highlighting the core values of Niels Brock of providing up-to-date, contemporary education.

As you embark on this enlightening journey through the pages of this book, I encourage you to embrace the diverse perspectives and engage with the thought-provoking ideas put forth by the authors. Whether you are a scholar, a business leader, or an aspiring student, you will find this book to be a valuable resource that inspires and guides you in navigating the complexities of today's rapidly changing business environment.

I extend my heartfelt congratulations to the authors and their former students for their remarkable collaboration and their contribution to the field of dynamic capabilities. May this book inspire future generations to continue exploring and unlocking the secrets of organizational agility and innovation, ultimately paving the way for a more dynamic and prosperous future.

Niels Brock Copenhagen Business College, Copenhagen, Denmark
Charlotte Forsberg

Preface

The purpose of launching a book on the "*Essentials of Dynamic Capabilities*. . ." is rooted on the understanding of the contribution it could bring to both the academic and the business world. This is a book written with the collaboration of some of our under/postgraduate students, and essentially, for the benefit of those same ones participating in the project. Likewise, is a book for industry practitioners within the horizon of micro, small, and medium enterprises, including upstarting ventures, either unaware of the existence of such organizational capabilities discussed along the chapters or already struggling with the acquisition of some of those aptitudes. Hopefully, the reading of these chapters will shed some light into the concerns or doubts of their incumbents.

This is a project that Jesper and I began to "cook" in our heads around the year of 2020. Our educational backgrounds and areas of research interest being somehow intertwined, and furthermore, sharing a couple of courses at *Copenhagen Business College (CBC)* we decided to utilize this in our favor to launch a pilot project which would, ultimately, allow our students to showcase to the outside world their proactiveness and individual knowledge built along the studies.

It is known that immediately after the conclusion of tertiary studies, early graduates face, in most cases, the harsh reality of attempting to establish the initial links with the labor market. Normally, endowed with a limited professional network, work experience, and understanding of the cultural context of the industry's side, early graduates are left at their own chance and astuteness to, per se, create "bridges" with incumbents from other ecosystems (they are totally unaware of), and so, establish the foundations for grabbing a new job and initiate a whole new career.

Inexorably is, to say, that the initial job options and work experiences are, typically, career defining and indelibly mark the whole professional life along one's adulthood. In this context, graduates from the most popular scientific domains among the student's population, experience, often, an extra layer of peer competition at this stage topping up to the expected entry-level industry's scrutiny. One may dare to say, in addition to the former, that international students are even more vulnerable or challenged to overcome these entry barriers to set foot into the professional world.

Most higher education institutions (HEI) are well aware of the aforementioned and prepare their student pool in multiple ways possible, usually through job counseling, internship offering, extracurricular skills development, job fairs, invitation to conference, and other event's participation and alumni-targeted social events. In addition, many HEIs also monitor the postgraduation life, including the early graduates job placement. At *CBC*, the student support, particularly assigned to the "*Academic Support, Development and Student Success*" area, endeavors, to prepare students for the professional life, holding several events, some of them especially dedicated to senior students.

Hence, at the dissertation module level, Jesper and I decided to set up a support plan for students whose academic path was based on distinction or merit and to give them an opportunity to equip themselves with a tool for personal, curriculum, and reputational enrichment. One may well consider it a "reward" for high-achievers!

We have shortlisted over a dozen of senior students who had already delivered at *CBC* their final dissertations in one of the two educational programs: *Business Studies – Strategy Stream* or *International Business and Management*. Each one of those students had to recover their final dissertations written on single domain (i.e., Resource-Based Theory), update the content, and refine it to fit into a book chapter to be published in the same topic targeting industry practitioners representing the firm's typology aforementioned, and eventually, to be utilized by other higher education students (HES).

All potential contributors to the project were invited to an initial session where all the general information was provided, including the major milestones (and inherent deadlines) of the project. Further support was provided, namely as to repository access, literature search, academic writing, and referencing and a shared account was established in *Zotero* for the organizing of external sources and further referencing purposes. No one was allocated a specific editor, since absolute freedom was given to approach indifferently any one of the editors and discuss their own micro-projects.

A mandatory one round of internal assessment was established (applicable to all the proposed chapters) and to the subsequent proof-reading of the manuscripts. At the end, some chapters went through several rounds of revision and adjustments of content and the whole chapters were at the end jointly written by the original contributor together with one or both editors. Needless to say that the high involvement of the editors in the project led to the need to split roles between editorial coordination work and the fulfilling of other support tasks (e.g., screening of manuscripts; revision of data), and in addition to general guidance, the peer-reviewing of each drafts and feedforwarding comments for further improvement.

This was a very gratifying project, as we had the pleasure to bring onboard and interact with an outstanding pool of students from five different nationalities, with quite different ideas, interests, and even work habits. In sum, the project has exceeded our expectations and we are very glad to share the manuscripts with the audience of *Springer Nature*'s readers.

Lisbon, Portugal — Bruno F. Abrantes
Copenhagen, Denmark — Jesper Lind Madsen

Acknowledgment

We would like to express our heartfelt gratitude and appreciation to all those who have contributed to the creation of this book on dynamic capabilities. Without your unwavering support, valuable insights, and tireless efforts, this project would not have come to fruition. Your contributions have played an instrumental role in shaping this work, and we are immensely grateful for your involvement.

First and foremost, we would like to extend our deepest thanks to the students who actively participated in this endeavor. Your dedication, enthusiasm, and commitment to the study of dynamic capabilities have been truly inspiring. Your valuable contributions in research, analysis, and discussions have greatly enriched the content of this book. Your hard work and passion for learning have left an indelible mark on this project, and we are immensely proud of your achievements. Additionally, we would like to extend our gratitude to the students who had the opportunity to contribute to this project, but due to work obligations or research interests, were unable to fully participate. We understand the commitments and priorities that can arise during the course of a student's life. Your willingness to be part of this endeavor and your understanding of the demands involved in producing a chapter for this book are highly appreciated.

We would also like to extend our heartfelt appreciation to Copenhagen Business College, especially Executive Vice President Charlotte Forsberg and Dean Kathrine Lassen, for their support and guidance throughout this project. Their encouragement and belief in the importance of this topic have been instrumental in its successful completion. We are grateful for their valuable backing, which has greatly enhanced the quality and relevance of this book.

Furthermore, we would like to acknowledge the dedicated staff of the research library. Your unwavering commitment to providing the authors with the necessary resources, research materials, and assistance has been invaluable. Your expertise, professionalism, and willingness to go above and beyond to support our research have been truly commendable. We express our deepest gratitude for your invaluable contributions, which have significantly contributed to the depth and rigor of this book.

Finally, we would like to extend our gratitude to all individuals, organizations, and institutions that have supported us in various ways throughout this journey. Your time, support, and encouragement have been instrumental in shaping our understanding of dynamic capabilities and enriching the content of this book. We are profoundly grateful for your unwavering support and belief in our capabilities.

In conclusion, we are deeply grateful to each supervisor for the students who has contributed to the creation of this book on dynamic capabilities. Your support, dedication, and expertise have made this project a reality. We hope that this book serves as a valuable resource for future research and contributes to the advancement of knowledge in the field.

Introduction

One of the most prominent themes within the field of Management Sciences is nowadays the Resource-Based View/Theory (RBV/RBT) of the growth of the firm and most particularly, the subfield of Dynamic Capabilities View (DCV). This theoretical field advocates that organizations may acquire and/or develop particular sets of resources and utilize them (in a likely) effective manner becoming organization-like assets instrumentalized the ones accomplishment of strategic goals.

Hence, the RBV has weighed the notion of organizational assets, exploring it with time like an industry-specific tool for leveraging one's competitiveness and achieving higher profitability. Moreover, is established in a universal-like manner by RBV scholars, that the continuous utilization of those assets in their operations, and the underlying routinization of their usage implies an additional benefit, i.e. the gain of unique bundles of skills (know-how's) and capabilities (know-how's and know-about's) cumulatively reinforcing the ability to develop firm-specific advantages (FSA).

With this regard, the *dynamic capabilities (DCs)* explored in this book are, neither more nor less than, a particular subset of *organizational capabilities (OCs)* that gained traction with time mostly due to their connection to one's competitive-edge gains. Consequently, we ought to emphasize the importance of their acquisition/development and their wary administration. Nonetheless, seeking for higher/broader bundles of DCs does not entail through an "opportunistic" view of the markets, but a mindset (shift which is necessary for many organizations which requires) a gradual modification of the dominant strategic thinking of their incumbents.

The RBV is not about ethical adjustment of the firm to the business ecosystem, but rather concerned with a corporate-level strategic management topic, i.e. simply the "growth" of the firm. Their historical appearance on the business scheme was triggered by an antagonistic stance faced against the dominant reasoning of economic principles during the 19th century and beginning of the 20th century (briefly described below), in which business-owners/managers blindly accepted as the

magus of organizational success. However, a behavioral movement began to challenge their uncontested superiority, questioning the surrounding market's functioning and their impact at micro-level. This movement shook the classic ideas of "balanced competition" or "competitive equilibrium" or "equilibrium versus evolution." Inherently, their novelty confronted and disrupted the doctrine of Organizational Management at that time strictly preoccupied with "competitiveness"; thus, accepting the deterministic function of the markets on one's activities, value proposition, and wealth.

Such a behavioral movement, scholarly-led, implied an increasing valuing of the role of knowledge, skills, and abilities (KSAs) and explored the potential of their absorption/retention, building, and transformation into collective learning and so into new KSAs. Those new competences required the use of processes of reconfiguration and renewal across a spectrum of broad intangible capital units (e.g., human; informational; intellectual, or social).

In the second-half of the 20th century, the RBV gained form and in the last three decades, the DC phenomenon grew into an entire new field within the RBV, i.e. the *Dynamic Capabilities View (DCV)* with markedly steep growth in multiple latitudes: (1) covering a wide range of scientific domains; (2) garnering the attention of many senior scholars; (3) having achieved staggering figures of article's publications (including in ranked journals within the most renowned publishers).

Unsurprisingly, DCs notwithstanding its sub-categories, or geographical dispersion, or even its utility, have seemingly been rising in prominence to a "holy grail" status, since it keeps capturing the attention of a growing number of scholars, not solely scholars of the Organizational Studies and Management Sciences in core domains (such as Corporate Governance; Organizational Behavior and Design; Leadership; Strategic/Innovation Management), but also across other interdisciplinary and neighbor scientific domains in Social Sciences and even throughout other Natural Sciences' domains.

At this stage, the reader might wonder: *How did the RBV (and subsequently the DCs) become such a widespread theme?* The answer to this question takes us right back to the roots of the economic principles described above, so would need to go back, at least, and to the 18th century to build a more robust understanding of the validity of those economic thesis that leveraged the RBV.

Surely, the initial input was given by the cumulative interaction of the two key societal-economic phenomena: rural exodus and the industry revolution. Firstly, a rural exodus of land/agricultural workers toward the appealing city-life (and jobs) provided by the advent of an industrial revolution initiated in the 18th century, especially in countries like France or England (and rapidly spreading across other Western-European nations). This triggered the interest of the scholars at this time and so a first wave of Organizational Studies emerged, including the seminal contributions on the scientificity of work and a subsequent humanist view of it. Secondly, the demographic transformations occurred during that time together with the social conquests and advancements in labor conditions approximated capital-owners to the new proletariat industry class which also led to a second wave of studies in this field; furthermore, enlarging their scholarly horizon toward

other tangent scientific domains, and intertwining Organizational Studies with Sociology, Politics or Economics (e.g., the developments on labor sociology or sociopolitical economy) with particular concerns as to the distribution of income of capital and income of work. Thirdly, the rapid development of the Economics discipline pillared on the (pre-structuralist) principles of Price Theory, which, in turn, triggered the economic thinking toward the Market Structure theory, in which competitive "equilibrium" became a cornerstone of. Fourthly, based on the latter (theory) which established itself as the primer for future thesis shall be outlined the appearance of an opposing movement centered on the competitive behavior. In such a movement, that rejected the static nature of traditional profit maximizing analysis, authors as *Joseph Schumpeter, Josef Steindl,* or *Israel Kirzner* emerged and became a bastion of, during the beginning of the 20th century, advocating the key role of innovation and entrepreneurship in the competitive paradigm. Fifthly, the emergence of a first inside-out approach of business competition advocating "resource-possession" as a way for companies to control their future growth. Fifthly, the joint contribution of a large number of scholars holding the discussion of modern resource-based theories alive (and pushing its boundaries further), from brilliant authors in this domain as *Edith Penrose*; *Birger Wernerfelt*; *Richard Rumelt*; *Sidney Winter*; *Daniel Levinthal*; *Jay Barney*; *Gary Hamel; Shaker Zahra*; *Kathleen Eisenhardt*; *David Teece; Margaret Peteraf;* among several others.

One might well claim that the RBV, and herein the Dynamic Capabilities View (DCV), descend from the contributions of Economic theory, specially the Harvard School of thought led by *Edward Mason and Joe S. Bain*, and subsequently, by the new Austrian School of thought and the even more by the influential Chicago School thought led by *Frank H. Knight, Milton Friedman,* or *George J. Stigler.* Though, the neoclassicism of the Theory of the Industrial Organization (IO), dominated by the perspective of Structuralism, was thought confronted in the 1950s by the *Penrosian* view of the growth of the firm which established, what one recognizes nowadays as, a primary RBV-type of reasoning. The latter, abandoning the view of market structures and competitive equilibrium (deriving from the well-known *Marshal*'s dilemma and influencing decisively the formation of an SCP paradigm) being deterministic of firm-level performance, recognized, furthermore, the resource-ownership's singularity as a key factor in the dynamics of competition for the achieving of above-average returns (a.a.r). Thus, an IO model of a.a.r. faced since then the antithesis of a resource-based model, commonly denominated as the Resource-Based View (RBV), which growing relevance with time, managed to incorporate seminal other concepts and grow in volume and scope, assuming new seminal ideas, such as the notion of core competences (CC) or the dynamic capabilities (DC).

Despite sharing the same etymology and even a complementary nature, these two constructs (CC and DC) are two separate phenomena. Core competences refer to industry-specific capabilities positively adapted to the market dynamic, meeting the key success factors of competition. Dynamic capabilities have embedded the properties of the former, being moreover associated with an ability to deliver long-term superior competitive advantage gains and alike performance gains. Inevitably, the second (DCs) are surrounded of a most robust morphology, and consequently,

garnered a higher attention of academics, particularly concerning the DC deployment and transferability (as *C.K. Prahalad; Will Mitchell; Venkat Ramaswamy; or Yadong Luo*—again, among others, including some already mentioned above). Indeed, these capabilities were on the origin of various spin-off views of the RBV, such as the knowledge-based view (KBV) or the technology-based (TBV) placing emphasis on particular attributes of some capabilities with an assumed superiority over the others.

Yet, distant to the specificities of the epistemological stances of these descendent views, the emergence of the Dynamic Capabilities View (DCV) explores firm-specific advantages (FSA) on a given industry, as valuable units of assets but sparsely found in other firms. Its rarity is accompanied by a difficulty-to-imitate, deriving from a high cost-of-imitation and a causal ambiguity effect seen in the complexity-to-imitate them a well. At last, their uniqueness is rooted in structural, cultural, and human capital features which are organizational in particular and which signals are somehow codified in organizational practices and embedded in shielded business process language.

Inevitably, what one may observe is a debate on DCs vastly academic-driven (tautological or not—as claimed by some) and academic-centered, from/to tertiary education postgrad students and researchers with the lower involvement of industry practitioners (namely for spreading the potential of industry-research avenues) and disseminating its fundamental ideas regarding the morphology and deployment of DCs. Nonetheless, from our point of view, a philosophical, theoretical, or empirical debate about the organizations, and for their benefit, requires invariably the joint effort of all stakeholders, from public to private sectors, from startups to large enterprises, professional associations, unions, (and federations/confederations), plus the authorities, regulators, investors, consultants, suppliers, buyers, employees, including all gravitating entities many times unseen as the incubators and accelerators in upstarting ecosystems, business angels, and inevitably the companies' representatives.

Typically, organizations tend to be left aside in research activities leading to knowledge development in this area and in the respective forums of debate of the topic. However, this book aims to fight this trend and some inertia. The book is specially conceived for the readers in the industry, working with and for the industry/ies, as researchers, (conscious) employees, strategic leaders, corporate entrepreneurs and intrapreneurs, middle and line managers, shareholders, senior/top-managing teams and advisors, executive boards/committees, members of a board of directors, board of management, board of trustees, including all the ones with non-executive roles in the organization (and furthermore with an advisory or freelancing consultancy role). The debate about DCs ought to be an inclusive one, hence, we invite furthermore other scholars to have a go, reading the different chapters of this book, which addresses separate topics within the DCV.

Curiously, a few years ago one of us were subject of a question involving the adoption of capabilities by a family firm, being symptomatic of this distancing between academia and the industry: *What are the exact number of competences my parent's company should develop to grow faster?* The ingenuity of this question,

foresaw, first, that one had "discovered the wheel." Undoubtedly, we did not discover any magical solution for all companies' desires and encompassing all market conditions, otherwise, we would have already been converted into the "magus of contemporary management." The question of this student missed a few things. Firstly, missed the bottom-line issue (*what is DCV about*?), which inevitably is a stance on the philosophy of management, empowering, at firm level, business-owner and managers to focus on organic growth, using inside-out approaches and privileging the aspects of competition they might rather control (against other they do not)—as their goals, resources, vision, values. Secondly, if naturally there is not a one-combination only of the capability-bundles that may fit all normative or utopic scenarios of firm and market expectations to make the first successful. Thirdly, there is also not just one-combination only of the properties or traits that a capability might hold. In short, the question above appealed to an answer that would tranquilize the need for human control of the uncontrollable business environment, which companies are a part of but that could not be answered.

Our recommendation to the reader who foresees an immediate application of those DCs contained in the chapters to his/her own professional reality is to not take the lessons from this book in a literal way, but receive it with some common sense (as required in managing anything in life), accounting always the focal firm's context. Consider the set managerial, entrepreneurial, and technological capabilities described in these chapters as critical for the company's future and for each strategic business unit (SBU) in separate, but not solely "the ones" one may require to succeed. An RBV model of growth is not a ticking of boxes, as an exercise of competence's check (and that's it!) but a philosophy of management, which applicability requires an accompanying strategy and structure in place: For instance, is pointless to develop competences if one manager dictates the rules of what/when/how to do things and is also useless the resource accumulation of intangible KSAs if one is tied to an overloading routine of work. Interpreting the DCV with some medical gaze requires looking at the virtues of a dynamic organization driven for change and by all.

Jesper and I, we are absolutely convinced that there´s no idea-generator without these thoughts:

What should I "know" to transform my idea into a business concept?
What does my firm ought "to know" to survive the competition pond?
How can my business take-off and thrive…?

The same thoughts circulate a little through all over the world, especially in the heads and hearts of who runs a small or family business, but surely throughout all types of organizations, as cooperatives and other forms of entities with direct intervention in the economic activity whether or not running maturely installed companies of different sizes. The questions are always the same:

How do I leave behind my sluggish performance?
What should I do to release the firm from tight and dominant competitors?
How may I contribute more to my customer-base and/or to the community?

The answer to such worrisome within the DCV is: upskilling, upskilling, and. . .upskilling! Refresh (core) competences and adapt to the ongoing change. In this context, we have gathered a set of chapters addressing various key organizational (dynamic) capabilities, with a narrative holding a type of language and terminological accessibility inclusive of all readers with a different background. The title of the book says everything, is all about the "*Essentials on Dynamic Capabilities for a Contemporary World.*" Hence, we garnered different types of managerial and entrepreneurial capabilities. These topics are divided into two parts:

1. Part 1 (Managerial capabilities):
   It contains chapters discussing several managerial capabilities, as follows:
   - Strategic adaptation; change readiness; knowledge management; financial skills; or business-models' circularity
2. Part 2 (Entrepreneurial and Technological capabilities):
   - Artificial intelligence; blockchain; operational efficiency; or platform-utilization

We ought to highlight these are not all "the" hot topics for the contemporary management of an organization in the 21st century (nor all the capabilities required by a firm), but are certainly a short selection of some of the most essential topics, with a narrative and content presented at an introductory level, which hopefully will contribute to a better firm's future, as to the avoidance of outside-playing or wasted potential to seize competitive and relational opportunities. In sum, we are hitting in this book to assist organizations defeating some extent of myopia, inertia, or strategic drifting.

Contents

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Chapter 8

Strategic Adaption (Capabilities) and the Responsiveness to COVID-19's Business Environmental Threats

Christoffer Hansson and Bruno F. Abrantes

1 Introduction

Unexpected changes happen out of a sudden and pivot the playing field for organizations. This is self-explanatory since it is "unexpected." One may however wonder if it is possible to prepare for these unexpected changes. This chapter delves into the organization's strategy realm, and herein into Strategic Flexibility to cope with critical market dynamics, as uncertainty or unpredictability:

> *How much (or little) does an organization commit strategically to build (a rational) response to adapt to the EBE?*

We argue that COVID-19 holds, both, a corporative warning to senior managers and a lesson to be learnt in relation to sudden external environmental changes (as COVID-19). The disruption caused by multiple and accelerating (in number and effect of) changing events has drastically changed the environment for today's companies (Abrantes, 2020). In addition, it does not even show any tendency to slow down (Weber & Tarba, 2014). Much of this can be alluded to globalization and technological advantages, which have led to more transfer of knowledge and new customer patterns (Vecchiato, 2015). Due to globalization, we have seen an increasing amount of foreign competition, which is now a severe threat to an organization's home turf (Hitt et al., 1998). Even internally organizations experience changes as

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pressure from their employees is forcing the organizations to be adaptive as a response to the market (Nejatian et al., 2019).

Today's leaders are, therefore, witnessing new rules to play by to put their organization ahead of competition. The combination of technological advances and globalization has resulted in a blurring line between where industries fit in. Furthermore, this shows it has become increasingly difficult for companies to analyze their surrounding environment (Hitt et al., 1998). However, COVID-19 became certainly the utmost familiar term in the manager's lexicon, as an external business environment (EBE) concern, unthinkable until the outbreak (Jacobides & Reeves, 2020).

This research explores the precautionary routes organizations may follow to be more sensitive to EBE kinesis, more aware of emerging changes, and more prepared for outer phenomena highly impactful on the organizational routines. A myriad of strategic concepts surrounding the adaptation to EBE changes (as presented in Sect. 2) is accompanied by an empirical testing based on the collection and manipulation of qual data from industry practitioners from the business-to-business software industry to provide insightful perspectives into the current reality.

Nonetheless, previous studies assert that organizations are building a gradual awareness of the importance of developing new (or renewed) knowledge, skills, and abilities (KSA) to comply with the natural and social dynamics of the outside world, which is an endeavor understood as something to be embraced beyond the technological and (global) synergistic awareness (Nejatian et al., 2019).

Such corporate openness, regarding the up-/reskilling of KSAs and so the upgrading of human capital to respond to a world in constant mutation society, perceives inertia (or institutional isomorphism) as the major negative cause of the organization's unpreparedness in such context. This requires a transposition (and materialization) of such openness of the corporate thinking into an effective renewal of the strategic design/s for the future. This becomes even more apparent when companies either thrive (by adapting) or perish (by drifting). In the latter case, getting relegated to the periphery or condemned to exclusion (Nejatian et al., 2019). It has, therefore, never been as important as now (as COVID-19 had the virtue to bring it to the spotlight) the fashioning of flexible business models associated with (corporate/business/functional/operational) strategies that assertively cope with volatility, uncertainty, complexity, and ambiguity (VUCA) in the EBE. This is an urge for today, and so can the firms navigate in this new playfield, both in the short and long term (Hitt et al., 1998).

Isolating here a single event (COVID-19) and abstracting ourselves from the rest of the remaining threats in the world (as a hypothetical exercise), this event offers per se a rich scenario for testing flexibility and the ex ante preparedness of the firms. On March 11, 2020, the World Health Organization (WHO) announced COVID-19 as a world pandemic. This event shook the Western world that experienced unpredictable spillover effects on multiple societal quadrants, namely a new economic crisis (WHO, online). As an external environmental event with unpredictable contours to the general public (thus, one could not possibly anticipate) contrasts highly to the apparently more predictable ones, as the globalization and technological trends

discussed above, raising other uncertainty-related challenges to the incumbent side, forcing organizations to reflect upon strategies and practices or revise current business models.

With COVID-19, the uniqueness of its context making an ideal setting for a study of such kind is the scale of challenges (broader in *scope* and with immediate *impact* than others), and thus adding an "urgency trap,"[1] requiring a swift response from each and every organization, as never seen before (Jacobides & Reeves, 2020). The solution drills downs to a baseline of fundamental capabilities firms need to own within the category of strategic adaptation (alias, *environmental awareness* and *patching*). However, both are time-sensitive (capabilities) and connected to a psychological quirk as if an inverse urgency-importance reward system was set in place (the "*mere-urgency effect*"). This uncovers the fact that urgent-solving tasks are the low rewarding ones, but the importance of these dynamic capabilities is high since their possession is preparatory for building a further absorptive capacity to adapt to other scenarios alike.

Over the last years, four different strategic concepts have reaped a fair amount of attention from scholars. *Strategic Adaptability* is the oldest concept and has mainly been researched by Miles and colleagues back in 1978, while *Strategic Agility* is argued to be the most contemporary one (Miles et al., 1978; Weber & Tarba, 2014). In between, *Strategic Flexibility* emerged mostly in the 1990s through the effort of researchers such as *Donald Gerwin*, *Ron Sanchez, Michael A. Hitt*, *Barbara W. Keats,* and *Samuel M. DeMarie* (Gerwin, 1993; Sanchez, 1997; Hitt et al., 1998). Approximately, at the same time, *Constantinos Markides* opened a broad new research avenue toward *Strategic Innovation* (Markides & Anderson, 2006, Markides, 1998).

Often, one hears in the organizations this terminology (Strategic Innovation, Strategic Agility, and so forth) being interchangeably applied with an unwarranted purpose to explain the corporate state of mind and postulations of being "agile," "innovative," or "flexible." Despite their commonalities (which terminological similarity seems to confuse business practitioners), most of the previous research has focused on one or a maximum of two of those subjects. Therefore, there is a recurrent research gap as to the boundaries, thresholds, complementarities, and commonalities of these conceptions, as to the way they connect at a more holistic level given.

This chapter aims to understand the association of the four strategic concepts (Adaptability, Agility, Flexibility, and Innovation) and their relevance for coping with or solving EBE threats. The knowledge derived from it can serve as a foundation for how organizations can adapt to a sudden external environmental change in the form of a pandemic, more specifically COVID-19.

The first aim is, therefore, to investigate how organizations work with different strategic concepts. Further breaking down into objectives it will first analyze how organizations work with their strategy in relation to the strategic concepts and then

[1] Idea withdrawn from the *Eisenhower framework* (or Urgency-Importance Matrix) written in 1961 by *Dwight D. Eisenhower.*

examine how organizations stay aware of their external environment and how they choose to adapt to it. The second aim is to gain an understanding of how COVID-19 as an unpredictable external environment affects the organizations. This is related to the objectives to examine the possibilities for an organization to be better prepared for an unpredictable happening and determine whether organizations can benefit from being prepared for external changes ahead of time.

2 Business Environmental Change: Four Key Dynamic Capabilities (DC)

2.1 Strategic Adaptability

The majority of today's organizations engage in processes of evaluating their external environment. At the same time, they have to manage their internal interdependencies. This two-sided pull results in a big challenge for the organization as it needs to find a way to handle the complexity and find a balance between the internal and external environment (Miles et al., 1978).

The balance in handling these factors leads to Strategic Management, explained by Chakravarthy(1982, p. 35) that "Strategic management is the process through which a manager ensures the long-term survival and grow." Ultimately this points out the big struggle for today's leaders. The big external changes in the environment are happening at an increased pace, resulting in a more difficult task to adapt. Therefore, effective organizations manage to cut out a piece of the market for them and establish procedures to complement their market strategy (Miles et al., 1978). Additionally, one of the important areas of Strategic Management is to optimally manage the company's own resources in the form of material and organization to find a balance between both and avoid misfits (Chakravarthy, 1982). This leads to that organizations primarily have two choices for their focus to address the environment. On one hand, they can have an external focus and benefit from the ability to adapt to the changes that appear in their market. On the other, they can have an internal focus, instead of setting their sight on a more niche market, but this will be at the expense of their ability to adapt (McKee et al., 1989).

Miles et al. (1978) showcase that there are four different strategy types that every organization can be attached to—Defenders, Analyzers, Prospectors, and Reactors. Overall, the greatest number of companies adopt a Defender strategy, while Reactor is the least favorable one.

Although in reality companies do tend to have a mixed approach across their different organizations (Abrantes & Venkataraman, 2022, Abrantes, 2020; Pleshko & Nickerson, 2008).

- Defenders: Focuses on a specific area of the market where they can create a stable presence, mainly by focusing on producing a limited number of products for a more specific segment. Through this, they show tendencies of ignoring trends and

developments outside their own business area. This may cause some risks in the form of ineffectiveness since their niched focus makes them vulnerable to strong market shifts.

- Prospectors: Reacts in a different way than Defenders as Prospectors' success comes in finding and developing new products and markets. They strongly value and emphasize their role as an innovator, sometimes even sacrificing their profit to maintain their innovative status. Since they are scanning through different environments and trends, they also need to stay flexible. This potentially causes some issues during a stable world with no major external changes as the investment made to stay adaptable will not bear any fruit.
- Analyzers: Positioned in between Defenders and Prospectors, they wish to find a balance and utilize the best of both worlds—low risk and high reward. Rarely operates with the first move and instead enter a market when it has proved viable. Through this, they imitate the successful penetrators, Prospectors, while also holding on to their stable set of products.
- Reactors: Where the other three all work in a proactive way to find their winning strategic and stable move, the Reactor instead functions in an unstable way. Usually, this is a result of drastic shifts between previously mentioned strategies or trying to go for both of them. Over time, however, this strategy is not feasible, and organizations need to decide and settle for one of the previous three strategies.

These companies can also be seen operating in different clusters and states—*unstable, stable,* and *neutral*.

- Unstable state: Is where Defenders operate and shy away from the environment. Usually, they can in the short term show good results, but during the long term they are a lot more vulnerable.
- Stable state: In contrast to shying away, these companies are instead open to the changes created in their environment. Analyzers operate in this cluster, and although they do not create changes, they react swiftly.
- Neutral state: These companies have either anticipated the environmental changes or are highly prepared through investments made to be ready. This is where the Prospectors operate (Chakravarthy, 1982).

Moreover, McKee et al. (1989) have tested these strategy types in relation to the application to market–strategy formulation. They suggest that the analyzer strategy would be favored whenever the market is mildly unstable but may not be when it is characterized by highly unstable markets. When operating in a volatile market, a flexible approach proved to be more successful, with the exception of when a market was highly influenced by negative forces. These differences force organizations to find an appropriate and suitable position in order to find a strategic fit toward its environment (Johnson et al., 2008).

Oktemgil and Greenley (1997) further prove that highly adaptable companies grow more when they operate in stormy environments. These companies also impact the market and customer behavior through their effectiveness to a further extent.

Furthermore, Analyzers appear as the most successful group in both terms of adaptability and performance. The second best in performance, Prospectors, only slightly beat out to others (Pleshko & Nickerson, 2008).

Prospectors and Analyzers also appear to compete for the same customer group, while Defenders and Reactors show similar traits in how they limitedly operate the markets. At the same time, a higher market orientation is often connected to above or on-average growth markets, which are the usual case for Analyzers and Prospectors (Lukas, 1999).

In order to keep up with the external focus, there is a large amount of activities needed to stay adaptable, for example, monitoring rivals, markets, pricing, and product development. This will come at a higher cost for companies, possibly limiting the amounts of actions the organization may take (McKee et al., 1989). However, further research shows that adaptive capability does not always have to be overly expensive. Organizations need to keep in mind that the result of higher performance can create business advantages that prove more valuable than heightened costs (Oktemgil & Greenley, 1997). These organizations can easily thrive and survive if they can handle the higher complexity of the environment since it shows a higher level of adaptiveness (Johnson et al., 2008).

2.2 Strategic Agility

One of the most difficult tasks today is to create a strategy for the future. The paradox is that companies become unsuccessful because they are doing what is right for too long time. Their once-successful business model has instead become a heavy burden that overstays its benefit, making it even a bigger challenge for previous successful companies (Doz & Kosonen, 2010; Vecchiato, 2015). This further shows the importance of transforming a company faster to meet global competition and face the disrupting tendencies (Doz & Kosonen, 2010). Strategic Agility is, therefore, more about inventing new models of business and less about regrouping old products or categories (Weber & Tarba, 2014).

Weber and Tarba (2014) explain Strategic Ability as "the ability of management to constantly and rapidly sense and respond to a changing environment by intentionally making strategic moves and consequently adapting the necessary organizational configuration for successful implementation," showing it is a combination of leadership knowing the direction for change and planning resources accordingly AND having an organization with the layout to implement the imposed actions.

Tying to the introduction, companies experience extreme difficulties to anticipate the unexpected, which often results in too late responses (Doz & Kosonen, 2010). These challenges are often alluded to the vast number of indicators that could be enabling and how they connect to each other. Therefore, it is crucial to find out where to find necessary indicators and prioritize them to not invest in improper areas since this might even block organizations from obtaining Strategic Agility (Nejatian et al., 2019).

Complementing the need and action surrounding business models, the information technology (IT) landscape also is proven to be an important part of Strategic Agility. Connections in the intranet and ERP systems are important pieces that enable organizations to succeed as it is crucial to support employees with the right tools. Employees, therefore, need to be viewed with importance by managers and be provided with relevant resources to obtain new and improved knowledge (Nejatian et al., 2019).

The reason why Strategic Agility is important today according to Doz and Kosonen (2010) is that "Strategic Agility is most obviously a keystone to having the ability to transform and renew business models." It will give organizations a more precise and correct view that fits external and internal systems since they are becoming aware of their environments in time to take necessary action. Through this, organizations can prevent an eventual strategic drift. Strategic drift is the phase when organizations focus too much on internal and earlier historical strategic successes while not being aligned with the environmental changes, which ultimately makes organizations much more vulnerable to outside threats (Johnson et al., 2008, pp. 179–182).

2.3 Strategic Flexibility

The increased powers coming from the new competitive landscape force organizations to be more flexible than ever. In response to this, Strategic Flexibility explains how an organization can act in a proactive way as well as rapidly respond to the changes in the market and thereby succeed (Hitt et al., 1998; Herhausen et al., 2021).

According to Sanchez (1997, pp. 71–72), Strategic Flexibility is "the condition of having strategic options that are created through the combined effects of an organization's coordination flexibility in acquiring and using flexible resources."

Especially important in the organization is the strategic leadership. Strategic leadership shows the necessity that the top management leaders need to both have knowledge of transformation and vision while providing inspiration to gain commitment through the whole organization (Hitt et al., 1998).

Without this, history has shown that previous successful leaders tend to focus on remaking their previous strategies that proved to be successful earlier, only to result in failure due to the changes in their work (Shimizu & Hitt, 2004; Herhausen et al., 2021). Other examples of failures are that companies have become too big and underestimate digital technology, the advantages it brings, and change the industry. The importance of rightful strategic leaders becomes more apparent as otherwise leaders often show to be unable to swallow their pride and admit something went wrong. Instead, they are determined to put more money to make it work, which often only results in lost time and investments (Shimizu & Hitt, 2004). In worst cases, even following an old way of optimizing might over time make it increasingly difficult for organizations to respond to the external environmental factors (Sanchez, 1997).

Hence, leaders need today to gain awareness of the changes and know more about the differences between the stable environment and unstable environment. An unstable state is often caused by a random event, which in turn is an occurrence that is impossible to predict. This leaves the leaders to use their foresight to meet the changes and help guide the organization through this uncertain time. For the leaders to be successful with this, they need to be accompanied with an organization proving it is flexible enough to make effective changes in a quick manner (Hitt et al., 1998). If organizations prove to be flexible enough, they can obtain advantages since they can quickly shift between strategies, creating business advantages against competitors (Cingöz & Akdoğan, 2013). Additionally, Strategic Flexibility does not always have to be viewed as a defensive approach toward adapting to uncertainties. It could also successfully work as a strategy to enforce uncertainties toward the competition (Gerwin, 1993).

Meanwhile, it is also important to not be overly flexible, and this balance is needed to be dealt with grace (Gerwin, 1993). To sum up, organizations need to find the balance between creating new competencies while also making the most use of the existing knowledge and resources and using these resources within the flexibility of the organization (Sanchez, 1997). One way to help solve this balance is that "shared decision-making across an organization appears to be crucial to promote Strategic Flexibility" (Herhausen et al., 2021).

IT helps companies both with product development and gaining insight about the outside market in order to be more responsive in a quick manner toward the market. This further proves its potential to be helpful and beneficial to companies by restructuring the IT resources in order to minimize the disadvantageous (Chen et al., 2017). Further, Chen et al. (2017) show that research on IT alone does not provide for Strategic Flexibility, but it enables companies to adapt and change over time. For organizations that are working in an ever-changing and unsecure environment, it is therefore crucial to have correct support from IT since it will help gather and analyze information while providing dynamic capabilities.

In short, two types of company strategies can be identified in accordance with its Strategic Flexibility. Either they hold a high or low focus on Strategic Flexibility. Simultaneously, these can be put into either high or low macroenvironmental activity, creating four typical scenarios.

- Organizational scenario 1: high flexibility in a high-turbulence environment (HF → HT)
- Organizational scenario 2: low flexibility in a high-turbulence environment (LF → HT)
- Organizational scenario 3: high flexibility in a low-turbulence environment (HF → LT)
- Organizational scenario 4: low flexibility in a low-turbulence environment (LF → LT)

From a short-term view, investments made into resources might affect the performance of organizations' strategic choices. In other words, if a company follows a high-flexibility approach during a low-turbulence environment, its

performance will decrease (scenario 2). In the same way, the reverse—a low-flexible organization in a high environment will also see decreased performance (scenario 3). This also shows that scenarios 1 and 4 will see an increased performance due to being better in synchronizing between strategy and environment, with a small advantage for scenario 4.

However, this changes slightly over the long term. Companies in scenario 2 will suffer even more by being low on flexibility during a highly turbulent environment. Absolutely best will instead be scenario 1 as it has been prepared to handle these types of changes. Scenarios 3 and 4 will in turn see no real influence on its performance. This shows that organizations adopting a high Strategic Flexibility will over time be better prepared for future external changes. At the same time, it may be dangerous for organizations to be cradled into a false security as a low approach to Strategic Flexibility in the short term might work, but in the long term it might hit them hard if the macroenvironmental changes are high (Johnson et al., 2003).

2.4 Strategic Innovation

Innovation works today as a competitive advantage for companies, no matter if it is from a managerial or technological point of view (Ion & Cristina, 2014). However, history is fertile in examples of business success and failure with similar ideas on how to be innovative about their strategy, but one became successful and one failed miserably. The key difference is for companies to deliver value to the customer while also being aware by keeping down costs (Markides & Anderson, 2006). Usually, you find innovation strategies in industries that are more dynamic, where either technological change or newer products emerge (Miller, 1987).

Successful organizations succeed when innovation is focused primarily on value and not efficiency, putting the customer at the forefront. This, however, does not mean that they are slow when it comes to IT. Successful organizations have shown to be early adopters of technology within their industry either by looking outside their industry for inspiration or even creating it themselves (Markides & Anderson, 2006). In order to create new strategies, top management needs to step aside and let new voices from previously unheard groups be heard. Finally, this will lead to new experiments of a smaller stature where risks are low to maximize learning (Markides & Anderson, 2006).

There can also be strong differences between newcomers in the industry and existing organizations. The biggest challenge for existing companies coming to Strategic Innovation is often alluded to its organization and the need to challenge the status quo by continuously focusing on developing its culture and mindset (Markides, 1998). Furthermore, there is an additional level to Strategic Innovation by adding disruption. The difference is that Disruptive Strategic Innovation is "both different from and in conflict with the traditional way," for example, low-cost airlines or online news. Eventually, these players grow big enough to make an

impact on the whole market, forcing established companies to acknowledge the competition (Charitou & Markides, 2003, pp. 56–57).

However, it is to be remembered that innovation purely from the technical side will not be enough to determine your success as you will need a right, commercializing strategy for it (Teece, 2010). It is not always the right thing to answer to newcomers who disrupt your industry. While you may be in the same industry, you can have completely different markets. This ultimately shows that it is not always the right thing to worry and start fighting the new innovators directly and that it depends on the company on what actions to take (Charitou & Markides, 2003).

Further evidence from Tuominen et al. (2004) shows that there are strong connections between a high level of innovativeness for how companies handle their adaptability. Strategic innovation differs in that way that it is not just a way to be reactive toward the market, but to work proactively to venture and expand into new market territories and opportunities (Charitou & Markides, 2003).

3 Instability and Turbulence of the Global Markets

3.1 Contextualization of COVID-19

It is difficult to comprehend and know the impacts of the pandemic that we currently are in the midst of. However, looking back at the last four downturns, 14% of the companies went the complete opposite and even increased their sales growth rate. Similarly, an earlier pandemic has impacted the market. Most specifically, the SARS outbreak in 2003 is viewed as the tipping point for e-commerce in China, paving the way for companies like Alibaba to become the major player it is today (Jacobides & Reeves, 2020).

Even before the outbreak of COVID-19, business models were highly affected, much as a result of the technological revolution and changes in consumer preferences. However, all these areas have now accelerated, creating a higher urgency for business leaders to take responsive actions. Therefore, organizations and leaders are forced to minimize the weaknesses in the business models in order to be better positioned for upcoming disruptions. As a starting point, organizations need to find out where the crisis has stretched or broken the existing business models, and identify the risks and results to create a minimum viable strategy by using the adaptive strategic tools (Howard, 2021).

On the opposite side, the most successful companies have been shown to be those that are willing to invest more than competitors. These investments are also made in fewer, more specific areas, focused on a higher return. In a time of a pandemic like COVID-19, organizations do not have the luxury to take the easy approach and follow old habits. Instead, they need to adapt as new business models are more valuable, not to mention they make it easier to thrive after the crisis has settled (Jacobides & Reeves, 2020). Thinking about both short-term and long-term effects may seem tough, but it is essential for successful leaders. An agile decision-making

in subverted strategy is crucial to create a lead over competition that even spans past the disruption (Howard, 2021). Additionally, companies can put together temporary adhocracies with the singular motivation to be innovative. These groups are a combination of specialists within different areas targeted to find quick digitization for an organization offering or finding digital replacements for its offerings (Seetharaman, 2020).

Given the lengths of lockdowns, the people of today have been forced to adapt and learn new habits. Therefore, companies need to develop a systematic understanding of these changes in order to obtain a strengthened position. This can be done in a matrix based on two questions. Is it long-term or short-term changes and were they existing trends or newly emerged? This results in Boosts (temporary departures from existing trends), Displacements (new trends that are temporary), Catalysts (existing trends being accelerated), or Innovations (new lasting trends). This will be helpful to understand what the changes are and better determine the fit and scope for investments (Jacobides & Reeves, 2020).

3.2 Strategic Adaptation and EBE Fitness: Connecting the Four Dynamic Capabilities (DC)

Organizations are heavily influenced by their external environment. In order to adapt to these changes in circumstances, Strategic Adaptability focuses on the strategy models as a recipe—*Defenders, Analyzers,* or *Prospectors*—to pursue that fits both their internal resources and external impact. It is of high importance to be in line with current environmental state, but over time Analyzers and Prospectors have shown to be most successful, especially since the disruptions occur more frequently.

Both Strategic Agility and Strategic Flexibility share various commonalities. They both advocate (1) the reconfiguration/renewal of business models and (2) the ownership of IT resources and capabilities (R&C) to the levering of change (or response) to changes in the outer environment. The bottom-line difference is, for Strategic Flexibility, the organization is the gear of change, while for others defending Strategic Agility is about the ability to respond to the changes in the environment. Nonetheless, previous literature does not denote incompatibility between both viewpoints. In addition, Strategic Innovation appears in the middle of them with a focus on how companies, through innovativeness, create value for their customers, whether fueled by self-driven forces (flexibilization) or responding to external stimuli (agilization).

COVID-19 is certainly an unpredicted external shift in the environment that highly affects all organizations, being the markets, therefore, is perceived as highly unstable and turbulent. Further, the literature shows support for that organizations with an Analyzer or Prospector strategic type would be better prepared to handle, even thrive and possibly grow during this time. However, previous literature does not provide insights into such a sudden and unexpected occurrence like a pandemic

and is addressed in the following sections. The closest experience from past market competition is the notion of big-bangs, yet a socioeconomic event, nurtured by the supply side, with the intention of some upstarters to create fast disruptions (Abrantes, 2020). An essential trait in any successful changing organizational strategy, for accommodating such disruptive changes (from the outside-in or inside-out), is through the type of strategic leadership, together with his/her proximity to the teams,[2] the timely actions taken, and the dimension of R&C allocation (namely IT-related ones to accelerate information needs and streamline the analytical processes).

Out of the four different strategic concepts, Strategic Flexibility and Strategic Agility have been shown to be the closest to each other. Strategic Flexibility emphasizes how strategic leaders often fail because they try to remake previous successful strategies, even pushing for more investments despite failing results, similar to Strategic Agility (Hitt et al., 1998; Doz & Kosonen, 2010). Meanwhile, both mention that the usage of IT can be very helpful, even necessary. In the end, IT itself is not resulting in flexibility, but instead is best viewed as a supporting resource to adapt to the environmental changes (Chen et al., 2017; Nejatian et al., 2019). This is no exception in regard to Strategic Innovation, where it is even of a much higher focus. Similarly, to the areas of Strategic Agility and Strategic Flexibility, the usage of IT itself does not provide a successful strategy. Instead, it is a focus on what value it brings both to organizations and their customers instead of pure efficiency (Markides & Anderson, 2006).

Additionally, in Strategic Flexibility this is further developed in categorizing the environment into stable or unstable, where unstable is the result of a random event that is impossible to predict. This creates uncertainty for all organizations, but flexible leaders can easily help navigate through this unforeseen storm, even resulting in business advantages (Howard, 2021). Therefore, Strategic Flexibility is to be viewed as a driven choice of being proactive in response to the environment while Strategic Agility is the next step and functions as a form of execution of this flexibility. In other words, how quickly the organization can work to adapt to the changes in the environment. In this way, both are tightly connected to the same areas, but have different focuses.

A very interesting point that ties into the Strategic Adaptability is how companies with a high or low focus on Strategic Flexibility work in either high or low market turbulences. It shows that the absolute most important thing to acknowledge is to be in check with the current high or low turbulence regarding the environment in short-term aspects (Johnson et al., 2003). This is mainly due to the investments that are needed to make to become both flexible and agile. However, from a long-term perspective it is clearly favored to adopt a higher flexible strategy. This can be seen in the Strategic Adaptability section, where Analyzers and Prospectors are shown to be more successful over time, even if Defenders could have some

[2]Note that the Kaizen philosophy of continuous business improvement would denominate this concern as a "Go to Gemba," as the proximity to the operations is key to success.

short-term victories (Miles et al., 1978; McKee et al., 1989). Again, the "mere-urgency effect." This also shows that Strategic Flexibility actually works as an offensive strategy and not only as a defensive protection (Gerwin, 1993).

Since literature continuously explains that environmental changes are happening more rapidly and intensely, one can begin to envision a pattern (and a connection) through these four strategic concepts, while their reasoning overlaps on the following market tendencies:

1. Organizational quest for *environmental awareness capabilities:* Organizations and their leaders are summoned to develop a sophisticated strategic vision and acquire a larger sense of awareness of the environment risks and opportunities.
2. *Preparedness is key to competitiveness and success*: Market research is a must for gaining new knowledge. In this context, market research is the output that seeds (knowledge) toward the preparation of a brighter (fit) future.
3. *Refrain from superfluous investment or over-investment moves*: Flexibility, agility, and adaptability require moderation and rationality in the acquisition of resources and their allocation to business units and projects. Resources are costly, scarce, and constitute only an asset in the right place and time where they can contribute to further value addition/appropriation. Thus, they are, by principle, temporary, mobile, and transferable.

These three trends are anchored on the necessity of organizational leaders to stop relying on their old business models and not to be afraid to make investments into new areas, while being innovative enough to respond to the external environmental changes to find the right strategic fit (Shimizu & Hitt, 2004; Johnson et al., 2008; Doz & Kosonen, 2010; Weber & Tarba, 2014; Herhausen et al., 2021).

4 Overview of the Cases and Results

Organizations that put emphasis on being flexible and agile to adapt through innovation are more likely prepared to, in a quicker and better manner, navigate through the stormy waters of uncertainty caused by external environments and even gain business advantages. Hence, the recognition of fads, and their transformation into emergent trends, is of great importance to separate the wheat from the chaff and determine which one is temporary or lengthy, impactful or not, harmful or an opportunity, plausible or simply a mirage (Hitt et al., 1998; Markides & Anderson, 2006; Jacobides & Reeves, 2020).

Table 1 Open coding: themes

Dimension		Theme	
Code	Description	Code	Description
OC	Organizational capabilities	OC-IC	Strategic (design) capabilities
		OC-IT	IT-capabilities
		OC-BPR	Business processes (routines)
CA	Competitive advantages	CA-GF	Growth focus[a]
		CA-MF	Market focus[b]
		CA-SM	Strategic (adaptation) models[c]
EBE	External bus. Environment	EBE-C19	Market changes due to COVID-19
		EBE-C19+	Positive impact on the firm
		EBE-C19 -	Negative impact on the firm

Source: Own elaboration

[a]Informants' insights regarding their corporate decisions regarding "portfolio development" as growth, stability, divestment, or turnaround

[b]Endeavors of market research to build environment and competitive intelligence.

[c]Based on the four strategy types of business adaptation to competitive changes (i.e., Defenders, Prospectors, Analyzers, and Reactors) of Miles et al. (1978)

4.1 Methodological Procedure and Open-Coding Outputs

A multiple case study research with a qualitative approach follows an interpretive paradigm (Saunders et al., 2019, p. 142). Semi-structured interviews are applied to senior representatives of three software companies.

The sampling method fits a nonprobabilistic category as the interviewees were purposively chosen due to their seniority and assumed accessibility to relevant content as gatekeepers of information able to convey a faithful portrait of the strategic actions of these firms under the COVID-19 pandemic. Qualitative data was crunched following a thematic analysis method, looking at separate cues or streams of initiatives, as different patterns of data. From the interviews, three themes have been identified under an open-source coding logic, as represented Table 1.

The strategic design seemed to be strongly influenced by culture. Participant 1 (P1) repeatedly attributed to culture the role of the main predictor of the way the company strategizes and stands out from its rivals. Surprisingly, such a feature also emerged in the interviews of P2 and P3. Firstly, P2 pinpointed culture as a "*strategic differentiator.*" However, in firm 1 (P1) the cultural variable seems more accentuated than in the others. For instance, P1 mentioned a long history of charismatic leadership as being part of the driving force of the company forward.

In the interview of P2, the impact of culture is verbalized to be negative, in general, hence not specifically associated with a particular EBE-C19, revealing that sometimes the ones who climb internally in the organization's hierarchy often do not "*put the neck out,*" which creates a more succumbing organization. P3 claimed that multiple projects' proposal and portfolio competition within and across programs are sometimes misunderstood by organizational stakeholders who actively transfer to

the cultural sphere their proactiveness becoming activists of intra-department separation and reluctance to collaborate.

The viewpoint about IT seemed a common denominator across the three firms. All participants pointed in the same direction, which is that a solid and secure IT infrastructure is nowadays a commodity for any computer-based business architecture from transactional to reporting and intelligence monitoring and strategic controls. P1 and P3 further developed this by stating that IT shows not just an essential resource but the drive that supports the process enhancement.

As to the business processes, P3 admitted to having no backup plan for unpredictable external threats such as COVID-19, stating that their full focus was until the pandemic scaled up quickly. This is also something mentioned by P1, revealing that the organization did/does not have any strategy in place, but an idea and a vision in what direction to solve their operational debilities and inefficiencies. Moreover, it was also revealed that business processes are administrated in a decentralized manner, being up to the different departments to drive initiatives (also recognizing that it is believed not to be the best practice; decentralization of the business process control). Similarly, P2 reveals a point of view in which the firm seemed to be strongly focused on product/service innovations.

Regarding competitiveness, the answer differed. P1 mentioned his organization follows a rather political posture, with multiple departments being involved in the early stages of the strategy process that in reality were deemed to be unnecessary and lead to a waste of energy debating diversified points, resembling more the gathering toward an "innovation theatre." He exemplified that dispersion by telling the history of a middle manager who once proposed a global roll-out plan for a product specifically sold to one single customer account. P2 instead mentioned they rather focus on the market, following the stream of thoughts of their users and customers' experience, and including their partners in an ample strategic dialogue. P2 revealed that his firm wanted to gain more awareness about and become a stronger part of the ecosystem, leveraged by its own innovations. P3 instead mentioned a big focus on scaling up quickly by pushing out sales and marketing. One similar aspect here was the desire to be an integrated platform. Additionally, P3 pointed out the importance when growing to have a "plan B" in an effective way. Recalling a previous crisis (in 2008), the interviewee brought an anecdote to demonstrate how successfully they managed to transform it into an opportunity by holding a product that worked across industries, which meant they could just diversify vertically (across industries) instead of their peers focused at the time on changing the whole product offer.

As regards the strategy modeling, all participants touched briefly on some of the aforementioned strategic concepts. Only P2 categorized strategic innovation in a business model as being a driving force of the firm. As innovation was already a big part of the organization's DNA, given the focus on AI and Machine Learning, the notion of agile hit them hard, shaking their cultural foundations, and crawling up the leader of the hierarchy, from processes to strategic design and controls, shaping the (re)thinking process toward a looping introspection and reflection upon corporate utility and reconceptualization. In P1 and P3, it was instead often a

type of buzzword being thrown around. P3 touched a bit more upon this, explaining his view that organizations need to be flexible in order to adapt to their surrounding.

Regarding the *market focus,* the viewpoints diverged. P3's view of the market was revealed to be closer to the notion of "place" where you push the products into. P1 mentioned the markets are changing very much due to digitalization, where niches start becoming more and more interesting and successful to focus on. This is also due to the world and individuals becoming more dynamic. As a result, his organization was working with a just-in-time concept to be more effective. P3 instead had much focus on developing their product in relation to what the market wanted. Both analyses and customer participation were useful to verify what to develop. Secondly, this also helped them plan out what countries to penetrate next.

It is interesting to observe, furthermore, that the differences when it comes to a firm's responses triggered are by the effects of COVID-19. Firstly, all participants admitted their firms were directly affected by this phenomenon and were forced to react and act upon it. In P2's organization, the physical presence in the field was something that had to be ruled out, hence changing the interactions and so the competition in their "game" (e.g., temporary abandonment of professional exhibitions and customer visits). This led to an immediate shift in the way they communicated and shared content. It was a fast-paced, operational-driven, tactical response pushing the organization's structure and strategic reconfigurations, but had to let go of some of its human resources. P1 mentioned something similar. The whole sales process changed. However, the interviewee argued that as the amount of changes occurred in such a short period of time, it is nearly impossible to compare their pre-pandemic with the on-pandemic and the post-pandemic realities and determine with any slight accuracy the extent of deviation or approximation to the past reality. In addition, P1 mentioned also the impact on human relations and individual's moral that were argued to have worsened considerably.

P3 disclosed an almost dramatic situation, revealing that this firm was the most negatively impacted one. Firstly, 85% of the service pipeline was stopped due to the lockdown and temporary closure of their retail customers. The company was subjected to an immense commercial and financial strain with cash-flows being abruptly slimmed down. The changes were introduced in a rather drastic way, coming as a sort of inner "revolution" to all stakeholders. The interviewee admitted that not only they were badly hit but also in the post-pandemic period their projects and deal sizes were considerably smaller than before.

However, the interviewees acknowledged also some positive changes (due to COVID-19). P2 mentioned the efficiency gains in the aftermath of processes' alteration. P1 emphasized an almost null impact of some of their coders who already worked from home, meaning that this was already their natural environment. For P3, there simply did not come anything really positive out of such environmental changes.

4.2 Sense-Making

Three fundamental ideas were extrapolated from the *Gestalt* analysis of the qual data:

1. Insufficient exercise of strategic thinking and strategy/ies formalization (or simply "*Organizations strategize too little")*
2. COVID had a noticeable impact on organizations (mostly negatively)
3. The most resilient organizations (regarding EBE changes) were also the ones who developed more sophisticated strategic envelopes

The next subsection describes these three major findings.

4.2.1 Responsiveness Scan: "Organizations Strategize Too Little"

Altogether, at the review of the interviews (already in a written format – transcripts), the manipulation of data per thematic codes, and their sense-making process (while matching the informants' explicit content into strategy-related conceptions), it became clear that organizations do not fully embrace strategy as a whole system of seminal importance for the success of their business and the sustainability of the firm.

It is clear to say that organizations actually strategize and organize themselves too little. Instead, they behave in accordance with a vision and results and make it up along the way. Organizations rather show a tendency to focus on results than the process, hence disregarding strategy-making that shows little meaning. However, those who do spend more time on strategic aspects are more aware and better prepared for the external environment, reaping those benefits. Furthermore, organizations adopt a terminology that visibly integrates strategy concepts, which we argue to be intended to give a professional appearance instead of an actual deep involvement in strategy design, execution, and control. We designate this as a "*strategy-washing*" phenomenon.

Formalization seemed limited and disconnected and involuntarily set in a top-down manner. We assume a low ability to involve organizational stakeholders in the fashioning of strategic goals (including middle managers). A second note also on an inferred sparse attentiveness to the *Communication* of strategy as the departments and projects seemed to be narrowly involved (only) in the operational goal-setting concerning their operational activities related to their own functional areas. Hence, line and middle managers and the operational line were left without an overall vision of the organization. We argue, based on previous literature, that strategic communication is a key mechanism for creating a large collation of interests and individual motivations to engage and further contribute. Hamel (1998), Shimizu and Hitt (2004), and Herhausen et al. (2021) refer to this as an overstaying of ideas in the head of the executives, instead of letting new voices be heard. However, the adherence to strategic visions, destinies, and goals is though

primarily dependent on the employee's general understanding of the strategic direction and the commonly shared goals. Conversely, weaknesses in formalization and communication were especially noticed in the informants' speech (in P1 and P3) and markedly absent in P3's speech.

Further to the fragilities in the two mechanisms above, another interesting aspect we have retained was the mediating effect of culture. In general, since the work on corporate culture of *Rosabeth Moss Kanter* and others, we acknowledged the effect of integrative cultures on better accommodation of change waves. However, this empirical test unraveled a negative effect of culture manifested in the stereotyping and compartmentalizing of professions and islands of practice, which was articulated with an unfocused strategic formulation. The culture just accentuated the latter problem in the context of COVID-19. A paradigmatic case explanatory of this problem was found in the professional group of "coders," seemingly left at their own fate, working individually and many working on a blended format (office and home) already for a long period of time. COVID-19 functioned as a kaleidoscope, accelerating and augmenting the problem, because it exacerbated the cultural features with the full transference of workplaces to a "work-from-home" routine. This brought even more focalization on the task/s and more individualization of the employee on their own interests, in turn, damaging the (somehow arguably low) sense of belonging and participation in the company's life. In sum, it is clear that culture plays a much larger role in strategy than the one recognized by the senior managers in these organizations, especially in firm 3, and if used in the right way could prove a valuable strategic asset.

Firm 2 (represented by P2) relied heavily on exploring their innovation potential, being also more agile than the others and more open to change and better culturally equipped to accommodate change of all sorts, hence demonstrating itself as a more flexible organization. Firm 1 (represented by P1) ranked second in our sample's flexibility assessment. They revealed some numbness (perhaps, with senior managers getting shocked and caught by surprise) and passivity as to the timely reaction to the environment happening, which demanded an immediate response. Firm 1 had a stronger internal focus. Firm 2 more actively embraced adaptation, denoting also, beforehand, an internal routine to dissect environmental events and flexibly to work with market information in their favor. This company revealed a higher sense of environmental awareness. In P3, we clearly see what happens when you have no attention to either environment or internal strategies. They utilized no real approach and tried to act first to gain first mover advantage without knowing much about the competitive dynamics in the industry. Therefore, they had a low focus and preparation that supports the literature by Johnson et al. (2003) that low flexibility in a highly turbulent environment proves to be highly troubling for the organization.

4.2.2 COVID-19 Impact: (Mostly) Negatively

The impact of COVID-19 is also shown to be big on all organizations (though not a surprise—as seen across several other publications). All three firms were hit and

needed to take action. Firm 3 was fully hit, resulting in major setbacks for the business. Additionally, it followed a financial savings approach to tackle the problem. Previous literature flags this approach as the wrong way to deal with it. According to Jacobides and Reeves (2020), this is the exact opposite of what an organization is recommended to do in a context of crisis. Instead, they are summoned to invest in the crisis.

In addition, these types of environmental rare events (so-called Black Swans—as COVID-19) also demonstrate the exposure of business models and susceptibility to collapse. An investment entailed a minimization of failure and a minimization of weaknesses. However, investing in strategic innovations (and new business model development) requires the right corporate mindset on an organization willing to be or maintaining a flexible condition, capable of constant adaptation and renewal. Hence, these four strategic concepts (Strategic Innovation, Agility, Flexibility, and Adaption) are interdependent and inseparable.

Firm 2 set a better example of a positive reaction. They quickly immersed in the problem and created new materials to adapt to the "new normal." Noticeably also they prepared themselves in advance to withstand external changes. Arguably, their product/s was already better equipped than the one in firm 3. In other words, all organizations were impacted by COVID-19 in some way and such a phenomenon truly changed the rule of the game in the industry. The big difference lies in the extent of the impact. Strategic preparedness (in the form of the four concepts above) seemed to be a direct predictor of the outcomes. Nevertheless, further studies on impact may account for organizational specificities (e.g., size or industry).

4.2.3 Resilience (Strategizing Is Beneficial and an Advantage)

The analysis of data from interviews supported previous literature. It revealed that business plans and strategies change nowadays more drastically and at a higher frequency than before. As we can see in P2 compared to P1 and P3, the best outcome happened to the ones who took an Analyzer standpoint and were more flexible and innovative in a turbulent environment. Just by looking at P3, there could be belief that a Prospector approach is the least suitable for a disruptive event such as a Black Swan; for example, COVID-19. But looking at the whole picture of the organizations, the panorama shown is a lack of strategic definitions, almost on the verge of inexistence. They were instead focusing on just selling and growing, without any real plan or any thought about the external environment. This is further evidence that collective resilience (including corporative one) is not randomly achieved, requires a hard focus, and work on strategic adaption to be able to survive and thrive.

Moreover, data made something else clear that organizations need strong management (including the adoption of clearly set Strategic Management processes) willing to take care of the overall responsibility and take the initiative of walking down the road of the necessary measures/steps to ensure a strategy running on track. Without the knowledge, support, and guidance of the executive boards and all top management teams' staff to a full commitment to the organization/ business

management, the firm is deemed to fail. This was shown in P3 as the worst example and P2 as the best example. P1 shows the in-between route, where management is knowledgeable, but takes a more passive approach, turning out to lose the ability to patch in the short term the imponderables of COVID-19 and build agility in the medium and long term.

So, a real manager is an essential part of success. They play a big role in pushing the organization forward. Those real managers are summoned to an ambidexterian focus on strategy/operations on one side, and the markets on the other side, acting furthermore as engines of collaborative networking, healthy working environments, positive cultures, intrapreneurial initiatives, and so being primary agents responsible for these essential components of business success in response to external challenges: innovation, agility, flexibility, and culture. This is how to build on incrementally one's resilience. Finally, organizations must provide a clear direction to all employees on how they should act.

5 Conclusion

This chapter aimed to look at, and explain, how EBE events, here instrumentalizing COVID-19, might affect a firm and comprehend, to what extent, Strategic Innovation, Strategic Agility, Strategic Flexibility, and Strategic Adaptation ought to, separately or combined, be a solution to a better fit into the EBE.

The takeaway is clear: *Organizations do not strategize enough*! Strategy is something that one cannot simply articulate in a responsive manner, through the development of Strategic Agility. Agility is not Holy Grail that saves any company from all hazards. This is maybe what some agility IT software solutions would try to sell you! The "agile cliché" that one-model-fits-all the environment's concerns is a rather naïve perspective of business competition and growth and an oversimplification of the environmental constraints. Market–firm interactions are dyadic. They are both an interaction *outside-in* pulled by market stimuli (e.g., by the impactful events—risks or opportunities, and by the key success factors of competitions) but also inside-out by the R&Cs that can better push a better positioning, hence requiring Strategic Flexibility to determine the direction of up-/reskilling, human/social/intellectual capitalization needs, challenges, and opportunities. Yet, strategic innovation occupies a mediating role in such a dyad since the openness to new business models and strategic designs requires both an attentiveness to the mutations in the market realm and also ex ante KSAs to induce (or disseminate) in the market innovative attributions to a more favorable competitive positioning or to promote adaptation to ongoing outer changes.

By combining the literature and participant interviews, a link between theory and practice has been established to provide key takeaways for you as a reader. Firstly, it answers that organizations strategize themselves too little. Instead, organizations have an idea or a vision combined with focusing on results. Strategic concepts are more used to give a light that they have a strategy in place. However, those who do

spend more time working with strategic aspects show to be more aware and better prepared for the external environment. Secondly, this chapter has explained that COVID-19 has impacted all organizations in some way. The difference instead is how the changes hit the organizations and there are still difficulties to see to what extent. All three organizations were forced to change processes both internally and externally. However, the extent of the changes was shown to be different between them. The organizations that worked more with strategy and adopted an Analyzer approach made better decisions and needed to change the smallest amount. The organization that had worked the least with strategy instead experienced the biggest impact and experienced massive difficulties.

This shows that organizations can be better prepared by setting up themselves to have a clear strategy that supports the process. This will work as a clear guidance for how the organization should act and tackle difficulties. It is also of high importance to be aware of the external environment and plan accordingly with internal capabilities. This proves to be extra true if the environment is highly turbulent. Additionally, this chapter shows evidence that organizations obtaining an *Analyzer* approach will be better prepared and more successful in volatile markets.

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Change-Readiness as an Essential Meta-Dynamic Capability (MDC) Tested Under the Effect of the General Data Protection Regulation (GDPR)

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1 Introduction

The European Union's (EU's) directives regarding the General Data Protection Regulation (GDPR) have impacted every company and business unit, regardless of the industries and organizations' s size, structure, or nature. Notably, the requirements for GDPR compliance seem to have disrupted the digital businesses' landscape (Abrantes & Venkataraman, 2022; Abrantes & Ostergaard, 2021). The far-reaching implications of GDPR, based on three major principles (transparency, privacy, and user control), have impacted the way firms process and secure their own (and customers') datasets. The GDPR uplifted the requirements regarding the data manipulation and security processes as to the way products/services ought to be built, transferred, and managed, within and across organizations and individuals (Abrantes & Venkataraman, 2022). The *change recipients* imposed by the GDPR encompassed an overall adaptation of the business portfolios, and therein, all the operational activities (so as the employees' practices); business processes and systems; and using technologies. This consubstantiated a change in the dynamics of the team/group's working habits and espoused norms at the workplace; hence, such obligations affected even the whole organizational culture as firms endeavored to comply with these new legal requirements.

The compulsory adherence to the GDPR by the European organizational ecology implied compliance of both European-born firms (plus other organizations from other regions with subsidiaries headquartered in any European Union state-member

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country) and/or with inward/outward trading or service flows with the EU. Such fundamental change in the way personal data is processed entailed from the company's side a preparatory path to a new legal framework. In essence, this may be designated as a *change management* process, and so the GDPR is a rather specific event that might be taken as a single study object that can be isolated and further examined separately from other changing events. The virtue of this event from a scholarly perspective is the mandatory adherence to its regulation. Being a mandatory one, it ensures the corporate involvement through the activation of strategic thinking and subsequent decision-making applicable to all divisions and business units. This is, in turn, an ideal scenario for diagnosing the extent of preparation of a company required to accommodate changes in compliance with the standards of the law. Thus, this study fits into a single case research as it instrumentalizes GDPR as the only object of a phronetic review.

According to Caldwell (2013), *change-readiness*, as an essential dynamic capability for managing change, has the virtue of being unswervingly linked to the timely recognition of the need for a change, and subsequent mapping of the scope of that same change. Thus, change-readiness comes with the benefit for its owner, that is, the enhancement of the chances of organizational success on the *change initiative.* Here, this latter concept (change initiative) refers to a process of accommodating changes instilled by outer circumstances. However, we argue that the likelihood of success lies not solely on operative compliance to *change requirements* (as the key properties to be changed), but it is likely to grow with strategic adaptation. Thus, it is asserted here the importance of the senior management's commitment toward both operational and strategic adaptation.

Operational adaptation allows organizations to overcome change, yielding competitive parity gains with other firms. However, strategic adaptation allows the firm to surf the wave of change by excelling at developing a fully open-to-change organization (i.e., a *changing organization*) capable of using every changing event as an opportunistic source of learning, to leverage businesses to more favorable strategic positions with technological and competitive gains over competition. Therefore, the benefits of strategic adaptation are argued to be applicable irrespectively of all types of change as short-term and less impactful ones (i.e., *fads*); durable or long-lasting and new trending events of significant relevance and impact for organization (i.e., *wild cards*) as the case of the GDPR, or even the most unpredictable ones, as the COVID-19 pandemic (i.e., a *Black Swan*). Nevertheless, *changing organizations* are not born-to-change but made-to-change. According to Nelson's (1985) E*volutionary Theory of Economic Change*, markets impose behavioral shifts in business firms, including an evolutionary path of own capabilities. Hence, strategic adaptation is not innate, is a skill that ought to be strategically developed, and operationally practiced across the whole business units and organization.

The singularity of this research is that the authors launch a subliminal invitation to all industry practitioners to a paradigm shift. Companies are here alerted to the importance of "unfreezing mindsets" and question what change is not a single event (as the GDPR), but in general. Hence, this urging of senior managers for action

might be designated as an awakening call for envisioning a large breadth of action needed in most organizations to be able to accommodate change, cope with its challenges, and explore its potential. Firms are here summoned through a set of general focus research questions (GFRQ) to reflect on their endowments as the combinative set of assets that may explicitly be used to manage change processes:

GFRQ1: What resources does one need to anticipate any market changes? (And to what extent do I own them?)
GFRQ2: How to allocate them (into assets) to prepare for potential predictable changes?
GFRQ3: How to develop and constantly update organizational capabilities to cope with outer change?

By *market change*, we refer to any mutation in an industry's status quo affecting the competitive strength of a firm and its conditions of appropriability of value (Nelson, 1985). Market change encompasses an evolutionary scenario of any kind in market conditions or growth of the economic system, affecting the face value of a single resource or skill and the combined value of an enterprise system or product/service portfolio (e.g., shifts in product demand or technological advancements).

Complementary to the concept of an organizational *resource* is the notion of organizational *asset*. Resources are owned, stored, (and if not used) static, and a superfluous good, whose existence is detached for value capture. A resource holds a hidden ability to transform itself into an asset with its placement (or allocation) to functional unit/s. A second feature of an asset is functioning as they are not only placed but also applied in the work context (resource utilization) realizing the potential value carried by the resource. Here, the asset gains a third feature, which is self-refinement through its routinization in the context of the undertaken activities.

Thus, our question above (GFRQ2) is not solely about what resource to acquire or possess, but also to conceive an allocation strategy of such resources for anticipating change. This falls into one of the responsibilities of a board of management of any organization, which is to develop a capital-allocation strategy at the corporate level.

Indeed, conceiving a need for change-readiness capabilities (including *change-envisioning* ones) entails, inevitably, an investment in specific competencies of strategic and operational flexibilization of the organizational structure and its resources' administration. Namely, a flexibilization as to the way it operates, formally and informally, and how current assets and capital are allocated across the portfolio of the whole business, programs, and projects, and how they can be reorganized and constantly mutated to allow gains of efficiency, risk-tackling, and/or exploiting/harvesting the benefits of opportunity-taking. Such an investment in upskilling a firm toward a changing organization is always one to move away from a defensive perspective of corporate self-preservation toward a more positive perspective embracing change as a window of opportunities to be seized by the firm.

In sum, the contribution of this chapter lies mostly on the industry's side as it sets the basis for a shift in strategic thinking and subsequently strategic formulation, with implications for the future growth of the firm. Managers and business owners are summoned to remain to look at the GDPR as an example of an opportunity for

opening new horizons, not simply as a *strictu sensum* new opportunity for creating new mechanisms of big data analytics for hypertargeting their potential customer base (as most companies did), but as in any other changing event, as a real governance opportunity to review the whole organizational scope (of structure, strategy, systems, and competencies), reflecting on the organization's nature and role, from A to Z, considering all the major principles of authority, accountability, control, direction, leadership, and stewardship, as to the relation to all internal and external stakeholders (Haq et al., 2018). Hence, it is crucial to investigate capabilities as an intertwined matter not to simply change management capabilities but to administer and enhance capabilities in general for being capable of creating contextualized value (core competencies) in a specific market and avoid letting them freeze into core rigidities (Abrantes et al., 2022a, 2022b, 2021).

This chapter encompasses furthermore a description of the GDPR, including the evolution of the data protection framework in the European Union and other equivalent regulations in other regions of the globe, intertwined with further literature on dynamic capabilities centered upon marketing-oriented and change management capabilities before immersing into change-readiness and its two major branches: strategic flexibility and adaptation.

2 Evolution of the European General Data Protection Regulation (EU-GDPR)

The GDPR was adopted in April 2016 and has been in application across the different countries within the EU since May 2018 (Abrantes & Venkataraman, 2022). This new legislation has arguably become the most globally celebrated piece of EU policies in the recent years in the sense that it provides a very comprehensive, balanced, and more uniform set of safeguards that can continue to provide individuals' fundamental rights with respect to the use of current and future technologies.

2.1 A Brief Description: Roots and Overview

The resolution of the European Parliament in 1975 constituted the initial directive on freedom of individuals' data processing to ensure European citizens of maximum advantage of protection (Walczuch & Steeghs, 2001). Then, a directive on the protection of individuals with respect to the processing of personal data appeared in October 1995. The primary objective of the directive was to safeguard the individuals and their personal data. This clearly implied an endeavor toward the advancement of the security of individuals, but also in the harmonization across EU state-members. The directive emphasizes two main objectives—collection of data to

be for specific and appropriate purposes; and data can be withheld only in case it is relevant and updated. This directive is laid down on six grounds: data subject's consent; legal agreement with the data subject; legal obligation to data collection; protection of data subject's vital public interest; and finally, the notion of legitimacy of interest in data processing.

These included several crucial rights, including own data access, knowledge about the origin, correction of inaccuracies (of information), redress in the event of illegal processing, decision on permissions of usage of data, and the right to control market–messages intrusion (Walczuch & Steeghs, 2001). Yet regulation on data protection is typically a European phenomenon, pioneered by its 1975 data protection directive (DPD). Nowadays, still a restricted number of countries adopt similar legislative instruments in this field (Abrantes & Venkataraman, 2022).

2.2 Evolution of Data Laws Since GDPR

According to the European Commission's "*State of GDPR in 2021,*" this event is almost fully implemented even though some countries, such as Slovenia, have not completely come on board (Bluestone, 2021). However, the depth of its core implementation varies. Nonetheless, even with the Brexit, the United Kingdom (still a part of the European Union until the end of 2020) has maintained the principles of the law in the United Kingdom's domestic law under Clause 3 of the European Union (Withdrawal) Bill. Indeed, the UK government has absorbed such principles in such a manner having decided to debate moreover on the extension (and exclusions) in the country of the personal data protection fundaments consecrated in the GDPR. For instance, as to the domain of right of erasure of the most specific digital contents, such as social media postings from childhood, or regarding the granting of exemption regimes from the Data Protection Bill for special individuals (such as journalists and whistleblowers) under certain instances. Meanwhile, the US Congress brought in the CLOUD Act before the GDPR became enforceable (Congress.Gov, Online). The CLOUD Act allowed the government to compel US companies to consent to data access requests without notifying the data subject—for data held both inside and outside the United States. Any company storing data in the EU, however, must comply with GDPR, which prevents PII data transfers without the explicit consent of the data subject (Congress.Gov, Online).

As regards the GDPR, the European Commission expressed though some concerns as to some divergence applicability and fragmentation of the state-members on the use of such legal instruments, namely as to the controlling powers and fair use of the enforcement across countries. Yet, it should be noticed that the GDPR can only work effectively across the EU's single market if all the member states are aligned. If the laws diverge, it might create or lead to polarization in the process of implementation. The following are the four major developments or key updates as the major focus areas since the revision to GDPR in 2018 that came into the forefront for all the businesses:

- Redefining the role and responsibility of *joint controller*
- Restructuring the format of *cookie consent* and *private user* access to content
- Major tech companies to start shifting from third-party tracking
- GDPR fines to become stricter and more stringent in terms of their application

As shown above, as regards the proximity of EU and US legislators, it created an avenue for the evolving of the legal framework and the means for data to be transferred between the EU and the United States via 2016's *Privacy Shield* regulations. However, such a path shrunk in July 2020 with the decision of *the Court of Justice of the European Union (CJEU)* ruling out cloud services hosted in the United States, asserting that they cannot comply with EU data laws (Noyb, 2020). This legislation is known as the *Schrems II*, based on the Austrian data activist and lawyer (Max Schrems) (Austrian data activist, lawyer), who has defined the reason for the ruling as a clash between EU privacy law and US surveillance law.

In January 2022, it was announced that the *Austrian Data Protection Authority* (DSB) had enforced "Schrems II" by issuing a fine for failing to protect the personal data of EU citizens by storing it in the United States without proper consent. The data in question was considered PII in that it contained IP addresses. This effectively meant that no guarantees could be made about how and where that data would be used as US authorities—such as the NSA—could potentially have unrestricted access to this personal data. To summarize the further changes introduced in the post-GDPR era, IP addresses are classified as personal data, so their transfer falls under EU data protection law. The US intelligence services use IP addresses as a starting point for the surveillance of individuals and the Google Analytics user did not do enough to block US intelligence services from accessing the data. As a "data controller," any company collecting PII in the EU must follow GDPR—it is not solely the responsibility of the analytics platforms to manage this. In February 2022, the French CNIL followed suit, finding a French website manager in breach of GDPR. The court ruled that the company in question should, under the current conditions of the GDPR, stop using Google Analytics.

2.3 *Strategic Effectiveness and Strategic Role of the Data Protection Officer*

Since the new revision of the GDPR policy, there has been an increasing recognition of the creation of the position of the *Data Protection Officer (DPO)* or *Chief Privacy Officer (CPO)* for both privately held firms and public sector bodies. The holder of this role is required to possess, or be endowed with, a set of competencies on data protection compliance, accountability obligations, and protection of fundamental rights as the freedom of individuals. These skills are essential for the application on the job on the monitoring and reporting of the status of his/her organization.

Nonetheless, the interpretation of the Data Protection Directive (DPD) is different across the EU state-members, hence inconsistent. This means the directive itself does

not contain any obligation for appointing a DPO, hence, companies are "invited" to meet the basic requirements of the law and not stimulated to change the organization side-by-side with the law (CIPL). Some countries mandate the appointment of a formal DPO in specific circumstances, others make it an option, to reduce the organizations' notification obligations to the relevant European Data Protection Authority (EU-DPA). Under EU law, only European institutions currently have the obligation to appoint DPOs.

The General Data Protection Regulation (GDPR) has explicitly recognized that DPOs are useful and necessary components of an effective data privacy accountability and compliance program. Articles 37–39 thereof deal with designation of the DPO and the position of the DPO, and set forth the DPO's responsibilities regarding their tasks, including to inform and advise, monitor, cooperate, and consult with the DPAs and act as a point of contact.

3 Market Changes and the "Capabilization" Path to Change-Readiness

3.1 Conceptualizing Dynamic Capabilities (DC)

Since the last decade of the twentieth century, *dynamic capabilities* (DC) became more universally recognized among the *Penrosian* followers of the resource-based view (RBV) as the Holy Grail for solving some of the business' (competitiveness) growth issues and for long-lasting organizational success. Surely, better said than done. The development of DCs whether focused on a specific domain (as addressed here to manage change) or more broadly considered as a business necessity of the distinctiveness of the firm is certainly a difficult matter to materialize. This brings us back to the GFRQ3 above (*How can an organization develop organizational capabilities?*).

Therefore, let us start by clarifying the meaning of a dynamic capability, hence dotting the is and crossing the ts in terms of its conception, for the purpose of its distinction from other "nondynamic" organizational capabilities, before addressing change-related DCs.

Firstly, it should be said that the proliferation of scholarly research in the last two decades on DCs opened also a myriad of definitions. Here, one gathered a couple of the most seminal ones for opening horizons for the triggering of an explanation of its meaning and utility for an organization.

> *The concept of dynamic capabilities includes the capacity to identify the need or opportunity for change, formulate a response to such a need or opportunity, and implement a course of action*. (Helfat, 2007, p. 2)

In addition, Zollo and Winter (2002, p. 340; cited in, Gibb and Sune, 2018) defined a dynamic capability as "*a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating*

routines in pursuit of improved effectiveness." Interpreting these authors' conceptions, a DC may be clarified as a subset of the wholly combinative set of organizational capabilities (OC), whose formation requires the use of multiple resources allocated to the execution of a certain number of task/s (i.e., assets) and whose cumulative utilization (i.e., resources used in an activity) allows the development of individual or group skills and abilities.

Hence, there are no capabilities being developed without two combined components (i.e., resources and activities). Moreover, the Eisenhardtian perspective on DCs emphasizes the notion of routinization (Eisenhardt & Martin, 2000). These authors advocate the importance of (not repetitive work but) experience gained by the continuous execution of tasks. They assert that experience learning carries with time (likely) proficiency in the activity, thereby the reinforcement of competencies.

They define dynamic capabilities as "*the antecedent organizational and strategic routines by which managers acquire and shed resources, integrate them, and recombine them.*" All these scholars agree though that DCs belong to a higher hierarchy of capabilities (or first-order) associated with the formation of sustainable competitive advantages (SCA), which Winter (2003) designates a "higher order" routines. So, one could ask what distinguishes a DC from a zero-order OC. The formation of SCA not all competencies in a firm can contribute so directly and to such an extent to value-appropriation and wealth. Here, the origin of such SCAs may be attributed to the nature of the DC as being either a cognitive or managerial capability, yet with the ability to evolve and influence other ones and allow the organization to seize new opportunities.

3.2 *Strategic Insights on the Dynamic Capabilities View (DCV)*

From Winter's (2003) point of view, dynamic capabilities are routines for changing routines, thus taking a higher place in the hierarchy of capabilities and thereby representing "higher order" routines (Winter, 2003). Dynamic capabilities are the concept that sheds light on the internal dynamics in the confluence of assets, routines, and evolutionary paths. Dynamic capabilities are supposed to explain the business performance from a long-term perspective and provide a sustainable competitive advantage (Teece et al., 1997; Teece, 2007). However, contradictions in the concept of dynamic capabilities confound the nomological network, thus making further research difficult. Some of the contradictions were specified by Arend and Bromiley (2009): inconsistency of usage, tautological or "too flexible" definitions, infinite regress (capabilities arising from capabilities), post hoc identification of dynamic capabilities when trying to measure them, and others.

The dynamic capabilities approach views competition in Schumpeterian terms. This means, at one level, that firms compete based on product design, product quality, process efficiency, and other attributes. However, in a Schumpeterian

world, firms are constantly seeking to create "new combinations," and rivals are continuously attempting to improve their competencies or to imitate the competence of their most qualified competitors. Rivalry to develop new competencies or improve existing ones is critical in a Schumpeterian world. Such processes drive creative destruction. Differences in firms' capabilities to improve their distinctive competencies or to develop new distinctive domains of competence play a critical role in shaping long-term competitive outcomes.

The strategic problem facing an innovating firm in a world of Schumpeterian competition is to decide upon and develop difficult-to-imitate processes and paths most likely to support valuable products and services. Thus, as argued by Dierickx and Cool (1989), choices about how much to spend (invest) on different possible areas are central to the firm's strategy. However, choices about the domains of competence are influenced by the past choices. At any given point in time, firms must follow a certain trajectory or path of competence development. This path not only defines what choices are open to the firm today, but it also puts bounds around what its repertoire is likely to be in the future. Thus, firms, at various points in time, make long-term, quasi-irreversible commitments to certain domains of competence. Deciding, under significant uncertainty about the future states of the world, which long-term paths to commit to and when to change paths is the central strategic problem confronting the firm (Pisano and Teece, 1994).

3.3 Dynamic Capabilities and Implication to Business Competitiveness

The notion of dynamic capability of Helfat and Winter (2011, p. 1244) is "*the capacity to perform a particular activity in a reliable and at least minimally satisfactory manner*" representing the true notion of worth, guiding the firm's creation, extension, or modification of its resource base. These capabilities rest upon collective activities inside the firm that alter the way the firm makes its living and "*promote economically significant change ... even if the pace of change appears slow or undramatic*" (Helfat & Winter, 2011, p. 1249). Putting it differently, dynamic capabilities modify existing organizational capabilities and resources or develop new ones (Teece et al., 1997; Winter, 2003). Teece (2007) provides a framework for dynamic capabilities, encompassing three underlying components: *sensing*, *seizing*, and *reconfiguring*. Sensing entails continuous observation of a firm's external environment and accumulation of insights regarding opportunities and threats (Augier and Teece, 2009). Seizing is characterized by the ongoing evaluation of a firm's capabilities and resources (Wilden et al., 2013), often accompanied by substantial investment in tangible and intangible assets (Helfat and Peteraf, 2015).

Reconfiguration entails the recombination of a firm's resources and ordinary capabilities to optimize complementarities internally and with the environment

(Teece, 2012; Wilden and Gudergan, 2015). The three components of sensing, seizing, and reconfiguring are interrelated, but not interchangeable (Fainshmidt and Frazier, 2017; Martin, 2011; Wilden and Gudergan, 2015). They act in concert to effectuate organizational outcomes (Danneels, 2015; Teece, 2007), and together constitute a framework for the overarching dynamic capabilities construct (Wilden et al., 2013). For instance, reconfiguration without sensing and seizing may lack direction and thus fail to create resource bundles that fit with environmental conditions (Drnevich and Kriauciunas, 2011; Wilden et al., 2013). Indeed, Teece (2007, p. 1341) emphasizes that 'the enterprise will need sensing, seizing, and transformational/reconfiguring capabilities to be simultaneously developed and applied for it to build and maintain competitive advantage." Although the capacities to sense, seize, and reconfigure may not be rare (Eisenhardt & Martin, 2000), there is variation in the frequency and skill with which firms enact such activities (Winter, 2000) because firms accumulate knowledge about how to change (Zott, 2003). Thus, dynamic capabilities can be a source of competitive advantage (Teece, 2014).

However, dynamic capabilities also entail costs associated with devoting resources to change activities (Zollo & Winter, 2002). For instance, firms usually incur transaction and coordination costs when altering their resource base (Chakrabarti & Punera, 2011), such as hiring external consultants and other professionals who facilitate the change. Similarly, sensing capability rests upon the allocation of managerial effort and attention to outward-looking activities (Helfat and Peteraf, 2015; Wilden and Gudergan, 2015). In addition, unlearning costs occur when it becomes necessary to remove existing processes to reduce friction from implementing changes (Lavie, 2006). The disruptive effect of changes to the resource base, especially when done repeatedly, can prevent a firm from realizing a potential competitive advantage (Schilke, 2014). Given these costs, contextual factors may ultimately influence the utility of dynamic capabilities with regard to competitive advantage.

Most notably, environmental dynamism has been put forward as a key contingency as dynamic capabilities can help the firm adapt to frequent environmental shifts (Teece et al., 1997). Indeed, studies show a positive relationship between dynamic capabilities and competitive advantage in dynamic environments though this relationship might become weaker at very high levels of environmental dynamism (Fainshmidt et al., 2019; Schilke, 2014).

3.4 Teecian's Dynamic Capabilities Framework

Dynamic capabilities can be distinguished from operational or "ordinary" capabilities, which pertain to the current operations of an organization, as, by contrast, the DC refers to the capacity to create, extend, or modify one's resource base (Helfat, 2007). The basic assumption of the dynamic capabilities' framework is that core competencies should be used to modify short-term competitive positions that can be used to build longer-term competitive advantage.

The Teecian notion of dynamic capabilities moves toward corporate agility, encompassing the capacity to (1) sense and shape opportunities and threats; (2) seize opportunities; and (3) maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the business enterprise's intangible and tangible assets. Furthermore, it recognizes the importance of absorptive capacity toward learning and the reconfiguration of current OC/DC bundles and their renewal to better seize opportunities.

Hence, the capacity to apprehend (as a DC) and effectively learn requires common codes of communication and coordinated search procedures. Such type of organizational knowledge resides in new patterns of activity, in "routines," or a new logic of organization. This Eisenhardtian notion of *routine* can be then defined as a pattern of interactions that represent successful solutions to problems. These patterns of interaction are resident in group behavior, and certain subroutines may be resident in individual behavior. Collaborations and partnerships can be a source for new organizational learning, which helps firms to recognize dysfunctional routines and prevent strategic blind spots. Like learning, building strategic assets is another dynamic capability. For example, alliance and acquisition routines can enable firms to bring new strategic assets into the firm from external sources. The effective and efficient *internal coordination* or *integration* of strategic assets may also determine a firm's performance.

According to Garvin (1988), quality performance is driven by special organizational routines for gathering and processing information, linking customer experiences with engineering design choices, and coordinating factories and component suppliers. Increasingly, competitive advantage also requires the integration of external activities and technologies: for example, in the form of alliances and the virtual corporation. Zahra and Nielsen (2002) show that internal and external human resources and technological resources are related to technology commercialization.

Fast-changing markets require the ability to reconfigure the firm's asset structure and accomplish the necessary internal and external transformation (Amit & Schoemaker, 1993). Change is costly, and so firms must develop processes to find high-payoff changes at low costs. The capability to change depends on the ability to scan the environment, evaluate markets, and quickly accomplish reconfiguration and transformation ahead of the competition. This can be supported by decentralization, local autonomy, and strategic alliances.

3.4.1 Co-Specialization

Over time, a firm's assets may become co-specialized, meaning that they are uniquely valuable in combination. An example is where the physical assets (e.g., plants), human resources (e.g., researchers), and intellectual property (e.g., patents and tacit knowledge) of a company provide a synergistic combination of complementary assets. Such co-specialized assets are therefore more valuable in combination than in isolation. The combination gives a firm a more sustainable competitive advantage (Teece, 2009; Douma and Schreuder, 1992).

3.4.2 Asset Orchestration

If capabilities are dependent on co-specialized assets, it makes the coordination task of management particularly difficult. Managerial decisions should take the optimal configuration of assets into account. Asset orchestration refers to the managerial search, selection, and configuration of resources and capabilities. The term intends to convey that, in an optimal configuration of assets, the whole is more valuable than the sum of the parts.

3.5 Market Orientation and Dynamic Capabilities

Market orientation is a specific dynamic capability within the category of marketing capabilities that provides the information so that firms may build the knowledge needed to continue their successful activity in turbulent environments. This information is integrated into the firm's activities and will serve as input for actions to be undertaken (Monferrer et al., 2015). According to Herhausen (2016), firms should be ambidextrous and score high on both domains of market orientation: *responsive* and *proactive*. *Responsive market orientation* (RMO) is the ability to satisfy customers' current and expressed needs and is associated with marketing exploitation, while *proactive market orientation* (PMO) refers to the ability to satisfy customers' future and latent needs, and is associated with the preparatory learning for exploring their potential (Correia et al., 2020; Narver et al., 2004).

Undoubtedly, market orientation may assume though a heterogeneous focus, hence developing divergent types of marketing capabilities. Two major perspectives of market orientation, not incommensurable from our point of view, are the orientation toward behaviors, and lifestyle traits and attitudes (*behavioral perspective*) (Kohli and Jaworski, 1990); versus the orientation toward sociocultural and demographic profiling traits (*cultural perspective*) (Narver and Slater, 1990). We argue that the processing activities of likely different information basis gathered from the typical actors (customer, competitors, and suppliers) are accordingly shaped by the focus (or perspective). Such shaping (focus → capability) occurs at first at the path/direction of marketing capabilities being developed, and subsequently, influences the upskilling/reskilling process and readiness to cope with a particular type of change; hence, the perspective impacts ultimately on the responsiveness (in nature and pace) to future market information inputs (Deng and Dart, 1994; Kohli and Jaworski, 1990).

For Tuominen et al. (2004), market orientation is per se a dynamic capability that enables firms to develop activities that make it possible to process and respond to market information. Such insight provides a better understanding of customer needs, competitors' 'actions and market trends, and allows the "market-oriented firm" to identify and develop the necessary skills for a good long-term performance (Day, 1994). One may naturally wonder how might managers encourage market-oriented

behaviors and design consequent processes (Kaur and Gupta, 2010). Our thesis of an effective market orientation follows a hybrid route (cultural and behavioral), with predominance of the behavioral perspective, as the latter leads to insights on more concrete/established behaviors and the immersion of specificities in patterns and trends holding superior value.

Essentially, market orientation equips the firm with the predisposition and further developed the ability to process market information, and so market-oriented firms are asserted to be (likely to become more) capable of adapting to market changes (Baker and Sinkula, 1999). We argue that change-readiness determines the strategic agility of the whole business architecture and furthermore the design of the strategic planning.

However, the narrative of the virtues shown here by the market-based view (MBV) scholars ought to be stressed to have a significant degree of divergence in several aspects, with the Penrosian Resource-Based view (RBV), including the dynamic capabilities view (DCV) being an endless philosophical discussion about the growth of the firm; moreover, it is confronted with human capital theorists (HCT) (as to the tier of upskilling) and even colliding with the Harvard and Chicago Schools of thought of Industrial Economics and with Porterian Positioning School logic as to the focus on the type of information.

3.6 Theoretical Foundations of Change-Readiness (CR)

3.6.1 The Conceptualization of CR and the Theory of Organizational Readiness for Change (TORC)

At the organizational level, readiness to change represents a joint commitment of the members of an organization (organizational stakeholders) to implement change and shared beliefs in their collective ability to do so (Budhiraja, 2019). Weiner et al. (2020) have summarized this notion of "joint commitment" toward change defining organizational *readiness for change* as the shared determination of organizational members to implement change (change commitment) and shared belief in their collective ability to do so (change self-efficacy), conceptually defining organizational readiness for change and developing a management science theory focused on the organizational level. Hence, it can be inferred that readiness to change is an individual's beliefs, attitudes, and intentions in implementing and managing existing changes. It refers to the collective commitment of members of the organization as a critical success factor based on a shared belief in the collective ability to adapt to change.

The *Theory of Organizational Readiness for Change* is a framework that provided a referential in change-readiness with a multilevel construction of change management building abilities, emphasizing the importance of overbuilding organizational readiness for change (Weiner, 2009). This theory recommends various strategies to accomplish it (i.e., create organizational readiness for change) with

the main determinants of implementation capability: task demands, resource availability, and situational factors.

Deriving from this framework, the measurement of readiness to market changes is a useful apparatus for managers entailing a scanning of the degree of preparedness onto five major properties or dimensions of this capability: leadership; organizational culture; communication; training; and reward of successful change targets (Balushi et al. 2014). Herein, a factor selection per dimension (facilitating measurement) is provided by Antony (2014) as follows: (1) vision of change; (2) commitment to change (in management resources allocated); (3) compliance of vision with the business strategy goals; (4) customer focus (on future needs/expectations); and (5) conformity in HR policies (as to the selection and training of workforce).

Here, the degree of *change-readiness (CR)* may be considered an output of the variable (change initiative) and also as a diagnosis of performance as to the dimensions per factor above. A *change-ready organization (CRO)* expresses a firm's abilities to, continuously, endure changes in response to environmental opportunities and threats (Weiner et al., 2020). Those abilities are particularly expressed into

- The identification of changing events (or *trigger identification*)
- The gearing up to act (preparation)

The first element (the ability to identify changing initiatives) is the readiness to sense changing events (i.e., *trigger identification)*. Identification of an environmental trigger with a likely strategic impact on the firm is a key signal for change action. In dynamic environments, it is important to respond quickly to external triggers. With rapid environmental changes (i.e., technology, markets, and regulations) and globalization, leadership is highly associated with pioneering, and thus requires early identification and quick decision-making in the face of external changes.

An effective identification mechanism requires specific organizational and managerial properties. First is the need to properly monitor the environment and intercept signals for trigger sources. Second, this information needs to be processed to separate a meaningful development from random noise. There is also a need to assess the expected likelihood of occurrence, impact, and timing. The third stage requires substantial attention on the part of higher management to translate the findings into a managerial conclusion that some response is necessary.

The second element in a firm's readiness for a change is gearing up to act (preparation). Recognizing a need, or an opportunity, is a necessary but insufficient condition for undertaking strategic change. The second variable therefore deals with the time it takes to respond. The time response variable is not detached from the environment-monitoring variable: If the organization is slow in identifying an environmental threat, then the time available for preparing action might be quite short. Response time is assessed by two parameters:

- *Time to start*
- *Preparation time*

The first parameter refers to the lag between the recognition of the need to change and the start of active preparation. This lag reflects the organization's readiness for taking change action, that is, being overly occupied with current projects or crises, or finding it difficult to put aside existing activities. Organizations that tend to postpone making key decisions are likely to have a long lag prior to the start of action preparation.

Preparation time encompasses two discrete components:

- The time it takes for the change (*changing time*)
- The prioritization policy (under criteria of *importance* and *urgency*)

The former is content-related, that is, if a new technology requires an extensive adaptation process, then a long preparation time is inevitable. The latter component reflects the organization's priority for dealing with the specific strategic changes needed.

3.6.2 CR as a Meta-Capability: Strategic Flexibility and Strategic Adaptation

Contemporary organizations are challenged to prepare for scenarios of unlikely and/or unpredictable mutations in markets, especially the most impactful and long-lasting ones. Thus, *adaption* involves an interplay of several elements of organizational endeavors one may denominate as the adaptation process, to be taken in a stepwise manner, as follows (Aaker & Mascarenhas, 1984): (1) actions taken in relation to analytical studies (aimed at anticipating multiple scenarios—focus on particular *change options*); (2) formulation of strategies for each scenario (determining a *course of action*); (3) upgrading the resources and capabilities (R&C) needed to execute those strategies; (4) implementation of strategies; and (5) preparing for action and for the adoption of alternatives.

The classic definition of *flexibility* holds that adaptation represents the

ability of the organization to adapt to substantial, uncertain, and fast occurring (relative to the required reaction time) environmental changes that have a meaningful impact on the organization's performance. Aaker and Mascarenhas (1984, p. 74)

The two concepts (flexibility and adaptation) bear different connotations even though being complementary ideas to each other. Adaptation is intrinsically connected to the level of operational agility of the firm while flexibility pertains to tactical aspects of the process. This means that developing agility requires the company to adopt a flexible approach in the execution of the base processes. Therefore, the two notions should be interpreted as complementary rather than mutually exclusive. Some companies intend on maintaining their strategic flexibility not only to keep stock of current environmental trends and changes, but also to introduce and consolidate operating conditions that safeguard the rapid implementation of changes, even the most radical ones. In addition, it may be useful to adopt scenarios as elements of the strategic planning process, as well as employ strategic

alternatives at the stage of formulation of development concepts. The ability to cope with unpredictable environments and strategic flexibility requires ambiguity management skills, understanding of paradoxes, broadening the perspectives of current analyses and focus on activities that facilitate fast reaction to changes.

Change-ready organizations are then agile firms that hold this dyad of capabilities (flexibility and adaptation), respectively, as a potential ability (input) to go through one or various changing processes (flexibility) and have furthermore realized the change/s as an output of its strive (adaptation). Such meta-capability combines, moreover, according to Carter et al. (2016), two fundamental (hidden) dynamic capabilities supporting strategic flexibility and adaptation, that is, *organizational resilience* and *learning orientation*. Altogether, these lead to better performance outcomes.

Expectedly, leaders in *change-ready organizations* (CRO) exhibit mindful behaviors that have a "snowball effect" on their wider organization, encouraging organizational ambidexterity, and creating alignment and adaptability at the same time. Change-ready, mindful leaders are continuous learners, drawing on others at different organizational levels and integrating everyone's contributions.

4 Current Perceptions about Compliance and Regulations

While there are dozens of types of regulations and compliance frameworks available, with a focus on cybersecurity and data privacy, these concerns are included in the GDPR. Arguably these are the biggest and most overarching of these regulations. It is not (just) impacting businesses based in the EU since any firm with business with European citizens must also adhere to these guidelines. More than 3 years after the GDPR was enacted, several companies are still struggling to adapt and are being hit with significant fines for failing to meet these regulations in time. In fact, fines levied for noncompliance with the GDPR reached over $1.1 billion in the third quarter of 2021 (PYMNTS.com, 2021).

Complying with GDPR is, admittedly a burden, mostly due to the rules on implementing encryption of data. There are still some misconceptions about encryption and the role of encryption in compliance. Yet, encryption is a mechanism to protect sensitive data from malicious actors looking for opportunities to steal it (Spindler & Schmechel, 2016). This is accomplished by encoding the data, a process of taking plain text and essentially scrambling it into an unreadable format called *ciphertext*.

Encryption serves the superior purpose of holding the data in privacy, a subject that gained enormous attention in the last two decades, as increasing the number and amount of shared units of digital information are accessed by third parties, tapping into confidential/personal records. The quest for data protection and defensiveness against data breaching is a sensitive matter to be dealt with seriously, consciously, and ethically. The notion of *data privacy* consecrates nowadays fundamental rights in articles 17 and 20 as the "right of erasure" or the "right to be forgotten (RTBF)"; or

even the "right to data portability" (Abrantes & Ostergaard, 2021). Moreover, the role of the Data Protection Officer (DPO) is established as mandatory in article 37 for all organizations (including the ones acting as data brokers). The benefit of encryption is basically keeping sensitive data secure.

In this sense, we foresee the encryption system not just as the "peace of mind" factor for customers and suppliers (including data brokers) but also as an intangible factor of competitive differentiation with reputational gains, holding the parts from risk-related rebounds and reputational embarrassments and losses. So, if compliance is mandatory and entails a moral imperative as to the administration of data, encryption routines may be a competitive differentiator in businesses.

The GDPR is a wild card-changing event that continues to carry adaptation challenges and opportunities. Certainly, the amount of changes needed varies across organizations due to their geographical and functional positioning and achieved preparedness to handle the GDPR requirements. The authors here instrumentalized though the GDPR merely as a single external event, which can be tested as to CR using the dimensions and factors presented in the previous section as to a seminal theory (TORC). Industry practitioners are summoned to implement or adapt their compliance programs incorporating a *readiness assessment tool* similar to the one presented above to assist with the auditing mechanisms, either internal or external, as well as evaluate the current state of data protection in business and the information system's environment. Here, the auditing of the CR toward the GDPR is recommended to follow four factors of GDPR compliance: *business context*, *authority support, processing control,* and *improvement.* Each factor may be decomposed into expectations, denominated in strategic management (SM) as the performance indicators with a respective standard or target measurement and limits' variation.

5 GDPR's Readiness in a Three-Step Method

In a nutshell, the GDPR compliance as a change event constituted a challenge to any organization. Moreover, the softened requirements across state-members put into evidence the need to still trim some edges. GDPR is above all a business challenge requiring from managers, undertaking the exercise of equating portfolio options and strategic formulation, the mental ability to account, prior to the actual (strategic) design momentum, the overall implications of the GDPR on the organization.

Hence, the spillovers of the GDPR as a changing event are not solely circumscribed to compliance matters, neither to the circumscription of value-negative implications, as cost disadvantages resulting from technological adaptation or opening new roles (as the DPO or CPO) in a firm.

Organizations are challenged to critically observe the myriad of possibilities opened by the event, and moreover on a higher degree of reflection the endeavors to be taken to build an organizational culture that integrates change as a natural circumstance of the business environment, working with it in an optimal way, for anticipating the moment of its awareness and proactively (and fearless) approach the

changing recipients to fabricate solutions for overcoming uncertainty, risks deriving from the uncertainty, financial rebounds attached to risks, and best of all, for imagining, collectively, new opportunities brought by change and future scenarios on how to exploit these opportunities.

This shift in strategic thinking entails certainly an upskilling/reskilling of the whole organizations on change management-related capabilities and cultural accommodation as well as integration capabilities. The strategic necessity is clear yet underestimated. If one looks at the GDPR as a business challenge, then what is the essence that shaped the strategic approach? The GDPR essentially requires that organizations can effectively demonstrate that they did what they could to process personal data in a more careful way. From that business perspective, the challenge is to start looking at how information management can be facilitated, mediated, and administrated. Such a strategic approach beyond GDPR compliance toward change CR as an optimal state of accomplishment might be achieved in a stepwise manner as explained below.

In a first stage (*awareness*), becoming conscious and aware of (the impact of) the GDPR, dominating the legal framework and mapping its implications in business systems and inherent processes. Surely, several organizations are struggling to abandon this stage. Making the organizations aware of the GDPR encompasses various aspects of the organizational system and is a broad task requiring the involvement of all.

The second stage (*assessment and methodology*) encompasses a familiarity with the legal framework and with its implication. This stage implies a subsequent endeavor taken from stage 1 to work upon the mapping of implication to a focal firm. Here, it implies conducting a thorough risk analysis at all the changing points required. Furthermore, making the accountability of the gap between the extent of resources-owned per activity and resources required (e.g., people; finance; technology). Note that the resources gap assessment presupposes a predefinition of the degree of accepted (or at least simulated) risk profile.

Practitioners are recommended to build visual elements, regularly updated, of a matrix of the degree of risk taken per activity and the required actions and their underlying resources.

The third and final stage is the implementation stage where the businesses effectively incorporate the decided course of action/s as to the change-readiness to GDPR to the strategic business plans, incorporating them into the targets set, or the performance indicators or into the operational instructions to reach the prior. This entails holding a strategic performance-controlling activity to monitor and evaluate how close it is to being achieved based on the initially defined objectives and how it can be further optimized as per the requirements.

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Knowledge Management (KM) as Performance Amelioration's First-Order Capability

Mahesh Nepal and Bruno F. Abrantes

1 Introduction

The various societal agents worldwide have gained a growing awareness in the past decade of the importance of digitalization in the business realm. With a reinvigorated importance, data units became a precious source one might yield as monetizable units of information, even with tradable value equivalent to any product or service. Whether in data bulks (or crunched) and bundled into large amounts for discerning hidden patterns, the (data) analytics function became a perennial in multiple organizational areas, often overly explored into "data fumes" opening horizons for (commercializing) new insights.

Increasingly, computer-assisted information systems (IS) gained roots in the last two decades. IS developed mechanisms to deepen the capacity to absorb informational inputs (and findings patterns in data), which were leveraged by the disruptive technological advancements of information and communication technologies (ICT), plus the upsurge of big data (BD) and the advent of artificial intelligence (AI). Unavoidably, on the latter, the Internet of Things (IoT) unleashed the underlying potential of connectivity and interoperability of machines communicating with men and with other machines. IoT contributed hence to an acceleration of the cobotization and robotization of (especially) the firms of the secondary sector at the same type that societal digitalization seems to be entering into a "digi-sense" era

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evolving from the effective automation of processes into the commoditization of mankind as a "chipped" communicating device. Moreover, ICT made further incursions into what our future may be like, on a future thinking logic, approximating present and future, by taking substantial steps into the anticipation of future paradigms, tapping into the technology for the virtualization of new realities (or virtual reality), which constitutes already a sub-technological cluster on itself but also attracting significant attention of other fields, for instance, the marketing and advertising agencies beginning to make initial investments on VR adds foreseeing not in a far way future the evolution of the sector.

Indeed, those events above were a fundamental piece of disruption, dragging companies into a second economy, where competition follows an unprecedented digital logic and where the information is no longer a conundrum. Instead, its abundance raises paradoxical challenges to its users, that is an *information availability paradox*, whose availability is not a synonym for the ability to unlock the potential carried by these inputs and transform it into knowledge outputs. Thus, business environments are evolving hastily and becoming day-by-day more unpredictable ponds. Our (assumed) baseline may be though that markets are spiraling up within a digitalization path, even when increasing in volatility, uncertainty, complexity, and ambiguity (VUCA) features (Abrantes, Eatmon and Forsberg, 2021; Abrantes and Venkataraman, 2022; Abrantes and Ostergaard, 2022). Addressing the contextual background challenges leads us to reflect upon a few hypothetical primary questions:

#1. What (type of) knowledge do organizations require to (constantly) adopt?
#2. How should organizations learn (hastily and effectively) to reconfigure or renew its knowledge base?
#3. How can a firm effectively administer multiple knowledge bundles?

Those questions are intricate ones, that various organizations, namely large enterprises, have been looking for "Holy Grail" answers, being summoned, under such context, to learn (further, faster, and smarter) than ever before, and this route will necessarily lead to the embracing of digital technologies. The spiraling path of digitalization entails an underlying need for surfing the wave of technological adoption opening horizons for effective knowledge management across the firm and subsequently opening new horizons for more criterious streams of acquired and disseminated knowledge (Abrantes and Venkataraman, 2022).

The ability to manage knowledge effectively (*#3*) seems nowadays a decisive apparatus of a priceless intangible value in a contemporary business world. Hence, this chapter immerses precisely into the realm of such a critical paramount tool, that is, *knowledge management*. We have refrained from entering into appealing cogitations comprising the microfoundations of learning, its morphological features, and the specificities of computer-assisted knowledge management options (#1; #2). Conversely, this research project centers itself on the understanding of KM as a dynamic capability:

Table 1 Most valuable companies in the United States: revenue and profit in billion USD (from 1980 to 2021)

1980			2000			2021		
Co.	R	P	Co.	R	P	Co.	R	P
Exxon	79.11	4.30	Gen. Motors	189.02	6	Apple	365.80	94.70
Gen. Motors	66.31	2.89	Wall-mart	166.81	5.38	Berkshire Hath.	276.10	89.80
Mobil	44.72	2.01	Exxon Mobil	163.88	7.91	Alphabet	257.60	76.00
Ford Motor	43.51	1.17	Ford Motor	162.56	7.24	Microsoft	168.10	61.30
Texaco	38.35	1.76	Gen. Electric	111.63	10.72	JP Morgan Chase	127.20	48.30
Chevron	29.95	1.79	IBM	87.55	7.71	Meta Platforms	117.90	39.40
Gulf Oil	23.91	1.32	Citigroup	82.01	9.87	Amazon	469.80	33.40
IBM	22.86	3.01	AT&T	62.39	3.43	Bank of America	93.80	32.00
Gen. Electric	22.46	1.41	Altra Group	61.75	7.68	Exxon Mobil	285.60	23.00

Notes: *Co.* company, *P* profit, *R* revenue
Source: Fortune (Online)

 # 3.1. How might KM successfully support the strategy's design and execution of a firm?

Hence, in this chapter, we plunge into the specifics of KM, attempting to provide meaningful insights for industry practitioners to replicate such KM, through a "quasi-imitation" of the KM process here drawn upon. Under the current second economy paradigm, the success of an organization depends on its ability to realize economic value from its collection of knowledge assets and its efficient management toward meeting the organizational goals (see Table 1). Thus, the contemporary business environment can be described, henceforth, as knowledge-based economy, in which KM is a fundamental strategic asset that senior managers ought to take it seriously for the survival, sustainability, and wealth of the organization. Table 1 exemplifies the disruptive effects of knowledge-based companies (KBC) (including tech-based) in the ranking of most valuable corporations:

The clear panorama of heavy industries populating the ranks nearly half a century ago were swiped away by industries and players (some were not even born in 1980) who do not manufacture physical goods and whose focus is service provision with a high degree of knowledge and technological adoption. The rise of these types of organizations represented a paradigm shift easily tracked by the historical figures of the highest revenue and profit earning by US companies (Fig. 1).

Noticeably, in 1980 the top 10 largest US companies by revenue and profit were placed in the primary and secondary sectors. Six out of the ten most profitable companies were natural resource-intensive oil corporations followed by three

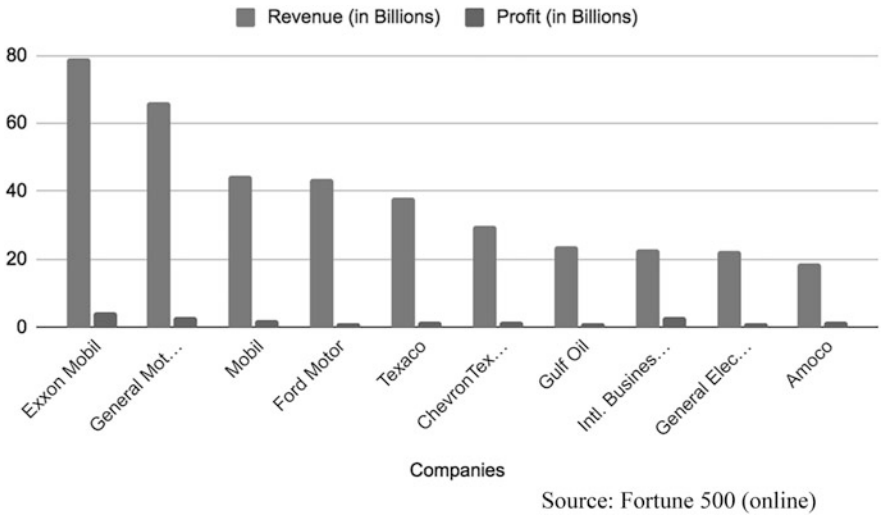

Fig. 1 Most valuable companies in the United States (1980). (Source: Fortune 500 (online))

industrial manufacturers. Their businesses surrounded oil and gas refinery (e.g., *Exxon*, Mobil, or *Texaco*), and automobile and components manufacturing (e.g., *Ford* or *General Motors*). This was a portrait of an increasing car ownership and a booming economy during the 1980s in the aftermath of the great 30 years after WWII, which uplifted the social conditions and income in Western Europe, which these large North American multinationals managed to capitalize from (Piketty, 2017).

At that time, only one technological company entered the ranking (i.e., IBM), which barely made it into the 10 companies list by revenue. Even then, the IBM's profit was high, only comparable with two companies on the top of the list. However, by 2000, the decline in these heavy industries was significant as all the energy giants (except Exxon Mobil) were out of the ranks. Nonetheless, automobile manufacturers Ford and GM held steady their place in the list. Yet, rank was a far more heterogeneous one, including firms from diverse economic sectors (e.g., airline, banking, consumer retail, or telecom).

Fast forwarding to nearly our days, American corporations had a very profitable year with Fortune 500 altogether generating $1.8 trillion USD in profits on the $16.1 trillion in revenue (Fortune, 2022). Meanwhile, major trends can be seen in the American business landscape (see Fig. 2).

Technology companies dominate currently the market space, and energy companies are in decline despite a rebound in 2021 (Fortune, 2022). *Apple* assumed the leading spot of the most profitable American companies in 2021, with 94.7 billion USD in profits and $365.8 billion in revenue. Apple had held tight to this top spot during most of the last decade (7 out of the 8 years) only being eclipsed once in 2019. The twenty-first century has become the century of tech, with major American companies being tech-based, that is, *Alphabet*, *Microsoft*, *Meta Platforms*, and

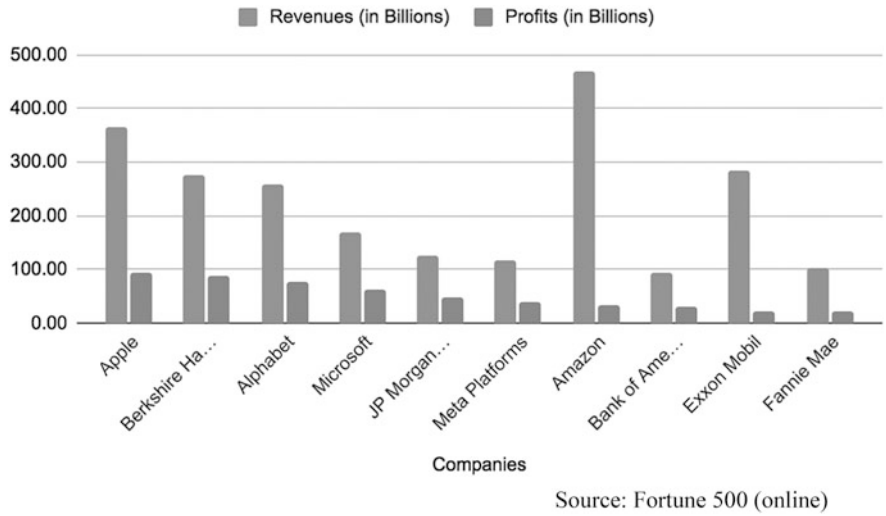

Fig. 2 Most valuable companies in the United States (2021). (Source: Fortune 500 (online))

Amazon dominating the ranks. Tech companies represented three out of the top five most profitable companies in the United States in 2021 and half of the top 10.

Hence, the trends are explicit, a new generation of skillful companies has achieved an unprecedented scale of market reach. *What do these companies have in common?* A dematerialization of their offer, with portfolios bundled in a sequence of complementary products/services, presented to target market groups on the web, defying the canons of value networks, changing the intermediation logic of supply–demand, in web-based managed business models and with a level of sophistication (of the portfolio, channels, system, and business infrastructure), which denote a high degree of asset's complexification and inherently a copious use of knowledge, skills, and abilities (KSA). Eye catching is also the average net profit differences from 2000 to 2021 since it rose nearly ten times during this period. While *Citigroup* yielded 10.72 billion USD in 2000, *Apple* garnered an impressive 94.72 billion USD in net profits in 2021. Invariably, any thesis on the contributing factors of such high profitability will derive into considerations about innovativeness and knowledge possession and crediting the morphological attributes (namely their mobility or transferability of these KSA units). Surely, someone would argue also the benefits of worldwide diffusion of these products/services due to their easy accessibility, minuscule variable costs, and the sheer volume of transactions.

Yet, as formulated above in the form of three general focus research questions (GFRQ: #1, #2, and #3), we argue that more important than understanding the morphology of intangible resources and capabilities in an organization is to comprehend how they might be (efficiently) deployed. Hence, our focus on this dynamic capability – knowledge management – has this optimal output destiny, that is, *efficient knowledge management*.

Efficient knowledge management (EKM) is an essential performance output, appraising the KM's realization of its potential. To achieve business and market competitiveness, organizations require individual and collective development, and partial (*reconfiguration*) and total (*renewal*) of the current knowledge base. Thus, EKM encompasses an adequate utilization of the seminal resources on a given moment (i.e., existing knowledge), both *manifest* and *latent knowledge*, and continuously updates needs accounting for furthermore its intended dissemination model across the whole organization (*intra-enterprise dissemination*) and across partners (*cross-enterprise dissemination*).

Effective knowledge management through the development of capabilities should contribute to the attainment of key goals: (1) above-average returns (a.a.r.); (2) consolidation of the strategic position and firm's competitiveness factors or firm-specific advantages (FSA); and none the least (3) lead to innovations in products, or processes, or market positions or paradigm shifts. Yet, the organization's structure in place is key in decision-making and action-taking. A scenario of clarity in goal-setting even under uncertain environment's circumstantialism surrounding the middle and senior manager's decision-making processes leads, more often, to decisions held on the adoption of *rational models* of decision-making, instead of likely other less fruitful decisional models (e.g., *political*, *administrative,* or even *garbage can*) (Boddy, 2017). Hence, KM is believed to be a contributor to assertiveness in decisions and shorter deviations to goal's accomplishment, even accounting for a typical bias related to the overconfidence granted by knowledge (i.e., *illusion of control*) by opposition to the under-confidence decisions (i.e., *satisficing*) bounded to accept a large degree of knowledge gaps and bounded rationality of the decision-holder. Another assumption is linked to the need for born-with or man-developed intellectual abilities to accommodate new knowledge. In other words, knowledge development requires prior knowledge. The largest is the breadth of the prior knowledge while ampler is also the likelihood of accommodating (more and faster) intellectual novelty in the form of *embrained knowledge* (Malhotra & Segars, 2001). Here, we link such inner-intellectual ability of the person and collectively the firm to learn together with Zahara and George's (2000) concept of *absorptive capacity (ACAP)*. For these scholars, ACAP requires prior knowledge or *preparatory* ACAP (PACAP) to be able to assimilate something new, that is, *realized absorptive* capacity (RACAP).

In this context, the primary resource (*knowledge)* is defined as the informational (intangible) asset for understanding something or furthermore acquires new skills either through education or experience (Oxford, 2022). Knowledge is the theoretical and practical understanding of the subject. In the context of an organization, knowledge is key for continued development; thus, information holds the value of *relevance* and *applicability* toward meeting organizational performance goals (Charles & Bixiler, 2005). It is a systematic process by which an organization attempts to gather, organizes, share, and analyze its knowledge base that will be easily accessible to its employee. It is a competitive necessity that an organization must become a knowledge-based organization and realize the economic value of its collection of knowledge assets.

The primary driver of the KM in today's enterprises is the progress of technology (information technology, communication, transportation, etc.). This technology has revolutionized the way organizations store and process information and influenced the development of new products. With the rise of big data, organizations know their customer more than the customers themselves. It is within this development context that the requirement for effective KM is critical. This chapter discussed how can an agent at the firm level administrate their knowledge base in order to achieve above-average returns, strengthen the competitive advantage, and innovate the product base and the operations. The section also looked at the influence of the KM on the decision-making and the accommodation of new knowledge to make the organization time relevant, young, and energetic. The trends from the last 61 years demonstrate the rise and dominance of the knowledge base companies in the twenty-first century's globalized marketplace. The strong knowledge-driven approach has given them exposure to global consumer base by bundling their knowledge-based product into a more accessible and portable form. This has led to the rise of juggernauts like Apple, Google, and Microsoft with a bigger economy than most nations in the world.

Further on, we will analyze dynamic capabilities in the next section; another holistic concept of dynamic capabilities is important to understand while discussing knowledge management. The next section also outlines the differences between dynamic capabilities with the operating capabilities.

2 Knowledge Management as a Dynamic Capability

2.1 Operational/Ordinary and Dynamic Capabilities

Despite the amount of literature on the topic of dynamic capabilities, its conceptualization is filled with inconsistencies, overlapping definitions, and an interchangeable use of dynamic and operational or ordinary capabilities bringing to the surface the long road scholars still travel until a universal understanding (Cepeda & Vera, 2007). Dynamic capabilities are largely understood as the way firms develop new skill sets and the routines to undertake organizational tasks that allow them to compete in the market. Operational capabilities are geared toward the operational functioning of the firm, including both the staff and line activities. Operational capabilities are capabilities that focus on how a firm can earn its living; dynamic capabilities, on the other hand, focus on the changes and improvement of the operational routines.

While distinguishing dynamic capabilities from operational capabilities, dynamic capabilities are dedicated to the improvement or modification of operational capabilities aiming to enhance organizational goals or outcompete the competition. These capabilities do not directly influence the performance of the firm but indirectly impact the operational capabilities (Helfat and Peteraf, 2003; Cepeda & Vera, 2007). Further on, dynamic capabilities involve a transformations process of the

form's knowledge resources, routines, and output to a new configuration of resources and operational routines (Cepeda & Vera, 2007).

Often overlooked, *operational capabilities* have an elementary role in the firm's performance and competitive advantage being embedded in the organizational fabric of business systems. The effectiveness of operational capabilities is challenging to measure as they are developed slowly and tediously, embedded, and manifested differently in the culture of the organization (Wu et al., 2010). They emerge gradually and are tightly associated with a firm's distinctive features; they tend to blend into the background (Helfat & Winter, 2011). Operational capabilities refer to those embedded into day-to-day activities within the organization. Both play an eminent role in achieving competitive advantage.

As a dynamic capability (DC), on the other hand, KM might be pictured as a learning capability since learning can be defined in terms of the processes of knowledge creation, retention, and application (Smith & Prieto, 2008). Similarly, KM might be labeled as managed learning; thus, both concepts bond together to provide a solution to knowledge-associated processes (Vera & Crossan, 2003). Organizational learning unifies both dynamic capabilities and knowledge management together (Simth & Prieto, 2008). The nature and evolution of dynamic capabilities can be described in terms of knowledge as a hidden resource of all DCs (Smith & Prieto, 2008; Eisenhardt and Martin, 2000). One of these DCs (KM) refers to the ways one organization best manages it in dynamic and discontinuous environments (Smith & Prieto, 2008).

Dynamic capabilities highlight two fundamental elements to achieve a competitive advantage. The first is *dynamism* of the organizational process or systems with the characteristics of continuous change, a business environment that is actively evolving and progressing, which mandates strategic response. *Capabilities* are the ability of an organization to perform a coordinated set of tasks utilizing organizational resources to achieve the organizational goal (Abrantes, Preto and António, 2022a; Kaur, 2019; Helfat and Peteraf 2003). Capabilities are organizational processes and routines rooted in knowledge (Cepeda and Vera, 2007).

Conceived as a source of sustainable competitive advantage, dynamic capabilities may be defined as the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments (Teece et al., 1997). In this context, the dynamic capabilities view (DCV), as a branch of resource-based theory (RBT), attempts to untangle complex problems of sustained competitive advantage in today's ever-changing technology-driven business environment (Eisenbardt & Martin, 2020). It is mostly positioned as an extension of the first (resources-based view) and suggests that each organization possesses resources (tangible and intangible) and capabilities differentiating them from the others providing competitive advantages and therefore improving company performance (Smith & Prieto, 2008). Dynamic capabilities emphasize the renewal of resources by configuring them into new capabilities and competencies (Teece et al., 1997).

Even though the concept of dynamic capabilities was introduced in the 1990s, the researcher's view on the true nature of the relationship between dynamic capabilities and the competitive advantage of the firm is still conflicting. Early literature on

dynamic capabilities, mostly focused on competitive advantage, argues that the possession of a dynamic capability is a sign of the ability of an organization to develop key competitive advantages in a focal market. The argument is that in a constantly evolving business environment firm advantages do not come from the organizational resources or the organizational process and routines, but it comes from the firm's ability to continually create new capabilities (Teece et al., 1997, Cepeda and Vera, 2007). Meanwhile, a contrarian academic reasoning claims that dynamic capabilities do not manifest the characteristics of heterogeneity; thus, it cannot be the source of competitive advantage (Kaur, 2019). In a relatively distinct definition of dynamic capabilities, Zahra et al. argue that it is the process to reconfigure a firm's resources and operational routines in the manner envisioned and presumed appropriate by its principal decision-makers.

2.2 Knowledge-as-an-Asset (KaaA)

Managers at the strategic apex of an organization rely today on an array of multiple knowledge typologies to solve problems, take actions, enhance performance, and simply get the things done in the technical enterprise. Unsurprisingly, a new information service-based economy has placed a premium interest on "knowledge," an internal development function to the benefit of all organizational stakeholders that we have denominated as *knowledge-as-an-asset (KaaA)* due to the increasing need for information, intertwined with other organizational issues, indissociable from the first, as technological advancements and accessibility (Baker et al., 1992 cited in Charles & Bixiler, 2005).

However, most of the scholarly research on the field of knowledge management has, in the context of the private-equity firms, focused on knowledge-based products and inherent sales performance, or alternatively, focused on comparing knowledge-based companies (KBC) with non-knowledge-based companies within the sphere of the "old economy." However, as discussed in the previous section, all the organizations are summoned, more than ever, to fulfill the imperative of knowledge-driven competition and to be effective administrators of multiple knowledge bundles, likely dispersed across the organization through multiple functional and geographical areas. Despite the effort, the causal relation of KM with its outputs, for example, the impact on the innovativeness of the firm, and strong potential for solving organizational problems justify on its own its full immersion into the exploring of the vital role of KM in the growth of the institution. The industries seem to have realized the spillovers of KM on integrating technologies, leadership, decision-making, and learning.

Being in the spotlight during the last decade, KM has garnered the attention of top executive teams, fetching investments in the building of infrastructures from the global pie of annual corporate spending. Predictably, the global market for knowledge is estimated to surpass the US$570 billion mark in 2023 and is expected to reach $1 trillion USD by 2026, growing at a staggering compound annual growth

rate (CAGR) of 19.8% over this period of time (Research & Market, 2022). Despite being a paramount tool (knowledge management), previous research revealed that incumbents, especially senior executives, find it difficult to roll down a KM program and transform their organizations into well-oiled machines with great operational synergies and knowledge traveling around multiple geographies, functional areas, and divisions (Charles & Bixiler, 2005). In addition, some scholars assert that the implementation of KM models and the effective routines of transference are largely unconscious, occasional, and uncontrolled as to the deployed knowledge (types and agents) Bienkowska & Ignacek-kuznicka, 2017; Morawski, 2011, Tabaszewska, 2011).

Hansen and Nhoria (2004) and Bienkowska & Ignacek-Kuznicka (2017) argue that one of the barriers surrounding the phenomenon of dissemination is that the fluidity is dependent on the type of organizational structure in place. These scholars argue that knowledge circulates rather in a noncontinuous flow, but also in a concentric way, involving the areas more sensitive to learning and where the willingness of the provider to share with a seeker does not constitute an obstacle to intra-organizational collaboration. For instance, Hansen and Nhoria (2004) argue that the degree of awareness of the seeker as to their own knowledge requirements, and the sources where it may be obtained from on the provider's side, is directly proportional to the absorptive capacity. These scholars, together with Abrantes et al. (2022a, b), claim that the absence of network ties to intra-collaborate with meaningful providers may constitute a large barrier to the intangible transference (one-sided) or mutual exchange (two-sided) of ideas.

Moreover, Bienkowska and Ignacek-Kuznicka (2017) underpin that cautious KM designs, in opposition to unconscious KM designs, require not only an open IT infrastructure that allows for the accumulation of data as a passive repository (as typically *knowledge portals* are) that in turn lead to knowledge drifting mostly across rational managers, but also with an architecture that stimulates continuous dialogues, flows of information and operational synergies, as a "social infrastructure," utilized across the whole organization. However, such a social infrastructure requires a holistic conception as a universal knowledge model that stimulates transferability, reconfiguration, and the renewal of knowledge bundles, being in turn a driver of structural and cultural change.

However, unconscious KM practices and thoughtless designs might not per se justify current inefficiencies. We argue that the organizational belief systems may contribute to an overvaluation of the IT infrastructure and consequently generate an optimism bias of the mechanism in place. A solid IT infrastructure is not a synonym for intra-unit collaboration since a large capacity to store data, secure it, and transfer it quickly simply is not KM, but system's administration! There are several examples of large enterprises collapsing due to their stubbornness, lack of willingness to embrace organizational knowledge, and short-sightedness toward technological changes in their space. Kodak's failure to lead the digital photography revolution is perhaps the greatest example of a managerial shortfall to harness organizational knowledge. Despite one of its engineer's inventions of the digital camera long before

its competition, the management lagged in seizing the opportunity to transform the company by utilizing its own knowledge.

2.3 Knowledge Management as a Process

Knowledge management defines the set of processes required to efficiently manage knowledge (Charles & Bixiler, 2005; Wiig, 1997). It is the systematic, explicit, and deliberate application of knowledge to maximize an enterprise's knowledge-related effectiveness and returns from its knowledge assets. In addition, Leonard-Barton (1995) argues that the process (and terminology associated with knowledge management) is often wrapped under the overuse of buzzwords; however, is practical, fundamentally sound, and concrete. To renew and sustain a competitive edge, an enterprise must capture and effectively administer all of its employee's knowledge, skills, and abilities (Charles & Bixiler, 2005). Hence, KM is a decisive organizational capability (OC) at the layer of first-order capabilities, so-called *dynamic capabilities (DC)*, which is based on the utilization (and routinized application) of the one seminal intangible resource (i.e., knowledge).

Taken from a learning view, KM is a heuristic phenomenon that requires prior knowledge to gain further experience accumulation, articulation, and codification (Zollo & Winter, 2022). It is an organizational process consisting of four stages as represented below.

It begins, as seen in Figure 3, with a twofold path of knowledge development (*acquisition* and *creation*) and continues likewise with a bifurcated knowledge diffusion processes (*sharing and implementation*; and *storage and documentation*). The acquisition of, perceived as the most costly and time-consuming, is traditionally appropriated through strategic alliancing mechanisms as equity-alliancing, join venturing, consortium, network alliancing, or most simply outsourcing (Andreeva & Kianto, 2011; Inkow, 2020).

Creation implies an alternative (but not exclusive) path of building own fundaments or microfoundations of a certain knowledge type. Less costly, nonetheless

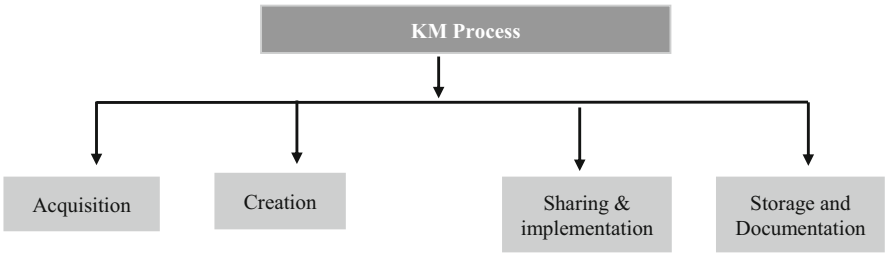

Fig. 3 Knowledge management process: four stages. (Source: Own elaboration)

also time-consuming. The first may constitute a shortcut for the second on interrelated typologies of knowledge, bringing an awareness of its need and our basic understandings of our own creation.

The third (*implementation*) refers to another DC known as *knowledge utilization*. The possession of knowledge (as an asset) is deprived of utility if not applied in the context of the business operations. Resources are static and require an instrumentalization by the organizational functions to exploit their benefits. The possession and administration of nonapplicable or obsolete knowledge bundles entail costs, which being supported meaninglessly by an organization constitute a superfluous or waste investment, hence a competitive disadvantage, deviating a company from maximizing its operational production or selling potential and from reaching a higher profit pool.

However, it implies also a collective dissemination across projects, teams, centers, departments, units, or divisions (i.e., *sharing*). The notion of sharing presupposes that knowledge is a mobile asset due to its intangible properties. Hence, it allows for transferability from the origin to multiple points of destiny (PoD) as to the partial or total sharing of properties and taking into account the organizational structure's intended model of sharing, that is, the generalist (knowledge-to-multiple) or idiosyncratic (knowledge-to-some). The latter model refers to a more reflexive way of conceiving knowledge transferability fluxes, accounting for the needs of the receivers (Abrantes, Preto and António, 2021).

Opposing the underlying logic of linearity above is the alternative reasoning of KM conceived as a cycle (Cepeda and Vera (2007). This involves the administration of novel (acquired) knowledge and existing one, in which KM enables firms to change the way one does things in the quest for higher rewards. Thus, KM, as a cycle, denotes alike four phases: *generative variation*, *internal selections*, *replication*, and *reaction*; nonetheless, these phases are rather focused on the handling novelty and its sequential linkages toward the formalization, consolidation, and exploitation of inputs. The generative variation encompasses the original ideas, individually or collectively generated by someone inside the organization or collected from partners or in external forums.

These bulk ideas are action-oriented, linked to industrial challenges faced at a certain moment in time, and the idea is the trigger for the resolution of organizational issues in a likely rational manner. From the idea generation to the maturing of the concept and development of a solution, the dossier of a solution (a proposal brief) enters a pipeline, which correspond to the internal selection phase, in which the novelty is accessed in its potential in comparison with other and straight connection with other programs and projects composing the overall unit's portfolio (Andreeva & Kianto, 2011).

Acceptability is dependent on its suitability and feasibility in a certain context. Naturally, the most effective and what one may yield the most are proposal-pool winners in this selection phase. These latter ones fall in the replication phase that is subject to a scrutiny of the requirements for its implementation, with the outlining of processes and communication to relevant stakeholders, coming back and forth for further refinement. The reaction phase refers to an ongoing appraisal of its impact on

the horizon of further possibilities. A revisiting of processes and routines is accompanied by a coding function systematizing less formalized processes and subsequently to a wider sharing within the organizational realm.

2.4 Knowledge Management as a System

In this regard, whether adopting new knowledge, registering it, or disseminating already existing one, ICT plays a critical role in the organizational setting for effective management of knowledge as an infrastructure, acting as a facilitator and steering a culture of knowledge (Pandey and Andrew 2013; Smith & Prieto, 2008). KM systems are coordinating mechanisms one strives for that store and retrieve units of information from/to, to improve your understanding of your own KM practices, leverage collaboration, and process alignment. Moreover, the infrastructure acts also as a growth system for carrying out transformations in available knowledge bundles into even more valuable enterprise assets (Charles and Bixler 2005).

Denominated commonly as knowledge management systems (KMS), they are information systems used to manage organizational knowledge to facilitate knowledge creation and dissemination, storage, transfer, and application (Santoro et al., 2018). It is devised as a technological solution so that teamwork can be accomplished and collaboration can be made to obtain the best organizational performance. Thus, from a KM perspective, it can be considered as the common platform capturing individual knowledge for broader organizational benefits as a collective purpose. Some of the characteristics of KMS are the centralization of information platform accessibility and scalability. A typical use of KMS is the research and insight library, accessible to the employees. Other uses of KMS are the enterprise resource planning (ERP) systems or the customer relationship management (CRM) systems.

An enterprise resource planning (ERP) refers to a strategic information technology tool whose utility is to enhance internal and external communications, appropriate the allocation of organizational resources, and improve the output of the product and services (Samiei & Habibi, 2020). The ERP is a system promising a positive impact on the organizations with such infrastructure's costs outstripping the investment. Thus, ERP is an infrastructure option that yields likely cost optimization and the amelioration of revenue streams in return for a more effective and rational allocation of resources (Gebert et al., 2003). ERP systems focus on the integration of different functions, harmonizing of business processes and information being shared intra-units breaking down with a silo mentality and boundaries in access to information (Vandaie, 2008). Thus, it enables knowledge flows and helps organizations to improve their competitive advantages, bringing an advanced computer-assisted technological infrastructure, to access and integrate data, reporting and effective communication among the employee and the customers (Rouhani et al., 2017).

Other seminal types of technological infrastructure widely spread across large enterprises are the customer relationship management (CRM) systems (Gebert et al.,

2003). These are focused on managing the relationship of business front-end activities with higher visibility to the customer base as a key for building reputation and sales. CRM tools hold key information to the understanding of the customer experience, especially when organizations achieve a global reach, in which the management of information is a rather challenging task and the possible abundance of data from/about one's customers is not a synonym for higher knowledgeability. Thus, the consolidation of multiple streams of inputs requires the organizations the adoption of an infrastructure to record, monitor, and analyze the demand's views, needs, requirements, and perceptions and so constantly empower the businesses. Customer relationship management are systems to be used to manage the everyday interaction with a customer, mine such data, and leverage data to drive decision-making and seize opportunities. The main objective of CRM is the building of system's processes to gain critical insights that seal off customer churn.

The integration of CRM in a KM function is asserted to yield several benefits. First and foremost, it is argued to contribute to the employee's productivity and lowering of costs. The rationale is that the management of knowledge-oriented customer relations is a framework for increasing the quality of relations with external stakeholders; hence, with spillovers on cost-effectiveness (Gebert et al., 2003). Secondly, as CRM tools store every single piece of interaction held with customers, so at the individual level, each interaction is a new opportunity of troubleshooting, redeemed from inefficiencies, failure, or unmet expectations and relaunch an account's opportunities. Needless to say, CRM as a system does not wedge the damages of faulty practices and inertia. Troubleshooting is key to regain customers' confidence, and so erase defective issues, bad experiences, and potential future business losses. Thirdly, the analytics is a crucial function for understanding patterns and instilling changes in processes. Consequently, the power of big data within a knowledge-infused system allows organizations to build consistent relations and align the CRM processes across teams and surrounding their goals.

Moreover, the higher the technical sophistication of the tool, the highest the likelihood of yielding further benefits. For instance, the ease of access to information and convenience of reporting and actual use in future rational decision-making. But the main benefit of higher technological incorporation in the CRM is the improvement of the quality of customer experience in the future and its customization toward a more personalized interaction. Hence, the tracking of search and query activity provides actionable insights for building business growth, such as building upon the most engaging content, improving the accessibility, or developing feedback mechanisms to track the customers' satisfaction (Ranjan & Bhatnagar, 2011). However, the greatest stream of opportunity arises from artificial intelligence (AI). CRM systems powered by AI constitute a large window of opportunity to expand the scope of support to one's customer base. Herein, the use of chatbots and related automatic text-generated content opens horizons for new forms of interaction with almost unlimited possibilities.

Considering the variety of systems with multiple means and purposes, as exemplified above, Abrantes et al. (2021, 2022a, b) argued in their research that KM as a dynamic capability requires not a KM system, but several KM systems, and so

organizations are entirely deprived of a holistic solution, a meta-system, as an overall capability management system (CMS) with an IT design and capability mobility design bringing these and other KM systems together as much as a record of other capabilities as well as in a dynamic and decentralized digital ledger functioning as the "memory of a corporate brain" of the firm.

3 Conclusion

Dynamic capabilities (DC) constitute the set of firms' abilities to integrate themselves within rapidly changing environments. Knowledge management (KM) is a pivotal tool associated with the ability to acquire competitive advantage gains and being comprised of a first-order type of organizational capability.

Knowledge per se is a static intangible resource that requires continuous utilization and routinization within the sphere of business processes to become an organizational asset. This view is epitomized here as KaaA (as presented in Sect. 2.2). Such a resource's dependence upon activities to transform it into a capability (resource utilization) is better optimized through a purposeful and rationally fashioned mechanism of knowledge utilization (i.e., KM).

KM is a heuristic device interpreted both as a process and as a system, and these two perspectives are inseparable. Both processes and IT infrastructure design are cumulatively needed in the building and reconfiguring of such capability. The first, KM as a process, whether conceived as a linear or a loop, is a stepwise view in which experiential learning's storage and dissemination is dependent on prior knowledge bundles. The second, KM as a system, is the backbone of technical infrastructure that provides robustness and consistency. This chapter strived to provide a direction on the administration of one's knowledge base. Inevitably, efficient knowledge management is an essential tool for performance amelioration; and in this regard, effective knowledge management (EKM) is a decisive contributor to the attainment of above-average returns. KM facilitates rational decision-making and develops the intellectual ability to accommodate new knowledge in an organization. We have looked at the beginning of this chapter some historical data about American Fortune 500 companies, whose ranking outlined an unequivocal pattern, that is, the general decline in revenue streams in natural resource-intensive companies (constantly observed for decades) and an ascension of the same variable for knowledge-based companies.

Technological resources and skills are seemingly a lever of KM; hence, the design and implementation of the latter require invariably the incorporation of an IT infrastructure. The rise of disruptive technology such as big data analytics or artificial intelligence (AI) has created surpluses of data and added new opportunities to explore and monetize information. Informational inputs were found to be essential pattern makers, which raised the firms' competitiveness to the next level and opened new horizons of datafication as a business model, increasing the need for newer and larger knowledge bundles.

For the implementation of a KM in the organization, the IT infrastructure plays a vital role as a knowledge management system (KMS) facilitating the collection, selection, storage, and more efficient retrieval of knowledge from multiple streams and furthermore allowing the ease of administration of their transferability and tracking of route (or itineraries), evolution (reconfiguration or renewal), and inherent analytics. Two of the most important IT systems mostly spread across the organizations discussed in the chapter were the ERPs and CRMs, a typical management information system (MIS) and respectively a transaction processing system (TPS). Yet, a myriad of others could be pinpointed as a repository/library or any other type of knowledge portal, or a learning management system (LMS) or a geographical information system (GIS), or an office automation system (OAS), among others.

Moreover, we argue that a KM with a single IT system is a utopia since no one-model-fits-all needs neither might be found anywhere available in the market nor under development. As shown in Sect. 2.4 and briefly discussed above, different KMS address dissimilar purposes and requisites and their integration seems the wisest (or better said, feasible) solution. We argue that a superior executive support system (ESS) unseen until current days is the meta-system proposed by Abrantes, Preto and António (2022a)—a capability management system, whose openness, integration, and ability to track knowledge, skills, and abilities and any occurrences as to the motion (mobility and transferability) and mutation (of inner properties) make it a powerful "brain," especially widely integrated with all other systems, supported on safe digital ledgers and with artificial narrow intelligence tech-incorporation.

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Essentials on Financial Literacy, Up-/Reskilling, and Firm Performance: Empirical Evidence from South Asian Public-Owned Companies (POCs)

Bruno F. Abrantes and Do Thuy Hang

1 Introduction

In the last decades, the technological advancements predominantly on information and communication technologies (ICT), cumulatively, as the advent of internet browsing, cloud computing, blockchain, digital/cryptocurrency or cybersecurity, intertwined with findings in other knowledge domains as computer sciences, physics, or statistics, had altogether an accelerating effect upon stock trade and brooking. Together with seminal research on financial market dynamics, it endowed, worldwide, personal and corporate investors with an unprecedented democratized and reinvigorating myriad of new possibilities. For instance, the *Black–Scholes–Merton* (BSM) model was paradigmatic of the influence of mathematics on stock exchange, adding theoretical value to the option's contract (Haug & Taleb, 2011). It changed the estimation of prices of call and put options (and subsequently the expected dividends and the option's strike price), which precipitated with the hastening of ICTs, a stream of events toward digital trading. Undoubtedly, the footprint of this model in the financial markets was dependent upon, or leveraged by, knowledge developments in other areas that allowed the tackling of, among others, latency and bandwidth issues, and so the initiation of a fintech revolution.

A decade ago, a commissioned report, as a part of the *UK Government's Foresight Pro*ject, denominated "*Technology trends in the financial markets: A 2020 vision,*" constituted a seminal publication condensing in one document the

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major concerns encompassing new technological risks or deriving from the combination of these technologies (e.g., the Caveat Emptor or the *Persaud* Paradox) (Cliff et al., 2011). These scholars highlighted the dark side of the window of opportunities opened by ICT, associated with this new reality of high-frequency algorithmic trade, which, in turn, had a gravitational force to attract more and more entrepreneurs, investors, and clients to the fintech sphere, which observed a drastic increase in agency on digital trade services.

> Disruptive technologies do not have to be able to improve beyond the capabilities of the currently dominant technology, they need only to be capable of improving to the point where they serve the needs of the mainstream market previously satisfied by that older, incumbent technology.

Indeed, the problem is only possible with a fast-paced technological diffusion, and respective adoption worldwide, by companies (and other organizations), households, and individuals, of Internet coverage, broadband expansion, and computer/smartphone users' dissemination. For instance, in 2000 there were 740 million mobile phone subscribers, while in 2020 the number has surpassed 8 billion; thus, it is more than the world population mark (World Economic Forum, 2020). In 2000, only half of the Americans had access to broadband at home; today, that number has risen to 90% in the United States. One may find similar patterns on a global scale. In 2000, less than 7% of the world's population knew what an online access was. Currently, more than half of the global population has access to the Internet. Technology has evolved in such a manner that is creating groundbreaking changes transversally across industries, disrupting global communications, creating new professions, and impacting climate action and even medical care practice. Thus, technology is no longer a tool of societal development; it has become a societal apparatus that is shaping the future of the world.

The technological ownership and its utilization in governance systems are, organization-wise, linked to performance, even in such a complex structural configuration as a firm with intra-organizational positive performance outcomes in other functional areas and even other positive spillovers across strategic partners' relations. Unsurprisingly, tech companies, including the trillion-dollar giants, such as *Amazon, Apple*, *Microsoft*, *Google*, or *Facebook,* are recurrently scoring high both in market recognition and value and have an implicit potential for above-average growth and so being of particular attractiveness to the investor's side. Hence, it is comprehensible the context of a leader of the rankings as to the (highest) market capitalization in the world (Forbes, 2021).

Hence, enterprises are complex systems to administer, embedded in societal environment where the technological landscape plays a big role (Abrantes & Venkataraman, 2022; Abrantes & Ostergaard, 2022). Their (electronic) business architecture is intrinsically dependent on the intertwining of external business ecosystems with the internal business architecture (and structural configurations), namely the informational systems infrastructure. Arguably, essential financial capabilities (addressed in the next section) ought to be blended with IT capabilities as these two categories of capabilities are inseparable in the global contemporary

e-business competition. Particularly, these IT capabilities are related to ICT new technologies (e.g., artificial intelligence, big data analytics, cloud computing, or cybersecurity), namely the most elementary set of skills related to *algorithms*, as a microfoundational skill related to the process of setting the rules to be followed in machine calculation or to the resolution of other complex problems (Kahneman, et al., 2021, p. 123).

2 Literature Review

Determining the price change of a regular stock, as briefly discussed in the previous section and exemplified through the BSM, has evolved from two neoclassic anchors, Mathematical Finance and Finance Economics. Firstly, at the beginning of the twentieth century, the research of *Louis Bachelier* created the pillars for the future development of the field of Mathematical Finance providing an agenda for probability theory and stochastic analysis for the rest of the twentieth century. His modeling of the stochastic process was something initiated with his doctoral thesis ("*Theory of Speculation*"), centering itself on the *Brownian motion* (or *pedesis*) phenomenon to develop a first used advanced mathematics applicable to financial markets to comprehend the valuing of stock options (Samuelson et al., 2006). His contribution was indeed influential and led to the foundation of the aforementioned *Black–Scholes–Merton formula*. Bachelier's utilization of the Brownian motion (in finance), also known as the *Bachelier's model*, arises as a model of the fluctuations in stock prices, as he asserts that small fluctuations in price seen over a short time interval should be independent of the current value of the price, assuming, in an implicit manner, an implicit dynamic of empirical randomness in price fluctuation as a phenomenon believed to be independent of past behavior. His reasoning, combined with the measurement of price's progression, assumed a logic mirrored in the *central limit theorem (CLT),* which led him to deduce that increments in the process with n units of randomized samples were drawn from a population with a μ overall mean yield independent and normally distributed patterns. Hence, he obtained insights on the independence of *price* from the past purchasing deals with the increment of the price process, treating it (price) as a *Gaussian* random variable and N as the underlying independent sampled observations. This seminal theory, in sum, described the way a commodity and stock price change in the market.

In addition, *Benoit Mandelbrot*'s research on Fractal Mathematics criticizes the ubiquity of the normal law and the notion of (Gaussian) randomness toward a vision of *fractal randomness*. The extension of the notion of randomness is crucial for the understanding of stock market movements as a "sprinkler" of volatility and so uncertainty; Mandelbrot postulates that the increase in the price process makes emerging repeating patterns (or *fractals*). His study with multiple applications, both in natural and social sciences, envisioned fractality as a visual geometric repetition of events at different scales and with some (events) being embedded in others. Someone termed the *Mandelbrotian* geometry as the vision of chaos theory

toward the infinite (Taleb, 2010). This fractal randomness extends the notion of (mild) randomness by introducing the problem of scalable distributions (*scalability*), together with the recurrence of events at multiple scales (*fractality*), as a critical knowledge-centered issue affecting, at the firm level, the financial returns and market capitalization's expectations. Needless to say, to referring to Mandelbrot's theory opened a door of (financial) economics for the discussion of the thresholds in the quantification of knowledge in purchasing deals, which is intrinsically linked with *Knightian* (market) *uncertainty* (i.e., the "incomputable" knowledge beyond human rationality and machine boundaries) and market *risk* (the computable or knowable).

Moreover, one ought to comment on the domain of Financial Economics, the seminal work of scholars such as *Eugene Fama*, *Leonard Savage,* or *Paul Samuelson,* for their theorizations on (commodity, currency, security) market efficiency, namely, with regard to spot prices, future markets and contracts' options, and security like options (or *warrants*). For instance, Leonard Savage's rediscovery in *MIT library* the Bachelier's (1914) publication ("*The Game, the Chance and the Hazard* "), and sharing, among others, with Paul Samuelson, was crucial to the development of *efficient market hypothesis (EMH)* (Sewell, 2011). Noticeably, the purpose of the EMH in modern finance is essentially to provide the basis for explaining the fluctuation of stock price when new information about a business is available (Țițan, 2015).

Moreover, *Eugene Fama,* who participated with *Benoit Mandelbrot* and other scholars, such as *Harry Robert, Lester Telser, or Merton Miller,* in the field, in a series of econometric workshops at the University of Chicago, has devoted within the radar of Financial Economics great attention to security price's forecasting and uncovering trends in price fluctuation. His research line and theoretical contributions are strongly linked to the observation of fat-tailed patterns of (probabilistic) distribution (opposing to independent distribution) and variations in stock prices. Likewise, he is recognized for the introduction to the finance lexicon of the first use of the expression *efficient market/s* (Merton, 2006; Fama, 1965). *Fama* followed *Mandelbrot,* rejecting the independent discussion of the normal law, advocating, on the contrary, in favor of a *Levy law*, as one should not ignore large potential dispersions in price distributions and focus merely on more likely variations as a reliable predicting pattern for future deals. He introduced also the *efficient market hypothesis (EMH)* and, from the *sophisticated investor*'s perspective, the "random walk of stock market price" (Delcey, 2017, p. 9). This assumes that agents are due, firstly, to an efficient resource allocation, for example, executing *fundamental analysis or MACD line/technical analysis,* and secondly, to maintain transaction costs under control, namely the ones regarding, brokerage, rebounds, or portfolio risks (Fama, 1965). In other words, the efficiency of information processing, in a timely and accurate manner, is a relevant skill within the realm of effective market theory (to be able to understand stock price volatility within the context of availability of information).

In parallel*, Paul Samuelson,* with the direction of *Leonard Savage* and furthermore inspired by *Bachelier,* has also explored price randomness, and so the authorship of the EMH is fairly divided between these two authors: *Paul Samuelson* and

Eugene Fama (Delcey, 2017). Their common denominator finds grounds on two aspects; firstly, price changes as nearly random, and secondly, they reflect economic fundaments, even though the relation of both remains unclear in the literature. However, *Fama*'s EMH and *Samuelson*'s EMH contributions are different in essence. One holds a rather structuralist etymology, and the other with a more accentuated behaviorist-like influence from the *Chicago School of Thought of Industrial Economics*. *Fama*'s EMH might be portrayed as a "competitive market," where price/s converge to the *fundamental value (FV)* altogether explaining the semi-randomized character of price. *Samuelson*'s EMH might be explained differently as the framework of investor competition, regardless of the real and/or fair market value (i.e., the FV).

This rhetoric of market efficiency, as proclaimed in the EMH following an underlying reasoning of effective competition and competitive equilibrium, whether with near-randomness or full full-randomness and (im)perfect competition and (des)equilibrium patterns, does not get the support of behavioral finance theorists (Maskin & Tirole, 1988; Fudenberg et al., 1983). For the latter ones, industry practitioners, as the incumbents representing the firms, alike any other investor, do not follow always *Mill*'s rational model (nor, many times, a rational-like model) of decision-making for the maximization of value as so emphasized in managerial economics. Thus, these theorists advocate that these ought to be considered as normal agents instead of rational ones due to their limitations to self-control, bounded rationality and satisfaction. Likewise, investors are influenced by their own biases.

Altogether, bias and cognitive errors lead to deviated perception, for instance, of what constitutes an FV or what is an accurate judgment or the optimal decision. Hence, behavioral finance is argued to be an alternative view to effective market theory, explaining the impact of psychological factors on the incumbents'/investors' behavior and subsequently the influence they exert on third parties' behavior in the financial markets (Kapoor & Prosad, 2017). Here, a good example is the stereotyping of the realization of an overvalued or undervalued stock, with a consisting trend line with perceptible heteroscedasticity to the projection, in which investors will continue to buy or sell the stock until they realize the FV or recover the nominal or par value. Unlike the EMH, behavioral finance expounds the rationale for a logical difference between real and fundamental value in stock price changes; however, it is not applicable to the prediction of stock price volatility. The reason lies behind the characteristics that carry many subjective factors of the decision-maker. In other words, researchers in the fields are summoned to explore the factor conditions leading, for example, to *garbage can* decisions due to emotion and psychological individual frameworks that create temporary scenarios of contingent stability that are detached from higher rationality. Thus, revealing contextual unawareness or even indifference to outer reality.

Conversely, in the stochastic process related to the efficient market hypothesis (EMH), the underlying behavioral logic of a "random walk" reflects the purposive utilization of the information for the understanding of the market structure or competition means (Chitenderu & Maredza, 2014). However, near-randomness

faces the criticism of behaviorists due to the undermining of latent risks conveyed by the individual as they claim that neither a *fundamental analysis* nor a *technical analysis* typically focused on long-term investments or respectively short-term trading outputs are capable of covering these cognitive bias and decision errors. Nonetheless, we argue that, beyond error and bias (sufficiently covered in previous literature), finance-related capabilities are essential for the firm's growth. However, most literature focus on either personal financial literacy with the radar of Human Capital Theory or, in a simplistic manner, on financial statement reading/interpretation as a single/dominant type of capability addressed within the scope of organizational capabilities. In this section, therefore, we will focus on covering a set of essential financial management-related capabilities regarding stock price fluctuation's monitoring and estimation.

2.1 Essentials on Financial Capabilities

The notion of *financial functioning* by Johnson and Sherraden (2007) is a relevant introductory one to understanding what a financial capability is. Despite the research scope of these scholars differing from our study, as they targeted the individual-tier aspects of personal governance and us the (collective) tier of a private equity firm, still, they share some commonalities, as we argue that the individual skills or the firm's skills required to administrate the financial assets in an organization is embedded in identical characteristics. In both contexts, at individual and firm levels, the capability formation entails two components*: knowledge* about financial themes and an assertive *behavior* in conformity with the owned knowledge bundle/s through the utilization of knowledge resources as assets at one's disposal to achieve own goals. Thus, financial functioning entails, cumulatively, the knowledge plus the behavior, regarding one's *income* (or revenue), *money management* (or budgeting and treasury planning of payables and receivables), and *spending* (or working capital allocation and expenditure), *credit* (loan's negotiation; equity and debt restructuring; financial leverage), and *saving* and *investing* (as account consolidation; balance sheet reading; cash flow analysis; cash-pulling; due diligence; disaggregation of profitability ratios; investor analysis, and so forth).

From the above description of the financial functioning scope within both a personal governance and a corporate governance perspective, Xiao and Huang (2021) described, briefly, what a *financial capability* is. These scholars categorize it as an ability to ensure financial resources for the activities of an enterprise in order to achieve the set of business goals. Hence, it encompasses the ability to raise capital to meet the activities of the enterprise and the ability to ensure financial stability and security for meeting current responsibilities and rewarding stockholders and organizational stakeholders, and ensure the growth in terms of the operations and returns and subsequently the development of the firm (e.g., in R&D, product development, technological renewal or people's continuous training) for the benefit of learning capital gains.

In turn, the set of *financial capabilities* of a firm is, often, misunderstood with the overall *financial capacity* of the firm. These are two distinctive constructs though they are interrelated. The financial capabilities entail the combinative set of managerial abilities to perform financial-specific activities (e.g., the management of liquidity, leverage, and profitability—as key activities exemplified below), while the *financial capacity* corresponds to the quantifiable limit of an organization to absorb losses with own funds and/or leveraged by borrowed funds (Abrantes & Ström, 2022). Hence, the latter (financial capacity) refers to the *financial resources' ownership* status of a firm at a given moment in time while the financial capabilities denote the *financial expertise ownership* acquired or developed in the same time frame.

However, we argue that these two constructs are mutually interdependent. The extent of capabilities (also from other categories beyond the financial ones) influences the financial capacity of the firm, and, in turn, the financial capacity might function as a positive lever (or negatively, as a hindrance) for the future reconfiguration of skills and upskilling opportunities. Such association is not clear in previous literature; however, the outputs of learning and up-/reskilling stimuli are amply covered in resource-based theory (RBT) and particularly in dynamic capabilities theory (DCT) as being correlated to a firm's performance (Do & Mai, 2021; Lichtenthaler, 2016; Zahra & George, 2002). Consequently, we elaborate on three essential financial capabilities of public-owned companies (POC) by reverse engineering the utility for determining the financial capacity. Indeed, these three capabilities are embedded in a bundle of three activities used to assess financial capacity. Together, they constitute a standard measure, as a baseline, for the allocation of investment capital by investors.

From the point of view of a long-term capital allocation by the stockholder (likewise required by the board of directors to chief finance officers), a functional analysis is seen as a mirror of the investor's philosophy since it constitutes a type of evaluation of one firm's value and its surrounding circumstances that interfere in FV. Hence, it cross-checks macroeconomic indicators in the general environment and industry-specific (e.g., interest rates, monetary policies, or the consumer price index) with a firm's profile (e.g., size, growth, or debt-to-equity). Then, a company's assessment typically from a short-term investor profile follows a technical analysis, in which the assessment of securities focuses on the market activity (e.g., price and volume).

In the realm of functional analysis, it is to be emphasized that *growth* is a process of expanding the size and level of activity of the enterprise. Thus, growth might be measured and judged in multiple ways, such as market share, assets' variation, market capitalization ratio, and increase/decrease in revenue or any other alterations in profitability ratios. *Revenue*, often taken as a measurement of growth, requires at a tier of above-average returns (a.a.r) an enlarging of asset's scope for the subsequent expansion of the enterprise activities, typically acquired through M&As and attenuated with leveraged buyouts (LBOs) for boosting the short-terms results without compromising other indicators of financial capacity. However, financial capacity is not just an advertisement or poster offering a new product; it requires a complex

combination of strategic and operational skills, namely of financial literacy for the firm's normal functioning and safeguarding of its future wealth. Hence, we introduce here a form of financial capability related to the understanding of one's liquidity, and to the ability to make a profit, the rate of use of financial leverage, or the market value of a business.

As a matter of fact, Bogdan et al. (2012) defined the *liquidity* of the firm both as a capability and an output, stating that it is a company's ability to meet short-term financial commitments, something one may plot as (*liquidity) ratio*, which, in its simplest form, is expressed as a *current ratio:*

$$\text{Current Ratio} = (\text{Current Assets}/\text{Current Liabilities}) \tag{1}$$

This current ratio allows one to interpret effortlessly the balance of the current assets and current liabilities on a firm's balance sheet. Thus, the understanding of the liquidity status refers to the financial solvency of a company and so to the ease to convert assets into cash inflows in a short period of time. Numerous studies have shown that the logic of stock price trends will depend heavily on the liquidity of the company as it reflects the ability and prospects of the business to settle the most basic debt (Chang et al., 2017). Thus, a high liquidity ratio will reflect an increase in the share price at the time the financial statements are periodically published (Chang et al., 2017). Liquidity indicators are not per se an instrument of market cap regulation, but, as explicitly mentioned, an "indicator" of performance denoting the degree of difficulty in the conversion of assets into cash flows, and subsequently an indirect indicator of the ability to repay debt, or financial exhaustion and even bankruptcy (Kluger & Stephan, 1997). Thus, the use of financial capabilities related to liquidity indicator's manipulation (i.e., calculation and interpretation) is a useful early warning system that may signal tensions with cash flow and approaching business failure.

Liquidity is measured by two major indicators: current ratio (presented earlier) and *quick ratio*. Cagle (1980) defined *current ratio* as one of the most commonly used financial ratios to assess a company's capacity to meet its debt obligations. Hence, a larger current ratio indicates greater liquidity. Meanwhile, the *quick ratio* takes a similar approach.

$$\text{Quick ratio} = (\text{Liquid Assets–Inventory})/\text{Current Liabilities}) \tag{2}$$

However, the quick payout ratio does not take inventory into account as it is one of the asset classes with low liquidity. It assumes that during a crisis (e.g., the abrupt deceleration of the economic activity due to the COVID-19 lockdown) it will be difficult to convert this type of asset into monetary units. Thus, as one might quickly deduce low inventory turnover carries additional costs inherent to capital utilization, administration, maintenance, and obsolescence. In a scenario of difficulty to convert inventory into cash inflows (as exemplified above), the quick ratio is clearly a better sign of liquidity than the current ratio. On the other hand, with high inventory turnover ratios, thus, the current ratio is an equally reliable tool for easy

administration (Cooper et al., 1985). However, there are industry specificities and resource specificities one may account for and so the contrast of the internal indicators with data from peers, and even from other geographies and other surrounding sectors or markets, may be very insightful for sense-making. For instance, several studies have shown that the inventory of technological products is traditionally not large, but still difficult to convert into cash if necessary. One of the main reasons is that the technological change is constant and so the renewal of product offerings on the supply side. This is a paradigmatic case of a category of products that today a product is new but tomorrow is old and replaced by another. This conveys moderate obsolescence risks. As a result, there are many large corporations such as Dell that have transformed production methods to limit inventory through custom-built business models instead of large production (Kraemer et al., 2000). However, the main disadvantage of this model is that it depends on the size of the enterprise and its ability to quickly disseminate a manufactured product. This constitutes a challenge that the just-in-time principle of the Kanban philosophy of lean manufacturing aimed to solve the sake of working capital alleviation and reduction of cost inefficiencies with inventory management. As a result, many tech companies prioritize quick ratio to reflect liquidity as a more effective measurement tool.

Another essential financial capability is related to the understanding of the *leverage*. The initial question one might raise is: *Why should you pay attention to the leverage?* This question may be particularly baffling to the ones oriented toward the technical analysis of price trends. The leverage refers to interpretation of the debt position of the firm materialized in terms of its respective indicators, and the most interested part in the *debt ratio* are the creditors of the enterprise. Leverage belongs to this group of indicators that reflect the exposure of the liabilities to other people's own capital money (Hull, 1999). This is explained by the fact that the more debt the company has, the higher the level of risk because it will most likely not be able to meet the obligations agreed with the lender (Hull, 1999). Thus, the debt indicators are a guiding tool for understanding the current debt situation and inherent risks to stakeholders. Therefore, shareholders instrumentalize the debt ratio as a basis for making investment decisions, balancing the debt to the estimations of profit (Mehdi et al., 2012). Accordingly, the trend of a stock will fluctuate based on the allocation of the investor's capital and the debt ratio is a premise for making individual judgments related to *bid* and *ask* (or also *call* and *put)* in relation to stock deals and options contracts. Specifically, the higher the debt ratio or leverage ratio of the company coupled with the weakness in managing loans to make a profit, the overall worsening of the company's financial situation. The implications are that, for instance, as shareholders have the ability to alter investment positions according to the satisfaction of creditor's requirements (and related payback compliance), and moreover to the distribution of the returns on shareholders (ROS), this directly affects the share price (Mehdi et al., 2012).

Understanding financial leverage implies, from the myriad of methods, the instrumentalization of two major indicators: the *debt ratio* and the *debt-to-equity (D/E) ratio* (Cai & Zhang, 2011).

$$\text{Debt} = \frac{\text{Total liabilities } (L)}{\text{Total assets } (A)} \tag{3}$$

$$D/E = \frac{\text{Total Liabilities } (L)}{\text{Common Stock Equity}} \tag{4}$$

The first, with parallelism with the current ratio, as to the simplicity to plot and ease of use, is the *debt ratio*. This indicates the relative weight of the total assets funded by its creditors (Zandi et al., 2021). Accordingly, the higher the ratio, the more the amount borrowed (or extent of leverage) from other parties (Zandi et al., 2021). Moreover, whenever the ratio is large there is the hazard that the debt exceeds its entire assets, raising issues as to the sustainability of the debt exposure and payback feasibility, especially. Besides, the *debt-to-equity ratio* measures the relative ratio of total liabilities and common stock equity used to finance the company's total assets (Kurniawan, 2021). Likewise, the higher the ratio, the greater the use of financial leverage or debt used by the company (Lubis & Alfiyah, 2021). Conducting a *D/E ratio analysis* targets an audience of ordinary shareholders instead of all (product market, organizational, and capital) stakeholders, because, after all, ordinary shareholders are the ones who would be most at risk of contributing capital to a company. On the other hand, a low D/E ratio is often interpreted as a sign that a company is not making the most of its financial leverage to increase shareholder returns (Zandi et al., 2021). Unsurprisingly, the debt-to-equity ratio has a very close connection with shareholders rather than debt ratios where shareholders are the ones who directly make capital allocation decisions and indirectly impact prices.

Unavoidably, a third typology of financial capabilities refers to the understanding of *profitability,* something related to the comprehension of gains and losses, allowing furthermore for a transversal comparative appraisal between years (longitudinal) and across business units (cross-sectional) of revenue outputs and growth. They may be subdivided into two major categories: *margin* and capital *employed* ratios, such as earnings per share (EPS), return on assets (ROA), or the return on equity (ROE) (Dutta and Meierrieks, 2021). Herein, the earning reports where each is represented as a percentage of sales are denominated in the *general-scale income reports* (Sari, 2021). Using this type of report, to compare performance over time, is especially valuable due to its simplicity to interpret the variations in the different categories of expenses and their relative frequency in the overall business volume. *Gross margin*, *operating margin*, and *net profit margin* are the three most commonly mentioned used indicators from the general-scale income report. In general, the net profit margin (NPM) is an indicator that wins the attention of stockholders because of its linkage to dividends distribution.

$$\text{NPM} = (\text{Income available to common shareholders}/\text{Sales}) \tag{5}$$

Or, it is also represented as

$$\text{NPM} = (\text{Net Income}/\text{Revenue}) \tag{6}$$

in which the net income (NI) is given by the expression

$$NI = \frac{R - \sum(COGS - E - I - T)}{R}.100 \tag{7}$$

At the NI, the R corresponds to the revenue, cost of goods sold (COGS) to the aggregate cost of inputs, and the E are the expenses with operations and other expenses. In the latter basket fall all the remaining service, general, and administrative (SGA) expenses, commonly denominated as the overhead costs. The *I* corresponds to the interest over the rents paid to lenders and T are the taxes.

In addition to the net profit margin, as to the analysis of general-scale earnings reports' data, in recent years, a threefold path of indicators in professional financial analysts has gained traction: *earnings per share (EPS) assessment*, *return on assets (ROA),* and *return on equity (ROE).*

$$\text{ROE} = (\text{Net Income}/\text{Common Stock Equity}) \tag{8}$$

However, ROE is the only financial indicator closest to the shareholders since it measures the profit earned from a common shareholder's investment in the company (Bedford et al., 2021). It assists investors recognizing a stock's ability to grow as a signal for larger *bids.* However, we would recommend an essential financial capability, regarding the company-specific (functional) analysis of liquidity, leverage, and profitability, reinforcing those with the screening of *market ratios*. The *market rate* entails the market valuation of a company measured by the price of its current market share with a certain accounting profit. In other words, current or potential shareholders place a lot of interest in how the stock is being valued (Imansyah and Mustafa, 2021; Choi, 2021). The market rate is like a measure of the intrinsic value of a company that can be understood as income and book value to the market value of that stock through its own trading price on the stock exchange (Imansyah & Mustafa, 2021). After the comparison process, the investor will find the difference between the real value of a stock and its market value. Investors will then rely on these assessments as a basis for conducting investments, thereby changing the number of shares traded in the market and directly affecting the price (Maani et al., 2021).

In this context, several scholars have acknowledged the effectiveness of using *price-to-earnings (P/E) ratio* in determining the fairness (or "cheapness") of a stock (Karadeniz & Iskenderoglu, 2022).

$$\text{P/E Ratio} = (\text{Market Price per Share of Common Stock}/\text{EPS}) \tag{9}$$

The P/E ratio method measures the willingness of potential shareholders to remunerate every euro of a company's income (Karadeniz & Iskenderoglu, 2022). In other words, this is a "confidence indicator" that shows the investors' reliance on

the future performance of a firm. Thus, the higher the P/E ratio, the greater the level of the investor's confidence (Dwinda, 2021). On the other hand, a high price-to-earnings ratio may uncover the overvaluing of a stock. In this latter case, the stock price is relatively more expensive than other companies or with the market as a whole. In particular, stocks in high-growth industries such as high-tech and medium-high-tech economic sectors, such as the ICTs, including the fintech companies and digital traders, have a high PE due to the investor's expectations of solid annual profit growth. Although PE reflects the prospects of a stock, at the same time, P/E also exhibits its fragility in stabilizing the price.

3 Methodological Approach and Data

As stated in the introduction, this study tests the financial capability-building of a sample of 10 POCs headquartered in a South Eastern Asian market listed in the two largest stock exchanges in Vietnam, that is, the *Ho Chi Minh Stock Exchange (HOSE)* and the *Hanoi Stock Exchange (HNX)*, functioning under the supervision of the *State of Securities Commission (SSC)* of this country. Both the HOSE and HNX count, each, with over 300 listed companies and hold an aggregate market capitalization of over 1.1 trillion Vietnamese dongs (VND), equivalent to over 50 billion USD. The HOSE accounts for more than 4/5 of their value.

The sample corresponds to 1.67% of the organizational ecology of registered POCs (in the SSC) in the security markets. The study tracked their market cap between a period of 2014 and 2020 to trace the evolutionary traits of their activities and the extent of their financial capability-building. From the investor's perspective, we focused on the analysis of price-determining factors. A selection of factors extracted from the literature and described in the formulated hypothesis below highlights five fundamental capabilities of financial literacy: *debt-to-equity ratio*, *quick ratio, net profit margin, return on equity*, and *price-to-earnings ratio*. The empirical testing deriving from those five capabilities looked at the results from the impact analysis on share price fluctuation (SPF), from the perspective of the investor, screening the evolution of trading of stocks on the secondary market.

1. Null hypothesis 1 ($H0_1$): *Quick ratio (QR)* has a significant impact on the *SPF*.
2. Null hypothesis ($H0_2$): *debt-to-equity (DE) ratio* has a significant impact on the *SPF*.
3. Null hypothesis 1 (H_{03}): *Net (profit)* margin *(NM)* has a significant impact on the *SPF*.
4. Null hypothesis 1 (H_{04}): *Return on equity (ROE)* has a significant impact on the *SPF*.
5. Null hypothesis 1 ($H0_5$): *Price-to-earnings (PE) ratio* has a significant impact on *SPF*.

Eluding a philosophical perspective of empirical skepticism as to the testing of the alternative hypothesis (Ha_n) in the light of the (*Popper*'s) falsification principle,

thus, we have denominated null hypothesis as *H1, H2, H3, H4,* and *H5*, which correspond to each of the $H0_n$. Stemming from simultaneous supply and demand forces (from both buyers and sellers), an ontological assumption assumed a significant fluctuation of share price. This study follows, within a mechanical perspective, along the continuum of paradigms, a positivist stance, which tests the functioning of the observed reality as to the performance of these five fundamental factors expressing fundamental financial capabilities.

From the theoretical framework in the previous section on financial literacy, capabilities and stock prices (and related liquidity, debt, profitability, and market rates), then this investigation proceeds with a description of the research design and endeavors of data collection toward the testing of our aforementioned propositions in these five hypotheses. Multiple streams of data deriving from the case firm's balance sheet statements and from the HOSE/HNX datasets were contrived into the fundamental parameters (latent variables) italicized in the hypothesis above and scrutinized through theoretical econometrics and descriptive/inferential statistics using a longitudinal horizon of 7 years (from 2014 to 2020), assessing the impact of the five exogenous variables in SPF to infer an underlying evolution of financial capabilities. Among others, using correlation and multiple linear regressions to understand the true relation of latent variables and stock price and interpret the meaning of the R-squared results in the model,

$$y = f\ (X1, X_2\beta_2 + \cdots + X_k\beta_k) + \varepsilon \tag{10}$$

One may represent it as

$$Y_{(\Delta\, SPF)} = (X_{SPF} - \beta_{SPF'}) \tag{11}$$

Cumulatively, it is given by the expression

$$SPF = (\alpha_n + \beta 1_{DE} + \beta 2_{NM} + \beta 3_{QRn} + \beta 4_{ROE} + \beta 5_{PE}) + \varepsilon$$

Considering the estimation of the model:

$$\begin{aligned}
SPF_{(1)} &= (\alpha_n + \beta_{DE1} + \beta_{DE2} + \beta_{DE3} \ldots + \beta_{DE10}) + \varepsilon;\\
SPF_{(2)} &= (\alpha_n + \beta_{NM1} + \beta_{NM2} + \beta_{NM3} \ldots + \beta_{NM10}) + \varepsilon;\\
SPF_{(3)} &= \left(\alpha_n + \beta_{QR1} + \beta_{QR2} + \beta_{QR3} \ldots + \beta_{QR10}\right) + \varepsilon;\\
SPF_{(4)} &= (\alpha_n + \beta_{ROE1} + \beta_{ROE2} + \beta_{ROE3} \ldots + \beta_{ROE10}) + \varepsilon;\\
SPF_{(5)} &= \left(\alpha_n + \beta_{DE} + \beta_{NM} + \beta_{QRn} + \beta_{ROE} + \beta_{PE}\right) + \varepsilon
\end{aligned}$$

In the regression model above, $y = \alpha_0 + \beta n + \varepsilon$, the constant variable is given by α_n while the latent variables are represented in the regression coefficients βn (i.e., *ROE, PE, DE, NM,* and *QR*). Error is plotted with a standard 0.05 and with the model being tested for multicollinearity as to the phenomenon of independence of the

Table 1 Descriptive statistics of the sample firms

Factor	N	Min	Max	$\bar{x}$	σ
SP (VND)	280	3077.03	47688.533	9223.372	7862.64
ROE	280	−0.0227	0.1265	0.0287	0.025459
PE	280	−149.47	98.96	11.0838	18.29534
QR	280	0.66	5.36	1.621	0.71883
DE	280	−0.3891	8.22	1.0270	1.46912
NM	280	−0.2164	0.7546	0.0503	0.08573

Note: *SP* share price, *VND* Vietnamese dong.
Source: Own elaboration

variables using the dialogistic collinear identified through tolerance and variance inflation vector (VIF), in which *tolerance* > 1 means an exogenous variable being affected by others (and 0.25 being the cutoff for tolerance) while a *VIF* > 10 implies a high degree of correlation (Table 1).

In the results from the statistics table with observations presented in $N = 280$, the quick ratios of the highest/fastest payment index belonged to the *ELC* stock code in 2017. This figure has revealed that by 2017 the ELC's assets were 5.36 times of the business short-term debt. Thus, the ELC had a high liquidity meeting and even exceeded the mandatory liquidity standards. The higher the fast payment index, the lower the investment risk. In contrast, it seems that the *SGT* stock code in 2019 did not meet liquidity standards when the fast payment index reached only 0.66. That means that with VND 100 owed, businesses currently only have VND 66 assets to compensate. In short, SGT's assets in 2019 were not enough to cover the liabilities with regard to debt obligations. However, the average fast payment index of the five technology companies with the largest market capitalization is positive with a ratio of 1.62. It partly reveals the liquidity of these businesses; the other part serves as an indicator of the liquidity risk of these companies on the stock exchange. A quick payment index greater than 1 ensures minimal safety in investing.

Furthermore, assessing the borrowing status of these businesses from an investment point of view the average D/E ratio stands at 1.02. It is understood that this ratio averages up to 102%. Accordingly, the debt of technology companies is more than equity. However, the average debt-to-equity ratio needs to be considered more closely. On the one hand, with the *SGT* stock code, the debt ratio in 3 years 2015, 2016, and 2021 exceeded 100%. It is the same for *PSD*, where the company's share has been five times that of equity continuously from 2014 to 2018. Meanwhile, the debt-to-equity ratio of the remaining eight companies is always below 100%. As a result, these two stock codes pulled the debt-to-equity ratio of 10 companies above 100%. While debt-to-equity ratios are high on average, that does not mean the level of risk of investing in companies is the same. In addition to the two companies with a very high debt, the remaining eight companies are still controlling very low debt. As a result, the remaining eight companies have lower levels of investment risk than the two companies with stock codes SGT and PSD. Through the descriptive statistics,

investors had figures to eliminate by retaining two stock codes *SGT* and *PSD* depending on their risk preferences.

Regarding NM index, as mentioned, this indicator reflects profitability outputs, the average net profit margin was 0.0503 (or 5.33 percent), a positive figure reflecting the after-tax profitability greater than the growth in revenue. In other words, with a dollar of revenue spent by the enterprise, there is up to 5.33 VND (of profit, after tax). In particular, the largest net profit margin belonged to *SGT* in 2014 with 0.7546 or 75.46%. This is a large difference from the net profit margin of the stock code itself in 2016. This indicator is only −0.21 or − 21%. Overall, the profitability index of all 10 technology companies in the study, although there were many differences, was still a positive number greater than 1. As a result, it has proved that investing in technology companies will eventually create a boost for investors.

For the ROE, the roe average is 0.0287 or 2.87%. This means that with 100 Vietnam dong shareholders contributing to the company in the form of share purchases, this capital will then generate VND 287 profit after tax. In the period from 2014 to the end of the fourth quarter of 2021, while the *SGT* stock code had the largest ROE of 12.65%, *CKV* had the smallest ROE of only −0.0227 or − 2.27%. This clearly reflects a difference in how the company uses shareholder capital. Accordingly, if the enterprise uses VND 100 effectively, then investors or, in other words, shareholders will benefit greatly. On the contrary, with the same VND 100 capital, the enterprise used for business activities does not create breakthroughs.

However, the "star" index that received the most attention from investors was PE. Accordingly, PE is one of the important factors scholars relate to SPF, specifically, in the 7 years from 2014 to the end of 2020, the results revealed the PE index to be highly fluctuating. Notably, while the highest PE belongs to *CMG Technology Group*, the lowest PE according to the statistics described falls on the *SGT* again. Moreover, the average PE of these 10 technology companies is 11.08. This figure is considered to be lower than the industry average of 23.38 in Vietnam. In general, the PE ratio of technology companies depends a lot on the business situation of each company, which in turn leads to a fluctuation in earnings per share and directly affects P/E. Finally, the only dependent variable (SPF) encountered an average VND of 9223. In particular, the largest share price of VND 47688 is not out of the calculation of the *FPT Group* in 2021—the number 1 tech company in Vietnam. With a strong growth after the COVID-19 pandemic, in contrast, it also had the lowest price in a basket of 10 stocks at 3077 per share during the outbreak. The question is whether the volatility in the share price has anything to do with the company performance shown in the financial ratios mentioned above. The correlation and regression analysis sheds some light on this point (Table 2).

The evaluation of the relationship variables accounted for a two-tailed test y and considered a meaningful correlation when observed below 0.01. According to the results, net profit margin (NM), return on equity (ROE), and price-to-earnings (PE) are positively correlated with stock price. In contrast, the results from the table also show that the share prices of 10 technology companies are negatively

Table 2 Correlation test (e.g., SP – ROE)

Var1 (n) (exogenous)	Var2 (SP)	Statistic		
		Lower C.I.	Upper C.I.	Notes
SP	0	0.14	280	0.023
PE	0.105	280	−0.013	0.219
QR	−0.121	280	−0.235	−0.004
DE	−0.044	280	−0.161	0.073
NM	0.078	280	−0.039	0.194

Source: Own elaboration

Table 3 Testing for multicollinearity

Model		Statistics	
		Tolerance	Bright
Estim 1	(Constant)		
	Quick ratio	0. 696	1.437
	Debt-to-equity ratio	0.933	1.072
	Net profit margin	0. 852	1.171
	Price-to-earnings	0. 783	1.278
	Return on equity	0. 826	1.211

Note: Dependent variable (var2) = stock price (SP))
Source: Own elaboration

correlated with debt-to-equity ratios (DE) and quick ratios (QR). The results of the multicollinearity test revealed the following (Table 3).

Collinearity dialogistic test was used to conduct the evaluation based on the examination of (var1 ~ var2) pairs through two criteria: tolerance and variance inflation factor (VIF). In a study with high multicollinearity, tolerance would be below 0.1 and vice versa. For VIF, if the index is greater than 10, the study has high multicollinearity. However, according to the results of the study shown in the table, all the independent variables in the study were not highly correlated with each other. The evidence is confirmed when the tolerance of all five independent variables is greater than 0.1 and the VIF of these variables is also below 10. Therefore, evidence of multicollinearity as a phenomenon in this context was incipiently shown with no significance.

The regression model is exhibited through the following results (Table 4).

Using multiple regression analysis, the study aims to determine the relationship between independent variables, including quick-to-equity ratio, debt-to-equity ratio, net profit margin, return on equity, and PE ratios with dependent variables. Specifically, to determine whether or not the volatility of the stock price is related to the change of the above independent variables, the author uses the linear regression model. Accordingly, the evaluation of the R-square parameter from the multiple linear model is considered an effective measure. The larger the R-square, the higher the level of explanation. An ideal R-square ranges from 0 to 1.

According to the results of multiple linear regression analysis from SPSS, R-square is 0.503. This means that 50.3% of the changes in the share prices of 10 technology companies are explained by five independent variables, including

Table 4 Result of model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.709[a]	0.503	0.497	10922.912

[a] Predictors (constant and coefficients: NM; DE, ROE, QR, PE)
Source: Own elaboration

Table 5 Analysis of variance (ANOVA)

Est	Model (Est. 1)	Sum of squares	Df	Mean square	F	Itself
1	Regression	1,246,992,388	5	249398477.6	4.271	<0.001[b]
	Residual	16,001,137,926	274	58398313.6		
	Total	17,248,130,314	279			

[a] Dependent variable: price (SP)
[b]Predictors: (constant), NM; PE; DE; QR; ROE); df: degrees of freedom.
Source: Own elaboration

ROE, PE, net profit margin, quick ratio, and debt-to-equity from the research model. In addition to the aforementioned factors, there are other factors that may be macro- or microscopic that explain the remaining 49.7% of the change (Table 5).

In addition to identifying the real relationship between independent variables and dependent variables through R-square from the linear regression model, the study determined also the statistical significance through the p-value. It is noteworthy that the linear regression model is only statistically significant when the Sig. is less than 5%. The degree of significance is essential to demonstrate that it is an independent variable acting on the change of the dependent variable. On the contrary, the model would not be statistically significant if the Sig. was greater than 5%. ANOVA simply assumes whether in the H0 (hypothesis)—our H1—H5—the independent variables do have an effect on the dependent variable. Specifically, if the statistical significance from ANOVA is less than 5%, it means that there is a relationship of the impact of the independent variable on dependent variables, namely on stock prices. In this later scenario, therefore, the H0 hypothesis is unmet, which would be appropriate to reject. Comparing the results from the analysis with the theory, it is clear that five independent variables, including PE, ROA, quick ratio, net profit margin, and debt-to–equity, did not have a significant impact on the stock price (as $Sig. < 0.001 < 0.05$). Therefore, the study rejects the testable propositions above as to the impact of the above five independent variables on the dependent variable (stock price) (Table 6).

From the result table, it can be observed that independent variables include quick ratio, debt-to-equity ratio, and net profit margin from the result table with Sig. greater than 5%, so these variables are not statistically significant. As a result, three variables, including quick ratio, debt-to-equity ratio, and net profit margin, did not affect the volatility in the share prices of 10 technology companies. Unlike the three variables mentioned above, the study demonstrated the impact relationship of return on equity and price-to-earnings ratios when the Sig. of these two independent

Table 6 Regression coefficients

Model	Unstandardized coefficient		Standardized coefficients		
1	B	Std. Error	Beta	*t*	Itself
(Constant)	0.069	0.024		2.817	<0.001
ROE	0.709	0.037	0.137	1.903	0.010
PE	0.001	0.01	0.034	0.547	0.008
QR	−0.030	0.012	−0.165	−2.535	0.130
DE	−0.016	0.006	−0.179	−2.634	0.350
NM	0.034	0.099	0.023	0.343	0.384

Source: Own elaboration

variables was 0.010 and 0.008, respectively. Accordingly, the Sig. of these two variables is less than 5%, so they are statistically significant.

4 Discussion

In the previous section, a positive influence of ROE and PE ratios on the stock prices of 10 technology companies was demonstrated. The regression using ROE as a latent *var1* had an estimation of 0.709 and p-value 0.01 uncovering an accentuated relation between ROE and SPF, thus leading us to the acceptance of H4. Accordingly, if the ROE of technology companies on both HOSE and HNX stock exchanges increased by 1 unit, then their share price increased by 0.709 units. The results of this iterative study are concurrent with previous ones on successful market capitalization (Maani et al., 2021; Fatmawati et al., 2021; Efrizon, 2019).

Likewise, the PE ratio has a positive coefficient of 0.001 and a p-value of 0.008. Therefore, the study accepts H5. It turns out that PE has a positive and meaningful impact on the change in stock prices. The results of this study are similar to the results of the study conducted by Manaseer (2020). Hence, potential stockholders are likely to increase their purchases in the scenario of undervalued stock prices and wait for them to reach equilibrium in a trajectory of adjustment between paper and real value. Conversely, when the PE is high, it means that the market is overvaluing the stock as to the bid/ask positions (bid/ ask) with an added risk as the profit projections hold overvalued expectations unmet by the earnings outlook.

The remaining hypotheses are rejected. Net profit margin, due to the coefficient of 0.34 and a p-value of 0.384, has no statistical significance despite results showing a co-variation with the SPF; however, it is not a determinant of price change, opposing the results of Fatmawati et al. (2021) but concurring with other replicative studies in the theme (Maani et al., 2021). Likewise, quick ratios and debt-to-equity exhibit insignificant impact(ful) relationships with SPF. For instance, the quick ratio with a coefficient of −0.030 and a p-value of 0.130. With $Sig. = 0.13 > 5\%$, the results are not statistically significant.

The study also successfully also revealed a model summary relevant info with the R-squared at 0.503, denoting that 1/2 changes in stock price are explained by the five independent variables (ROE, PE, debt-to-equity, quick ratio, and net profit margin) with other (confounding) variables beyond the study model explaining the remaining 49.7%, thus, a large room exists for the continuity of further iterative studies with a similar research angle. Furthermore, the findings from the ANOVA table show that $Sig. < 0.001b < 0.05$, with two latent variables (PE and ROE) holding a positive effect on SPF of 10 technology companies in the study, denoting an idiosyncratic POC business ecosystem's context.

A takeaway from this study is the successful market cap results of the *SGT and CMG Technology Group,* which held, respectively, the highest ratios of ROE and PE, unsurprisingly, the ones with a positive association to SPF. Thus, this opens horizons as to these start indexes of stock capabilization to any POC to build capabilities on functional analysis centered on the microsphere of the economic–financial controlling, particularly focused on the monitoring of progression of benchmarks on these two successful ratios, as exercised with the sampled POCs listed in HNX and HOSE stock exchange. In practical terms, the research is expected to be useful for business managers, particularly to the incumbents with responsibilities, in general, in the administration of corporate finance, and herein, centered on financial investments. We argue that developing capabilities in this area is an essential step to be taken/used as a premise to be able to analyze the determinants of changes in stock prices and use it as a basis for budget allocation/expenditure and investment capital decisions, thereby limiting risks and the likelihood of rebounds, and on the other hand, increasing the probability of attaining higher economic rents.

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What Can Companies Do to Adapt Their Business Models Toward a Circular Economy?

Lovisa Solkvint and Jesper Lind Madsen

1 Introduction

This chapter introduces the connection between environmental and economic issues and resource overexploitation. It also presents the demand for a new economic model and indications for change to a circular economy.

1.1 Background

Greenhouse gas emissions are increasing rapidly. By 2025, the demand for resources globally is predicted to double. In addition, 8 million ton of plastic are thrown into our oceans annually (Geng et al., 2019, p. 153). Speaking of water, according to the UN Environment program (2018), it requires 3781 liters of water to produce one pair of jeans. Cultivation of cotton, manufacturing, washing, and transportation was included in the calculation. Furthermore, to build a computer weighing a few kilograms, a ton of silicon, plastic, and metal is needed (Geng et al., 2019, p. 153). The conclusion? Industrial processes are extremely wasteful.

Waste is equal to lost economic value and profit. Simultaneously companies have experienced vulnerability in terms of unstable resource prices and supply disturbance, which may have a negative impact on economic growth. For example, during the last decade changing prices of metals have been the highest ever in the twentieth century. Longer globalized supply chains due to trade among countries cause supply risks. Yet, countries are depending on import and export. Nevertheless, to produce

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unrenewable resources and make a transition to a new economic model that emphasizes the need for circular economy would help to overcome the challenges of structural waste, price risk, and supply risks in the linear model (Ellen MacArthur Foundation, 2015, p. 3). Pollution, land degradation, pressure on natural resources, climate change, and decreased biodiversity are only a few of the environmental problems the world is facing because of resource overexploitation. These issues are highly linked to the linear economy and more and more requests are made for a new economic model. A model that is resistant and not associated with resource exhaustion and volatile systems (Ellen MacArthur Foundation, 2015, pp. 3–4). These problems will guide research onward to the possibilities of circular economy. Even though circular economy is more discussed when the issue of global warming is increasing, there are a lot of uncertainties regarding putting it into practice. This chapter will mostly focus on circular economy from a business perspective since there is a lack of knowledge on the topic. The aim is to investigate how businesses can adapt their business models to a circular economy. The objectives are as follows:

- Address the advantages and disadvantages of circular economy and how it influences markets and businesses
- Find out the challenges, difficulties, and complications of modifying a business model toward the circular economy.
- Present the key activities on how to adapt business models to a circular economy

2 Literature Review

2.1 Linear Economy

Linear economy has been a part of our society since the industrial revolution. In a linear economy, we produce, consume, and then throw away. Products get classified as trash once they served their purpose. This requires the use of an endless amount of natural resources. The materials often end up in nature and destroy important ecosystems (Naturskyddsföreningen, 2021). The world population and the demand for products are increasing; therefore, we overconsume limited resources and increase waste. Due to mass production and overconsuming, we would need 1,5 globes to maintain the linear economy on a global scale (Johansson & Edlund, 2018, p. 1). The current linear system is unstable and continues to damage the environment. Resources are scarce, the size and volume of ecosystems become smaller, and therefore contribute to the reduction in natural resources (Korhoen et al., 2018, p. 38). Moreover, materials in the linear economy often get mixed and diluted, which reduces their economic value. Resources that cost a lot in extraction are not useful anymore. One example that a lot of people can relate to is old electronic devices that are often stored in our homes for no use (Naturskyddsföreningen, 2021).

Most companies have linear business models, which means that they are not responsible for what happens to the product after the customer made its purchase

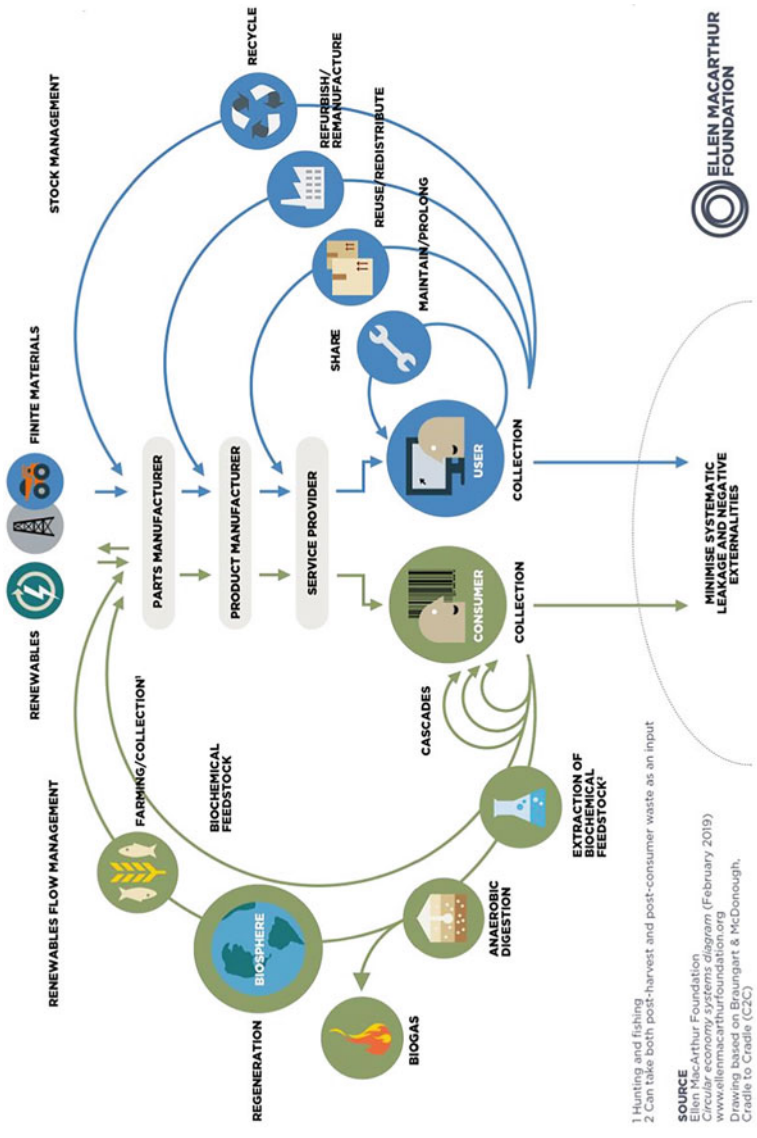
(Berg et al., 2018, p. 2). According to Papadopoulos and Balta (2022), pp. 3–4), there are several challenges businesses face due to climate change. Supply chain and resource problems can cause higher prices and a lack of product quality. Changing energy consumption, maintenance, adaptation, and investments into innovative solutions may bring extra costs and a reduction in profits. Furthermore, businesses can experience changing customer behavior and demand. For example, the need for climate-friendly products may increase. Extreme weather conditions can damage facilities, energy networks, and infrastructure that can cause transportation problems and other issues. Human migration due to climate disasters as well as diseases and infections related to climate change can affect customers and employees (Papadopoulos & Balta, 2022, pp. 3–4).

2.2 Circular Economy

The opposite of linear economy is circular economy. The idea of a circular economy is to reuse everything that has been manufactured for as long time as possible. Eventually, products and materials are recycled and reused repeatedly (Naturskyddsföreningen, 2021). The Ellen MacArthur Foundation (Ellen MacArthur Foundation, n.d.-b) explains on their website that circular economy makes it possible to reduce negative impact on nature and at the same time create jobs and wealth. The focus of circular economy is to maintain value and extend the lifetime of products and resources (Larsson & Saulo, 2019, p. 2). "We must transform every element of our take-make-waste system: how we manage resources, how we make and use products, and what we do with the materials afterward. Only then can we create a thriving circular economy that can benefit everyone within the limits of our planet" (Ellen MacArthur Foundation, n.d.-b).

Circular economy is based on three principles. "Design out waste and pollution," "keep products and materials in use," and "regenerate natural systems" (Ellen MacArthur Foundation, n.d.-a). The first one "Design out waste and pollution" is to terminate waste, pollution, and greenhouse gas emissions. The ideal would be if it never was generated (Ellen MacArthur Foundation, n.d.-a). The second is to design sustainable, rebuild, recycle, and reuse components, materials, and products (Ellen MacArthur Foundation, n.d.-a). The resources should be preserved at their most efficient and profitable value (Johansson & Edlund, 2018, p. 12). The last principle is to give back to the environment by protecting and improving it, like setting back nutrients to the soil for renewal (Ellen MacArthur Foundation, n.d.-a). Moreover, the last principle is not only about restoring nature, but also about ameliorating society and promoting system efficiency. This means less harm to systems like food, education, air, land, and health (Ellen MacArthur Foundation, 2015, p. 7) (Fig. 1).

The Ellen MacArthur Foundation has developed a model most known as the "butterfly diagram" explaining the cycle of resources in a circular economy, one for biological and one for technical materials. Biological materials can reenter the environment (Ellen MacArthur Foundation, n.d.-a). Biological materials can, for



Source: Ellen MacArthur Foundation

Fig. 1 Butterfly diagram of the circular economy system. (Source: Ellen MacArthur Foundation)

example, be used for fuel or nutrition after it has been used in multiple products (Wennborg & Berg Helgöstam, 2018, p. 8). Johansson and Edlund (2018, p. 14) explain the same principle, and the idea is that biological nutrients will be returned to the biosphere and eventually be reused in new cycles. In order to close the loop, the product must be designed in a way that enables the transition to raw material, which later can be used for new products. For instance, a consumer can sell his sweater made of cotton so it can be used for upholstery instead. In that way, value is created. Materials that are nonbiological are referred to as technical materials. In order to create a cycle for technical resources, remanufacturing, renovation, and recycling must be achievable (Johansson & Edlund, 2018, p. 14). Technical materials cannot be reentered into the natural world and must circulate in the system (Ellen MacArthur Foundation, n.d.-a).

In summary, the Ellen MacArthur Foundation (2015, pp. 7–8) explains the five characteristics of circular economy:

1. Waste is nonexisting, and products are designed in a way that makes no waste possible.
2. Diversity enables resilience. Different types of businesses in numerous sizes are essential to an economy. In that way, risks can be spread in the event of external disturbance.
3. The third principle explains how to use renewable energy to operate circular economy. This would reduce dependence on certain resources such as oil. As a result, the system becomes more stable.
4. Circular systems are based on a holistic perspective. All components (businesses, environment, etc.) are connected to each other. For maximal efficiency, this must be taken into consideration.
5. Costs for negative externalities are transparent and considered. The transition to a circular economy will slow down when the externalities are not revealed.

2.3 Economic Growth and Circular Economy

According to the Ellen MacArthur Foundation (2015, pp. 3–5), changing to circular economy has a lot of advantages such as economic growth, better resource management, and environmental benefits. Economic growth should be possible without an eternal connection to resource consumption. The Ellen MacArthur Foundation also claims that circular economy would increase GDP since circular activities require new circular businesses. Moreover, circular economy enables lower production costs and higher revenue due to effective recourse management. It will impact economic growth, for instance, wealthier households due to better salaries, which also will affect consumer behavior and the demand for products. Together, these direct and indirect effects would benefit economic growth and GDP (Ellen MacArthur Foundation, 2015, p. 11). The Ellen MacArthur Foundation estimates that Europe could increase its GDP by 11% by 2030 instead of the predicted 4% if the changeover takes place, and by 2050 27% versus 15%. They also calculated net material cost savings

for medium-lived products up to 630 billion USD yearly in Europe. Another study made by the Ellen MacArthur Foundation, SUN, and McKinsey (cited in Ellen MacArthur Foundation, 2015, p. 11) showed that there would be more employment opportunities in a society where circular economy is implemented, innovation goes hand in hand with employment and economic growth. Other advantages are better land use and soil health, resource preservation, and reduced pollution and carbon dioxide emissions (Ellen MacArthur Foundation, 2015, p. 12–13).

To enable the transformation, the focus must be on adapting companies' business models, even though laws, regulations, and governments also play a critical role (Berg et al., 2018, p. 8). Circular economy has a positive effect on resource optimization and supply chain risks (Ellen MacArthur Foundation, 2015, p. 5). Even though savings can be done, as little as 6% of materials are recycled. For instance, recycled plastic is calculated to be around 80% cheaper compared to producing it from new materials. Companies could benefit from cost reduction because of fewer disposals and new earnings from resources that otherwise would have been lost (Geng et al., 2019, p. 153). This is proved by different studies (Larsson & Saulo, 2019, pp. 11–12). A study made by Geng et al. (2007, cited in Larsson & Saulo, 2019, pp. 11–12) shows that companies could save money through reduced costs on waste disposals, incurrences connected to waste, and decreased purchases of raw materials. In another study by Noci and Verganti (1999, cited in Larsson & Saulo, 2019, p. 11), a business started to collect packages from its customers to reuse them, which made them save capital. A third research by Agyemang et al. (2019, cited in Larsson & Saulo, 2019, p. 11) showed that increasing profit was the main motivation for the requested businesses to implement circular economy. Nevertheless, there are also business leaders who think sustainability is important and do not think of it as a strategy (Larsson & Saulo, 2019, p. 16).

In comparison to the findings that recycling reduces the pressure on resources, Mayer et al. (2019, p. 63) discuss that recycling may not reduce the need for resource extraction. There is a risk that more energy and material must be used to enable recycling and therefore suggest a set of indicators to measure the total material and waste flows. Furthermore, the problem is that the use of stocks of manufactured capital is growing in most countries and an increase in overall resources is required. Therefore, the possibility of closing the loop in the circular economy is substantially limited (Mayer et al., 2019, p. 63), which is indirectly assumed in a 100% circular economy. In the current linear economy, we are dependent on new resources and mass production to grow capital and therefore it could be hard to maintain economic growth in a circular economy due to the occasionally extra energy needed to enable recycling. Yet, as specified by the Ellen MacArthur Foundation (2015), p. 14), using recycled materials reduces the risk of unstable raw material prices. Disrupted supply chains can happen in the event of natural disasters or political circumstances, but the development of more circular processes reduces the risk of disrupted supply chains thanks to more decentralized suppliers. Furthermore, a circular economy would create the demand for certain businesses like logistics to pick up products for reuse, remanufacturing, and recycling and industries that can rebuild them or use

their components (Ellen MacArthur Foundation, 2015, p. 14). There is still a long way to go; in 2014, EU countries processed material of 7,4 Gt and only 9,6% were the share of secondary materials in the processed materials (Mayer et al., 2019, p. 70).

Hannon et al. (2016) argued that the linear economy contains an incredible amount of waste when use products end their life either by incinerating them or dumping them in a landfill destroying all the value that was created in the process. Therefore, the implementation of the circular economy is important to create loops in the supply chain in order to retain that value that is otherwise lost in the linear economy. They argued that recycling is the least value-capturing loop in a circular economy because it is only incrementally better than disposal. Instead companies should create tighter loops to capture more of the original value by focusing on refurbishment or increased utilization, secondary life uses, and parts harvesting. One of their examples are cars that only have utilization of 5–8% of the time, and the capacity of the car is on average only used by one and a half people in a five-passenger vehicle. In sum, they argue that the circular economy should be seen as a value-creation driver that needs new forms of collaboration, partnering, and leveraging your ecosystem to find creative solutions.

2.4 Shared Value

Today, the world is facing environmental, societal, and local economic problems. These problems are shaking the economy and are viewed as threats to profit increases (FSGImpact, 2012). The concept of shared value, created by Michael E. Porter and Mark Kramer, suggests that these threats are in fact opportunities (Shared Value Initiative, n.d.). They mean that it could be risky for businesses to ignore the creation of societal benefits (FSGImpact, 2012). The argument is that companies can move beyond corporate social responsibility and create competitive advantages by incorporating environmental and social concerns into their strategies. Handling societal challenges as business opportunities was introduced as a new important dimension of corporate strategy and a significant approach to social change.

Akpinar (2020) suggests that creating shared value is part of the transition into the circular economy and shared value should expand the borders from a narrow focus on companies to a broader focus, including government, universities, and society. This proposal expands the original perspectives of Porter and Kramer and is specific to a circular economy and needs to have a clear leadership and activation of the society like Finland has done within government regulation and incentives to test business models, education, research at universities, and by the Finnish Innovation Fund Sitra. Overall this research highlights the link between the circular economy and shared value. Kramer and Pfitzer (2016) argued in line with the approach of Akpinar for a collective-impact approach that is needed because the social problems

arise from a complex combination of actions of actors and therefore need to be solved by coordination of their efforts.

Investments in shared value strategies are becoming more and more common for businesses around the world. Some companies use it to realize the opportunities in circular economy principles (Mahmud et al., 2017). Shared value means that corporations can create economic as well as societal value. Creating shared value is long-term thinking and does not only focus on immediate profit. It is based on three principles: reconceiving products and markets, redefining productivity in the value chain, and cluster development (FSGImpact, 2012).

Businesses' focus has mainly been on the creation of demand and how it is met, not if the products they sell are good for their customers. The first level that shared value operates in is about meeting customer needs and social needs. The first step is to identify needs and demands. Next, businesses should review their products and consider whether they bring benefits or harm to society (Aljibouri & Kurbegovic, 2018, pp. 7–8).

Level 2 identifies value chains, how companies can improve their productivity, and how that leads to shared value (Aljibouri & Kurbegovic, 2018, p. 9). According to Porter and Kramer (2011), pp. 9–11), energy use and logistics, resource use, procurement, distribution, employee productivity, and location are the most important areas when implementing shared value through value chains.

The third step represents supporting activities related to the business. No company works 100% independently; they are all affected by their surroundings such as suppliers, competitors, education, infrastructure, and laws. By improving communities, corporations can perform shared value as it gives rise to economic and social success (Porter & Kramer, 2011, p. 12). Focus should be on weaknesses that constrain business growth (Aljibouri & Kurbegovic, 2018 p. 12).

2.5 Cradle to Cradle

Cradle to grave implies that the death of a product enables another product to replace it. The components used in making the product become waste. The opposite perspective is called cradle to cradle, which means that the death of a product is also a new beginning for its resources (Wennborg & Berg Helgöstam, 2018, p. 9). Cradle to cradle is a philosophy formed by Michael Braungart and William McDonough (cited in Wennborg & Berg Helgöstam, 2018, p. 9) and covers three qualitative design principles. To start with, all biological waste should be composted. As a result, there is no need to minimize the use of resources since they would become nourishment for new ones. The second principle is to use renewable energy (Wennborg & Berg Helgöstam, 2018, p. 9). According to cradle to cradle, there is no shortage of energy, but the creation of energy needs to change. The third approach is diversity, which means more even resource extraction, greater stakeholder benefits, and more sustainable processes. It is possible for firms to C2C-certify products and materials (Ronneby Kommun, 2019).

2.6 ReSOLVE Framework

ReSOLVE framework is based on six business measures with the aim to help companies and governments to become circular. Moreover, the Ellen MacArthur Foundation (2015, p. 9) argues that the tool helps organizations to create specific circular strategies. ReSOLVE stands for regenerate, share, optimize, loop, virtualize, and exchange and is a model developed by the Ellen MacArthur Foundation. The Ellen MacArthur Foundation (2015, p. 9) declares the different parts of the model:

Re*generate* refers to businesses' transformation to renewable resources. This includes protecting and healing ecosystems as well as integrating biological recourses into the biosphere.

S*hare* assets like facilities and cars to maximize their use. Focus is also to extend the life span of a product by, for example, maintenance, reuse, and second hand.

O*ptimize* by developing products for the better that also will prolong its life. Furthermore, it is also about optimizing manufacturing by excluding waste and taking advantage of technology like automation and big data.

L*oop* touches on closing material cycles with, for example, reproduction and recycling.

V*irtualize,* for example, dematerialize, in other words using data to digitalize processes. For instance, music online rather than CDs.

E*xchange* to renewable resources and implement better technologies.

2.7 Business Model Canvas

To develop and ultimately implement the ReSOLVE framework in their business model, companies must engage in the process of business model innovation (Osterwalder & Pigneur, 2010). Through business model innovation, companies can develop business models that integrate circular economies into their model by integrating slowing and closing resource loops (Nußholz, 2018). This innovation is an important element in the shift toward a circular economy. The circular business model integrates environmental and economic value creation by capitalizing on the value embedded in reused materials and products.

The business model canvas is a well-applied framework that illustrates business models. It is developed by Osterwalder and Pigneur and consists of nine areas: value offering, target group, customer relationship, partnership, distribution channels, revenue streams, cost structure, key activities, and key recourses (Lewandowski, 2016, p. 10). The following part moves on to analyze the nine building blocks from a circular economy perspective.

2.7.1 Value Proposition and Delivery

Value offering, target group, and costumer relationship A business offer must meet customer needs. The life of a product is extended in a circular business model. They are designed in a way to enable the resources to be reused, recycled, remanufactured, or disposed of safely. Greenhouse gas emissions should be minimized in production (Lewandowski, 2016, p. 16). Moreover, companies can, when using circular business models, profile themselves as environmentally friendly, which can create a good reputation and image (Larsson & Saulo, 2019, p. 18). Research by Geng et al. (2007, cited in Larsson & Saulo, 2019, p. 18) shows that most stakeholders want companies to adapt to circular business models. The research by Geng et al. also claims that businesses that do so increase their customer base by attracting new ones and making old ones stay. The Ellen MacArthur Foundation (2015, p. 15) also claims that long-lasting products and high-quality items can lead to better customer satisfaction. Moreover, a circular model can allow companies to tailor products to meet customer needs. Additionally, there is a switch in the thinking of business models. Some markets observe a larger demand for renting and sharing instead of owning products and services (Ellen MacArthur Foundation, 2015, pp. 3–5). Customer and company advantages with sharing models are, for example, reduced cost for repairing, returns, and ownership as well as increased comfort (Ellen MacArthur Foundation, 2015, p. 15). Today, the average car in Europe is parked 92% of the time. Sharing or renting assets may lead to value creation and less economic losses (Ellen MacArthur Foundation, 2015, p. 3). Contracts like these are also likely to build long-lasting customer relations (Ellen MacArthur Foundation, 2015, p. 14). The Ellen MacArthur Foundation (2015, p. 13) presents that if washing machines were leased more people would have access to one. Consumers would save around 33% per wash and manufacturers increase earnings by around the same percentage. More than half of the world's population lives in cities and urbanization is predicted to increase even more. By 2050, 66% will live in urban areas according to the Ellen MacArthur Foundation (2015, pp. 4–5). Sharing and circular business models and reuse of materials will benefit from this because of more assessable pick and dropoffs as well as easier logistics.

Closed loops are essential in circular economy. Recollecting resources from customers and reverse logistics is vital in a circular business model (Lewandowski, 2016, p. 20). Adding closed loops to the business model canvas by Osterwalder and Pigneur is where the value delivery is connected back in a circular loop into the value creation of the model. Closing resource loops is concerned with recycling material and products and putting them back into the economy at the end of their functional life in order to revitalize the products and implement the philosophy of cradle to cradle (Wennborg & Berg Helgöstam, 2018, p. 9).

Slowing resource loops is aimed at prolonging product, component, and material life through, for instance, maintenance, reuse, and remanufacturing, and this strategy is typically more economically and environmentally profitable than closing them (Ellen MacArthur Foundation, 2013). Jensen (2018) demonstrated that slowing

loops by retrofitting for wind turbines improve energy and extend product lifetime and are economically and environmentally viable. Whereas closing loops are only viable for certain high-value components, for example, permanent magnets.

Distribution channels Virtualization is essential in a circular economy. Virtualization includes virtualized offers, deliveries, and customer communication, as well as selling via virtual channels (Lewandowski, 2016, p. 17). Circular economy is meant to close loops of material flows in the economic system. In order to do so, smart logistics are required. Logistics links resources, products, and customers (Ociepa-Kubicka & Seroka-Stolka, 2019, p. 472).

Revenue streams There are different ways for companies to collect revenue. Pay per product or service, pay per use, performance-based contracting, or availability-based product–service system (Lewandowski, 2016, p. 17). Circular economy enables the shift from selling products to service solutions offering multiple costumer value. Moreover, product service system is directed to improve the environmental aspects of consumption. PSS includes products and services, product use, maintenance, and valuation. However, PSS requires changes in relationships between producers and customers (Witjes & Lozano, 2016, p. 40). The integration of circular economy into a company's traditional business model can as an example mean to change from price per unit to value provided price per service, including shared responsibility of the PSS (Witjes & Lozano, 2016, p. 42).

2.7.2 SValue Creation

Partnership To enable circular businesses, partnerships that support circular principles are needed along the supply and value chain. Key resources and key activities in a circular economy are dependent on collaborations (Lewandowski, 2016, p. 18). A business has external and internal stakeholders that help them to move forward. Goni et al. (2021, p. 895) claim that there are key principles for stakeholder involvement: partnership, participation, communication, and consultation. When companies adjust their business models, they are driven to engage with stakeholders in a better way (Witjes & Lozano, 2016, p. 40). Moreover, they create competitive advantages for the business, customers, and society. Circular business models also change the relationship between the supplier and producer from product focused to service focused (Witjes & Lozano, 2016, p. 40). Witjes and Lozano (2016, p. 40) argue that there are both advantages and difficulties in collaborations. For example, collaborations can improve product performance and market access and increase innovation and efficiency. Although unproductive decision-making, conflicts, and complication in the coordination of costs and budget overruns are common problems. Partnerships have the potential to share assets (Ellen MacArthur Foundation, 2015, p. 9) and develop the shared value in these assets (Porter & Kramer, 2011).

Cost structure It is likely that changes in the other nine blocks will result in a changed cost structure (Johansson & Edlund, 2018, p. 23). Organizational changes

may be required when implementing a circular business model, and businesses could start by analyzing the cost structure (Lewandowski, 2016, p. 19). Firms must, in order to be circular, adjust their financial management. For example, by doing calculations on how circular systems can be profitable and measuring the economic growth of an investment (Wennborg & Berg Helgöstam, 2018, p. 10).

Key activities Value chains are activities to provide valuable services and products; they can be used to manage business activities. Suppliers, customers, resources, operations, logistics, services, marketing, and sales are all elements in a value chain (Goni et al., 2021, p. 894). According to Witjes and Lozano (2016), p. 37), resource efficiency is maintained in a circular business model by protecting the added value throughout the whole value chain. This can be achieved by organizing the use of energy and raw materials well. Nevertheless, the key activities are linked to the company's value proposition and may therefore vary (Johansson & Edlund, 2018, p. 23).

Today's increase in advanced technology can enable business adjustment. This may lead to better collaborations and knowledge sharing, improved material tracking, expansion of renewable resources, and superior logistic systems (Ellen MacArthur Foundation, 2015, p. 4). Better process controls can eliminate losses and spills and enable optimal conditions in production. Other key activities can be, for instance, the use of big data and machine learning, as well as management and leadership (Lewandowski, 2016, p. 18). Organizations should create common values and goals, as well as solidarity to improve business performance. It can be done through training and social activities. Management is therefore just as important when implementing circular economy into the business model according to Wennborg and Berg Helgöstam (2018, p. 10). Goni et al. (2021, p. 895) also argue that core values and organizational values are important for decision-making and strategy. These should set the direction for the corporate strategy. Moreover, the existence of a company relies on business achievements. Resource optimization and efficiency affect the result of a company. A business model requires performance measurements involving several indicators like management, quality, capacity, and service (Goni et al., 2021, p. 894–895).

To reduce waste and manage resources in the best possible way is essential in a circular economy. Businesses can achieve that through sustainable design, maintenance, repair, reuse, recycling, refurbishing, and remanufacturing. Additionally, efficiency, stakeholder, and economic value should remain high throughout the product life cycle (Goni et al., 2021, p. 894). Witjes and Lozano (2016, p. 38) also agree that organizational and technical innovation, resource management, design processes, stakeholder partnership, and financial instruments are essential for a company to adapt to a circular economy. They also mention capacity building, policy-supporting tools, logistics, new consumption models, citizen engagement, communication, and product and design services.

Key resources For producing operations, sustainable and recollected materials can be a key resource. Platforms, knowledge, and experience can be important resources for businesses that offer services and virtual products (Johansson & Edlund, 2018,

p. 22). Technology, both hardware and software, helps companies to control processes. For instance, it can improve interactions between suppliers and customers, as well as improving manufacturing and trading (Goni et al., 2021, p. 894). Technology is also an important aspect of recycling and remanufacturing (Johansson & Edlund, 2018, p. 23). Finance, production, human capabilities, intellectual property, and relationships are examples of intangible assets that contribute to value creation. A value-creating strategy enables resource adjustments to align with the goals of a business (Goni et al., 2021, p. 894).

Summarizing the analysis of the business model canvas, we have argued for where a linear model as the business canvas model can incorporate circular economy by applying the principles. Specifically loops should be created from the value delivery activities back into the value-creating activities, virtualization in the distribution channel, optimization in the key activities, share assets among partners, and apply regenerative resources within the key activities and upgrade technology.

2.8 Businesses' Potential Drawbacks

Companies are experiencing difficulties adapting their business models toward a circular economy. In order to investigate how to make it possible, we also need knowledge about the potential barriers. Research has shown that it is hard to implement circular economy because of how deeply rooted linear economy is in today's society (Johansson & Edlund, 2018, p. 15). The Ellen MacArthur Foundation is the leading circular economy organization. The foundation was created in Great Britain in 2010. Their mission is to create awareness and encourage the change of consumption habits in society toward a circular economy (Larsson & Saulo, 2019, p. 9). Although the Ellen MacArthur Foundation's definition is the most used interpretation, there is no set definition of circular economy. This may lead to confusion and a negative impact on implementation (Johansson & Edlund, 2018, p. 12).

Currently, businesses have not adopted circular economy to any great extent. One reason is lack of strategic guidance; however, it is hard to find a model that fits all organizations. Companies find it hard to think long term over current costs and experience difficulties with lack of knowledge and external market factors like customer demand (Berg et al., 2018, p. 7). Some businesses feel uncertain regarding if target groups will appreciate their attempt to adapt to a more circular business model. Another factor is cost. The transition requires investments and an expected payback period. Other barriers such as technology and resource management (e.g., time and human resources) can also complicate the process (Berg et al., 2018, pp. 7–8). Especially resistance arises if the business model already works great in its current form. It is also hard to calculate the environmental difference between a circular and a linear model since it requires time and other resources (Berg et al., 2018, p. 9).

The research by Haleem et al., (Haleem et al., 2021, p. 132) shows that laws and regulations are the most experienced barrier when adapting to a circular economy. Examples of restrictions are lack of tax policies for promoting circular economy, lack of implementation of environmental management certifications and systems, little government support, and lack of a system for measuring the performance of circular economy (Haleem et al., 2021, p. 116–117). Another example by Haleem et al. is that many countries do not have a standard for refurbished products, which may lead to inferior quality products. Management-level barriers such as resource optimization, planning, and organizational structures are the second most common drawback according to Haleem et al., (Haleem et al., 2021, p. 133). Technical complications show that there is a need for advancement in order to close loops. However, implementation of new technology can be costly, complicated, and time-consuming (Haleem et al., 2021, p. 118–119).

Another category of barrier Haleem et al. mentions are the social or customer-level barriers. The barrier includes customer perception and customer knowledge. Haleem et al. (2021, p. 135) argue that if consumers are aware of the circular economy advantages, they can influence corporations to adapt their business models. Furthermore, lack of short-term economic benefits and financial resources and investment costs also hinders organizations (Haleem et al., 2021, p. 121–122). Cannibalization is the problem of a product taking market shares from another product from the same seller, which could be the case in the transition to circular economy models according to Larsson and Saulo (2019, p. 13). Today, companies can use unsustainable materials because they do not want the product to last long so the customer must buy more often (Larsson & Saulo, 2019, p. 13). Recycled products with a lower price could also compete with newly produced products with a higher price. Therefore, these corporations, besides their products, should make sure to offer services to ensure that the contact with the customer continues (Larsson & Saulo, 2019, p. 14).

There are also environmental barriers. Circular business models can require further resource usage and energy. Tóth Szita (2017 p. 8–9) warns that when using renewable recourses the environmental impact can in fact be stronger, and the positive effect be decreased. Businesses need to measure the effect of circular economy. This can be done through a life cycle analysis (Tóth Szita, 2017 p. 5).

3 Discussion

The research question is “What can companies do to adapt their business toward a circular economy?” To answer that we need to sort out what circular economy is. Even though there is no set definition, it seems like organizations and researchers are explaining circular economy alike. Circular economy is about maintaining value and resources for as long time as possible. Including the whole cycle, from resource management, manufacturing, use, and what we do with materials afterward. This research demonstrates the importance of integrating circular economy into the whole

business. The literature review mentions different aspects throughout the whole value and supply chain.

Prior studies have noted the importance of economic winning and cost savings. This is, according to research by Agyemang et al. (2019, cited in Larsson & Saulo, 2019, p. 11), the main motivational factor for many businesses to become more circular. Savings can occur in, for example, production, when using circular materials or when reusing resources. Increasing a product's life through development contributes to slow loops and new materials do not need to be used to the same extent, which can lower costs. Profits can increase from materials that otherwise would have been wasted and from increased customer satisfaction. The literature review states that remanufacturing, reusing, reducing, and recycling are essential to a circular business model in order to close the loop and decrease waste (Jensen, 2018; Porter & Kramer, 2011; Hannon et al., 2016; Akpinar, 2020). Products and components need to be designed in a way that makes it possible. However, when using renewable resources, the environmental impact can be stronger. Therefore, companies need to measure the impact of their circular economy procedures. Another important finding was that logistics are important in a circular economy. Resources need to be brought back to businesses to be able to circulate them.

The findings indicate that organizational management competence is key in order to change a business model toward a circular economy. Internal communication is important to unify the organization. External communication is important as well to increase customer demand and differentiate the business from its competitors. Furthermore, this study has been able to demonstrate the importance of key suppliers for reliable value chains. Several reports have also shown that technology enables corporations to adjust their business models. Still, lack of knowledge and strategic guidance complicates the transition to circular models. Nevertheless, various laws and regulations in different countries can complicate the transition. It can thus be suggested that companies can start small and not make the whole organization totally circular at once. In conclusion, companies should think of circular economy as a long-time investment. Businesses that would like to implement circular business models need specific measures (Mayer et al., 2019) on how to do it in practice, but no model fits all organizations. The actions necessary can vary depending on the business industry and offer.

Circular economy relates and reinforces the notion of shared value. One shared value principle is that threats can be opportunities. The current linear economy comes with a lot of problems and in the view of shared value these problems can be business possibilities, which enables circular economy transformation. The three shared value principles could be applied to circular economy, product's effect on society, improved value chains, and supporting activities. This study found that circular economy most likely benefits society, economy, and business performance. Taken together, these findings suggest that there is an association between shared value and circular economy.

4 Conclusion

The purpose of this research was to find out how businesses can adapt their business models to a circular economy. This study has reviewed key aspects of transformation summarized below.

In order to adapt, businesses can design out waste and enable recycling, remanufacturing, and reuse. An important circular economy principle is to make the life of resources longer and close loops. This research shows the importance of product design, renewable resources, and sustainable materials. Businesses can therefore switch to those types of resources. Organizations can find ways to reduce costs and at the same time increase sustainability. This research shows that switching to recycled, reused, or remanufactured materials as well as the extension of a product's life can lower costs.

Circular economy can enable new revenue streams. Businesses can find new earnings in resources that would have been lost in a linear model. Circular economy enables the shift from selling products to service solutions offering multiple costumer value. The integration of circular economy into a company's traditional business model can as an example mean to change from price per unit to value provided price per service, including shared responsibility of the product service system. Circular economy creates a need for completely new businesses, for example, logistics to pick up already-used products. Special competencies for making reuse, remanufacturing, and recycling possible would also be needed.

Implementing a business model conducts to circular economy principles. Need an adaptation of the business canvas model with new principles to change the model from a linear economy model to a circular business model. The main change in the model is that the circular business model incorporates loops from the value delivery side to the value creation side of the model. It is important that some loops are profitable to engage in, but it need to be measured clearly to ensure the profit (Mayer et al., 2019). Recollection of already-used materials and products can be implemented. In a circular economy, customers can be suppliers when the business is buying back resources. Transportation and logistics to enable that are needed.

Corporations can find new creative ways to maintain a high costumer value and service. Firms can consider investing in long-lasting products and high-quality items rather than fast-moving consumer goods. Businesses can apply frameworks and models such as cradle to cradle, ReSOLVE, business model canvas, and shared value. The chapter discusses how key suppliers and partners make it easier for businesses to transform into circular models by applying the principle of *share assets*. How to *regenerate* by transform into renewable resources as input to key activities, but also *optimize* the development of the products to its lifetime and *exchange* to better technologies that reduces the need for input. Businesses can do a life cycle analysis to ensure environmental performance. Branding and marketing may be important to create customer demand. Digitalization and technology can help companies to adapt to a circular economy. *Virtualize* branding and marketing

reduces the need for physical inputs. Finally, circular principles must be implemented in the whole business, the value and supply chain by *loops*.

The results suggest that time, research, capital, and long-term thinking are important. Knowledge about laws and regulations in different countries facilitates the transition to a circular business model. This research indicates that cost structure and organizational management is a key factor in changing a business model. Finance, production, human capabilities, intellectual property, and relationships are examples of intangible assets that contribute to value creation. A value-creating strategy is vital to reach business goals and therefore also goals connected to sustainability and circular economy.

In conclusion, both internal and external business activities matter. Overall, the result of this study indicates that the possible benefits of a circular business model exceed the drawbacks. Even so, adapting takes time and requires resources. Businesses need to think of circular economy as a long-term investment.

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Linking Strategic with Operational Efficiency: Lesson Learnt from Lean Startup Strategies

Bruno F. Abrantes and Axel Nicolas Lindberg

1 Introduction

This chapter delves into the strategic and operational efficiency aspects of an organization underlying the fundamental (Japanese-rooted) philosophies of continuous improvement as the Kaizen or the total quality management (TQM) (Lutra et al., 2020). Here, we zoom in the realm of organizational capabilities to understand the ones specifically related to resource-efficiency one of the pillars of the *Lean*'s 3M (*Muda, Mura,* and *Muri)* and subsequently grasp the (capabilities) related to waste-control and resource efficiency that are at the core of lean operations.

Hence, we instrumentalized a Swedish startup company to conceive a phonetic case surrounding lean capabilities in order to inspire other firms from this (upstarters) ecosystem and, furthermore, open horizons of investigation for other researchers following the *resource-based view (RBV)* to proceed with this investigation line within the scope of *dynamic capabilities* or *ordinary capabilities*.

What we have denominated as "lean startup strategies" finds ground on Sull's (2007) reasoning of a loop of "strategy in action" that in four phases entangles strategic design with operational execution. This is for us a philosophical assumption, that the dialectic between *strategy* and *operation* is a conversation hold in unison, as these two are inseparable parts of a whole (organizational) strategic management system. Henceforth, this assumption is compliant to the neoclassic fundamental idea of *Mr. Maasaki Imai*'s (the father of the Kaizen philosophy), that is, to involve everyone, whose brilliant assertion is transferred into one of the five

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Kaizen principles ("*Go to Gemba*"), which explains the importance of proximity of these two components for the success of strategic business cycles and the future wealth of an organization (Hides et al., 2000; Kaizen Institute, online). In such a context, we immerse into the background context of lean startups to understand their capabilities, especially often disregarded by most firms, thus, the hidden work of resource allocation that (effectiveness) is the key to the positivity of downstream results. The right resource deployment determines the positivity of the routines at work, with resources utilized as (effective) *assets* and subsequently their exploration (asset development) contributing to the ability of individuals and teams to uplift their capabilities and the strategic and financial performance of the firm in the form of high economic rents (Capron and Mitchell, 2009).

In turn, the oversight of resource deployment with careless equity in the what/where/how to allocate (or maybe worse, an irrational distribution) inconsiderate of asset formation just accentuates *capability gaps* between the requirements to compete on the industry's side and the actual firm's ability to compete in a certain moment in time. Narrowing down the capabilities deployment to lean thinking we have, unavoidably, come across the need to focus on the *lean triad* (aka, *3M*), and so explore the subset of capabilities that land on the surrounding aspects of efficient allocation of resources to understand more in particular the capabilities startups develop since their inception/establishment related to the waste (*Muda*), unevenness (*Muda*) and overburden (*Muri*).

This investigation centered itself, particularly, on the subset of Swedish high- and medium-tech startups that are, in several areas, at the forefront of business innovation supported by a mature entrepreneurial ecosystem, with over four decades of existence, and counting with the support of the national and regional public policies, local incubators' initiatives, the interest of venture capitalists, and furthermore leveraged by the Swedish universities, cumulatively, instilling a context that creates jobs, innovation, and economic growth, particularly felt in larger urban centers (Adler et al., 2019; Dahlstrand and Berggren; 2010; Henrekson & Rosenberg, 2001). We followed the case of a Gothenburg-based startup called *Tiro* as a Software as a Service (SaaS) upstarter, established in the middle of the COVID-19 pandemic, and will discuss their journey from the idea generation until the implementation of a business concept in order to grasp their *sui generis* capabilities.

1.1 Background

The emergence of the startup phenomena can be traced back to the 1970s. This whole new conception had to oppose the initial myths associated to the individual misjudgments of its meaning and importance. A rather narrow view looked at it as a pretentious new buzzword to elevate the merit or the status of the person initiating a new business venture. Yet, the notion of startup conveyed much more on its trail than the naïve idea of business-opening-related aspirations. According to Curry and Baldridge (2021), a startup belongs to the realm of the entrepreneurs and is an

admirable new world of new communities of practice, surrounding the professional domain that is per se a business ecosystem, transversal to all existing industries. These scholars defined *startup* as a newborn or young company founded to develop unique products or services, and market them to customer target groups to whom these offers are irresistible and irreplaceable (Curry & Baldridge, 2021).

Sweden has in this context outperformed larger ecosystem infrastructures placed in countries such as Germany, France, or the United Kingdom. The contribution of Swedish startups to the flourishing of a community in the country and overseas is a long-lasting and significant one. Hak postulates that Sweden managed to create favorable conditions for entrepreneurs to thrive and so has been designated as a unicorn factory of technological startups, inevitably, proven in the increasing number of them, but also in the figures revealing their prosperity, as a large number managed to achieve an enterprise valuation over a billion USD. For instance, companies such as *iZettle*, *Klarna, or Mojang Games* (the latter, the creator of the famous game Minecraft) emerged from the Swedish ecosystem in the last decade.

Indeed, the ability to captivate the interest of new consumers and incentivize them to switch consumption habits or extend the threshold of consumption to include a new product/service is not a story of success across all entrepreneurs. Naturally, one may well comprehend that many startups have succeeded and many have failed. However, this study is not a replication of others on successful entrepreneurial ecosystems. Also, it is not a study about innovation theatres and entrepreneurial (or startup) failure nor about business cemeteries. This study focuses on the strategic thinking held by the founders of the case-firm bridging strategic formulation with operational execution, so we could understand the firm's formation of capability bundles, through the linking of the founder's visualization of the whole value chain to the development of (lean) capabilities.

In order to accomplish the purpose of this study, we conducted a case research on a Swedish startup (*Tiro*). This firm intended to solve a problem common to all Swedish firms, that is, the inefficiencies in the handling pools of early graduates from the higher vocational education (HVE) programs. Moreover, they expected the improvements in resource handling to intrinsically lead to spillovers as to the connection of the actors (graduate firm) and subsequently yield a small contribution to a more cohesive and efficient functioning of the market structure.

In Sweden, the HVE programs (the so-called *yrkeshögskoleutbildning or YH-utbildning)* are flexibly adjusted to qualified workforce needs across economic sectors in the country. However, these HVEs are though confronted with a rift. Despite the balance of theoretical and practical components of education, including a work placement as "learning in the workplace" logic, *Lärande I Arbete* (LIA) senior students face market entrance challenges, partially related to the way resources are deployed surrounding the process of handling talent pools. On the other hand, while local firms face the additional costs by dealing with the scrutiny of HVE job applicants. This is the current/dominant paradigm of inefficient use of resources; hence, the accommodation of HVE graduates is, from a firm's perspective, a matter of *Muda (waste*). The system is far from efficient. HVE early graduates are typically incorporated into firms via internships with the underlying burden of administrative

workload, resources consumed along the hiring process, and inevitably the inherent cost ("*inkörningstid*") that these processes represent. Plus, we highlight all the invisible losses deriving from opportunity costs from a missed alternative allocation of resources (e.g., as time, equity, and human capital) in value-creating activities; and furthermore, the hidden losses deriving from potential capability development opportunities inherent to the pursuing of other value-creating tasks by several organizational stakeholders. However, HVE degrees are different from traditional (bachelor's or master's) degree programs. The Swedish National Agency for Higher Vocational Education (*Myndigheten för yrkeshögskolan*) conceived a postsecondary form of education as an alternative form of proceeding high school education ("*gymnasium*"). These academic programs with a maximum 2-year length provide the accreditation of competencies within a credit system, in which one may earn up to 400-HVE credits in 2 years (Myndigheten för Yrkeshögskolan, online). These programs offer a myriad of opportunities to the firms to acquire new capabilities from these graduates and develop human capital pools unseen in traditional educational programs. However, the linkage of actors resembles an old-school type of "analogical" or "manual" practice not adapted to contemporary business issues and distant from the digital era ruled by artificial intelligence and cyberphysical informational systems.

Here is where/how *Tiro* is coming up on the scene. As a Software as a Service (SaaS) provider, this startup appeared last year as a digital intermediary (or data-broker) willing to transform the existing *lose–lose* relationships between applicants and firms into a win–win relations. In order to accomplish, they began to provide an intermediary solution that opens a window of opportunities to the first and heals the "scar" of inefficient resource utilization in the latter (Abrantes & Ostergaard, 2022; Abrantes & Venkataraman, 2022).

Contrary to the case-firm, our investigation focused on the behavioral patterns, regarding the resource allocation (in)efficiency/ies, not the whole Swedish organizational ecology across tech industries, but only the case-firm owns idiosyncrasies serving others as a SaaS/service. The study scrutinized, thus, the extent of lean capabilities built, considering that resource misallocation is (an assumption of) a negative phenomenon surrounding operational efficiency with impact on the strategic competitiveness of the firms. Such repercussions (negative externalities) are felt in the pockets of stockholders and employees (e.g., lower returns or bonuses). Hence, we assert that blocking the invisible drainage of organizational resources that are being wasted (and other opportunities of asset-usage lost) is a firm-level imperative, which the positive lessons taken from this case study (in terms of strategic/operational upskilling to yield a lean startup) have certainly a parallel (and so also interest) in other geographical spheres and industries.

1.2 Research Gap and Contribution

Our struggle identifying studies on startup-related strategies in Sweden hampered, at first, the formulation of a more concrete initial context, with country comparisons

being the bulk of information portraying the country (Skawińska & Zalewski, 2020a, 2020b). The vast majority are detached from the "big picture" of how startups strategize, with the encountered theory in core areas (entrepreneurship and strategic management) and in other interdisciplinary fields having a (well) narrowed scope into the specifics of the startup realm (e.g., competitive landscape, business models, opportunity-seizing, branding, and so forth) with sparse hints of an essential exercise of (bottom-up) lifting these findings into the spectrum of strategic thinking and so enriching these knowledge fields (Edehult and Riaz, 2019; Lagerstedt and Mademlis, 2017; Åkesson and Dajakaj, 2016).

Conversely, our *Boolean* search of the same topic, by eliminating "Sweden" (and the inherent Boolean operators from the variations of this word), confronted us with an abundant number of studies addressing the problem referred to in the previous paragraph, and especially, with theoretical exercises focused on China and the US-based or Born-Global startup strategizing.

However, this dual contingency, with obstacles felt in theoretical deficiency and neglecting the Swedish tech startup ecosystem, has stimulated us to pursue such avenue since a contribution is notoriously required and our study brings a singular research angle, which is the biggest approximation to ours, "*The Lean Startup*" book, does not fulfill since it passes blandly through the point of our study, that is, managerial capability building surrounding resource waste management (*Muda*) as a key element of operational efficiency and as emphasized by this case study (Ries, 2019).

2 Literature Review

2.1 Startup: Anchors and Stages

The notion *startup* is often misperceived. The interchangeable use of this term is, sometimes, associated with an innovative microventure from a seed phase up to its market maturity, in other occasions, referring simply to one phase of the entrepreneurial development process (Skawińska & Zalewski, 2020a, 2020b). Thus, in the initial two paragraphs we will make a preliminary clarification of what a startup (and a startup ecosystem) is, revisiting previous literature. Hence, we are able to define startup in two ways, in *lato* sensu and in *stricto* sensu. In lato sensu, a startup may be described in two major attributes: (1) a relatively newly established business venture, moreover, with limited finances and human resources; and (2) a business model oriented toward innovation, scalability, and rapid growth.

In *stricto* sensu, this definition is often confused with the phases of the development and maturity of a startup, namely confused typically with the *standup* and with the *scaleup*. However, the *standup* corresponds to the initial phase of discovery of a (somehow still fuzzy) idea or invention. In the context, the *startup* corresponds to a second phase in which the microventure is formed from the previously created innovations. The *scaleup* corresponds to a third phase (subsequent to the startup

one) of shakeout, related to the abandonment of short-runs of production (or service delivery) toward a rapid/exponential growth and market development, which, ultimately, culminates in the ability to maintain market leadership and growth as the scaleup consolidates as a *scaler*. We follow here the soft definition of a *startup* blending these two perspectives:

> . . . is a young, small, independent enterprise, which is creative, innovative, conducting research and development activity (R&D) to solve actual problems, and proposing prospective solutions, striving for talented employees, and sales growth, with an attractive business model. (Skawińska & Zalewski, 2020a, 2020b, p. 6)

This definition has the virtue to encompass both *hardware* and *software startup ventures* and to accept the dynamics of startup development along these phases above, matching their evolutionary path with the four phases of an entrepreneurial/product development life cycle: *startup*, *stabilization, growth*, and *evolution*. The notion of *(entrepreneurial) ecosystem,* which constitutes the scenario for the marketing of these new ventures, corresponds to an overall set of factors, such as the diversity of the interdependent actors (within a geographic region), which influence the formation and trajectory of the entire organizational ecology or group of actors within the ecosystem and eventually the market dynamics and the ability to generate high economic rents and wealth (Tripathi et al., 2019). Another unavoidable ecosystem's trend is technological advancement. This is a factor one cannot neglect, as revealed by Agilecraft's CEO Steve Elliot – cited in Nir (2018):

> ... the pace of technological change is eating companies that try to operate without a lean mindset. Large enterprises must transform to compete and thrive in the modern digital economy

Within an entrepreneurial ecosystem, typically in a radius of 30 miles, the majority of innovative tech startups, according to Minalo, Hahn et al. (2020), grow and take advantage, to some extent, of the existing scholarly knowledge and the entrepreneurial structures in place, namely the ones provided by their local higher education institutions (HEI) where startup founders have studied on, or been affiliated to, or even incubated therein (Abrantes, 2020; Eatmon et al., 2020). These scholars' argument fits the notion of *Entrepreneurial University (EU),* a concept extensively explored in previous literature, as a societal mission assumed by these HEIs (Guerrero & Urbano, 2010; Rothaermel et al., 2007) Etzkowitz, 2004).

The notion of an entrepreneurial university "support" to the startup is shaped by a combination of environmental factors (EF)—formal and informal. Here, one may consider the degree of the *entrepreneurial organization and governance;* the *entrepreneurship education* and the *support measures for entrepreneurship* (environmental formal factors) and the attitudes toward entrepreneurship/*university community*; *entrepreneurial teaching methodologies*; and the *role models and reward systems* (environmental informal factors) (Guerrero & Urbano, 2010).

These environmental factors (EF) that form the entrepreneurial context of the HEI are crucial and interplay with the internal factors (IF) influencing the EU outcomes:

$$\mathrm{EU}_{(\mathrm{Outcomes})} = f\ (\mathrm{EF}, \mathrm{IF})$$

In this context, the internal factors are the endogenous abilities (again, of the HEI) that shape the startup European environment. The most critical are the combinative set of resources and capabilities (R&C), but also the systems and routines, with the maturity of the EU being determinant for the ability to jointly create new knowledge and disseminate it effectively. Thus, the availability of physical, human, financial, and commercial resources associated with capabilities built on, for instance, visibility, localization, status, (collaborative) networking, or proprietorship, are essential for the development expansion of the radius of influence to its periphery.

Although, regardless of the context that may leverage a spark of motivation or dissociate one from becoming an entrepreneur's candidate, the process of discovery is entangled on a typology of entrepreneurial individual: the *idea generator.* This is the type of entrepreneurial person with (1) a high intelligence and (2) with a cognitive style oriented toward conceptual construction. At the same time, this cognitively sophisticated person holds three other attributes: (3) the desire to innovate; (4) a belief in new product development; but in turn, (5) a risk-avoidance profile (Rauch & Frese, 2000; Miner, 1996). Consequently, the idea generators, despite being great visionaries of something concrete in the future, lack other competencies observed in other types of entrepreneurs, such as the *supersales person*, the real manager, or *personal achievers*.

Miner (1996) research line, complemented by Timmons (1999), advocates that this type of entrepreneur holds five overlapping characteristics: (1) *empathy*—or capacity to understand and to feel with another person; (2) *service motivation and orientation*—a desire to help others; (3) he/she *values socialization*—beliefs on the social processes; (4) needs *rapport building*—has a need for consciously develop positive relationships of mutual trust and affinity with others; and (5) assumption on sales force potential—a belief that a salesman and a sales force are crucial to carrying out a company strategy.

The real manager is a style of entrepreneurial oriented toward the organization of a venture and monitoring their execution and control it. The attribute surrounding this style is a strong supervisory orientation/ability and the need for occupational achievement *(n-ach)* and for self-actualization, equivalent to needs (n) study of organizational behaviorist David McClelland in the 1960s (Rauch & Frese, 2000; McClelland, 1965). In addition, they are propense to competition (and holding a desire of).

The personal achiever has one point in common with the real managers (i.e., the n-ach) as to professional accomplishment and self-development/ mastering their skills and surrounding them self-imposing high standards. The research of Miner (1997) argues that growth is higher in firms founded by entrepreneurs with a personal achiever profile, but also startups founded by entrepreneurs with two or more entrepreneurial styles were more likely to succeed. In this sense, we are tapping into the notion of a *multistyle leverage* as an anchor of successful entrepreneurial endeavors. Identically, Ries' (2019), p. 8–9) Lean Startup Method resembles a

postulation of the multistyles as these styles assume different roles in an organization and so serve complementary functions. For instance, the method argues in favor of personal achievers, what he calls the "*validated learning*" and" "*build–measure–learn*" functions, and real managers because "*entrepreneurship is management*" and startups more than other types of firms require specific processes of "*innovation accounting*.

In this way, Beverly's (2017) assertion of the importance of visualization (and so the idea-generator style) is not necessarily refuting Miner's ones, neither incompatible with Miner's reasoning. The first (*Harland T. Beverly*) advocates that the cognitive process (of *visualization)* is essential for starting a new venture. Thus, the idea generator walks the road of discovery though the *harvesting* (i.e., the ability to monetize it) is then dependent on other types/styles to reap the rewards of such a new venture.

De facto, this author considers visualization a first step in startup creation and takes it as a motto: visualize what is to be achieved! Then, the second and third steps entail market research. It is advocated the running of a *reality check* as fundamental part in which the entrepreneur screens the market essentials of structure, conditions, and performance to spot whether there is room/interest for such product/service concept. A third step encompasses a *maturity check* to comprehend if an idea that passed the reality check is grasped assertively by the consumer target group and so whether the market is mature enough to host such a concept. Subsequently, an investment and investor profile analysis is the next step. Here, the funding ought to be equated dualistically (inside-out and outside-in). The entrepreneur is summoned to a self-enquiry first, regarding the startup needs and its own interest in investing its own capital to the table and so sponsoring the initial equity for the formation or participation in further rounds of investment. Also it is required to conceive the planning and modes of investment most suitable for the project and the (un)desired profile for an investor. An appraisal of *ex ante* knowledge is also crucial. The assessing of prior knowledge, together with knowledge gains along these phases (namely about the market–structure, competition, dynamic/cycles, and success factors); and moreover, the knowledge gaps, between what one knows and holds as competitive assumptions and the necessary upskilling, are requisites still to be met before market an idea or before starting its commercialization. A reflection about the direction of a startup would be a desirable take and the envisioning of the strategic options and own values one wishes this company to assimilate are essential components for a rational strategic formulation with a clearly defined vision, mission, and milestones (as long-term goals).

As a final note, it ought to be emphasized the mixed nature of results in prior literature focused on the success outcomes of startup ventures. Divergent viewpoints and explanations are pinpointed in different context and research angles for the competitiveness of startups against other installed and larger enterprises. On one side, scholars such as Skawińska & Zalewski, 2020a, 2020b advocate the success is due to the clustering of startup capabilities and hence focused on the gaining of specific competitive advantages on eight major distinctive groups: *resources and competencies; information; intellectual capital; innovation; entrepreneurship;*

relational strategies; and *value management*. On the other side, other studies, such as the one of Díaz-Santamaría and Bulchand-Gidumal (2021), on the measurement of startup success revealed that for the universe of 340 European startups the success (output) measured in terms of financial revenue and financing capture until a scaler position contradicts the results of cluster of competitive advantages, but also asserts that success is mediated by four additional factors (not mentioned above): the *location* of the startup, the *engagement* of promoting partners, the level of *maturity* (as the age of the company), and the existence of nonpromoting investor partners.

2.2 Linking Strategic and Operational Planning with Performance

In Sect. 1.2, we exposed an incipient extent of literature on startup' s strategy with some notable exceptions, some already paraphrased above. Such deadlock seems to arise firstly from an oversimplification of previous literature on startup strategies normally associated with the fashioning of innovation-based business models. We should here emphasize that innovation strategy is a branch of strategic management (SM), but not the whole SM breadth, and likewise, business strategy is not the same as business modeling. Secondly, a dispersion is observed of previous research endeavors into multiple strands of the startup realm around SM. Although the closest to a whole startup corporate or business-level strategy is (apart from the innovation strategies) the noteworthy attempt of other studies to sketch their cooperative strategies (e.g., relations of startups with large enterprises or intra-communities strives) or sustainable-like strategies (exploring of their competitive benefits).

Alike Ries (2019), briefly referred to in the previous section, another "stone casted into the pound" is the book of Michael Nir ("*The Pragmatist's Guide to Corporate Lean Strategy: Incorporating Lean Startup and Lean Enterprise Practices in Your Business*"). With a reversed logic, instrumentalizing startup lean principles, the book reverse engineers their practices to prescribe, with the dazzling medical gaze of the author, a lean "startup thinking pill" to installed incumbents in other scaled/matured companies (Nir, 2018). This prescriptive pill, among the "five lessons" he recommends one to withdraw from the startup lean thinking, recommends companies to synthesize an "*integrative operational model*" and subsequently "*identifying the metric that matter*" (Nir, 2018, p. 38).

The author advocates the adherence to a "strategic operational model" that encompasses (what is called the "three-things must happen") to develop organizational practices that bridge strategy and operations that provide an end-to-end vision of one's business. Firstly, this entails avoiding a corporate mindset with an engrained culture segregating other organizational stakeholder's interests, typically of short-sighted organizations trapped into a *silo* mentality (*silo-trap*). This scholar argues that such phenomenon is a threat to strategic competitiveness due to the interconnectedness of the whole activities, transversally across the value network. Secondly,

the need for focusing on business outcomes (and suggests a particular methodology—the OKR model that we discuss below). Thirdly, the need to connect different initiatives into a bigger picture. The latter (assumption of a quest for holistic thinking—or being aware of the "big picture") is also something we have discussed in Sect. 1.2 since to some extent scholarly literature in startups suffers in general the same "illness," that is, a lack of studies, with a bottom-up logic, lifting multiple research findings toward the broadening of the horizon of organizational strategic thinking.

These three guidelines for a joint strategic operational action, based on the scrutiny of startups functioning, are furthermore pillared on five lessons of lean thinking that he inferred from startups (Nir, 2018, p, 11): (1) *customer in mind* (or customer centricity); a customer-centric structure of thinking and approaches mainly driven by *Rita Gunther McGrath* (Perkin & Abraham, 2021); (2) *define/communicate the mission and vision* (is a vital) step stone for aligning and engaging a whole organization toward a strategic route and destiny; (3) *synthesize an integrative operative model* (summarized in the "three-things must happen"); (4) identify metrics do matter (postulating the adoption of an OKR model by opposition to the traditional key performance indicators (KPI)) followed by companies who follow a management by objectives (MBO) path; and (5) *pivot or preserve*; acknowledging the need to build strategically flexible organizations, with the agility to accommodate timely (swift) action, in the result of environmental changes in the industry (e.g., demand preferences; competitor's ambitions and maneuvers; or technological trends).

In essence, the development of capabilities for putting into practice a strategic operational model (based on these five lean lessons) entails a shift of the organizations toward the valuing of *outside-in* logic of governance, with a *heterarchical* (or less hierarchical) and *flexible* mindset and structural configuration to embrace change, in which all organizational actors are aware of the competitive premises and contribute to some extent to the decisions that shape the future of the organization. Nir's (2018) lean vision of the contemporary success around a strategic operational model of management of the firm is something we do corroborate as unavoidably is an essential aspect of strategy-making within market dominated by trending features such as volatility, uncertainty, complexity, and ambiguity (VUCA); hence, as advocated by Donald Sull, it is foremost imperative to link strategy with execution and so strategic design with operational activities (Sull, 2007).

With this regard, the strategic operational model, in its five lessons, is profoundly attached in theory and practice to the following two fundamental seminal frameworks: the "Strategy Loop" of *Donald N. Sull* and the "Balance Scorecard" (BSC) of *Robert S. Kaplan* and *David P. Norton* (Kaplan & Norton, 1996). *Donald Sull*'s philosophical reasoning, as a replacement for *Henry Mintzberg'* s old-fashioned notion of linearity, comprised an emergent process linking deliberate, intended, and (un)realized strategy-making. Sull (2007) advocates a substitution of the linear approaches for an iterative approach, in which incumbents and their teams iteratively execute a four-step loop of *making sense* of the situation (thus, scanning the business environment context), then *making choices* concerning their current and future

actions (i.e., the to do's and don'ts), then putting it in practice their decisions by *mak*ing *it happen*, and so executing on agreed objectives, and finally controlling of ongoing progressions versus objectives within the market-evolving context. So *making revisions* by revisiting initial assumptions (and comparing them against what actually is happening or happened). This is an iterative process that views strategy and execution as intimately linked and indeed inseparable (IBSCDC, online).

The philosophical principles of the BSC, as explained in the book *The Strategy Focused Organization*, revealed some common features with the strategy loop (Kaplan et al., 2001). It assumed the importance of translating strategy into operational terms (principle 1) communicating and describing strategic options in a consistent and insightful way to facilitate the success of the operations. Consequently, the BSC aspires naturally to an alignment of the organization to the strategy (principle 2), in which the perception of the organization as a whole system presupposes that changes, assumedly linked across functions, have to account for further changes in other functions they are integrated with.

Reinforcing, likewise, Mr. Imai's ideas (drawn into the Kaizen principles), the BSC also argues that strategy is everyone's everyday job (principle 3); thus, organizations have the obligation to educate employees to strategize (i.e., to think and execute strategy in their jobs) so that they can develop personal objectives and get compensated on their involvement in business' strategies by adhering to active operational strategy-making. Subsequently, an assumption translated into another principle is the notion of *consistency* (principle 4). Strategy is a function requiring consistency, which Robert Kaplan and David Norton argued to be a continuous process for all stakeholders to participate in (managers and non-managers), through the usage of effective supervision strategic tools (such as budgeting and strategic reviewing) intertwined with operational tools (such as continuous learning; continuous improvement of processes; and preparedness to evolve and adapt). Finally, seeding strategy into a culture of proximity (again, seen in Kaizen) with senior executives serving as role models of executive leadership for mobilization (principle 5). Then through governance and strategic management (embedded into culture) instilling the management systems that drive change.

The first model (strategy loop), assumedly, configures the strategy function as an emergent process (iterative approach). Such understanding opposes *Henry Mintzberg*'s assumption of linearity, with the linkage of concepts as *deliberate*, *intended,* and *(un)realized strategies* unraveling a serial linkage. This notion of emergent process does not mean a simple repetitive process but an iterative approach for constant renewal. Thus, Sull's iteration is not a redundancy of actions with a useless tautology but corresponds to strategic renewal in action comprised of a looping continuous process; hence, with revealed consistency and (argued) reliability. The second (BSC) exhibits an adherence to the overarching ideas of the first and develops a management system to monitor the strategic execution.

The initial idea to retain the BSC is the notion of "management system" since it is not solely a management tool but a set of four instruments for the monitorization of strategic execution comprised of (1) a *strategy map* (SM); (2*) a tactical action plan*

(TAP); (3) an *implementation plan*; and (4) and *after-action review* (AAR). The SM overlaps a strategic design with a strategic execution function since its apparatus is used for both. The TAPs and IPs are pure strategic design tools and the AAR is a pure analytical tool for the evaluation of utility of the prior. Within such BSC system, the strategy map is unavoidably a seminal tool for bringing clarity into the strategic design to align the whole organization around common strategic objectives (SO) and subsequently block the temptation of one closing itself into department silos. The SO are designed based on a strategic destiny statement (SDS) previously set and a combination of (commonly) a triad of strategic themes, in which a new business-level strategic cycle with be centered on.

Kaplan et al. (2001) argued that within the information age, strategy maps are essential as intangibles become a source of competitive differentiation (e.g., the ability to, innovate, develop customer relations, or one's employee skills). Intangibles possess inner value, but their exploitation is dependent on four principles. Firstly, the understanding of chain of cause–effect relations (e.g., the employee training in TQM and Six Sigma leads to direct improvement of processes' quality, but also to a subsequent—indirect—improvement of customer satisfaction and again an improvement in customer loyalty and moreover the customer-retention ratios). Hence, value is *indirect*. Secondly, the exploring of the potential value of intangible assets ought to be adequate to the strategic direction and model in place (i.e., value is *contextual*). Thirdly, value is only *potential* (not market value) until its realization. The tangibility is achieved when the exploiting of capabilities takes into account the shaping of internal processes that meet the customer value proposition in order to reach financial improvements.

Fourth, *assets are bundled*. Assets have only true value when intertwined with others that leverage their potential. An effective combination of intangible and tangible ones aims to solve the mutual interdependencies and needs. This is key to adding and appropriating tangible market value (Kaplan & Norton, 2004). In sum, understanding/describing, integrating (and effectively align), and measuring capabilities are fundamental constituents in strategic management processes.

Herein, the strategy map is a diagrammatic representation of organizational strategic execution, in a chain of objectives in a single worksheet for ease of communication, containing causal links across strategic objectives placed on different strategic dimensions. These dimensions were designated as "perspectives." Kaplan et al. (2001), Kaplan and Norton (2004) admit that a change introduced in one perspective has systemic outcomes. Recall that value is indirect, thus, reformulating a strategic objective (or its target or the explanatory performance indicator/s) will "drag" the rest of the perspectives to a subsequent revision, which is simultaneously an update of strategy and (likely) an upgrading toward one systemic solution with higher market value.

These perspectives are the *projects*; *learning and growth; internal processes; customers;* and *finance*. Moreover, the logic of fashioning the objectives obeys a bottom-up approach, in which changes in the first (or lower) perspectives are conducive to further strategic changes in the objectives of the upper perspectives. Hence, following a resource-based model, the SM assumes that an "injection" of

acquired capabilities (or recombined asset bundles) with higher ability to explore indirect/contextual/potential value, for increasing the breadth of utilized human capital, information capital, and organizational capital, is the recipe for the extension of value gains. In this context, *human capital* refers to the strategic competencies brought to the business activities as the availability of skills, talent, and knowledge to perform its activities. The *information capital* entails the strategic information of the company and market, crossly observed, as the availability of information systems and knowledge yielding and reporting applications (namely the infrastructure to support the strategy performance management activities). The *organizational capital* refers to the openness and typology of the culture/s across a firm's realm, such as the embeddedness of strategic direction in one's professional life (how aware/internalized is/are the shared vision, mission, destiny statement, and strategic objectives); or aware/compliant to the organizational values (to execute one's strategy); the (in)formal leadership to mobilize the whole team/s; the alignment of goals with incentives; and the teamwork spirit and knowledge-sharing.

The virtue of the strategy map is the dual focus, on the driving of execution (hence, transferring strategy into concerted operational plans) and also measuring the results of the strategic decisions. However, the intra-operationality of the BSC centered upon the strategic benefits, aiming to capitalize from value appropriation, might well learn from the lessons of agile startups (Nir, 2018). The conduct of the latter holds, in sum, a bottom-line lesson to be withdrawn to other incumbents and corporations, as the common denominator of the startup's successful thinking accounts both a lean agile component at the enterprise and (its versatility complying to) VUCA business environments. Herein, lean startups focus on the development of five major capabilities: development of *customer relations* (and we would add involvement and intimacy); the clear definition and *communication of strategy* (vision, mission, and goals) to all stakeholders; the synthesizing of an *integrative operative model* of strategy/operations with (multiple) directive plan/s encompassing all the required components: as activities, staff, materials, and timeline, per functional area; to *set appropriate metrics and measurement practices* accounting for the use of "smart goals" and "smart measurement" as to the performance indicators, targets, accepted deviations to the standard and incentives and, moreover, as to the analyzability of the progression and results; and finally, pivot or persevere by living/experiencing, on a timely manner, the "build–measure–learn cycle."

This latter capability is, due to its breadth, seemingly the most strategically challenging one. Such cycle requires feedback and learning loop, in many cases, that is, a challenge of dealing with enterprise-wide issues that involve several functional areas and stakeholders (Abrantes et al., 2022; Nir, 2018). Their resolution was associated with an improvement backlog, which Michael Nir denominated as *Lean Pilots* (following his experiments overlapping Lean and Agile practices). Nonetheless, the degree of complexity and breadth of some of these issues repeat itself across multiple processes and activities (and so being candidates for the application of Lean and Six Sigma principles and practices), and they may also be encountered in fast-moving and VUCA environments. This totally justifies Nir's

(2018) assertion of "Lean pilots." *What do we mean by this?* A lean philosophy combined with agile to deal with them in the most effective way. A problem-solving mindset with a customer-centric approach entails unfolding the build–measure–learn cycle into a practical Six Sigma DMAIC (*Define, Measure, Analyze, Improve, Control*) cycle that looks at each issue separately to improve its processes. The purpose of the DMAIC is to bring a methodological dimension for measurability and so qualitative improvement. Hence, the DMAIC is a qualitative procedure whose framework implementation might be adopted as a standalone mechanism glued to each business process for quality assurance.

3 Methodology and Data

3.1 Approach and Case Description

The methodological approach lies in the spectrum of multimethods, and herein, into a mixed-method one with a dyad of primary data sources, with origin from archive and structured interviews. Both the collection and analysis assumed a (mixed) concurrent logic for a mutual confirmatory purpose, yet without assuming triangulation as a methodological component of any sort even instrumentalizing primary data from archive (i.e., the consortium final report) in combination with primary data from direct human participation (interviews). Hence, the qualitative research approach was complemented with a quant one deriving from vis-à-vis (open-ended) questionnaires applied concurrently to nine other CEOs of other startups in Sweden from the same entrepreneurial ecosystem, surrounding the Gothenburg region.

This study followed a deductive structure to comprehend the business decisions surrounding the canalization process of the case-firm. Moreover, the exploratory purpose of this study makes the findings and conclusions to be logically case-specific, yet with spillovers comprising the lessons to be withdrawn from the case. Yet, the reader is also recommended to revisit the literature review section (above) and recall the five lessons (or major capabilities) to be extracted from lean startups.

The case-firm is a SaaS provider beyond digital recruitment. It offers an apparatus of e-recruitment services made available on a meter-used model of self-service utilization of the pool of HVE graduates according to the typology of HVE credits required per job position and industry. This service avoids the weight/costs of traditional recruitment and selection processes, external recruitment, holding recruitment pools, repetition of processes, and releases firm's resources to other value-creating activities/projects, which otherwise would be delayed or forgotten/lost.

From this case-firm constituting our single-case research, we adopt an embedded approach for case study by collecting data from *five participants* (P1; P2; P3; P4; P5). P1 and P2 are the two entrepreneurs/founders of the company in 2020 while P3, P4, and P5 are advisors/mentors. These two independent capital owners who agreed to voluntarily participate in this study constitute the two direct Units of Analysis

(UA) of the empirical part of the study, who were interviewed separately as concurrent UAs of equal importance and data being used to build on a perspective until a point of saturation of information. Moreover, the use of snowballing through P1 and P2's network in the same entrepreneurial ecosystem allowed us to interview their advisors/mentors, P3 (*Eric Nilsson* at *Yuncture)* and P4 and P5 (*Carl-Martin Landqvist* and *Thomas Andersson* at *AcumisMinds)*.

Making a simple distinction between UA and P, the UAs constitute the momenta of collection of data and the P_n (the founders) were the sources of information (or gatekeepers). The latter (participants) are *direct participants* (founders/owners of the firm), and the *indirect participants* are the mentors that constitute their advisory committee. Nonetheless, such distinction does not invalidate the application of a single-case paradigm with embedded UAs, which Robert Yin classified as a *type 2* case (Yin, 2003). The two case-firm's founders have an undergraduate profile with P1 having education in Data and Economics from *Borås University* and P2 in International Business and Sales from *IHM Business School*. The remaining companies hold a similar demographic profile. All startups are now in phase 2 of development/maturity (startup), and none of the firms has been active for more than 5 years ($\leq$ 5 years; excluding the stand-up phase time). All companies are tech startup providers of digital solution-based services.

3.2 Data Outputs and Analysis

Individual interviews conducted with the founders of the case-firm and their advisory board were complemented by a questionnaire to other nine startups in the same region, targeting, identically respondents with senior managers/executives of other tech startups.

The results discussed below represent an executive summary of the Gestalt analysis of the transcriptions of the five interviews with the founders and mentors of the case-firm, in which the collection of data implied the use of an interview guide and a prompting technique. Likewise, the results of open-end questionnaires in the form of the relative frequencies of the respondents followed a short set of five questions about (1) the perception of the entrepreneurial ecosystem's support (to a new venture); (2) the bottom-line factor/s determining their initiation of their venture; (3) the type of capabilities most determinant for their upstart; and (4) their agility and continuous improvement.

3.2.1 Qual Data

This study considered solely manifest content. This type of data derived from the interviews/transcripts as potential signifiers to be handled under the light of content analysis. Our qualitative data analysis (QDA) procedure followed the *Weber protocol* for the creation of a codification system (Weber, 1990). The system had no

aprioristic logic since the outsider researchers took a seminal decision to adopt an Open Coding logic to avoid limiting the mapping of the reality to a codification system, which could be restrictive of sense-making. Hence, the *coding units* (CU) were the ones derived directly from the transcripts. The CUs correspond to distinctive phenomena, recoiled from the words of the participants, hence, entailing a unique signified *(CU = 1 signified)* unseen in other codes. The list of CUs observed is presented in Table 1.

The *CID* identifies a unique code that corresponds to a particular phenomenon inferred from the transcripts. The "sense-making rationale" presents a justification to the reader of what constitutes a certain code. For instance, *RE1* refers to codified evidence (in the words of the participants, thus, *signifier*/s) of the verbalization of something about the alleviation of the burden of dealing with the administrative tasks (now transformed into *signified*/s) for hiring a new HVE graduate intern or employee. However, the coding of this theme may entail different outcomes, according to the individual contribution of each informant. Those differences are codified in *quotations.*

You are invited to scan below the correspondence of these codes (as the signifieds identified in the interviews) and their correspondence to each respective quotation.

Table 1 Coding frame

CID	Code description	Sense-making rationale
GPA	General problem awareness	Need for an easy-to-administer software app
SPA1	Specific problem awareness 1	No software targeting HVE internships/graduates
SPA 2	Specific problem awareness 2	Outdatedness of e-recruitment management systems (OEMS)
SPA3	Specific problem awareness 3	Nonorientation toward resource efficiency
EM1	Entrepreneurial motivation 1	Problem-solving in general
EM2	Entrepreneurial motivation 2	Founder's professional independence
PS1	Problem-solving—issue 1	Absence of solutions for HVE interns/graduates
PS2	Problem-solving—issue 2	Outdatedness of e-recruitment management systems
PS3	Problem-solving—issue 3	Digital infrastructure detached from tech advancements
PS4	Problem-solving—issue 4	Digital infrastructure detached from resource-efficiency gains
PSD1	Problem-solving decision 1	Narrowing the software scope and target-user/client
PSD2	Problem-solving decision 2	Business concept as an overlapping solution for PS1/2/3/4
IG	Idea generation	Software for HVE internship and graduate's placement
RE1	Resource efficiency 1	Administration alleviation (of process load)
RE2	Resource efficiency 2	Time saving (by reducing the number tasks and its time)
RE3	Resource efficiency 3	Risk reduction (mismatched competencies and added costs)

Note CID: Code ID
Source: Own elaboration

Certainly, you will immediately realize, in some cases, a multiple number of quotations per code. Hence, the same informant/participant or others have addressed the same theme on multiple occasions, generating several quotations, containing likewise a unique trackable identification number, known as a *Quotation Id* (Qid). This refers to multicoding as the same phenomenon (or CU) sometimes is verbalized several times creating redundancies and also complementarities of information. In addition, the column "overlapping" refers to the existence of multicoding but occurred within the same sets of words or chunks of text. Hence, this refers to a specific type of multicoding designated in QDA as co-occurrence (Cooc).

In Table 2, the *Qid* is composed of the set of *Cid*, the interview (or participant number) and a sequential number of times a unique CID appears per participant (Pn):

$$\text{Qid} = \text{Cid} + P_{(n)} + n_{(Px)}$$

The first quotation identifies the first appearance of the code on a given momentum of collection, thus on each separate UA. Since the sources of collection were individual (per participant), the quotation ID used sequential number (1, 2, 3. . . .) to count the overall *N* (i.e., the total number, or absolute frequency) indicating the times the phenomenon emerged per each participant. Such procedure, manually constructed due to a manageable number of interviews, is identical to the Qid generated in C*omputer-Assisted Qual Data Analysis Software* (CAQDA), utilized in more intensive coding projects. The decision to present the first quotations of each code referred to the ease or readability of the mapped signifies as the first Qid provides anyway an overview of the intensity of the coding. Nevertheless, multicoding is recurrently observed with participants overlapping in the same themes: for instance, in *PS1*, as to the problem-solving of issue 1 (absence of solutions for HVE interns/graduates), both founders (P1 and P2) have elaborated in their contribution on this theme. Here, the first Qid of the P2 (not seen in the table above) was *EM1/PS1:2:01*. Moreover, as to the discussion of the code *PSD1*, the participant (P3), one of the mentors, has clearly pinpointed three perspectives that seem to have shaped the path of the company as to their motivations for problem-solving. P3's contribution does not appear likewise in Table 3; however, the coding of *EM1/PSD1:3:01; EM1/PSD1:3:02; EM1/PSD1:3:03* was essential for understanding their strategic thinking: (1) narrow scope of product offering, (2) circumscribe the target group, and (3) follow a niche market.

Naturally, the mapping of *Cooc* reveals multiple overlapping CUs. Yet, this study did not map intra-participant co-occurrences since the extrapolations eventually withdrawn for it did not matter to our research angle as we were not intending to grasp individual perceptions (about the case-firm lean capabilities). An outlier is evident in Table 3, the *EM2*, regarding the founder's professional independence. It seemed a sterile code, denoting that the signifier was an isolated comment by P1, which did yield further associations with other phenomena/codes.

Table 2 Coding: units and quotations overview

CID	Signified	Qid	
		1st	Overlapping
GPA	Nonexistence of an easy-to-administer software app	GPA:1.01	GPA1:01 IG:1:01
SPA1	No digital solution in the labor market for firms to administer HVE internships and graduate's placement	GPA/SPA:1:01	GPA/SPA:1:01 IG:1:01
SPA 2	Firm detachment from new (fourth industrial revolution's) technologies—such as AI or IoT—for operational and strategic efficiency gains, more intelligence, and software self-updateness/development opportunities	GPA/SPA2:1:01	GPA/SPA2:1:01 IG:1:01
SPA3	Resource inefficiency: nonorientation toward operational efficiency gains	GPA/SPA3:1:01	–
EM1	Problem-solving	EM1:1:01	EM1:1:01 IG:1:01
EM2	Founder's professional independence	EM2:1:01	–
PS1	Absence of labor market solutions for HVE programs´ graduates	EM1/PS1:1:01	EM1/PS1:1:01 IG:1:01
PS2	Outdatedness of e-recruitment management systems	EM1/PS2:1:01	EM1/PS2:1:01 EM1/PS3:1:01 IG:1:01
PS3	Digital infrastructure detached from tech advancements	EM1/PS3:1:01	EM1/PS3:1:01 EM1/PS2:1:01 IG:1:01
PS4	Digital infrastructure detached from potential efficiency gains from resource's redeployment	EM1/PS3:1:01	EM1/PS3:1:01 IG:1:01
PSD1	Enterprise resource redeployment is solution broad, costly, and timely to implement (and not focused on the issues refereeing in PS1 and 2) Narrowing the scope of the software (preferentially to a niche) is essential for solving market problems In addition, a reflection about the target groups was also key (*who to serve?*: Firms; schools; or candidates)	EM1/PSD1:2:01	EM1/PSD1:2:01 EM1/PSD1:3:01 EM1/PSD1:3:02 EM1/PSD1:3/03 EM1:1:01 EM1/PS1:1:01 EM1/PS1:2:01 EM1/PS2:1:01 IG:1:01
PSD2	The business concept ought to be narrowed to overlapping solution, solving cumulatively PS1/2/3/4	EM1/PSD2:2:01	EM1/PSD2:2:01 EM1:1:01 IG:1:01
IG	The initial business idea of a software for HVE internship and graduate's placement	IG:1:01	IG:1:01 GPA:1.01 GPA:2:01 EM/PS3:1:01 GPA/SPA1:1:01 GPA/SPA2:1:01 GPA/SPA3:1:01

(continued)

Table 2 (continued)

CID	Signified	Qid	
		1st	Overlapping
RE1	Streamline the talent pool's administration and alleviate the administrative burden of individual processes with school and authorities	RE1:1:01	RE1:1:01 RE2:1:01
RE2	Eliminate tasks and equate the time spent in the whole process (from recruitment, selection, hiring, and administration)	RE2:1:01	RE2:1:01 RE3:1:01
RE3	Reduce the risk of competencies and expectation's mismatch; and the avoid the financial rebounds of repeating these processes	RE3:1:01	RE3:1:01 RE1:1:01 RE2:1:01

Notes: *CID* Code ID, *EM* entrepreneurial motivation, *IG* idea generation, *GPA* general problem awareness, *PS* problem-solving, *PSD* problem-solving decision, *Qid* quotations ID, *RE* resource efficiency, *SPA* specific problem awareness
Source: Own elaboration

3.2.2 Quants Data

A vis-à-vis questionnaire was applied to nine other startups that provide likewise digital services in the same ecosystem (in the south of Sweden). The number of participants targeted through snowballing from P1 and P2, with a CEO/founder/senior executive profile, matched identically the same number of enquired startups. A set of, informally raised, questions on the five themes (i.e., ecosystem's awareness; entrepreneurial motivations; startup capabilities; success factors; and strategic/operational competitiveness) was formulated identically to all participants, whose collection was dependent upon a pre-submission/approval of these questions by the respondents. The quant results were treated as an indicator with confirmatory value of the dominant part (i.e., the QDA). Hence, quants data was treated descriptively, accounting for the overall relative frequencies and accompanying measures of central tendency/dispersion to provide a referential of the level of variability of the case-firm to the other upstarters in an identical setup (Table 4).

Using a 5-point Likert scale with a transitivity principle, ranging from 1 to 5, with position 2 representing a bigger score than 1, and subsequently 3 bigger than 2, and so forth, the scale measured the results of the five investigative questions (IQ_n): IQ1; IQ2; IQ3; IQ4; and IQ5. The plotted data of descriptive stats revealed a large (accepted) extension of the deviation to the mean, unsurprisingly, due to the number of enquired respondents. More relevant is the interpretation of the results per question. In IQ1, an incipient degree of awareness as to the attributes/benefits of the ecosystem in comparison with others is observed. The responses were, in aggregate, rated with a 2.33 as partial-low (awareness). In IQ2, the mean was felt in 4 with a predominant pattern of "*timing*" as being the dominant entrepreneurial motivation factor, while in IQ3 the capabilities that anchored the elevation of these standups into startups were the timely awareness of market needs (or timely testing of the acceptance of an innovation) with 3.77 (mean), in which the ability to utilize

Table 3 Mapping of co-occurrence (Cooc) patterns

	Cooc		
CID	type	Aggregate (type)	First Qid overlap
GPA	Single: 1 Cooc	IG	*(GPA:1:01;* GPA/SPA1:1:01; GPA/SPA2:1:01; GPA/SPA3:1:01; *EM1/PS2:1:01)* intersect . . . IG:1:01 = {GPA:1:01, GPA/SPA1:1:01, GPA/SPA2:1:01, GPA/SPA3:1:01, *EM1/PS2:1:0*} ∩ {IG:1:01}
SPA1			
SPA2			
SPA3			
EM1			
EM2	Null	–	–
PS1	Single: 1 Cooc	IG	*(PS1:1:01)* intersects. . . IG:1:01 = {PS1:1:01} ∩ {IG:1:01}
PS2	Multiple: ≥ 2 Cooc	PS3 IG	*(EM1/PS2:1:01)* intersects. . . EM1/PS3:1:01 {*EM1/PS2:1:01*} ∩ {IG:1:01} And, IG:1:01 = {*EM1/PS2:1:01*} ∩ {IG:1:01}
PS3	Multiple: ≥ 2 Cooc	PS2 PS3 IG	*(EM1/PS3:1:01)* intersects. . . EM1/PS2:1:01 = {*EM1/PS3:1:01*} ∩ {EMI/PS2:1:01} And, EM1/PS4:1:01 {*EM1/PS3:1:01*} ∩ {EMI/PS4:1:01} And, IG:1:01 = {*EM1/PS3:1:01*} ∩ {IG:1:01}
PS4	Multiple: ≥ 2 Cooc	PS3 IG	*(EM1/PS4:1:01)* intersects. . . EM1/PS3:1:01 = {*EM1/PS4:1:01*} ∩ {EMI/PS3:1:01} And, IG:1:01 = {*EM1/PS4:1:01*} ∩ {IG:1:01}
PSD1	Multiple: ≥ 2 Cooc	EM1 PS1 PS2 IG	*(EM1/PSD1:2:01)* intersects... EM1/PS1:1:01 = {*EM1/PS1:2:01*} ∩ {EMI/PS1:1:01} And, EM1/PS2:1:01 = {*EM1/PS1:2:01*} ∩ {EMI/PS2:1:01} And, IG:1:01 = {*EM1/PS1:2:01*} ∩ {IG:1:01}
PSD2	Multiple: ≥ 2 Cooc	IG	*(EM1/PSD2:2:01)* intersects. . . EM1:1:01 = {*EM1/PS2:2:01*} ∩ {*EM1:1:01*} IG:1:01 = {*EM1/PS2:2:01*} ∩ {*IG:1:01*}
IG	Multiple: ≥ 2 Cooc)	GPA SPA1 SPA2 SPA3 PS1 PS3	(IG:1:01) intersects... GPA:1.01 = {IG:1:01} ∩ {GPA:1:*01*} And, EM/PS3:1:01 = {IG:1:01} ∩ {*EM/*PS3:1:*01*} And, GPA/SPA1:1:01 = *{IG:1:01} ∩ {GPA/SPA1:1:01}*

(continued)

Table 3 (continued)

CID	Cooc type	Aggregate (type)	First Qid overlap
			And, GPA/SPA2:1:01 = *{IG:1:01}* ∩ *{GPA/SPA2:1:01}* And, GPA/SPA3:1:01 = *{IG:1:01}* ∩ *{GPA/SPA3:1:01}*
RE1	Multiple: ≥ 2 Cooc	RE2 RE3	*(RE1:1:01)* intersects... RE2:1:01 = *{RE1:1:01}* ∩ *{RE2:1:01}* And, RE3:1:01 = *{RE1:1:01}* ∩ *{RE3:1:01}*
RE2	Multiple: ≥ 2 Cooc:	RE1 RE3	*(RE2:1:01)* intersects... RE1:1:01 = *{RE2:1:01}* ∩ *{RE1:1:01}* And, RE3:1:01 = *{RE2:1:01}* ∩ *{RE3:1:01}*
RE3	Multiple: ≥ 2 Cooc	RE1 RE2	*(RE3:1:01)* intersects... RE1:1:01 = *{RE3:1:01}* ∩ *{RE1:1:01}* And, RE2:1:01 = *{RE3:1:01}* ∩ *{RE2:1:01}*

Source: Own elaboration

Table 4 Other entrepreneurs: measures of central tendency and dispersion

IQ	Dimensions	X^-	f^a	σ
1	Assessment of awareness	2,33	0.67	2,68
2	Entrepreneurial factors	4	0.67	2,5
3	Prior knowledge/capabilities	3,77	0.56	2,17
4	Success factors	4,11	0.89	3,49
5	Strategic/operational agility	4,11	0.89	3,49

[a] *f* indicates the relative frequency of the results in sample's mean
Source: Own elaboration

human capital and product ideation was the subsequent valued capabilities. The answers to IQ4 mirrored a marked tendency of all the enquired startups to perceive the creation of digital products and digital business models as the most essential success factor in their ecosystem. The IQ5, with identical results, identified the integrated strategic-operative competitiveness of their firms to derive from the focus on daily improvement of front-end customer processes.

4 Findings and Conclusions

The intensity of coding manifested in the (typology of) *Cooc*, with a majority of coding units with an overlapping of the coding with other CUs, was an initial indicator of the complexity of the participants' ideas in the qual part of the study, free riding in multiple themes/codes, in a same part of an answer. Entering the spectrum of the informant's verbalized answers (or signifiers) and so inferring their significance for this study, it was clear that the low extent of EM2 (with one single quotation and with null co-occurrence results), uncovered a marked reality that the extrinsic motivations were present on the heart and mind of the entrepreneurs (more than anything else). However, they (extrinsic motivations) were a secondary category of motivations denoted in this study, yet they were not so decisive for pursuing such a new venture. On the other hand, a dominant intrinsic stimulus unraveled that both entrepreneurs were aligned in a common objective to solve a problem, in a utilitarian way, transversal to several industry sectors, with regard to the firm-level inefficient design and execution of business processes and consequent deficits in resource optimization.

The ideation is traced back to the individual curiosity of the entrepreneurs (P1 and 2) that triggered a cognitive process that resulted in awareness status about the industry's general and specific issues (GPA and SPA), and personal achievement of solutions. The cognitive process that led to the generation of the entrepreneurial idea (IG) is a marked feature observed here since the upstream aspects of rationalization disclosed in the (codes of) specific problem awareness (SPA1/2/3) until the downstream aspects of cognitive processing of obstacles (PS_n) to be dealt with and the modeling of a new product solution (PSD_n). The proactive behavior of these entrepreneurs (transforming PSs into PSDs) toward a new product solution unraveled particular vision and values of the importance of basic strategic decisions upon the customer side, something that *Toyota's Production System* has denominated as *genchi gembutsu* (Ries, 2019). So, their *genchi gembutsu's* core principles of the lean manufacturing do not encompass the typical *Kanban* domain of production capacity but are rather focused on the resolution of front-end constraints (or bottlenecks) and inefficient routines in industry practices with a software solution that solves the amorphous HVE hiring process. Their *genchi gembutsu* is therefore a unique one, fulfilling the canons of lean manufacturing-specific type of process inefficiencies with a "*Go to Gemba*" lean vision of a proactive participation in the "operation's theatre" but articulated with a profound focus on customer value.

Regarding the entrepreneurial motivations, we verified that EM2 (i.e., the founder's professional independence) was a secondary motivation (P1) and only exposed by P1; however, the primary motivation was problem-solving that dominated their speech in three dominant aspects: (1) problem awareness, (2) problem classification, and (3) problem resolution. Hence, the entrepreneurial drive seemed to be, on the focal startup, grounded on intrinsic motives following *Bentham*'s utilitarian logic.

Moreover, the intrinsic motivations seemed accompanied by *Timmons´* Entrepreneurial Capabilities of dissimilar typologies (from ideation to personal achievement

and real management) and IT capabilities to conceive a solution-oriented digital application with a business infrastructure capable of contributing to the dilution of the industry-wide peculiarities in the Swedish labor market and, moreover, at firm level, resolve some of the difficulties experienced by the incumbents in efficient resource deployment. Nonetheless, peculiar to note is that the founders revealed no particular capability advancement in lean-related skills.

This configures a scenario in which the studied startup develops, against the odds, an atypical *Contextual Ambidexterian Business Strategy* (CABS) of indirect upskilling. Instead of developing capabilities to optimize the efficient use of resources and the reduction in inefficiencies (e.g., unnecessary interruptions/ in tasks or overall task time; waste of resources; overexpenditure; obsolescence and obsolete resource's allocation, among other issues), the entrepreneurs developed indirect capabilities for a lean-CABS, combining, instead, other types of capabilities (market orientation; entrepreneurial and IT capabilities). Their business model does not instrumentalize the expected operational planning and operational management lean capabilities for solving resource allocation inefficiencies, but a combinative set of other four categories of capabilities—*entrepreneurial*, *IT*, *marketing,* and *patching capabilities*—to solve, in an alternative manner, the same resource efficiency issue (and even rebalance the relations across industry actors). They are "patchers," personal achievers with a unique set of *patching capabilities* to engineer a SaaS business solution capable of solving a particular market challenge.

Opposing the other startups in their ecosystem that revealed *an inside-out* strategic thinking process (i.e., capability-centric), exposed by the linkage of entrepreneurial motivations (dominantly "timing") and their notion of valuable capabilities ("product development"), these contrast to the focal case approach, an *outside-in* strategic thinking logic, that is, customer-centric, considering the prominent solutions of encountered market problems. Hence, these other startups seem to value marketing capabilities in general. This is consistent with the assertion of the *resource-advantage (R-A) theory* assertion of the existence of two types of marketing-capability seekers, the companies that develop *market-oriented* capabilities and others focused on *market-adaptation* capabilities. Based on such a strategic path, they formulate different marketing strategies oriented to one or the other direction: market-oriented or market-adaptive strategies (Abrantes et al., 2022; Hunt and Madhavaram, 2020). On a global scale, the pattern is repeated as born-global upstarters tend to develop global market-orientation capabilities (as a subset of global dynamic capabilities) or another type, global product design and innovation capabilities (Peng & Lin, 2017).

These startups revealed coherence as to the entrepreneurial motivations articulated with the exploring of prior (marketing) skills as a logic of competition game's entry advantage. This sine qua non-condition, as the balancing of the value of timing (IQ2) with critical marketing-orientation capabilities (IQ3), seems though disconnected from the IQ4 as to the perception of the industry's key success factor (KSF) dependence on product innovation. Hence, a focus on the acquisition/development of capabilities on product/materials and product design's research would have a logical, rational (also likely) preferential, incidence on market adaptation by these

entrepreneurs to fulfill these *key success factors* (KSF). Nonetheless, their vision of what sort of marketing capabilities are more valuable and how to better achieve KSFs seemed a cognitive-behavioral disconnection point or gap between the startup thinking about the best way to succeed in the markets and the behaviors adopted to succeed therein.

Moreover, these nine supplementary startups included in this investigation confirmed a contextual ambidexterian operative advantage context (over other firms), further corroborated by two of the mentors of the focal startup (P4 and P5), which is that these microventures begin small mostly due to resource constraints. This is a context that typically sharpens their acumen for customer-centered approaches and customer-focused informal and agile routines of work, developing a natural aptitude to gradual scaling (up) and a sense of openness to mold the operational activities more flexibly than other actors to their partner's requirements. This is also one of the takeaways extracted from the "five lessons" of lean startups in the theoretical review of literature (Nir, 2018). However, the case-firm adheres to the same lean principles observed in these other firms; however, it developed a unique business model, an indirect-capabilities' lean integrative model of a CABS. This recipe of an indirect combinative set of capabilities is counterintuitive at first glance and certainly has not been observed before in Sweden and other entrepreneurial ecosystems. The continuing of this research line, as to the following of the company in the following years, can reveal interesting insights regarding the performance outputs for the re-equating of strategic innovation and new business venturing and model development, abandoning the traditional radial upskilling or direct up-/reskilling.

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Online Trading and Platform Capabilities on the Chemical Industry in Germany

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1 Introduction

Triggered by significant advancements in information and communication technologies (ICT) in the last two decades, the phenomenon of *digitalization* has drastically changed the architecture of modern businesses worldwide. The emergence of *online markets* and the advent of a Second Economy summoned contemporary firms into a new paradigm of competition in the web, while a global business revolution took place with the appearance of *platforms*.

With the beginning of the twenty-first century, we entered both a new century and a new age (*e-Age*) with the convergence of computing and communications toward an Internet (boom) fueling this revolution. At firm level, the shift toward digital platforms represented the creation of new streams of value, opening horizons to new market opportunities and the emergence of new industries (Kim and Min, 2019).

On the other hand, several brick-and-mortar businesses, especially in the business-to-consumer (B2C) sphere, were swiped from its wealth and power across multiple economic sectors and regions (e.g., *Blockbuster*, *Toys R Us*, or *Xerox* were some of those "victims"). Hence, platform competition altered profoundly the rules "of the game" and the industry's dominance. New business "elephants" were born in such scenario (e.g., *Alibaba, Amazon, Coupang, eBay, Global Sources, Rakuten*, or *Uber*) (Yang et al., 2020).

As firms competing in online platforms achieved a steep and hasty growth in recent years, unsurprisingly, 40% of the top 20 largest digital firms worldwide were

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engaged in platform business in 2019 (Yang et al., 2020; UNCTAD, 2019). Just the Chinese market alone was accountable for more than 711.2 billion USD worth of online transactions already in 2016, with an accentuation of this global trend with an increase of 31.6% in comparison with the previous year. Here, *Taobao*, a spin-off of *Alibaba-com*, the largest B2C platform in this country, holds over 9 million listed sellers that trade over 53,000 items every minute (Li et al., 2019). Noteworthy is also the position held by the North American e-commerce giant Amazon, with an identical B2C platform business model. The company accounted for 9.2% of the global gross merchandise volume (GMV) in 2020. Their e-commerce retail sales seem to grow at staggering figures. In 2019, attaining a remarkable growth rate of 84.38% to a total of 295 billion USD, from the already impressive number of 160 billion USD in 2019 (Digital Commerce 360, 2020). According to Statista, the e-commerce and electronic data interchange (EDI) market value of B2B in 2020 in the United States exceeded already the 10.9 trillion USD mark (Statista, 2020a, 2020b).

1.1 Initial Problem and Research Objectives

Scholars argue that such "digital revolution" is strongly anchored in the consumer markets. However, they foresee likewise opportunities within the sphere of business-to-business (B2B) and even at the consumer-to-consumer (C2C) realm, both holding a large potential for European firms (e.g., cost–base reduction, extension of buyers/sellers networks, and/or improvement into operational systems; Abrantes & Ostergaard, 2022; Riemensperger & Falk, 2020).

Despite the digitalization of the transactional industries as a topic extensively studied in the last years, namely as to the effects of platform affiliation and performance implications in consumer markets, the proliferation of platforms among the scope of B2B and their inner opportunities is still a black box, with regard to the inner advantages it may hold: as new streams of revenue, extension of sales opportunities, or even as to the capacity to attract critical actors placed upstream/downstream of the firm (Yuan et al., 2021; Täuscher & Laudien, 2018). Hence, the pathway to success in platform trade remains unclear. Thus, one may raise at this stage two simple (precursory) research questions (RQs):

(RQ1): What key success factors (KSFs) do platforms possess (determining their business development indicators)?
(RQ1.1): What organizational capabilities (OCs) are required to fulfill those KSFs?

With this initial problematization and underlying research gap, we have delimited the scope of this study to the European firm's engagement in platform trading activities in B2B platforms (RQ1). The exploratory purpose of this research entailed the understanding of the contribution of the *organizational capabilities* (OCs) in the building of competition's key success factors (KSFs) (RQ2), which, in turn, might determine higher performance ratios with regard to the indicator of *sale growth*.

The aim of this research is, articulating the precursory RQs above, to assess the perception of added value generated by B2B platforms of trading. To avoid any conceptual misunderstanding from the inception, we clarify here that the notion of *platform* (in RQ1) refers to an electronic marketplace (e-marketplace) of trade connecting sellers and buyers.

In this context, the *locus* of attention of this study is the German chemical industry. We dig into the fluctuations of international trading deals of raw materials, middle compounds, and final goods of this sector. We have targeted four of the largest German-headquartered multinationals as previous literature sustains the urge for the decomplexification of the operations in this sector and suggests the incumbents consolidate *online trading* as a mechanism of alleviation of their transactional procedures, and in turn, relaunch profit pools (Plank et al., 2018). These scholars assert that the avenue for further firm's growth is digitalization, which contrasts with sector practices hampered by the meager investments in digital development. The industry holds the heavy burden of maintaining a miscellaneous of globally dispersed processes, whose operational synergies and digital networks would be expected to have advanced much further in the direction of a digital business infrastructure. Thus, a research with this angle is a rather intuitive one as the allegedly myopia of the German sector including its multinational companies (MNCs) seems to be preparing for what might be a "perfect storm" in the future for the disruptive changes to hold a *Schumpeterian* effect, especially in the laggard firms with regard to technological adoption, most likely, the most affected ones by the upcoming industry changes.

Plank et al. (2018) sustain that the international trade of chemical raw materials is linked to complex global value chains. This suggests that this industry could benefit from the facilitation of transaction between supply and demand through B2B platforms. Although such inertia is not solely a phenomenon of German firm but European firms in general (Riemensperger & Falk, 2020). These scholars underpin that most companies in Europe are not exploiting the opportunities offered by B2B platforms to their full extent. As Teece (2018) points out, promising opportunities can only be identified when companies have the capacity to see them. In accordance with these views, this research is intending to shed light on the perception of industry participants in the chemical industry toward B2B e-marketplaces. In order to accomplish this research aim, one intends to provide insights into the dynamics that influence and drive trade in the chemical raw material industry and seek out the market players' preferences to do business. Furthermore, current participation in platform environments will be explored and the expectations toward them will be captured.

2 Literature Review

2.1 The Shift Toward Platforms

With traditional business models currently in decline due to the technological advancements in ICT and the subsequent upsurging of digitalization, the firm's adherence to platforms create a safe ecosystem for e-businesses to thrive within a new e-marketspace context, functioning as a magnet force aggregating multiple agents, which, in turn, exploits unprecedented competition advantages (Ozalp et al., 2018; Tiwana, 2015; Hein et al., 2020; Reimers et al., 2019). Surely a couple of questions must already be popping up to the reader's head: *Are e-commerce websites the same as platforms? Or, are e-marketplaces a synonym of digital platforms?* The answer is a straightforward one, nope (to both questions)! In e-commerce websites, owners provide the virtual space for the purchase and moreover the goods. E-marketplaces are online spaces of e-commerce that connect third parties, other sellers with buyers. Typically, the transactions are managed by website owners (McIntyre & Srinivasan, 2017; Täuscher & Laudien, 2018). Moreover, within the spectrum of *digital platforms* one may recognize a myriad of electronic business ecosystems. Hence, these two constructs (e-marketplace and platform) overlap when the latter one (platform) assumes a more specific typology of *digital commerce platform*, which previous literature defined as Internet-based trading hubs, attracting the agents to explore trading opportunities, carry out commercial deals, and engage in complementary services by the platform provider or with its intermediation (Zhang & Bhattacharyya, 2010). Hence, one could argue that e-marketplaces are subset of digital platforms, but not the opposite. Digital platforms are large in scope, as we describe here below other kinds of them (Hagiu & Wright, 2015).

However, platforms opened not solely new channels by creating new business models (e.g., virtual management systems) and whole new industries (e.g., the financial technology or fintech industry). For instance, fintech industries gave rise to a new type category (*stock platforms*) enabling the connection of specific types of financial service's purchasing (e.g., stocks, bonds, currencies, commodities, options, or futures) where the buyer (or "*investor*") engages with the broker (or the "*trader*"), the latter intermediating the placing of orders of the first ones. Other typologies of platforms are also recognized nowadays as *digital advertising platforms* (allowing the monetization of media audiences and visitor's traffic) or *digital crowdsourcing platforms* (where one seeks resources from a large body of onlookers). Yet, the dominant category falls on the *digital commerce (or trading) platforms,* especially the e-marketplaces with a B2C target group (Täuscher & Laudien, 2018; McIntyre & Srinivasan, 2017).

Malone et al. (1987) called them electronic intermediaries (*e-intermediaries*), and subsequently, denominated them of *matchmakers* as online marketplaces connecting businesses and consumers in a digital environment where there is perceived to be a mere inter-organizational information system or an upper technological solution,

bringing the parts together facilitating the exchange of product information between buyers and suppliers (Jung Oh & Wook Kim, 2011; Bakos, 1991).

Although Galbreath (2005) pointed out that e-marketplaces create no value per se. Their advantages come primarily from lower transaction processing costs due to reduced search costs, integration, and process automation (Cennamo, 2021). They frequently integrate with existing back-end systems at both buyer and seller level, resulting in greater operational efficiency for both parties. Depending on the platform provider, they can offer various tools to facilitate product search for buyers and product promotion for sellers.

Yet, the utility of platforms, further instrumentalized by companies as *Platform as a service (PaaS)*, is leveraged by cloud computing and big data analytics' capabilities, bringing a simplification of business activities to an increased integration online. This chapter delves into the aspects of B2B platform-related capabilities within the sphere of digital trading platforms. Unavoidably, B2B e-marketplaces make it easier for buyers and sellers to connect by allowing them to reduce transactional costs, approximating the parties and allowing them to reach far-distant potential target groups (Alsaad et al., 2021; Hermès et al., 2020; Lnoue & Tsujimoto, 2019; Hein et al., 2020; Martinez-Caro et al., 2020; Belleflamme and Peitz, 2019; Chakravarty et al., 2014;). The B2B platforms provide, thus, ICT infrastructure that acts as a facilitator, enabling far more efficient, flexible, and secure online transactions (Martinez-Caro et al., 2020; Lanzolla & Frankon, 2016; Cennamo, 2021).

However, the "adaption jump" into an e-business, whether to improve systems and/or leverage sales, demands a substantial shift in the strategic mindset (Tiwana, 2014; Wang et al., 2020; Riemensperger & Falk, 2020). The fusion of technology adoption with strategic business design leads to the emergence of a new organizational requirement (i.e., a *digital strategy*), which extends the importance of IT in the whole business sphere and "shakes the waters" for marketers reforming the old notion of school ideas of marketing (Wang et al., 2020). Boddy (2017) argues that it requires a whole system's adaption to strategically evolve from the adoption of the Internet as an informational tool into a transformational tool. In order to reach this latter stage, firms are summoned to embark on a learning journey to use ICTs to interact, trade, deal, and ultimately transform themself and their relation with the surrounding markets.

2.2 *Benefits and Drawbacks of Digital Platforms (for Buyers and Suppliers)*

As transaction facilitators, e-marketplaces can yield value to platform affiliates on three streams of benefits: (1) relational gains, (2) opportunity gains, and (3) cost-efficiency gains. Firstly, the integration of business systems and their entanglement online and further automation of processes, including the managing of business

relations, liberates firms to an increased market participation to achieve an enhanced visibility online (Lee and Falahat, 2019). Secondly, reinforcing the activities (and so the skill online) improves the e-business experience in general and creates new opportunities to repeat the interactions, develop intimacy, and create further customer value (Galbreath 2005). Finally, this means, moreover, further information (and accessed more swiftly) and lowering of transactional costs. Previous studies on online procurement assert that these buyers saw significant cost savings since workers spent less time searching, ordering, correcting errors, and reconciling invoices (Pagani and Pardo, 2017 as cited by Lee and Falahat, 2019).

Then, a hefty volume of scholarly work has underpinned the main benefits for the buyers' side in participating in these e-marketplaces (Loukis, Spinellis and Katsigiannis, 2011):

1. Access to lower prices
2. Improved supplier selection
3. Price transparency
4. Quicker access to product information
5. Abundance of alternatives (including potential substitute products)
6. Lower the time spent in procurement and inherent service, general and administrative (SGA) costs

On the other hand, suppliers mainly benefit from e-marketplaces by

1. Tapping into new clients and increase in number of sales opportunities
2. Acquiring new customers
3. Reducing transactional and customer service costs
4. Decreasing the dependence on marketing stationery and salesforce
5. Eliminating traditional market intermediaries
6. Adapting production systems

Nonetheless, these factors resulting in benefits for the buyer side correspond to a negative externality to sellers (Galbreath 2005). One should stress that e-marketplaces impact direct and indirectly the competitive equilibrium forces within and across strategic groups, affecting price and service offerings, in the sense that the reduced search cost increases market efficiency, intensifies competition, and consequently lowers the product's prices. Digitalized business relations, in essence, diminish (or even erase) the necessity for human intervention, thus holding an inner ability of pushing transactional costs down but also unitary prices of a good in the same direction, dragging all agents (in the supply side) to a zero-sum logic of customer value (Singh et al., 2019 cited by Lee and Falahat, 2019). This affects the general intra-business and inter-business relationship dynamics in a profound way, molding, moreover, the working habits of sales personnel. These drawbacks (i.e., win–lose pressures of price competition) lead some of the suppliers' decision to withdraw product offerings from a platform or to retrieve their company position in a platform to safeguard profit margins, or ultimately, to abandon the platform competition mode (Loukis, Spinellis and Katsigiannis, 2011).

2.3 Uncertainty and the Digitalization Path

One of the major aspects that arguably constitutes neither a benefit nor a drawback of a digital trading platform is the transfer of the responsibility to self-administer one's customer base by "lending" such responsibility to the platform provider. On behalf of their clients (i.e., the firm's partaking in the platform or the platform users), platform providers administer the business relationship processes of the first ones, which, apparently, as emphasized by Loukis, Spinellis and Katsigiannis (2011), is a benefit since it yields some direct transactional cost savings.

However, this comes at an added (opportunity) cost, which is the accepted (affordable) loss of control of the customer base by each firm voluntarily accepting to transfer the managing of customer relationships (and opportunities inherent to the interaction) to this intermediary platform provider, then constituting a drawback. For instance, instead of identifying, evaluating, and managing trading partners themselves, companies rely on the platform provider to undertake the background work of attracting and screening qualified market participants, trusting the quality of their endeavors as to targeting an ample trading pool that satisfies its own prerequisites. Considering both sides of the coin, one may argue: "*benefits and drawbacks are (theoretically) even.*"

Definitely, the final result in any balance sheet as to the transference of a business system to a third entity (a platform provider or any other outsourcee) may account multiple outcomes. Here, we have plotted "final result" using a simple fraction with a unique variable *(x),* that is, the surplus of revenue (profit), is utilized to express such divergent outcomes:

$$\text{Profit}_{(x)} = (\text{Benefits}/\text{Drawback}) \Leftrightarrow x > 1; x = 0; \text{or } x < 1$$

Consequently, a much safer ground is to advocate (based on the above) that whether the setbacks outstrip the gains, or vice versa, a shift in business paradigms, even a cautiously made decision within a systematic rational model, without modifying the existing customer base, comes with an uncertainty bill. We argue that *uncertainty is entrenched in any change process*!

Platform competition comes thus with the uncertainty of adoption of a new channel of communication, plus the uncertainty of trading without downstream intermediaries in sales (e.g., importers, wholesalers, or retailers) and other sociocultural and motivational uncertainties at its trail such as the reluctance in the adoption of digital means and/or the trustfulness about a specific platform brand (Mourtzis, Angelopoulos and Panopoulos, 2021b; Grewal and Purdy, 2014).

Undeniably, as pinpointed in previous literature, the absence of social interaction in a two-sided deal is per se a promoter of uncertainty (in a digital environment) as one lacks the personal contact, which blocks the spiraling perception of firm-level risks (Mourtzis et al., 2021a). In this context, Li et al. (2019) advocate that the lack of face-to-face interaction leads to

1. Increase in information discrepancies (between the actual reality and the interpretation of it).
2. Creation of gaps in the understanding of the counterparts, which in turn derive into.
3. Accentuation of asymmetries between selling and buying parties.
4. Growing concerns as to the trading environment.
5. Perception of risk, about malpractice, opportunistic behavior, and misconduct of the seller). Also, the leanness of an e-marketplace poses supplementary risks as the product quality, as seller's identity is more difficult to evaluate, making them more prone to fraudulent actions (Pavlou and Gefen, 2004).

This latter concern (*risk perception*) is another impediment to the establishment of trust, especially at an early stage of commitment with regard to spot sales (international) trading. To mitigate the signs of ambiguity that erode trust in digital trade, Yoon et al. (2021) conducted a study examining the utilization of quality signals and recommended platform providers/administrators to develop and promote buyer–supplier matching on B2B online marketplaces. Their findings showed that a suitably designed *recommendation system*, similar to the review systems on consumer markets *(such as BirdEye, Trustpilot, or Yelp,* among others), is needed for B2B digital trading platforms as the platform's presentation of the seller information has an influence on buyer–supplier matching. Yet, recommendation system requires not simply the rating but the suggestions of relevant products of interest to one user (as the buyer–selling matching). Hence, recommendation systems, at individual level, allow one to communicate and scale with lower perceived risks, and at platform level monetize from the value addition (convenience to the user and an argued acceleration of their adoption) as two key functions of relevance for the platform success: maximizing the user satisfaction and the number of transactions (Mehrotra et al., 2018).

In addition to recommendation systems, Yoon et al. (2021) found value in incorporating online channel data with conventional offline channel data in order to measure the drivers of buyer–supplier matching. Their research corroborates Lanzolla and Frankort's (2016) study, sustaining that offline company characteristics such as their geographical location or legal status are important in the comprehension of competitive heterogeneity—even in online B2B marketplaces—as they can give indications on which sellers are most likely to attract business online.

Similarly, Chang et al. (2020) assume that the information provided on B2B platforms is a key driver for market participants to reduce perceived uncertainty and implied risks. Their study analyzes the connection between *trust* and *purchasing*, considering the two streams of trust (trust in intermediaries and sellers; and trust in commodity information) that they intertwined with online purchase intentions by the procurement personnel in B2B e-marketplaces. Likewise, Cen and Li (2020) and Cennamo and Santalo (2013) studied the relation between trust in commodity information and online purchase and have shown that such association is influenced by the sensed value of the deal.

Additionally, the extent of trust in commodity information is significantly and positively affected by trust in intermediaries as well as sellers. This gets confirmed by a study conducted by Bao et al. (2016), which assessed on the seller's side the association of satisfaction with trust, which ultimately leads to the buyer's intention to repurchase. However, despite the linkage between trust and repurchase intentions, user loyalty in online B2B constitutes an avenue for further research (Cen & Li, 2020).

Nevertheless, the process of digitalizing business activities brings changes to the customer relationship management (CRM) traditional scope (Li et al., 2018). Studies have shown that digital *servitization* of goods yields opportunities to (1) explore further customer involvement, (2) build-up customer intimacy, and (3) improve, in general, the quality of the relations toward a more positive status (Grandinetti et al., 2020). Such (servitization) enhancement is predominantly due to the virtue of information-sharing within the B2B network, which results in better resource allocation, efficient operations, and enhanced service quality. These scholars' assertions are consistent with *Metcalf's law*, in which the value of the network is directly proportional to the number *(n)* of *connected users*, or even with *Reed's law,* suggesting an exponential scaling up of communication opportunities due to the squaring of network nodes (n^2) with an increase in users in the whole network.

Furthermore, the digitalization of business relationships brings down transactional costs and increased customer value as the entire supply chain begins to connect directly (i.e., *disintermediation*). This leads to blurred boundaries between customer and supplier firms, promoting further collaborative competition modes (e.g., alliances) between supply chain parties (Lee and Falahat, 2019; Pagani and Pardo, 2017) and constitutes the microfoundations for the reinvention of new supply chains models (e.g., with the inclusion of *e-retailers* or *e-hubs*) in the middle of the supplier and client providing new types of services (*reintermediation*). In addition, this places the customer in the epicenter of the product/service design (Boddy, 2017). So, *how does such integration look like in a "relational web-based business"?*

Firstly, the aforementioned price comparison (services) engrained in review systems or product comparison embedded onto recommendation systems (or other types of services alike), it represents a first step of involvement of the buyer in the value network. Here, the traditional mindset of "individual digital service provider" shifts to embrace the notion of *user-generated content* (UGC) with users gaining an active voice by engaging in producing new bundles of information accounting their assumptions, knowledge, needs, and vision about the network, sellers, and products (i.e., a customer view). From this tier, a second step is the platform involving the client in the *co-creation* of new products, creating a trust path for deep customer intimacy, fidelity to the product/brand/seller and new opportunities. A perfect example of co-creation is the pioneer work of Lego, with an online community of fans co-creating the new toys of the future the end user would like to play with (Body, 2017).

Nonetheless, *offline channels* are still an element of relationship management with reduced importance since ICT has proven to have changed CRM practices as

companies shift gradually their business activities to the web (Li et al., 2018). This means the "old school" style of CRM tools (e.g., trade fairs) has lost partially the magic they held in the past and was relegated to a seldom use as a backup solution as a supporting element of interaction/engagement with a customer pool as web-based companies use them more sporadically, and their decreasing interest made them the underdogs of the CRM strategies for monitoring or leveraging customer relationships (Li et al., 2018).

Although this element of face-to-face interaction is still active and the soft capabilities associated with the administration of the closeness/proximity, culture, moods, climate/environment and other unwritten challenges or rules of conduct as social components of vis-à-vis skillful interaction are pretty much alive and considered to be valuable on relationship management. The need for a blending of social and digital capabilities is key, re-instrumentalizing the role of sales and sales professionals as "digital relationship builders" or change architects and knowledge brokers (Rustholkarhu et al. 2021).

Aside from substantial changes for marketing and salespeople, *sales digitalization* and *automation* might be taken as a system re-engineering tool where tasks may be reshuffled, becoming tech-centered, and redistributed in a different manner. Eventually, as advocated by Mahlamäki et al., (2020), shared between parts, for example, a *vendor management inventory (VMI)* with duties shifting the ownership of responsibilities. In this context, automated sales comes at the virtue of *self-servicing* to a certain degree with the buyer performing simple transactions without sales personnel, allowing them to focus on higher value tasks (e.g., product, navigation, or profile analytics; or interaction features' development). In this context, digital platforms offer B2B salespeople opportunities to impact and interact with customers in a broader scope, utilizing them to scale sales (Mattila et al., 2021; Thaichon et al., 2018; McIntyre and Srinivasan, 2017).

In this context, we underpin that organizations are summoned to overlap these social skills, historically held by their salesforce, with digital skills developing a *digital social meta-capability,* which is key for its fortunate exploitation in the digital channels. ICT is a trend and a request by many organizations. For instance, a recent study of *McKinsey* stresses that over 70% of decision-makers prefer to make purchases remotely or using self-service purchasing (Bages-Amat et al., 2020). Thus, in order to succeed in the digital environment, salespeople and their willingness to adopt new technologies are vital and can only take place if old ways of knowing and doing selectively get discarded and transformed into new practices (Mattila, Yr¡ölä and Hautamäki, 2021).

This blending of capabilities is a requisite especially for organizations in less-matured stages of digitalization, where the use of the Internet is still at the initial stages of i*nformation* (phase 1) or *interaction* (phase 2), as an embryonic or early-stage apparatus of communication, in which these organizations are not web-based yet; moreover, where the potential gap between demand–supply expectations may collide and less digitally adapted organizations are the ones with higher costs of opportunity.

Technology is taking over the business architectures across industries worldwide, devaluing (or almost erasing) the relational component between parts. With the assumption that technology dismisses interaction, web-based models have, in general, almost swiped out to a corner of the office's facilities the importance of the social(ization) pillar in business. However, in the short run, the technology embedded in digital platforms holds scanty interaction settings (mostly the automation of sales-related tasks), hence, not fulfilling the relational gap that comes with the absence of the warmth, safeness, joy, or excitement of human interaction, which one does not experience online, nor taking advantage of them in the design of digital sales tools. Thus, technology (ICT) did not catch up on interactive tools to completely replace the intervention of salespeople (Mattila et al., 2021). So, digitalization has still a bittersweet taste as it eliminates the necessity for human intervention, but only to a certain degree, in turn having a direct impact on B2B traditional business models, B2B business relationships, and the daily life of the marketing and sales professionals (Lee and Falahat, 2019; Singh et al., 2019).

In sum, we corroborate with Alsaad et al.'s (2018) assertion that the embracing of the B2B e-marketplaces has a beneficial disruptive-change effect on businesses practices and outcomes whether the organization is an ascending start, a maturely successful one, or even struggling with some sort of strategic drifting.

The transformative machine of digitalization, one ought not to let standalone (and become a *Schumpeterian* source of creative destruction), requires organizations to strategically rethink their B2B relationships, instead of leaving them at the corner as a minor issue and abandon or deny the digital realm as organizations certainly may desire to clean the closet, dust it off, break free from the ingrained inertia, and embrace the acquisition /development of digital capabilities to relaunch it as a *hybrid sales organization* (Lee and Falahat, 2019). This is the subject of our next section: *platform utilization capabilities (PUCs).* As this section covered the uncertainty inherent to the implementation of a digital business model and the required platform provider capabilities on the supplier's side, thus, the following section will immerse into the essential capabilities to acquire or develop capabilities as a platform user.

2.4 Quest for IT Capabilities in Digital Ecosystems

As briefly presented in the previous section, with the disruption of traditional business models by the ICT and the event of B2B/B2C/C2C platforms, new capabilities are required to stay competitive in a digital world, and herein, born competitive, become competitive, and hold firm as a platform user (Mattila et al., 2021). Thus, in order to meet the challenge of adapting to digital platforms, it is crucial for organizations to unlearn some practices encrusted into traditional value chains and reconfigure outdated capabilities, which requires a selective discarding of old information and behaviors (processes) to be able to gain and deploy new capabilities (Mattila et al., 2021). This requires a candid reflection on current routines in order to identify the outdatedness of some one ought to purposely let them go (Klammer &

Gueldenberg, 2019). Unlearning them effectively enables an organization to prepare itself to learn others and accommodate change (Klammer & Gueldenberg, 2019; Becker, 2010).

Dynamic capabilities are vital to constantly adjust the firm's strategy to arising changes (Abrantes et al., 2022a; Teece, Pisano and Shuen, 1997). Nonetheless, their competitive and performance implications only materialize when one targets core competencies adequate to the typology of market; thus, being in e-marketplaces core the online marketing and ICT capabilities.

From the dominant (so-called) *Teecian* perspective (as discussed in the previous section), the role played by learning capabilities is to prepare their holder to a favorable position and respond effectively to changes in the outer environment (Teece, Pisano and Shuen, 1997). Hence, *dynamic capabilities,* as organizational bundles of collective abilities that reconfigure themself and facilitate the seizing of new opportunities, navigate through an ever-changing digitalized environment. Thus, firms are required to explore technological changes for the sake of facilitating the success of their digital strategy. To remain static or inert is not an option in a rapidly changing contemporary world, with the societal digitization being an accelerating force of those environmental changes. When one neglects to accompany these (technological) changes, it jeopardizes the firm's ability to improve its own contribution to the value system in an industry. Conversely, competitors occupy that empty space, appropriating suitable means others do not, those capabilities becoming a source of competitive advantage and above-average returns; (Coreynen et al., 2020; Vendrell-Herrero et al., 2017; Raddats et al., 2016; Eggert et al., 2014; Finne et at., 2013).

A digital strategy is an underlying process of adapting the inner links between digital assets and business strategy (Coreynen et al., 2020). Therefore, it is critical for organizations to know how to integrate technology with business functions as this allows for strong competitiveness. As pinpointed by Abrantes, Preto and António (2022b), a firm's level of competitiveness is intertwined with its capability possession. But Canhoto et at. (2021) claim that there are barriers toward the initial conception of a digital strategy (and inherently digital capability building), which include inadequate planning, deficient understanding of the value of digital technologies on business performance, and a strong dependence on external IT competency. Adeniran and Johnston (2016) revealed that DCs, such as the *absorptive capacity*, *entrepreneurial orientation,* or the *patching* ability of the firms, are different types of DCs that can assist organizations in preparing themselves to develop further *IT capabilities* and IT enablers to overcome issues connected to IT utilization. Indeed, Teece, Pisano and Shuen (1997) described DCs as being complex in nature and with an influence on other capabilities. They delineated the utility of the DCs as the ability to approach rapidly changing environments by integrating, building, and reconfiguring internal and external competencies, which are unique combinations of organizational, functional, and technological skills and therefore hard to imitate (Abrantes, Preto and António, 2022b; Canhoto et al., 2021; Teece et at., 1997).

Hence, as to the *integration* (property) of competencies in traditional business models, in their transition to digital business ones, namely stepping into the platform

competition's realm, previous marketing capabilities are key (and should not be abandoned) to be intertwined with the to-be-acquired IT capabilities that may leverage, altogether, a unique value proposition. The property of integration of a DC gives room to the expansion of the current resource base to tap into new resources and so develop additional capabilities, thus, constituting the seminal heuristics of an *upskilling* process. On the other hand, the *flexibility* of a DC is a property that enables them to modify itself (*reconfiguration*) or modify itself completely (*renewal*), following the assumption that adaption to change is key in fast-changing environments (Abrantes, Preto and António, 2022b).

From a resource-based view (RBV) pure perspective in which the DCV lays, capabilities are non-transferable assets, firm-specific, and embedded in its processes to increase productivity and economic rents (Makadok, 2001 as cited by Chiarelli, 2021). The RBV framework can be used to achieve competitive advantage through the determination of a firm's resources and the exploitation thereof, but the capabilities and their contribution to competitive advantage can differ. Such original stance of the RBV diverges from the DCV that foresees its morphology and deployment as something dynamic as the features of a DC may evolve and totally change, such as the nature of its deployment. Hence, the DCV argues that DCs are units of collective competencies built-in with an inner mobility and transferability potential, across multiple functional or geographical units of the same organization and/or (intra-unit transferability) or across firms (Abrantes, Preto, & António, 2022b).

An interesting distinction is made by Chiarelli (2021) and Helfat and Winter (2011) about operational or ordinary capabilities (zero-order capabilities) and dynamic capabilities (first-order). Operational or ordinary are those that enable a firm to function in the present, while DCs are what lead to competitive advantage. The latter ones (DCs) include an ability to sense, learn, integrate, and coordinate (other) capabilities (Chiarelli, 2021). Essentially, the idea that resources by itself result in a competitive advantage is an outdated thought. Today markets change rapidly and the staticity of resource ownership per se is insufficient to cope with them. This requires a leverage by (1) the recombination of multiple resources into meaningful activities (assets) and (2) the development of routinized capability gains (Abrantes, Preto and António, 2022b). Scholars claim nowadays that DCs are required to utilize a firm's resources to improve performance and sustainability (Teece, 2018).

In this context, a subgroup of DCs are the *dynamic managerial capabilities (DMC).* They are based on the managerial cognition, managerial social capital, and managerial human capital (Li et at., 2018; Helfat and Martin, 2015; Adner and Helfat, 2003). *Managerial cognition (MC)* comprises personal beliefs and thinking patterns in regard to decision-making (Adner and Helfat, 2003). It involves the comprehension of ongoing events and anticipations for the future (Li et al., 2018). Thereby, it also affects how managers sense market changes and adapts to those. A lack of managerial cognition may result in insufficient awareness of environmental changes, dragging organizations to inertia (Helfat and Martin, 2015).

Managerial social capital (MSC) includes all sets of formal/informal relationships a manager holds (Helfat and Martin, 2015). Extensive *social capital (SC)*

matters as the inward follows of information with novelty in benchmarks, data variables, or novelty in the type of information constitutes a gained resource, allowing the social exchange processes with networking partners of the same company or supply chain or collaborative entities we are engaged with in other types of business networks (Li et at., 2018). *Managerial human capital (MHC)* focuses on the manager himself. It covers the manager's knowledge, experience, and skill set and educational background. Decision-making is based on these factors and can differ among individuals with different backgrounds (Helfat and Martin, 2015) Therefore, it is desirable to possess diversified teams with complementarities in know-about and know-how, whether it is *embrained, embedded, embodied,* or *encoded* (Li et al., 2018; Lam, 2004). Well-developed DMCs help organizations to successfully conduct strategic changes such as digital transformations and thereby improve performance (Helfat and Manin, 2015 as cited by Li et at., 2018).

2.5 Platform-Related Capabilities

Holding an IT infrastructure, and subsequently, competing in a digital platform environment, such as B2B trade platforms, involves, unavoidably, the integration of ICT into digital business strategies (DBS). Thus, molding competition-based established on traditional value networks toward web-based ones requires the challenging paradigmatic shift that is embedded in ones needed to acquire and/or strengthen IT capabilities (Wang et al., 2020; Martínez-Caro et al., 2020).

Being a subset of IT capabilities, *platform utilization capabilities (PUC)* are described as the organization's capacity to explore the technical functionalities of digital platform and use them for its own benefit for marketing purposes (Li et al., 2018). These capabilities are DCs (category of IT capabilities) that sense their acquisition or development that enables the companies to enlarge the span of digital behaviors and capabilities. These scholars argue that PUCs enable companies to

1. Improve *data mining*
2. Sense customer preferences
3. Explore a frame of existing functionalities
4. Sharpen the *hypertargeting* possibilities (namely through analytics software)
5. Enhance the connection to customers and target groups (*customer involvement*)

In complementarity to Li et al. (2018), we unravel the most visible capabilities adjacent to such digital empowerment brought by PUCs (Table 1).

Scholars, especially in the DCV field, may argue whether these new five types of DCs deriving from PUCs (from the exploring of core digital technical activities/functionalities) are five new subtypes of PUCs or simply other DCs belonging to other categories (such as learning, marketing, or IT). We avoid here such discussion about the mapping of those DCs since we believe that the most important aspect to retain from their unraveling is that, altogether, these are essential components one firm may want to reach out to developing its own PUCs toward its digital

Table 1 Technology utilization-derived PUCs

PUC benefits (Li et al. 2018)	Unraveled dynamic capabilities (our research)
Data mining	*Data-related* capabilities
Sense customer's preferences	*Market demand analysis* capabilities
Explore functionalities	Deeping the acquired *PUCs*
Hypertargeting possibilities	*Big data analytics* capabilities
Enhance customer interaction/s	*Customer involvement* capabilities

Source: Own elaboration

transformation path, in which *technical refinement* (IT capabilities) goes side by side with *DBS's refinement (*strategic development capabilities); in short, both are intrinsically dependent upon *capability augmentation*. Capabilities are a key to success. The more sophisticated the digital business model gets, with the recombination of digital activities and the use of digital assets to accomplish those activities, also the DBS moves forward, gradually, to more mature features and so becomes a more refined version of an e-business player (Li et al., 2018).

Therefore, PUCs constitute an important subset of IT capabilities in regard to platform competition, and they are subclassifiable into three different categories: *technical* (TPUCs), *marketing* (MPUCs), and *financial* (FPUCs) (Li et al., 2018; Galbreath 2005). For instance, in the study of Li et al. (2018), the compliance to the platform provider's *guidelines (technical compliance)* and the subsequent adherence to the recommended tools proves to be a positive technical refinement (hence a TPUC), which is beneficial to the sensing and matching of customer preferences (MPUC). Some scholars within the dynamic capabilities view might even consider technical compliance as a meta-capability with the PUC spectrum.

Another PUC, as to *market analytics* capabilities (hence, also an MPUC), that some SMEs use is the "*click data*" to capture sociocultural regional preferences, and then propose recommendations for the tailoring of their products based on the visitor's feedback and location. Still another example is rewarding clients' *information completeness* (typical profiling and product information) to increase their *visibility* and likelihood of commercial *engagement* with other potential partners. The underlying logic is that the company rating is subject to the promptness with which it responds to a customer query. Thus, this implies developing a mindset of "online rapport," which means having the capacity (built) to understand the buyer's side when they navigate online, regarding the typology and amount of seeking information, and easy-to-access in time these sources.

Nonetheless, Martinez-Caro et al. (2020) argue that firms have a deficit of these PUCs, and IT capabilities in general, a condition that constrains the acceleration of DBS. They stress this to be a digital competitive hazard. Yet, Li et al. (2018) point out the right way as they argue that to thrive in an e-marketplace companies are summoned to recover the PUC deficits but also work on the reskilling of *business development capabilities* suitable for these digital markets.

An essential financial platform utilization (FPUC) for determining whether one firm should enter or continue in a platform is the notion of *e-marketplace*

participation growth anchored on the profitability ratio measure of return on investment (ROI) (Galbreath 2005). These scholars developed a *Game-Theoretic Model of E-marketplace participation growth* based on the principles of ROI applicable to adherence decisions, which gives insights into the dynamics of expected growth, a key variable for taking decisions with regard to e-marketplace commitment. This theory helps in determining the viability and expected long-term size of an e-marketplace, but also assists in understanding the impact of costs, competition, and volume on e-marketplace participation. Here, the best estimate to value of participation is given by the total seller volume (V_s) to total buyer volume (V_s).

$$\text{Value} = (V_s / V_b) \Leftrightarrow$$

$$\text{Value(buyer)} = \begin{pmatrix} \text{Volume} \times \text{Proportion of volume transacted in e} \\ - \text{ market place} \times \text{Cost savings} \end{pmatrix}$$

Or,

$$V_b = T_b \min\left(\frac{V_s}{V_b}, 1\right) D_b$$

The optimal strategy accounts for the total purchasing (T_b) and sales volumes (T_s) and the net buyer and seller savings as a percent of the transactional volume (D_b; D_s). Both potential e-marketplace participants benefit from developing this FPUC capability regarding the calculation of optimal point of participation based on Galbreath (2005) model by enhancing the efficiency of administrative activities while also solely benefiting buyers by discounted prices, reducing the value for sellers. The volume of transactions tradable in the e-marketplace determines its value for participants, which results in a two-sided network effect. Sellers react to buyers and vice versa. Only if there is a reasonable expectation of sufficient transaction volume to justify the cost of participation do buyers and sellers join an e-marketplace. The transaction volume of a buyer is determined by the buyer's intended transaction volume, the available seller transaction volume, and all other buyers' intended transaction volumes in the network. Likewise, seller transaction volume is determined by the seller's available transaction volume, all buyers' requested transaction volume, and all other sellers' available transaction volume. When no additional buyer or seller expects to conduct enough transactions to justify their cost of participation, participation growth comes to a halt. At this point, the game-theoretic model predicts an e-marketplace equilibrium, and the interdependent nature of *two-sided network growth* becomes evident, as follows.

1. The *network effect* is symmetrical: buyers and sellers are both affected by growth on both sides of the market.
2. The *network value* depends on the extent to which buyers and sellers can conduct transactions on the platform (i.e., Metcalf law).

3. *Transaction outputs* assume the form of cost (reductions) and/or competitive (penalties).
4. *Potential value* is *independent.* The financial benefits of participation must be compared with the costs of acquiring and maintaining the required systems.
5. The *e-marketplace identity* is transaction facilitation. It has no intrinsic value for its participants—all benefits come from network effects.
6. Equal cost of participation across participants on the same side of the market.

Based on the assumption that e-marketplace benefits are driven by transaction volumes, the largest buyer or seller who has not yet joined the e-marketplace at any point is the most likely to have justification for joining. An increased participation on the same side of the market can indirectly lead to the attraction of more participation on the other side of the market, thereby growing the size of the e-marketplace as a whole. In turn, the increased e-marketplace size can attract participation on the same side of the market. On the other hand, increased participation on the same side of the market is reflecting a negative network effect due to imbalance of supply and demand. This sequence of potential positive and negative effects—present throughout the growth and maturity phases of the e-marketplace—forces the e-marketplace toward equilibrium.

In short, whenever the administrative cost savings do not exceed sales discounts, sellers have no motive to join the e-marketplace even if participation costs are zero. The network effect of price reductions and administrative savings must result in a positive net effect for sellers. This positive effect can emerge due to high administrative costs outside the e-marketplace, high reductions in administrative costs in the e-market place, low price reductions in the e-marketplace, or any interaction of these factors that bring about a positive overall value proposition for sellers. Conversely, once the value of joining the e-marketplace exceeds the cost of joining, the buyer or seller will join. If value does not exceed cost, they will not join. When both buyers and sellers become indifferent to join, the e-marketplace stops growing.

Seller savings is a parameter prone to change over time in an e-marketplace. In an effort to gain market share, sellers may shift price boundaries, which causes other sellers to adjust their pricing to remain competitive. Buyer and seller savings in the e-marketplace as a whole tend to self-adjust to reflect new price savings, and the equilibrium participation levels adjust accordingly, including an adjustment to reflect the fact that lower prices might cause some sellers to leave the e-marketplace because participation was not profitable at the lower price level. The opposite move (raising prices) has a similar effect on the equilibrium of the e-marketplace. Sensitivity analysis shows the effects of varying the price reduction percentage from 14% to 32%. As the percent price discount increases, more buyers are willing to join, but this effect is limited by the fact that seller participation decreases, as smaller volume sellers are no longer able to justify the participation cost. Therefore, there is an increasingly smaller seller volume available to satisfy an increasingly larger buyer volume desired. In sum, these effects clearly demonstrate the importance of a cautious and meaningful value proposition for both buyers and sellers, given the two-sided nature of e-marketplace growth.

Inevitably, addressing the game theory aspects with regard to platform competition (as the "prisoners' dilemma" on price moves) and its effectiveness on the achievement of net/Nash equilibrium points requires in our view further considerations beyond the simple monitoring of value of participation and price maneuvers.

An *ex ante* consideration is the key to understanding platform competition and the precursory decision any agent ought to account for platform selection and commitment decisions related to the *seller's reputation*. Here, we return to the realm of marketing PUCs (and to the category of marketing analytics again) as the Competitive Repertoire Theory (CRT), particularly the platform-based function repertoire (PBFR) of Li et al. (2019), who assert that for comprehending competitive differentiation in e-marketplaces, one needs to reframe platform competition beyond the game theory premises. In fact, Li et al.'s (2019) research extends the CRT in the context of e-marketplaces, claiming that CRT is, per se, not sufficient to understand performance as a whole as the challenges for buyers in terms of lending credibility to sellers online are too severe. Their theory, designated as platform-based function repertoire, complemented the CRT on a firm-specific factor: *seller's reputation*. This factor has been neglected in previous research in CRT; however, for Li et al. (2019), the seller's reputation is a central aspect of purchasing choices as it refers to the perceived credibility of each seller in the eyes of the overall buyers expressed in the customer ratings. Thus, feedback systems have not gained traction in digital platforms as their benchmarks are understood to be redefining the extent of future repurchasing online. Firstly, these scholars argue that competitive differentiation arises from the unique combination of four platform-based functions: the *volume* of trade, the *complexity* of goods, the *heterogeneity* of the offer (including information), and the *reputation* of the agents participating in the platform to assume a distinctive or even pioneering positioning therein. Seemingly, the intangible equity of those four functions is not totally captured by Galbreath (2005) game-theoretic model of e-marketplace participation growth. Secondly, unravel *reputation* as a critical success factor and assert its importance on platform utilization decisions from the buyer perspective, placing reputation at the epicenter of online sales assessment variables. For these scholars, the success of the platform-based trading function from the seller's perspective is determined by the IT capabilities it possesses enabling competitive (re)actions.

Nonetheless, Li et al., (2019) consider also the platform-based function repertoire (PBFR) *volume* as another key indicator of platform competitiveness. Volume refers to the total number of times that a seller uses platform-based functions to support competitive actions. Thus, the higher the usage of the platform, the better the sales performance. In our opinion, considering the mediating factors interplaying with volume, such as complexity, heterogeneity, reputation, and other eventual confounding variables, eventually not disclosed in previous literature, we assume that such function is not a cause–effect but a correlational function whose strength is required in different business ecosystems (platforms) and a specific scrutiny; thus, a net-value relation between number of times one seller uses the platform and the direct rise of sales figures over time seems a daring conclusion.

The same with the PBFR's *complexity*. The dispersion of offers into different function categories beyond price orientation makes the seller more equipped to compete so as to make the platform more robust. The more complex the sales offer, the better the estimation of satisfaction of buyers' needs and better the sales performance. The PBFR's heterogeneity refers to the combination of utilized platform-based functions differently from other competitors. Such repertoire is also argued to be directly proportional to sales performance. The PBFR refers to the difficult-to-imitate attributes of a seller in a platform triggered at its highest point by the customer ratings on that same platform.

The underlying proposition of this theory is that sellers' ability to assimilate and configure a platform-based function repertoire differs even though platform-based functions can be employed by all sellers. The scholars of this study (Li et al., 2019) argue that this premise is strongly linked to a firm's degree of IT assimilation (IT capabilities), which depends on the coordination between IT and business within the organization.

This coordination between IT capabilities (including the different forms of PUCs) and the business development is heavily connected to an organization's capabilities (e.g., marketing, learning, patching) as a full repertoire of intricate combinative sets of dynamic capabilities and ordinary ones that set the path for digital competition. Hence, we believe that the degrees of IT assimilation differ from one firm to another due to an organization's unique set of capabilities, which signals how capabilities can have an impact on performance on e-marketplaces.

Based on the above, we argue that the strengthening of digital business development is intrinsically dependent on capabilities (digital and non-digital), such as PUCs and *preparatory* and *realized absorptive capacity,* in which the latter stands for an organizational (cap)ability to tap into external knowledge. Thus, absorptive capacity is key is digital business as it identifies, assimilates, transforms, and applies new knowledge inflows (Martinez-Caro et al., 2020). In this context, new streams of learning (upskilling), being key to digital operation's success, just like the internals also the external stakeholders (i.e., especially the customers and suppliers) can be a source of (passive) learning of a focal firm and act furthermore (actively) as a promoter of such learning providing feedback and information to the organization (Martinez-Caro et al., 2020).

Platform utilization capabilities, and more or less formalized *feedback* system's skills, that build on competition inputs for business development and shape one firm's digital reputation, constitute a key means of learning and similarly assess the degree of commitment and satisfaction with one firm's products/services and the likelihood of rebuying or churn. Therefore, both financial and marketing PUCs for business development purposes and absorptive capacity can be integrated into a "package" of learning capabilities, to be reconfigured, constantly, together with IT capabilities (including the TPUCs) and as a unique formula for blocking digital hazards.

We contend, furthermore, that the *absorptive capacity* per se as a preparatory capability is not enough to trigger the development of PUCs. The latter needs to be accompanied by another preparatory capability to digital competition, that is,

strategic awareness. The awareness of external environmental change is essential to tap into new opportunities, risks, and even serendipity.

Answering one key question about *how may one develop PUCs,* putting it blandly, requires prior knowledge deriving from quest to comprehend the global dynamics of competition across ecosystems as to market requirements and business intricacies. One needs multiple streams of knowledge (as a resource) to develop knowledge-based capabilities (transform resources into capabilities). This constitutes the firm's absorptive capacity whose breadth and depth shape the hasty development of PUCs. Yet, to "sniff" external resources, one needs to be actively looking for market patterns, trends, and changes. This constitutes a sense of awareness about the surrounding dynamics, which entails filtering raw data into workable information and deciding on adaptable moves beyond short-sighted ploys to equip itself with new resources and capabilities to be constantly aligned between internal goals and market gravitation.

This dyad, absorptive capacity and strategic awareness building, is letting one firm be prepared to actively absorb (and not just accommodate), but work with the possibilities of new fads, wildcards, or trends as a strategic openness to constant renewal. In this sense, considering the fast-moving global context we are experiencing in this second decade (of the twenty-first century) of multiple and disruptive offers in hardware/software, we would recommend particular attention to the tech advancements, trends, and public policies (or even lack of digital regulation) on tangent areas of PUCs such as cybersecurity and blockchain technologies; machine learning and artificial intelligence algorithms; virtual and extended reality; chipping and machine–human interaction, digital devices, Internet of Things, and cyberphysical systems; cloud computing; data science; co/robotics; 3D; genomics; digital trust and fake detection; cashless/contactless payments; non-fungible tokens, cryptocurrencies, and smart contracts; other forms of digital assets or central bank digital currencies; and so forth. In essence, it is essential to signify to be aware of what those aforementioned phenomena are and acquire knowledge of those more sensitive and/or more directly related to one's business activities (Lee and Falahat, 2019).

3 Data Mining and Findings

In order to accomplish the aim proposed in the introduction section and contributed insights into the dynamics that drive trading in the German chemical industry, we have chosen a qualitative research path. The rationale for such choice lands in its adequacy to interpret subjective meanings from the manifest data (gathered from a set of participants who voluntarily adhered to the project) as social constructionism signals whose (shared) meanings and perceived realities depend on people's interpretation of occurring events (Saunders, Lewis and Thornhill, 2016). Adopting a comparative design upon a set *revelatory cases,* we immersed into this study a replication logic of a real-life phenomenon (i.e., B2B trading platform) to understand

its dynamics (i.e., a shift from the use of traditional sales channels to digital platform). Thus, using a *multi-case study* with *literal replication* logic across the multiple universes in observation (the four multinationals), we intended to make alternative descriptions or explanations of the cases that will allow us to comprehend the phenomenon as a whole. Consequently, such endeavor fits into an explorative research mode (Yin, 1999, p. 40).

Indeed, being a *multiple-case replication design*, the empirical part of this investigation adopted Yin's case study *type 3*, holding four separate contexts, one per each of the four MNCs in observation, and therein, one single case per firm (*Firm n*) (Yin, 1999):

- Context 1 (Firm 1)—Case 1 (UA1)
- Context 2 (Firm 2)—Case 2 (UA2)
- Context 3 (Firm 3)—Case 3 (UA3)
- Context 4 (Firm 4)—Case 4 (UA4)

The study holds no embeddedness of other cases but one simple unit of analysis (*UA*) per case due to the existence of four UAs (UA1, UA2, UA3, and UA4) matching four distinctive contexts of this multiple-case research.

To accomplish this, we followed a mono-method approach using interviews as a technique for the extraction of insights from gatekeepers of information, with targeted focuses directly on the topic, elected to dig on a one-to-one basis of interaction with relevant participants, pre-selected (and voluntarily adhering to this study), as they held experiential knowledge in their jobs as a representant of a firm here sampled and with responsibilities upon the sales function. The use of interviews is a valuable means of data collection in this set of contexts and according to the angle of investigation adopted, having the virtue of capturing people's perception of experiences important to them (Arsel, 2017; Kozinets, 2017). Hence, being insightful providers, interviews allow for causal inferences about one's view and ultimately a comprehension of the focal phenomenon altogether as cases function as pieces of information of one puzzle.

Interviews were conducted vis-à-vis with participants with the job titles of "Product Manger" and "Sales Manager." For the sake of simplicity, we designated these professionals uniquely as Sales Managers. We observed some natural differences in the sample's profile, not only in job titles, but also in seniority (or number of year in the Firm *n*) and also in their managerial tier. Profiling differences are minor across cases and likely irrelevant to the dimension of internal validity of the study in this topic. Just as a straightforward clarification, the internal validity refers to the pattern matching of informant's data with the theoretical ground or with the explanation building, or with the use of logic models.

The four participants counting as four UAs followed a convenience sampling, and therefore their selection was based on their acquaintance or familiarity with the topic, being the natural candidates to enlighten about the digital transformations in this sales area in their companies and so allows us to approximate to a point of saturation of information. The interviews assumed the format of a semi-structured one, equally utilized across UAs grounded on a *prompting* technique, in which the previously

designed questions were transferred into an interview guide similarly adopted across firms. Nonetheless, the interviews accounted for a flexible adaptation to the context and participants as the outside research were allowed to apply a supporting technique (*probing*). A seminal decision taken before the collection momentum was that we would consider the probes not as a preparatory strive to the interview/s with bulk topics previously fashioned, but as typically observed in conversational techniques, and only used in its pure form as a further trigger for more in-depth insight gaining of a particular *signifier* already verbalized from the participants. Hence, the use of probes was dependent on the outside researcher's sensing of its need, whenever it was assumed that the interviewee held possession of (likely) more significant data as embrained knowledge yet not shared with the interviewer, but relevant to be questioned at some point in the interview. *Probes* were not replicated to other UAs as they are dependent on personal experience and knowledge, yet those were considered for the coding stage as a valid source of data.

The prompting was set a funnel approach, starting with broad questions gradually transferred to more specific ones. The interview guide was designed in a way that the first part of the interview is composed of more general questions anchored on information and industry trade stats, permitting a reflection with a very ample variety of answers. In this part of the interview, probing played a vital role in a couple of interviews. This second part had a set of questions markedly being a perception-specific enquiry to withdraw particular ideas, views, and expectations about the present and future of B2B e-marketplaces, anticipated benefits, and skills required. The formulation of the questions was purposively fuzzier, requiring a slow and loud second reading of the questions several times, in which we allowed ourselves to jointly interpret them using other words and so facilitating the assimilation of the question, hence, as we intend to, activating the interviewees to the topic in discussion. Such activation process began with a previous sharing of questions for their validation.

A pilot test was conducted with a fifth interviewee before interviewing the four participants to test the degree of assertiveness of the questions to trigger a response stimuli and again tailor the questions for getting more and better feedback. The specificities of the collection momentum, as to the context, question differences, and discussion with the participant, made us exclude this pilot test from the remaining cases. Although the participant was a key informant from a fifth company, the established chain of evidence was broken on the application of data collection instrument since the interview was interrupted more than once for the interpretation of meaning, remarks on structure, note-taking about question reformulation, and so forth. Despite the pilot test being excluded, the participant's contribution was the key to the strengthening of the prompts as we actually performed some adjustments in questions. Moreover, the participant opened horizons generously toward the possible types of answers with a particular formulation opposing another.

The mining of data implied an initial step of transcription of the recorded materials to a Word document format, queuing the four documents (D1–D4) in *Atlas.Ti* software, followed by an inspection reading for eliminating typos and unnecessary expressions as linguistic errors and redundancies. Yet, idiomatic

expressions were retained in these documents and their numbering corresponds to the exact numbering of the firm/context and case/UA. The dynamics of the interviews (e.g., nonverbal language) was purposively left aside and also paid no attention to latent data as phonology, syntax, or semiotics encompassed in the language, entirely irrelevant to this study.

The documents were rendered into summaries and discussed the highlights of the interviews. The coding followed a sense-making framework (or a *Gestalt* analysis), in which the pattern matching corresponded to a particular procedure of coding, that is, transforming relevant pieces of information verbalized by the participants (*signifiers*) into perceptible pieces of platform utilization practices and skills (*signifieds*). This procedure implied an open-coding approach, in which the parts of text containing signifiers were coded as matching a unique phenomenon and so were coded with a distinct identification's code (*cid*). However, codes repeat itself along the documents, thus, each unique piece of evidence of a particular cid was labeled as a quotation, holding also a unique, and so unrepeatable quotation identification (*qid*) that allows qualitative data analysis to track with precision the part of the transcript in which one signifier became associated with a theoretical construct.

The initial codification, individually taken by one single coder (one who held the interviews), was revised and shared as a document-specific coding report, discussed, explored variations of coding hierarchical coding, and finally approved as the results below express it. Another aspect to account is that the same signifiers possess in some parts evidence of multiple constructs as one chunk of text contains quotations with more than one cid. In these cases, we are in the presence of a coding overlap in which one signifier unravels more than one code/construct, and so, we are in the presence of *co-occurrence*. Herein, single co-occurrence (cooc) is determined by one signifier (sig) leading to two quotations *(sig → 2 quotations)* and multiple co-occurrences when the signifier contains three or more quotations (*sig→ ≥ 3 quotations*), as follows:

$$Cooc_{(s)} = sig_{(x)} = 2\ qids$$

And

$$Cooc_{(m)} = sig_{(x)} \geq 3\ qids$$

Hence, below we present the relative frequencies (f) of the coding, co-occurrences, and the distribution of themes. Moreover, we introduce the *cids* we have utilized and the therefrom resulting themes will be presented, followed by a discussion of data outputs, an interpretation of the manipulation procedure, and a reflection on the inferences made upon data outputs, which support the key findings. The latter (findings) will then be discussed in light of the existing literature establishing bridges from the empirical testing and the previous scholarly work, namely as to the commonalities, contradictions, and/or complementarities between this research and previous literature.

Table 2 Sense-making: codes

Cid	Code description	*n*	*f*	*F*
ATM	Automation	14	0.05	0.05
CL	Customer loyalty	15	0.05	0.10
CRPD	Challenges, risks, and potential drawbacks	18	0.06	0.17
CRM	Customer relationship management	33	0.12	0.29
ERPI	ERP system integration	5	0.02	0.31
F2FC	Face-to-face communication	14	0.05	0.36
HSO	Hybrid sales organization	11	0.04	0.40
MDO	Market developments and observations	23	0.08	0.48
MPE	Marketplace expectations	–	0	0.48
MRA	Marketplace requirements and anticipations	29	0.1	0.58
PMS	Product marketplace suitability	17	0.06	0.65
RC	Required capabilities	17	0.06	0.71
TCS	Transaction costs	18	0.06	0.77
TFE	Trade facilitators and efficiency	–	0	0.77
TIP	Transparency in platforms	52	0.19	0.96
UNC	Uncertainty	11	0.04	1

Source: Own elaboration

Table 1 gathers the sets of codes opened in documents (D1–D4). In total, we observed the existence of 16 codes, with 14 of them containing references from the data. Codes without references have been kept in the code set to serve as themes as 3 of these 16 codes ($cid = 16$) have been convened into thematic codes. Each thematic code contains a minimum of three focused codes. The overview of thematic codes and focused codes is illustrated in the tree diagram in Table 2.

In total, the 277 quotations ($N_{Qid} = 277$) have been assigned to these codes, in which transparency costs and market requirements were the most vocal, and, on the other hand, the technicalities of systems integration are covered less. The trade facilitators and expectations were zeroed in after the discussion subsequent to the initial coding, yet the codes were maintained inside the coding frame. The groundedness of the codes (intensity) has not been considered since the length of coverage of text was considered to be an irrelevant factor to the further comprehension of the topic (Table 3).

However, the diversity of coding is clearly observed in the general figures of Table 2 with large variance demonstrating a heterogeneity of the coding encompassed in the multiple nuances of the speech of the four participants (P_n), denoting some richness and complementarity of the signifiers. Such heterogeneity in platform utilization arises, from our point of view, from a different stage of maturity in digitalization as demonstrated below (Table 4).

As the four firms are at different stages of digitalization of their businesses, the signifiers were in the same token markedly different. Firstly, a dogmatic conservative resistance in the German chemical industry to shift practices with only one out of four firms being a platform user and two others not considering adhering or refusing

Table 3 Descriptive stats of open coding (D1–D4)

Qid	$\bar{X}$	Med	σ_{x^-}	σ2	CL
$\sum_n$	17,53	17	13,71	176,12	0.95

Notes: $\sum_n$, sum of quotations; $\bar{X}$, mean of the sample; Med, median; σ_{x^-}, standard deviation (sd); σ2, variance; CL, confidence level.
Source: Own elaboration

Table 4 Adherence to B2B 2 marketplaces

Firm (*n*)	Status	Observations
F1	Refuses to adhere	F1 has been approached by a platform provider and actively decided against the affiliation of the company in the platform
F2	No use of platforms	Not intending to shift sales to an external digital platform
F3	Already a platform user	Multiple ongoing projects underdevelopment, including the discussion of the briefs of project proposals as potential spin-offs the current digital business model in place
F4	Internal discussion	Efforts were made within the company to introduce a discussion about the opportunities of e-marketplaces and the extension of the sales channels currently in discussion

Source: Own elaboration

to do so is notorious. Secondly, the experiential knowledge that led each of these participants to contribute to an interview was anchored on different premises as ¾ companies rely on expectations, challenges, and risks and only one out of four may actually refer to experience, skills, and results.

However, a common dominator across firms is the understanding that somehow, sooner or later, the mainstream of business practice will be digitalized processes (including sales). There seems to be consensus in this vision of the chemical industry for the future and companies recognize that inevitably sales processes will continue to change and there is/will be a need to explore new channels and look for new solutions outside of their current sales repertoire. As one of the interviewees stated:

> *We are looking to a buildup extra sales channels .... have we continued with the original approach taking orders on the phone, this would have become unsustainable. This is a matter of how people prefer to buy in the future.* (*D3/P3-MDO001*)

For participant 3 (P3) quoted above, platform models were acknowledged in his firm (F3) to be one of those potential new sales channels. But, even the Sales Managers of the companies not participating in B2B e-marketplaces yet have anticipated digitalization to be one of the dominant paradigms of the future of sales in this industry. A couple of quotes support these beliefs:

> *I am firmly convinced that it will partially be the future in the business. But I think it's going to come with a lot of unknowns for now.* (D1/P1-MDO004)

> *A lot has happened and will continue to do now.* (D4/P4-MDO-003)

We understood that on the latecomer's side the fear to adhere to the digital platform had a myriad of reasons within the sphere of CRPD-cid: (1) whether the platform represented the *target audience* of their product's reach; (3) the likely *accessibility to potential new customers* to be an uncertain variable (refraining them from investing further in this avenue); and (3) the *newness of platforms* to the company and its clients. Here, we would add the hidden factor/s of high perception of risk due to low preparatory skills. On the other side of the trench, Firm 3 revealed that the motives for the adherence were (1) the *opportunity to link* with new trading partners*;* (2) the desire to *pre-emption or gain a privileged access* to them; and (3) *master a collaboration* between networking firms.

It became clear after the data reduction and interpretation (sense-making process) of the data units (quotations) of the CRPD coding that the firm's decision to enter a platform typically follows a dichotomic view. Using a simple analogy, some managers see the glass as half-empty and others the glass as half-full as some might adopt a more positive attitude and risk-taking behavior while others a more resist to risk-taking, sticking to more cautious stances. Therefore, with this analogy, we mean that the *market-perception*, a phenomenon understood as the assumptions made upon your strategic awareness and realized absorptive capacity, is a determinant variable in *strategic behavior*. Some (firms) seem to activate self-survival mechanisms by focusing on the risks (risk-avoiding companies) and creating strategies to shield risks, becoming ultimately crystalized players as to tech adoption, channel diversification, and business model's innovation.

By opposition, there are companies that are not reluctant to step in (a platform), focusing rather on seizing opportunities than letting themselves to get consumed by a perpetrating fear. These companies are, simultaneously, eager to gain experience in platforms and aware of a need for a shift from where they stand. Some recognized that they would foresee a reduction in transaction costs in the sense of diminishing administrative tasks as well as minimizing customer contact. This is reflected in statements such as

> *The advantage is of course retrenchment, time wise, personnel wise, if you can send out an extremely large number of offers with one click, then that is definitely more efficient than having 10 people calling other people.* (D3/P3-TC007)

> *You have to disconnect the supplier more from the customer. That's why I said full product information and availability has to be posted . . . like a shopping cart. The customer must no longer be interested in contacting me as a supplier. They can make the purchase directly on the platform and my points of contact with the customer are minimized, so my time expenditure is also reduced. I would be willing to pay a commission for that.* (D1/P1-TC006)

A major constraint (on CRPD) noticed in the type 2 companies (the "opportunity seekers") is the rigidity of the technical infrastructure and the operational capabilities constituting a barrier to forward-thinking as a fully automatized digital model since its inception. The first concern expressed by the participants is the *system's integration*, an obstacle referring to the link of enterprise resource planning (ERP) systems of each firm with their nonlinked suppliers and the platform. Undoubtedly, this requires the ability to monitor and update on a daily basis prices and inventories

since automated sales require a sharp and dynamic control of inner processes. The second concern is referred to as the balancing of the *flexibility-to-the-buyer* versus the *business goals*. For instance, Firm 4 shared its organizational sensing of being trapped between the desire to introduce automation with a *self-service* buying system (whether or not in a platform) and the difficulty in achieving a satisfying *parameterization* of the purchase components. They assume to be still insecure about the setting of these parameters, such as the minimum size-to-order or product specifications or even the delivery time/costs, as in a B2B context the over-standardization of digital business is taken as a barrier to global mass trade. They reckon that over-standardization is a significant impediment, which results in an oversimplification the company is not ready to assume without further data and a safe net to avoid the business to derail completely off the track. This firm claims that the functioning of an e-business platform-based is diametrically different from their traditional mechanics, thus, the value added by the platform automating sales processes ought to significantly reduce their resource consumption. They anticipate that the participation in B2B e-marketplaces will come with an improved efficiency benefit: "*If you look at this from the point of view of efficiency, then of course the question is how many process steps can one take off your hands … that's a big advantage, that you can simply act in a resource-saving way*" (D3/P3-TC002). Although the firm's representative reported the strategic vision of a predictable cost reduction yet emphasized an unpredictable reaction of the fit of the technical features to buyer's adoption. The company seems to fit into the group of type 1 companies' behavior ("risk avoidance") not being able to grasp a range of *minimum affordable loss* and *safety forecast* with sufficient clearance as an estimated reaction to the current buyers and other potential target buying audience, avoiding to switch on the plug of any IT incursions into technically exploring the platform functionalities and deepen trade-profiling options. Ultimately, a *collaborative approach* is recommended, especially for type 1 companies, in which any future platform committing may be based on incremental steps. For instance, exploring the settings of multiple platforms and their adequacy to current buyer's profile. Secondly, to explore, again, in several platforms, whether the technical design of multiple-buyer profiling of trade allows for flexibility to establish and mold for the future and exploring the technical potentialities and determine the most suitable to one's needs. Thirdly, engage in discussions with the buyers, and jointly experiment pros/cons, opportunities, and even other commit to bi-/multilateral administrative or political decisions as an informal collaborative research endeavor upon platform utilization.

Moreover, it comes to surface one clear reality about the type 1 companies regarding the preparatory (strategic and operational) capabilities. Despite being large enterprises, these corporations are relatively inexperienced with platform competition matters in a B2B realm and mostly deploy other sales channels in order to conduct their business. Their sales repertoire (capabilities) is more limited as also their business posture (strategy/DBS) is also too more limited and cautious.

This is a completely new branch for us that one have to understand first. (D1/P1-RC003)

This notion of capabilization or upskilling in order to succeed on B2B e-marketplaces was also expressed by another research participant, stating

> *I think one would certainly have to build some capabilities even holding a solid IT support*. (D4/P4-RC001)

In this context, Firm 3 shared how they started in a B2B platform as *gradual* entrance accounting transitioning risks, which is clearly aligned with the recipe we unveiled above (of a gradualist and collaborative approach for type 1 firms):

> *We prepared ourselves. We approached the whole thing a bit like a small project. We built up an extra team that only dealt with it and naturally built up certain expertise.* (D3/P3-RC002)

This quotation brings an anecdote that makes a contrast between type 1 and type 2s. In other words, Firm 3 sustains that nonplatform users overestimate the required technical means (IT capabilities) for succeeding in e-marketplaces. In turn, the lesson learnt is that one firm may acquire some degree of *affinity* to market their products online without assuming the placement of the entire product portfolio of whole business units available online and for all markets. Nonetheless, this quote may, potentially, signal also the shortcomings of IT capabilities. Actually, during the interview the participant (in Firm 3) constantly referred to "market expectations" clarifying that sales managers are professionally biased by nature in B2B markets, individuals, and teams due to the binding commitment to short-term (or at most medium-term) results. He claimed that this is an encouragement to refrain from moving toward new forms of sales as it challenges the *status quo*, especially when the latter is stable and successful in economic rents. Moreover, this participant claimed that companies are though summoned to instill a culture of constant desire/need to learn, adapt, and grow as a positive attribute of the structure strategy linkage. He believed that culture is a "launching pad" that may project the company into the future and shift "nervous market expectations" that segregate change into "ambitious market expectations" that play on with change.

In addition, another theme of seminal importance and rather consensual across firms is *customer loyalty (CL)*. The relative frequencies *(f = 15)* of Table 2 do not live up unfortunately to the true value of the signifiers verbalized by the participants, so we instrumentalize here more intensely a few more quotes to support our assertion that in the German chemical industry the sales repertoire is truly unique, rooted on practices of vis-à-vis sales as the dominant paradigm of customer relationship management (CRM), which unlike other industries exercises a tremendous force of *customer loyalty*. All firms agree that digital communication cannot outstrip the benefits of personal communication; moreover, they argue that this is especially felt in both sides (supply and demand), where the scenario of trade is continuous, stable (in the customer base and deals), and typically long-lasting, and where the demand side is particularly attached to the relations established with the salesforce professional structure of these corporations.

> *I would say very roughly, in our area it's about 90 percent turnover through returning customers or even more. The entire chemical sector is also limited to a certain customer*

base. That means the likelihood of doing business with the same company again is extremely high. In addition, we have many long-term contracts, which means that our customers just keep coming back ... (D1/P1-CL003)

We have settled pretty solid customer relationships. We certainly benefit from this in contrast to companies that have very fluctuating customer relationships. (D3/P3- CL001)

Without customer loyalty, there is no trust and no business. Customer loyalty must be in the forefront and an open and result-oriented exchange is essential. *Of course, you always have to make sure that you keep an eye on the resources and see with which customers there is a connection. But customer loyalty is a clear priority.* (D4/P4-CL-013)

Unquestionably, the importance of loyal and returning customers was a key aspect in the marketing and sales strategies of these four corporations, with the CRM being a dominant component of it. These interviewees placed loyalty at the highest point (thus "*clear priority*"), describing it as one of the most essential features for sales success, which seemed to be grounded in the personal contacts and social engagement of individuals beyond professional responsibilities.

In order to maintain customer relationships and therefore achieve customer loyalty, all the interviewed Sales Managers underlined the (still) relevance of face-to-face communication in the sector. This connection between *personal contact* and *customer loyalty* and its perceived impact on sales performance was a noticeable pattern in the conducted interviews. Additionally, strong direct customer relationships have been pinpointed to lead to less fluctuation in the customer base and lower customer churn, which was described as beneficial for the company.

Conversely, digitalized communication was perceived to have negative effects on relationship building, which seems to be the "breadwinner" of sales in this industry. The main argument firmly advocated by Firm 2 and Firm 4 was that self-ordering systems (or even meeting customers online) cannot fully replace the dynamics of interaction and so substitute in-person meetings as the following observations suggest:

We've done video calls with customers like we're doing now, we've done online events for our distribution partners, we have done webinars and training online, but is not the same thing. You notice a certain fatigue and disconnection. It is totally different from, when you talk to each other in person . . . Of course, you can set a good compromise, but still not the same. (D2/P2-F2F-CL- R3)

. . . I believe that switching completely to digital sales will not work in the future either, because the one-to-one contact to the customer is simply important. Especially for new customer acquisition, and this feeling is not realized via a video call, because you create a different frond when you meet in person. (P4-F2F-I-R6)

P2/Firm 2 emphasized in the customer loyalty context the importance of social networking as a particular CRM approach of this industry of great value, indicating that showing presence and connection with customers have significance even when there is no direct sales negotiation involved:

> . . . That's *why a ski fair works! That's not a sales fair for us. It's a pure presence or a network event, where the customer comes for pure information purposes, but also because of a personal contact.* (P2-F2F-I-R2)

> *. . . if you don't put pure selling in the foreground, the customer is much more likely to come back, if he feels so much more compelled to buy something then.* (P2 CRM R10)

While the results throughout all research participants indicated that face-to-face communication with customers was highly appreciated by the representatives of sellers and buyers, presumably strengthening personal bonds and likely inter-firm relations, yet their signifiers did not represent an irrefutable argument that such strong personal relationships would lead, at the end, to better strategic or financial returns (e.g., higher profits than digital platforms would do or tapping into new business opportunities).

It seems that the industry is not myopic to digital businesses, and one of the participating firms adopts already a hybrid approach. B2B platform-based business models seem to be on the radar of the whole industry with several question marks as to the path and pace of adherence to them. The idiosyncratic condition of the industry hanged by an industry-specific culture deeming proximity as a success factor and a company-instilled concordant position to those dominant CRM procedures seems to be delaying the advancement of platforms, which is dependent on the stable purchasing (frameworks contracts) and long-term institutional buyers.

Keeping in mind that customer communication can be digitalized, *transparency* was a third extensively theme referred to by the participants and against the odds was seen as a risk to their business performance when becoming an increased feature of their business models; however, the participants also acknowledged that there is a growing demand for transparency from the customer side and that increasing transparency might also offer open new opportunities. The transparency was addressed as something to be improved in regard to pricing policies; inventory, logistics, and supply; product specifications; and documentation. Participants assumed that digital sales and platform environments would lead to more transparency on the market, which, in turn, by becoming more transparent would be a challenge for the companies at hand as it constitutes a change in mindset as they also stated the spillovers of perceived transparency and aspiring for higher transparency in the demand side with increased policies laid in the terms of private and public tenures, which may lead to further intangible gains (e.g., rise in ethical standards or reputational gains). One participant stated:

> *I think that's a big mental challenge in a lot of companies. You're giving away your flexibility, you're exposing data, but I think that's the only way it actually creates value for the customer.* (D1/P1-TIP006)

Two others expressed more specific concerns about pricing transparency:

> *The more transparent I am, the less I can hide my gains here and there and it just becomes a price war.* (D3/P3-TIP002)

. . . In terms of pricing policy, is important that we do not tell the customer the cost of goods that we sell – at a higher price – so that we can sell others at a lower price. That remains the internal price engineering. (D2/P2-TIP009)

These statements indicate that companies use a certain degree of transparency in their pricing strategy with a closed book accounting to improve profit margins indirectly (and perhaps in some cases) creating a less transparent market. However, it was also mentioned that

transparency is a disadvantage in the eyes of companies today. I think is seems worse than it actually is. I think the user product specifications are more problematic than price and maybe available quantities. (D1/PI-TIP014)

. . . you won't be able to fully disclose everything. (e.g. compound-recombination´ formulations), but standardized specifications it can be shared. (D4/P4-TIP-002)

It was furthermore noticeable that standpoints differed as to which type of information could harm business performance when made more transparent. While prices and inventory were of concern for some, product specifications and documentation were the key point in the discussion for others. This can further be understood by the following statements:

I think, it is more of an advantage for the customers in the moment that things are made transparent, everyone would make an effort to adapt to the market in one direction or another, which in turn would also reduce barriers to product choices. (D1/P1-TIP- 012)

Another key aspect, traversal across themes (CRPD, CL, TIP, or PMS), was that the chemical industry has a degree of product specialization that for the better or worse impacts the sales activities and confines practices ruling out (among others) some sales channels due to their unsuitability. However, in regard to this unavoidable product *specialization*, there have also been some contradicting statements of the participants about their suitability for B2B e-marketplaces:

The difficulty that I see with this whole platform concept is fewer people, less customer contact of products that have too many specific requirements and the platforms are not suitable for that. (D2/P2-PMS003)

Noticeably, the degree of specialization was also linked to the level of transparency, as to where was stated that

transparency is a question of which business strategy to use. For us if is important to see as intransparent as possible and simply give the customer the feeling that we are the experts. You buy from us and you get the right product. We take care that our product fits your requirements. (D1/P1-TIP011)

Other concerns with more digitalized trades involved chemical raw materials with the customer testing phases that are based on samples and that can take up to 6 months of running laboratory tests. Again, the concerns of feasibility of trading deal and suitability of the B2B platform arise. For instance, the auditing of production plants that is conducted by the buying companies and that might preclude buyers to switch to alternative suppliers simply based on price without auditing any

facilities, quality assurance, and controlling procedures before any trade can take place.

> *This is a limiting factor, there are chemical compounds that have to be tested for half a year in the company*. (D2/P2-PMS005)

> *Difficult, very difficult! It's not easy to determine which products this type of B2B marketplace works better with.* (D4/P4- PMS-R3)

> *What I see in the market is very fragmented. Different platforms focus on different product categories, these is not one platform where you can find all the raw materials one needs nor a specialized offer; so, you have to present yourself on 5–10 platforms because the business groups are totally scattered. That's very time-consuming and I think the work input for the business deal is no longer in a reasonable ratio*. (D1/P1-UNC-001)

Hence, the complexity of trade in this sector and the different levels of specialization in chemical raw materials handling have led to the participants disclosing a specific scenario of industry-related uncertainty as to platform adoption with challenges and drawbacks of implementing one product portfolio into the B2B e-marketplaces. Thus, concerns reach different competitive quadrants: *fragmentation*, *specialization*, *feasibility, suitability*, *risk-taking,* or *transparency*. The issue pinpointed above (*fragmentation)* refers to a breadth of multi-industry platforms, with a diversified offer per platform, overlapping in many cases, encompassing in the pipeline a portfolio of potential partnerships without interest or connection to the focal industry. This feature seems to serve better platform owners (as observed in *Metcalf* and *Reed*'s laws) in terms of platform user's optimization of the infrastructure of most B2B platforms (as to the value matrix and profit-making), making it for the chemical industry a central technical concern as to the attractiveness to other players and their own value proposition.

4 Discussion

This research contributed to the existing literature by assessing the perceived value of platforms to trade in the chemical industry in Germany, unveiling a dyadic paradigmatic context of the adherence to a digital economy in the B2B realm, providing further insights into the complexity of elements at interplay impacting the sales strategy decisions.

Although platform business models provide, seemingly, great opportunities in various industries, thus, benefiting all product market stakeholders by facilitating trade connections (buyer–seller) and moreover, hasty*, easier*, *efficient*, *flexible*, *secure, transparent,* and with *reduced costs* of transaction, our results demonstrate an opposite trend with some, arguably, resistance of the participating firms in this study to their acceptance revealing also some degree of inertia in testing platforms on an experimental basis (Hermès et al., 2020; Hein et al., 2020; Martínez-Caro et al., 2020; Lnoue & Tsujimoto, 2019; Chakravarty et al., 2014).

Despite platforms holding an intrinsic valuable in general to business development, yet the reduced transaction costs are still the most eye-catching benefit firms foresee for themselves while transparency is the least benefit intended to appropriate. The reduced transaction costs are perceived to be likely realized through integration, automation, and digital communication (Lee and Falahat, 2019).

However, the potential value of B2B platforms is not realized in most players in the German chemical industry as their incumbents consider them to have embedded several *uncertainties* and *risks* due to (1) the technicality of the product and supply specifications; (2) the doubtful acceptability, suitability, and feasibility of platform utilization from both sides, demand and supply side (with an assumption that the lack of face-to-face interactions increases information asymmetries); and (3) the encountered *fragmentation* of platforms uncovering the absence of a one-model-fits-all needs to the focal industry (by opposition to the current generalist type of multi-industry platforms).

Hence, at this point in time, the companies included in this research are primarily not active in e-marketplaces and have no substantial track record of e-marketplace participation. Nevertheless, the interviewees recognized the importance of platform utilization capabilities to compete therein in the future (though likely not in such a near future) as platform competition has gained traction in the last decade. Thus, this constitutes still an untapped opportunity (to exploit platforms as transaction facilitators) for various European companies in the B2B realm, but also signals that there may be challenges to realize such potential.

Under an asynchronic current paradigm of trade interaction in the focal industry, customer relationship management is a key element in the marketing and sales processes and herein customer loyalty is a superior objective anchored on face-to-face communication being highlighted as a remarkably valued one by the research participants. Customer loyalty is developed with a significant component of informal and interpersonal (social) networking toward relationship-building, these instruments being a foundation for mutual trust and a strong customer retention. This means that the reduced transaction costs of platforms per se are not significantly attractive to trigger a shift toward platform competition.

In the future, we argue that one might assist a gradual shift in trade patterns with the emergence of a hybrid sales organization (HSO), characterized by a blending of traditional salespeople employed along with digital channel analysts/managers. This can especially be recognized in Firm 3 in their stepwise entrance in the digital channels through such hybrid model, changing the sales processes for the existing sales team and subsequently reconfiguring their capabilities, participating in first instance in platforms as a need for representativeness in a new ecosystem type (in which one wishes to attraction a new audience) and afterward as an accentuated tendency of deal-making beyond the mere capture of new clients or channel visibility, as Firm 3 exhibits a consolidation path of sales, optimization of its omni-channel exposure, and extending the traffic of sales within platforms. However, such path requires an "unlearning of processes" and relearning of others aside with new capabilities-to-be-built (Mattila et al., 2021). Thus, the salespeople's willingness to

adopt new technologies is vital for success in a digital environment but also demand separation from selected old ways of knowing and doing.

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Blockchain Technology and the Future of Accounting and Auditing Services

Duc Nguyen and Bruno F. Abrantes

1 Introduction

The contemporary organization at the beginning of the twenty-first century is exposed to a business environment framework of multiple uncertainties with a set of unprecedented challenges and opportunities. Businesses are becoming increasingly aware of that as the need to rapidly adjust in order to endure and thrive in a contemporary digital world.

In this context, the window of opportunity opened by blockchain technology, as one of the most prominent technological trends of the present, is frequently discussed, beyond expert communities, within economic forums and public policy debates. The *Blockchain Market Report* underpins that such technology was already worth 4.8 billion dollars by the end of 2021, predicting though to accentuate the acceleration of its adoption, with a consequent market capitalization of over 67.4 billion dollars by 2026, corresponding to a compound annual growth rate (CAGR) of 68.4% (Markets and Markets, online).

The attention garnered by cryptocurrencies uncovers though a myriad of applications for a large number of stakeholders in multiple industries. Blockchain is defined as "*a shared, immutable ledger that supports the process of recording transactions and monitoring assets in a corporate network*" (IBM, 2022). The notion of "asset" encompasses in this definition physical assets (e.g., a car or a house) and intangible ones (such as a cash or intellectual property rights). Such technology is regarded as ideal for sharing real-time information with full

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transparency, stored on an immutable ledger that can only be viewed by network members who have an authorized access to it. The central point of a blockchain network is that it allows the tracking of various units of transactional data, including orders, payments, accounts, production, and so forth as a competitive mechanism of business development anchored on dataist logic (Abrantes & Ostergaard, 2022).

In Southeast Asia, namely in Vietnam, the target country of this study, blockchain technology is still in its infancy, with many limitations and obstacles, but the positive changes and applications that this technology offers, particularly in the domains of accounting, auditing, banking, and other financial services, deal with personal/confidential/sensitive data, benefits that are of an unavoidable utilitarian gain. The major virtues in these areas encompass the transparency, security, and stability of the systems, with regard to the administration of (booking or reviser's) datasets, storing market communication and transaction records, nonbreached (exchange of) data, or traceability of information.

For Vietnam industries, the dominant vision is still that blockchain is an esoteric phenomenon for geeks with some more curious incumbents aimed to adapt it in some cases, but facing implementation challenges who do not (in many cases) own the right capabilities to proceed in such direction. Consequently, the implementation is still unclear, but hiding, on the other side, an enormous and promising potential market growth. Moreover, its impact on the financial sector has not yet been thoroughly studied.

This context is especially more appealing as, under the pressure of global trade, the practice of accounting and auditing services has drastically changed in the last years in Vietnam, particularly redefined since 2019 by the *Vietnamese Accounting Standards* (VAS) at the trail of digital technological advancements as its diffusion is now more widespread. This constituted a starting point for a general focus research question (GFRQ): *What's the impact of blockchain technology on the Accounting & Auditing industries in Vietnam?* Such GFRQ is furthermore linked to an overarching general goal/aim: to grasp the impact of blockchain technology in the accountancy and auditing industries in the country. We argue that such an aim requires, beforehand, a general understanding of the scope of blockchain technology, which the revision of literature in the next section will succinctly demonstrate.

Considering the combination of the initial problem and the general aim, this study covers a time period from 2015 to 2022, in which blockchain emerges in the market and is gradually growing without the support of a clear regulatory framework from the Vietnamese government.

2 Literature Review

As underpinned by Friedman (2005a, 2005b), the world is on a flattening journey of differences across different regions. The digital era, with the upsurge of new information technologies, is playing in this context a key role. Digital technologies are blurring our national boundaries, summoning the companies to adapt to the

ongoing rapid evolution of the markets or perish due to the core rigidity of old core competencies applied mistakenly to a fierce digital environment (Taleb, 2007). Therefore, the escape forward avoiding such a disastrous scenario urges firms to test and prepare themselves for such strategic transition, and subsequently manage the change processes as an imperative of business resilience, which ought to function as a motivation activator.

2.1 Microfoundations and Evolutionary Path

Blockchain has emerged as a ubiquitous phenomenon, whose pervasiveness holds a far-reaching impact on people's lives and organizations beyond the labs and offices of scientific personnel (Zheng et al., 2017; Peters et al., 2015). Introduced roughly a decade ago, their original developers, *Stuart Haber* and *Scott Stornetta,* started with a time-stamping framework as a mechanism that safeguards data and the anonymity of data stored, breach-free as well as their social exchange. Using a cryptographic hash functions system, the framework secures that an original document once created is secured through time stamping in the system (chain of) blocks (Haber & Stornetta, 1990, 2007). The blocks allowed the storage of multiple documents per single block, something that Haber and Stornetta argued furthermore to be more convenient and would prevent them from being altered or backdated.

Based on this principle, a computer scientist, *Hal Finney,* developed later the *Reusable Proof of Work (RPoW)* system (Finney et al., 2004). In this system, once one registers the token ownership on a trustworthy server, users anywhere in the world can verify its veracity and authenticity in real time, eliminating the possibility of double spending (Finney et al., 2004). The RPoW constituted itself as an important precursor for the appearance of cryptocurrencies. Subsequently, in 2008, a person (or group) going by the identity *Satoshi Nakamoto* sent a white paper to a mailing list for cryptography proposing *Bitcoin*, a decentralized peer-to-peer electronic cash system. The double spending prevention in Bitcoin is based on the hashcash proof of work algorithm, but rather than using a hardware-trusted computing function like the RPoW is provided through a decentralized peer-to-peer protocol for tracking and confirming transactions. In essence, the proof-of-work method is used by individual miners to "mine" Bitcoins for a reward, which is then validated by the network's decentralized nodes (Easley et al., 2019).

In this context, it is almost unavoidable to bring up "Ethereum" when talking about blockchain networks for two fundamental reasons: its remarkable growth and also for the introduction of the notion of *smart contract*. According to *Vitalik Buterin,* a programmer who co-founded the *Bitcoin Magazine*, a programming language is necessary for the development of decentralized apps on *Bitcoin*. Therefore, he started working on *Ethereum*, a distributed computing platform built on a blockchain and featuring smart contracts, definable as a type of scripting, to be run in blockchain networks. On the Ethereum blockchain, smart contracts can be deployed/run, for instance, to execute a transaction once certain conditions are met, allowing

programmers to create and distribute applications that use the *Ethereum* network, frequently designated as decentralized applications (*DApps*) (Buterin, 2014). Currently, blockchain technology is used more widely than a cryptocurrency and has garnered an increase in a wide range of purposes.

2.2 Core Attributes

On a technical level, blockchain ought to be considered a technology, which is based on a series of encryption algorithms, storage technologies, and peer-to-peer networks. Three major characteristics of such technological ledger are *immutability, consensus*, and *decentralization* (Yaga et al., 2019). The five essentials to understand such technology are (1) the notion of blockchains, (2) the existence of a *distributed ledger technology (DLT),* (3) running of preinstalled *smart contracts* in one's computer, (4) trusted computing environment, and (5) the *proof of work (PoW).*

All these components are required in the creation of a distributed ledger wherein all transactions are recorded and updated in real time at which point all other participants will automatically be given access to the updated data (Zheng et al., 2018). The major virtue of this technology is that the network can trade and track virtually anything, with a reduced risk and lowered cost for all participants (IBM, 2022). Without exception, in the context of accounting and auditing services, blockchain has the role of facilitating the secure transmission of personal and sensitive data via an extremely complex encryption system that replicates with due differences the analogous one utilized in the accounting ledger used in the technical field (Fig. 1).

Data is divided into blocks, the genesis block and other blocks, which are append-only connected, while the distributed ledger employs autonomous computers and those function as a machine connecting the genesis block and other blocks ($i + n$) to record, share, and synchronize transactions in their respective electronic ledgers (World Bank, 2018). The DLT represented thus a fundamental change from the traditional centralized storage model in which data is kept in a traditional ledger.

Moreover, the network can validate blocks using cryptographic methods. In addition, each block includes a *timestamp*, the hash value of the previous block

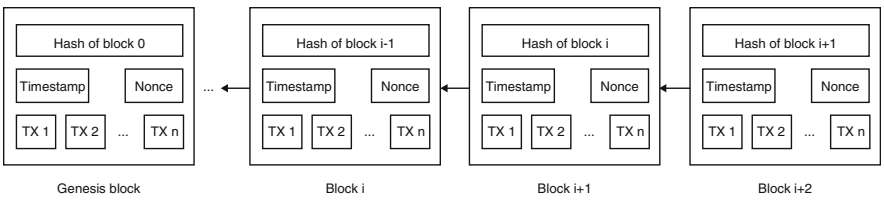


Fig. 1 Example of a blockchain network

("parent"), and a *nonce*, the random number used to verify the hash. If a block wishes to be added to a chain, it must certify itself via a *consensus mechanism*. The latter corresponds to the process by which a majority (or in some cases all) of network validators agree on the state of a distributed ledger. It is a set of rules and procedures that allows multiple participating nodes to maintain a coherent set of facts (Swanson, 2015). Hence, this kind of characteristic has the potential to significantly alter the practices of the whole banking and financial industry by making it more effective, resilient, and reliable (Zyskind et al., 2015).

Each blockchain, which might be argued to be a semi-public data store, is very secure, being though a limited storage medium organized in compartments (blocks), where public good is limited to the safeguard of the user. The *signature* of the blocks allows anyone to verify the owner's input, but only the *owner* (or a program) with the secret key can alter the data contained within the block (Zheng et al., 2017). The blockchain is similar to a datacenter as to the storage function, but unlike a database, its header is not hidden from view (Amazon, 2022). Values or cryptocurrency holdings are two examples of data that can be stored (Di Pierro, 2017). A blockchain is a distributed ledger that can be used as a secure alternative to traditional methods of exchanging value because the data storage process is encrypted. This system relies though on a combination of openness and privacy on being seen by the public while remaining out of the public's hands (Di Pierro, 2017).

The applicability of *smart contracts* to transactions as a self-executing mechanism to digitally enforce, verify, or facilitate the performance or negotiation is characterized by distributed consensus, presuming that there are no conflicting computation resources (Christidis & Devetsikiotis, 2016). Moreover, smart contracts can enhance the credibility of transactions between contracting parties without the need for third parties, as is the case with conventional contracts (Zyskind et al., 2015; Luu et al., 2016; Xu, 2016). Another advantage is smart contracts cannot use secrecy or fully protect the information because its data is replicated across all network nodes (Brandenburger et al., 2019). To resolve this issue, the blockchain nodes should be executed within a trusted computing environment, preventing untrusted nodes from accessing the data. Consequently, it can be stated that the trusted computing within the blockchain guarantees a secure and dependable operating environment and management mechanism using the IoT (Yan et al., 2021).

The notion of *proof of work (PoW)* is also a central one to blockchain operations. Proof of work is a consensus algorithm frequently used on blockchains to confirm transactions and generate new blocks. Specifically, the PoW algorithm requires that individuals are authorized to add data or confirm transactions to perform a substantial amount of work. Thereafter, blockchain transactions become more trustworthy and can be conducted peer-to-peer without the need for a third party. Hence, it prevents double spending and is used to secure the cryptographic ledger in the majority of cryptocurrencies (Bentov et al., 2016).

2.3 Operability

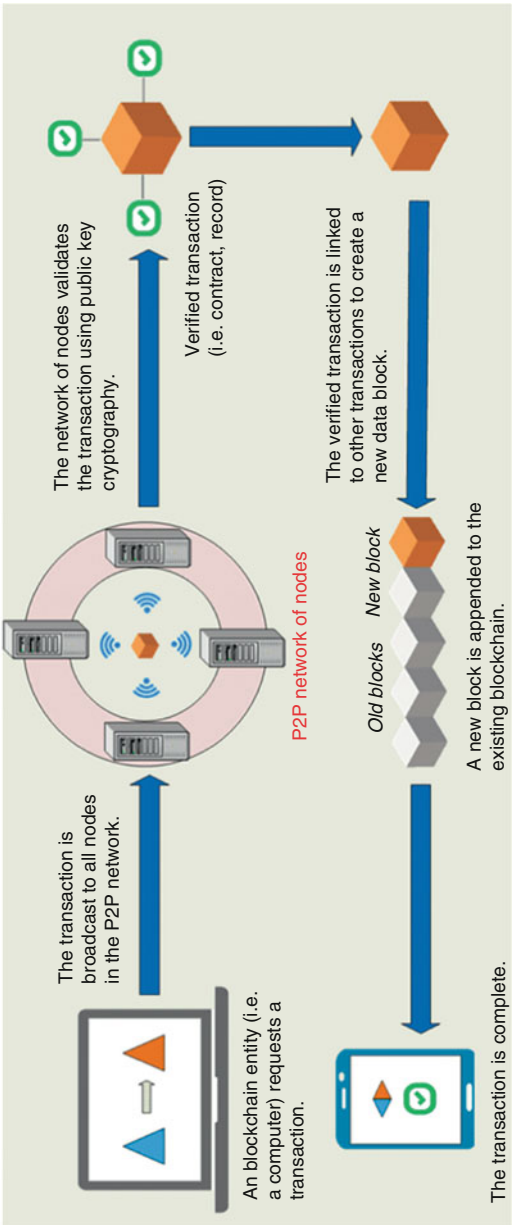
There are numerous ways to explain the fundamental operation of blockchain technology, whether in terms of technical or economic fundamentals. According to IBM's explanation from the technical point of view, the operation of blockchain technology is comprised of three distinct and sequential steps. The steps are recorded, linked, and then blocked (IBM, 2022) (Fig. 2).

Firstly, each transaction is recorded as a "block" of data as it occurs. These transactions represent the transfer of a tangible (a product) or intangible (a service) asset (intellectual). The data block can store any user-specified information, including who, what, when, where, how much, and even the condition, such as the temperature of a food shipment. Secondly, each block is connected to its predecessors and successors. These blocks form a data chain as an asset moves from one location to another or as ownership is transferred. The blocks verify the precise time and order of transactions, and their secure connection prevents any block from being modified or inserted between two existing blocks.

Transactions are blocked in a chain that is "irreversible." Each additional block reinforces the verification of the preceding block and, by extension, the entire blockchain. This renders the blockchain tamper-evident, delivering the immutability that is its defining characteristic. This eliminates the possibility of tampering by a malicious actor and creates a trustworthy ledger of network transactions. Consequently, via the deployment of blockchain technology, security trust will be considerably enhanced, and work efficiency will also increase, resulting in a healthy and productive digital workplace (Yaga et al., 2019).

According to *Blockchain: Blueprint for a New Economy*, blockchain is divided into three versions, focused respectively on currency, trade, and ethical use (Swan, 2015). *Version* 1 entails the currency, services associated with currency and remittances, such as payment systems, and remittance services. There are currently hundreds of various cryptocurrencies on the market, with Bitcoin being the most popular. Currencies may have varying characteristics, such as being pegged to fiat money or actual currency, but their fundamental purpose stays the same: to pay for and transfer digital assets.

Version 2 is about smart contracts on *blockchain 2.0*, as discussed previously. Smart contracts can represent securities, options, mortgages, and intelligent assets. While *blockchain 1.0* refers to the decentralization of money fluxes, blockchain 2.0 refers to the decentralization of the market itself. This notion encompasses all technologies designed to decentralize the relationship between several partners, such as clearing houses, banks, and businesses (Christidis & Devetsikiotis, 2016). Consequently, a BCA is an accounting system fitting within the notion of *blockchain 2.0* intended to represent a particular smart-contract system, in which invoices, payables, receivables, order notes, or other types of receipts typically mirroring a transaction in the general accounting in a double-entry accounting ledger are automatically recorded and implemented.



Source: Nguyen (2019)

Fig. 2 Blockchain operation. (Source: Nguyen et al., 2020)

Version 3 refers to the organizational activity since blockchain technology has moved beyond the financial industry and is being utilized in the government, healthcare, scientific, and social spheres, with its attributes promoting the principles of freedom, democracy, and equitable distribution of wealth (Becker et al., 2013).

2.4 Triple-Entry Bookkeeping and Blockchain Accounting Capabilities (BAC)

Modern financial accounting is pillared on a double-entry registering, known as the *double-entry bookkeeping (DEB).* The creation of the DEB in financial accounting solved the classic problem of trust in own books. Hence, the DEB was created as a bookkeeping accounting, in which every entry (debit) into one account required, at least, a corresponding exit record matching the extent of value of the activity/ies, and vice versa, with these financial transactions occurring in multiple accounts spread across the categories of assets, liabilities, equity, expenses, or income.

However, blockchain technology might well represent the next step in accounting. Instead of holding separate records based on transaction receipts, companies are able in the present/future to record their transactions directly into a shared ledger, creating a system of continuously linking accounts. Since all records are distributed and sealed with cryptography, any harmful event caused by the willingness to tamper, hide, or destroy them is essentially an activity with an almost impossible successful outcome.

With the development of microfoundational technology leading to appearance of blockchains, notably, the concept of *triple ledger accounting* appeared in 2005 with *Ian Grigg* approximately 3 years before the actual unraveling of blockchain as a novel technology. In order to explain its meaning and application to the accounting realm, one would need to step into the concept of *blockchain-based accounting (BCA)* as a model of *tripartite accounting*, which is described as an improvement to conventional double-entry accounting in which stakeholders' accounting entries are cryptographically sealed by a third entity. Thus, the immutability of any data makes it literally impossible to falsify or delete written accounting entries.

The first coherent description of a blockchain accounting capability (BAC) was conveyed by Lazanis (2015) referring to conventional companies. He emphasized that blockchain eliminates the need to trust any intermediary such as a bank or insurance company. Companies are expected to benefit in many ways. *Standardization* will allow accountants and auditors to automatically verify a large portion of data behind the reporting to stockholders and investors. In addition, the cost and time required to conduct an audit will be significantly reduced and auditors may consider to re-center their energy toward other development tasks. As the use of technology is transparent so is also extremely useful in today's accounting structure for ensuring the integrity of records and their full traceable auditing processes.

Moreover, BCA brings visibility to all transactions for approved users, and this can reduce the auditor's job in sampling and validating transactions. We argue that more or less in the near future it will evolve further as companies begin to imitate each other and proceed embedding blockchain technologies from the simplest applications as customer-relation-oriented no-code *chatbots* (e.g., *Jenny, Vainu, GPT*) into more complex forms integrated into their enterprise resource planning (ERP) systems, leveraged by artificial narrow intelligence (ANI) mechanisms (e.g., *Alteryx, IBM Watson*, or *RapidMiner*) applicable to internal controlling and involving transactions of high complexity or vertically integrated tasks—such as procurement and supplier management—in which the role of accounting and auditing might be expected to change drastically in the direction of automated audits. Eventually, fully automated audits might become a reality and the dominant paradigm.

3 Design and Data

3.1 Methodology, Profiling, and Document Analysis Framework

The purpose of the study is to evaluate the influence of BC technology on the accounting and auditing functions using as a testable market outlined in the introductory section. Considering the GFRQ presented in the same section, the precursory/general-focus RQ is divided into three clear testable propositions:

- *RQ1 (OTs): What are the opportunities and threats arising from the use of blockchain technology in the practice of accounting and/or auditing?*
- *RQ2 (SWs): What are the strengths and weaknesses/difficulties of local firms to implement this technology (namely the specific constraints of the focal functions)?*
- *RQ3 (Innov. Strategy): How prevalent is the use BC technology (specifically in the auditor and accountant's work) and the relation with blockchain-tech providers?*

The RQs are set to observe the internal context and the external context of one firm and cross-observe the prior ones to seek answers for the status of tech utilization and the typology of utilization.

Blending two of the categories of research of Collis and Hussey (2003), we followed a descriptive-evaluative archival research as a purpose, utilizing though a mono-method approach. The study holds a predominant descriptive nature attempting to map out the background of the Vietnamese financial sector and role of blockchain on it played in the sensitive organizational functions of accounting and auditing.

The path followed (qualitative) the analysis of data and instrumentalizes the thematic analysis (TA) as our empirical framework, which seems an adequate

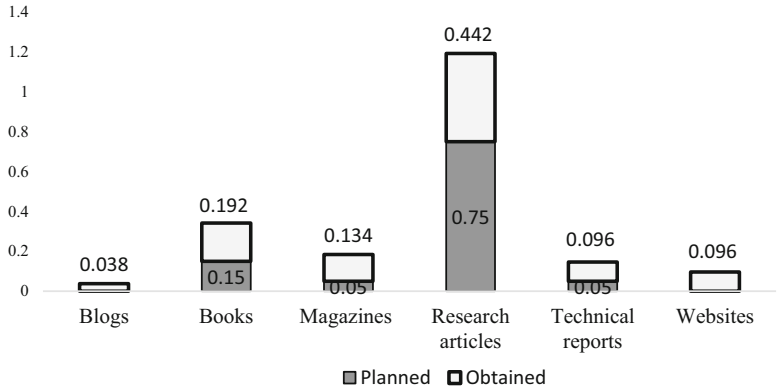


Fig. 3 Distribution of data per typology of sources. (Source: Own elaboration)

method applicable to archives (Bowen, 2009). Hence, the primary focus of qualitative data analysis (QDA) procedure was an in-desk study of the topic, in which documentary sources had origin on multiple streams of data as outlined in the section as to the profiling of the sources.

One might clarify that the planning of the collection of data as described beneath encompassed the utilization of five types of documentary sources (i.e., research articles; books; and technical reports; financial and technological magazines) focused on the Vietnamese market; however, the scarcity of information, considering furthermore the *Boolean* searches we had run, accounting for both Vietnamese and English languages, implied a shift in the sources in use to six sources (i.e., blogs; books; magazines, in general; newspapers; technical reports; and websites).

The direction of the study, with an ongoing adaptation of the sources in use, implied the opening of the spectrum of archives in number, but also enhancing the use of webgraphy. Thus, it is quite evident that there is a gap between the expected framework of data sources and the obtained ones that one managed to reach in the end. The balance (of expectations versus outputs) implied a shift from the use of applied research documents into a more hybrid form, combining applied and basic resources. Yet, applied research was still the predominant source available on this topic. The figure makes a representation of planning of data sources per typology and crosses it with the relative frequencies of categories of data utilized at the end.

Figure 3 illustrates the distribution of expected and gathered data at the end, in which the relative weight *(f)* of research articles decreased almost to half (0.44) from what we projected from the beginning of the project (0.75). Table 1 represents amply those changes in the access to sources.

The number of sources with a total of 52 documents ($N = 52$) revealed that applied research accounted still for 73.1% of the sampled units. Nonetheless, with some significant variation to the planning as emphasized below (see Table 2 and Fig. 4).

Table 1 Frequencies and deviations in data sources

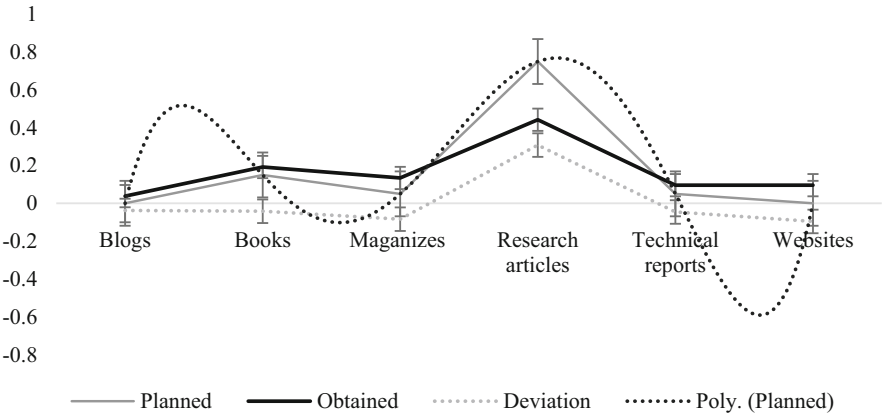
Sources	Expected		Gathered		Deviation
	n	*f*	*n*	*f*	
Blogs	–	0	2	0,038	−0,038
Books	–	0,15	10	0,192	−0,042
Magazines	–	0,05	7	0,134	−0,084
Research articles	–	0,75	23	0,442	0,308
Technical reports	–	0,05	5	0,096	−0,046
Websites					−0,096

Source: Own elaboration

Table 2 Measures of central tendency

Data	*n*	*f*	$\bar{X}$	Med
∑ (sources)	2	0,038	11,5	11
N	52	–	–	–

Source: Own elaboration



Source: Own elaboration

Fig. 4 Data outputs: deviation and standard error. (Source: Own elaboration)

Figure 4 shows the output data and polynomial function (*order* = *5*), in which the rather discrete categories are measured and the continuous variation curve from one category to the others and furthermore accounting for the standard error figures.

In sum, Table 1 and Fig. 4 demonstrate that the study proceeded predominantly with applied sources, in which the analytical procedure applied to them as disclosed in this section follows an identical approach to the one established by Bowen (2009) document analysis framework.

The methodical procedure influenced by the seminal work of *Glenn Bowen* was encompassed from the search for relevant documents (over a trimester length) to the treatment of 52 documents even though constrained by the meager research conducted in this field so far. Hence, the systematic procedure of documentary

Table 3 Document analysis process

Phase	Description
1	Planning of data requirements and running a *Boolean* search
2	Screening of data inputs
3	Scanning inputs and documents' exclusion (sample's definition)
4	Initial organizing of the sample per document's category
5	In-depth reading of sampled units (*n* documents)
6	Note-taking per source and registering of the extracted ideas
7	Cross-reading of notes and comparison of ideas across sources
8	Extrapolation of results and a roadmap about the topic

Source: Own elaboration

analysis self-refined from the one above followed eight steps from search, observation, and mining to the extrapolation of ideas (see Table 3).

The tags "Blockchain," "Vietnam," "Accounting," and "Auditing" were combined with respective *Boolean* operators to filter the sample to the strictly related documents to the topic. The query was applied at *Google Scholar* and *De Montfort University (DMU) library*.

3.2 Results

The results presented below, both in short and long term, make reference to some of the sampled documents of the study. Firstly, in the short term, previous literature envisions a shift in the way companies will work with technology affecting front-end practice with customers. They predict that auditing is a function likely to become digital and continuous in the close near future (ACCA, 2016). But, in the long run, such a trend will accentuate itself as audits will likely be done through automated transactions and will increase the use of predictive tools and artificial intelligence to spot any anomalies, non-conformities/compliances, and identify trends. BC is expected to be further used as an apparatus to enhance risk and fraud-control, as well as eliminate manual tasks. More parsimonious in future envisioning, Pat Sweet argues "*auditing processes and financial transactions will not remove the need for professional judgment*" (Sweet, 2019, online).

The same sources state that the use of blockchain by auditors for independent data mining, real-time monitoring, exception reporting, and unmodifiable evidence will be a common practice in the future, and BC is presumed to change the way records of accounting transactions are kept. The traditional accounting system will move to write transactions into an open ledger; the transaction data is verified and not fake data. This can reduce the auditor's time and resources on some of the more mechanical steps in the audit process and allow for greater focus on areas that require critical judgments such as redundancy and estimation. Table 4 summarizes and discusses in more depth the possible impact of blockchain on audit practices.

Table 4 Blockchain influence in (external and internal) accounting and auditing (A&A) activities

Activities	Impact	A&A processes	
		External	Internal
Collecting evidence	The census replaces the traditional sampling method; direct access to transaction history	X	X
Transaction validation and verification	Real-time transaction confirmation by a network community All records are verified and maintained by all users	X	X
Compliance assessment	Built-in compliance with the most recent standards, regulations, and laws Immediate presentation of basic regulations to an operator Detect violations immediately	X	
Transaction reconciliation	Automation of reconciliation (if transactions take place between parties in a single blockchain network) Resolve immediately Reduce the time spent on collation and increase efficiency	X	X
Financial statements	Near-real-time financial reporting There are no errors Fraud is unlikely	X	X
Planning and consulting	Provide complete, accurate records for auditors to quickly uncover problems, prioritize plans, and find long-term patterns	X	
Support decision	Provide reliable and timely information stored in the blockchain to perform analysis Predict the consequences of actions Facilitate smart contracts using embedded analytical models (i.e., to identify trends)	X	

Source: Own elaboration

In short, the application of blockchain technology in these focal will convey benefits such as time and process efficiency, reducing steeply the resources allocated to it, as processes get streamlined by AI and more concisely and efficiently portioned into smaller tasks (ACCA, 2016). However, transactions recorded in a blockchain may remain fraudulent, so auditors will be needed anyway to undertake duties of minutia. From the insights gained from our sample, there is a general feeling that BC advantages outstrip its risks and disadvantages (Hà, 2019; Nguyen et al., 2020; Nguyen et al., 2018). The application of blockchain in accounting and auditing is though in its inception not just in Vietnam but across the large majority of practitioners worldwide.

In the coming years, accountants and auditors are expected to embrace gradually that this technology will have positive changes associated with technology. By streamlining processes and eliminating duplicate tasks, AI and blockchain together might lead auditors to create more efficient and secure deliverables through the adherence to verified and unchangeable systems, in which they may program

specific control protocols for each smart contract and so focus on more complex projects as one whole integrated inventory data check rather than test samples (Accounting Today, 2017, online). In the same source, *Joel Shamon*, national audit leader at RSM in the United States, asserted:

Instead of working with the client's accountant, the auditor will work more with the IT department to access information and check through transaction cycles, or the auditor must maintain data literacy and analysis, be skilled in translating data samples into relevant audit evidence to improve audit efficiency and quality.

On the other hand, the auditor will see an increase in management's estimates, particularly for the accounting standards surrounding the aspects of revenue, leasing, and loan-loss provision. These are significant changes that move the recording of account information of financial statements from historical or transactional based on estimates. Once other aspects of blockchain are adopted, auditors will have to focus on the security and reliability of the blockchain. So, even though blockchain is designed to automatically generate transaction flows and trigger events, auditors will not be able to rely solely on blockchain to initiate a transaction unless they can prove that the blockchain is secure and works by design (Accounting Today, 6/2017). Hence, the component of IT capabilities is key and so the accounting and auditing professional will require inevitably an upskilling of professionals toward the fulfillment of the above. These capabilities will be essential in the close future everywhere.

3.2.1 Impact of BC Technology on the Formation of New Capabilities

One of the aspects clearly emphasized in the reviewed documents was the technological disruption of the old-fashioned double-entry bookkeeping. With the BC, once the accounting records are saved to the system, they cannot be modified or altered. Since every daily transaction is recorded and verified on the blockchain network, this ensures the accuracy of financial records. According to Nasdaq (2017), the top-tier consultancy firms (*PwC, Deloitte, E&Y*, and *KPMG*) have all established research committees on blockchain and institutionalized its use in their accounting practices. For instance, Deloitte has released *Rubix*, its first blockchain-based software platform that enables users to create a custom blockchain and smart contract (Minichiello, 2015). *KPMG* has partnered with *Microsoft* to build its digital ledger services, which are claimed to enable faster and more secure transactions, streamline back-office activities, and reduce costs (KPMG, 2018). Similarly, Ernst & Young developed *EY Ops Chain* focuses on payments, invoicing, inventory data, pricing, and digital contract integration (Prisco, 2017).

Blockchain is regarded as the next generation of "accounting technology." In lieu of separate accounting books for each business unit based on invoices and receipts of originating transactions, they might record their transactions directly into a common register, so creating a system of interconnected accounting records. Since all registry entries will be distributed and cryptographically sealed, it is allegedly impossible to fabricate or destroy them to conceal actual activity, which some authors regarded as the next generation of accounting system, the "Triple-Entry Accounting" (Peters &

Panayi, 2016). As presented in Sect. 2, this constitutes an improvement in traditional accounting systems involving a higher degree of *security* and *transparency*. The BC tech ensures *the integrity* and *confidentiality* of financial data, with every transaction being recorded and verified, hence the records remain intact.

BC-secured and transparent databases in the field of accounting will provide furthermore a broader ground, with equal excellence, to track other streams of data, including the tracking of goods/services as they move physically or digitally throughout the supply chains and across organizations (Kluwers, 2018). In addition, BC implies *authenticity* of parties and transactions, ensuring that payables/receivables with minimized risks for parties, as the ledger safeguards the financial accuracy of records and prevents data change manipulation and fraud.

In this context, we do concur with the assertion of ICAEW (online) and KPMG (2018), BC tech is poised to upgrade traditional invoicing, voucher, contract, and payment processing methods across all industries, making accounting a faster and more accurate process. Furthermore, we foresee the accounting and auditing professionals to evolve significantly in IT capabilities. It is expected that the simplification of processes and delimitation of tasks will lead to fewer jobs, with the reduction or even the elimination of double entry-effectiveness or the verification of the provenience of information. Technology and management consultancy are sectors likely to expand, in which accountant skills are a plus to advisory job's opportunities, where the IT skills are likely "the" transversal differentiating factor across candidates with identical level of education and experience.

3.2.2 Specific (Dis)advantage/s of BC

For the accountant or auditor, blockchain technology is a synonym for security, transparency, efficiency, evolution, and growth. These profession-specific insights contrast with the incumbent's strategic view in senior management (as discussed in Sect. 2) that perceive it as something experimental in the domain of computer sciences, believing that eventually some curious minds are willing to adopt though incurring some risks. From our document analysis, the first ones perceive BC as a gain of efficiency in their daily activities. For instance, the most clearly noticed was the dropping of tasks related to confirmatory checks of accuracy of the information, once using blockchains. This is believed to have a profound change in the way things are done so far. It is argued that blockchain solutions combined with big data analytics can validate the level of transactions involved in audit work. To accurately audit a company with blockchain-based transactions, the auditor's focus will be limited, and the auditor can obtain the information needed in a consistent and continuous manner.

The second aspect also pinpointed as an advantage is security of the BC network. This concurs with the revision of literature in the previous section. We found ground on this advantage cross-observing it with previous literature. For instance, as emphasized by Nakamoto (2008), Yaga et al. (2019), or Brandenburger et al. (2019), BC is designed to withstand data modifications. Information contained

there is traceable and cannot be modified and can only be added when all nodes in the system agree. This means on a very unlikely hypothetical scenario of a data breach in one portion of the BC system the other computers and nodes will continue with safeguarded data on an ongoing basis as the ledger checks and corrects the data automatically without the participant's intervention; thus, accountants are not required to process and adjust the entire transactions. In short, employees will not need to spend hours beyond business hours compiling and updating financial data in accounting software (Lazanis, 2015).

Despite the technology ought to decrease inaccuracies and fraud, the scouring of data in the documents unraveled also some skepticism about the practice of accountants/auditors within the BC network.

Firstly, data is supposed to be always correct in the blockchain, but this is only true if and only if all the parties have been engaged in reliable informational inputs to be transferred to the system blocks. The reliability of the information even without any data breach seems to be contingent on the how's the process is constructed like. The quality of the inputs determines the accuracy of overall information and any "blind reliance" on blockchain technology might be hazardous for the companies.

Secondly, one is expected to gather a sheer volume of data that might result in information overload and obstacles to its effective control.

Thirdly, a system with inadequate design might pose a wide range of risks. If the fashioning of the system and the original implementation of BC consensus processes are inadequate, subsequently, the information recorded will be untrustworthy.

Fourthly, if a participant manipulates the consensus protocol or the organization engages in off-chain activities, the recorded information is equally unreliable and may generate an untrusted information cascade. Users should be very conscious of such risks because the dependability of the technological benefits is contingent on the dependability of the designed architecture of business process/es and practice. Nonetheless, accounts/auditors are error-prone such as any other human beings, and so it is quite difficult even for senior professionals to put to devise a suitable monitoring system to install and maintain the system, on a continuous basis, with an inflow of error-free data.

Fifthly, these four aspects summarize a clear fifth point of skepticism (that we foresee as a great opportunity), that is, a capability gap of these professionals to clutch these expectations for the use of BC and overcome technical barriers. In evidence, there is the need for these professions (and specialized) and firms to develop IT capabilities, and more specifically BC capabilities in general, and particularly BC capabilities surrounding the initial verification of data to be launched therein.

Inevitably, a BC revolution is imminent, as argued by the *Association of Chartered Certified Accountants (ACCA),* asserting that some auditing firms have already started to utilize image recognition technology upon inventory checks, connecting cameras mounted on unmanned equipment to computer systems, and arguing moreover that more than half of their chartered professionals believe that automated accounting and auditing systems are the future coming closer to their firms/clients.

Table 5 Opportunities and challenges of blockchain implementation in accounting and auditing

Category	Opportunity	Challenge
Permissionless BC	• Easily check and records transactions on the blockchain • Development of a new audit process for blockchain transactions • Verify consistency between entries on the blockchain and in the real world	• Cannot reverse erroneous transactions • There is no centralized authority to verify the existence, ownership, and measurement of items recorded on the blockchain • Difficulty in retrieving data due to customer loss of private key • There is no centralized authority to report cyberattacks
Permissioned BC	• Developing guidelines for blockchain implementation • Leveraging industry knowledge and experience to advise on best practices for blockchain consensus protocols • Taking advantage of the business networks to form permissioned blockchain based on market demand • Acting as planner and coordinator of potential blockchain participants • Leveraging IT audit expertise to audit blockchain' s internal controls, including data integrity and security • Providing an independent rating service for a particular blockchain	• Need to be proficient in various blockchain technologies • It is difficult to reach consensus rules among all participants when acting as an organizational agent • How to solve the situation when the central authority has the power to overwrite the information on the blockchain • Deal with the change of consensus protocol in a blockchain

Source: Own elaboration

In sum, the current major problem unfolds in a triadic of aspects: capability-acquisition, technology-ownership, and shift of controlling practices. We argue that the future will bring a BC technology-centered practice but not a human-free one. Despite that launching may be automated such as the validation of information across blocks; nonetheless, common sense buzzes our hears that one should invest in other activities of bookkeeping integration across divisions and subsidiaries and instill a practice of thorough planning of the system design and verification of data units. Yes, these professionals will be needed anyway (perhaps even more), regardless of the technological progress and the acquisition of newer capabilities, the future carries both challenges and opportunities, as succinctly outlined in Table 5.

In general, it can be remarked that while the landscape of blockchain technology is still in its infancy, it carries a great deal of transformative potential. Creating a new platform to redefine the accounting and auditing fields, blockchain transaction tools provide the biggest prospects for change in these areas. There are many reasons why blockchain is undoubtedly one of the most debated technologies of this decade. As a type of "indestructible" (or unalterable) ledger, blockchain accounting provides a mechanism to store data that is simultaneously available to auditors and regulators. This could decrease the need for accountants to record transactions in disparate locations with no means to combine or validate them. Blockchain is able to provide a

more secure and transparent framework for accounting and auditing to trace transactions and safeguard assets

Consequently, traditional accounting is on the verge of a disruption that will alter the role and demand for accountants within an industry with a shift in functions and skills. In order to execute and manage data effectively and efficiently, accountants and auditors will soon have to become interpreters and direct decision-making facilitators in the digital ledger. However, the path is expected to be still a long one particularly to Vietnamese firms while attempting to replicate these worldwide accounting and auditing firm growth trends. The dominant paradigm of professional practices across departments and consultancy firms in Vietnam ought to be modified to reap the benefits of BC technology, and moreover likely react to the expected demands of enterprises that are the early adopters of technology, adhering to industry 4.0. We gathered evidence of several business that began to modify their organizational models to include seminal technologies such as blockchain, big data, and/or artificial intelligence in Vietnam; however, this heuristics is somehow a tortuous journey where the required changes to adapt are unprecedented and the learning is experiential, transformative, and path-shaping.

4 Discussion

According to the *Vietnam Blockchain Panorama Report* from 2018 published by *Nicole Nguyen* and her colleagues, the Vietnamese banking and financial sector has made a significant headway in using blockchain technology (Nguyen et al., 2018). The Vietnamese government actively approached fintech in 2017, launching a set of initiatives to establish a strategic discussion committee to bring awareness to local agents and stimulate research and development in this area. These scholars estimated the existence of approximately 50 fintech firms and such number seems to be growing in diverse services (e.g., from payments; money transfer; wealth administration; to capital investments) and 14% of all Vietnamese financial market agents are willing to develop specific products within this realm, including 91% of all commercial and investment banks. Such dynamics of recovery of such structural technological delay is seemingly leveraged by a set of Vietnamese tech firms pushing BC adoption further (e.g., *Viettel Business Solutions Corp, TMA Solutions, FPT IS,* or *MISA Joint Stock Co.,* among others). Besides, a trend is emerging of BC startups with the opening of investment capital to blockchain startups (e.g., *Vakaxa, AChain, Kambaria, Kyber Network*). For instance, one of the accounting software enterprises in Vietnam (*MISA)* has built upon BC, having already put into practice an e-invoicing software (*MeInvoice.vn)*, whose application was already implemented by *Vakaxa*. The application of e-banking connection services, based on a blockchain platform, is also integrated into the *MISA* accounting software Anh (2019). As a result, the enterprise's information security is gradually increasing, and in the opposite direction, decreasing the purchasing costs, with software users receiving

documents more quickly and the tax authorities having the ability to easily scan any record (Thu, 2019).

In addition, other application platforms in BC accounting are also being researched by information technology (IT) and software development (SD) companies in Vietnam, namely in the domain of smart contracts.

Yet, the first obstacle in BC adoption arises from the Vietnamese software disadjustment as to the compatibility of the Vietnam Accounting Standards (*VAS*) to the international financial reporting standards *(IFRS)* as to the fulfillment of the international accounting standards (IAS) and their suitability for the characteristics of the Vietnamese economy and to the context of the Vietnamese businesses (Bizpective, 2022). It remains still a substantial gap between *VAS* and *IAS/IFRS*, which has a considerable impact on the integration processes of Vietnamese firms particularly with frequent cross-national records, affecting most directly Vietnamese MNCs.

An investment from the Vietnamese government's side in creating policies that alleviate such constrain and moreover improve the public IT infrastructure toward the promotion of an easy, timely, and secured synchronization of local with international data is crucial. The governance of these issues is summoned to place a high priority on the promulgation of a bill that mirrors the VAS in the international norms, the latter disclosed in the IAS.

We do commend a public discussion leading to the fashioning of a project law with directives for the implementation in the near future—a couple of years (2025)—that would mirror the IFRS at three levels: (1) companies with a public interest, as to the implementing of a "prototype" of IFRS; (2) other public-owned and private-held firms using a dual VAS/VFRS; and (3) and a more simplified accounting regime that revision would target micro-, small-, and medium-sized enterprises. As a result, full IFRS adoption will assist Vietnamese accountants in ushering in a new age, transforming the way financial statements are recorded, measured, and presented. Moreover, we argue that public policies ought to stimulate the training of professionals (in particular, the up-/reskilling of accountants and auditors) and furthermore stimulate the influxes of highly qualified professionals of the Southeast Asian member countries of the *ASEAN Economic Community (AEC)* and other professional from the Asian regions from major economic spaces as China, India, or Japan; and subsequently to encourage consistent cross-border collaborations.

It is crucial that all stakeholders understand that the auditor's profession faces real risks from blockchain technology and must adapt accordingly (Coyne & McMickle, 2017). Auditing firms need to have a deep understanding of international business management and operations to be trusted advisors to companies adopting cutting-edge technologies; and consequently, their professionals need to modify and improve the function of strategic partners to accommodate the shifts brought about by this disruptive technology (Karajovic et al., 2019). The auditor should take the following preliminary actions during the current time to adjust to the new environment: knowledge and control gains over blockchain systems; and take part in BC tech developments, while considering their risks.

Auditors need to be able to weigh the pros and cons of using different blockchain solutions so that they can advise their clients (Sheldon, 2019). Such objective ought to be realized through the modification of their approaches to hiring and training; thus, this refers to what we have designated as the "BC capability quest." The role of auditors needs to evolve from checking for compliance to evaluating the efficiency of risk management and providing advice on how to improve internal controls and provide greater guarantees. There are huge possibilities for auditors in today's fast-developing technological landscape. Auditors should look ahead to the following potential outcomes in order to advocate the quality of their services and maintain or improve honorarium: migrating to continual auditing; and creating a BC consulting function.

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