Network Focus and Scalability in International New Ventures

by

Bisan Abdulkader

to be submitted to

Central European University

Department of Economics and Business

In partial fulfillment of the requirements for the degree of Doctor of Philosophy in Business Administration

Supervisor: Gyorgy Bogel

Vienna, Austria

October 2021

CENTRAL EUROPEAN UNIVERSITY
DEPARTMENT OF ECONOMICS AND BUSINESS

The undersigned hereby certify that they have read and recommend to the Department of Economics and Business for acceptance a thesis titled "**Network Focus and Scalability in International New Ventures**" by Bisan Abdulkader.
Dated: October 4, 2021

I certify that I have read this dissertation and in my opinion it is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.
Chair of the Thesis Committee:

DocuSigned by:
Michael LaBelle
246A5DB2EC31408...
Michael LaBelle

I certify that I have read this dissertation and in my opinion it is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.
Advisor:

DocuSigned by:
György Bőgel

I certify that I have read this dissertation and in my opinion it is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.
Internal Examiner:

DocuSigned by:
Yusaf Akbar
7E0AF0BB0E4422...
Yusaf Akbar

I certify that I have read this dissertation and in my opinion it is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.
External Examiner:

DocuSigned by:
Jonathan Calof
0D055DAC81E4428...
Jonathan Calof

I certify that I have read this dissertation and in my opinion it is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.
External Member:

DocuSigned by:
Manlio Del Giudice
E0E589B6C738418...
Manlio Del Giudice

CENTRAL EUROPEAN UNIVERSITY
DEPARTEMENT OF ECONOMICS AND BUSINESS

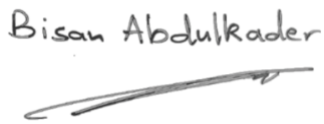
Author: Bisan Abdulkader

Title: Network Focus and Scalability in International New Ventures

Degree: Ph.D

Date: October 4th, 2021

Hereby I testify that this thesis contains no material accepted for any other degree in any other institution and that it contains no material previously written and/or published by another person except where appropriate acknowledgement is made.



Signature of the author

Abstract

Purpose – The firm's network is gaining a great deal of attention as an important nexus of study as it is considered to be a significant holder and influencer of a firm's knowledge, which in turn is widely recognized as a unique source of competitive advantage. Although the literature tends to focus on social networks or inter-firm relationship networks, it has seldom addressed networks at the operational level which involves examining the influence of the firm's internal configuration of activities on growth. This study aims to find evidence of the extent to which network focus plays a role in the internationalization and scalability of young enterprises. Specifically, the study posits that international new ventures (INVs) are potentially recognizable in the early years by the idiosyncratic use of the network as a holder of knowledge and information in a strategic internationalizing posture. In this regard, the network is viewed as a key component of the coordination of value chains in the combination with technological learning and ambidexterity, namely exploitation and exploration activities.

Design/methodology – The study adopted a sequential, mixed-methods approach (quant-Qual) with an emphasis on the qualitative study. In the first (quantitative) stage, the research question tested the significance of network factors (network embeddedness, technological learning, ambidexterity) in influencing the level of international expansion and scalability, as well as through moderating effects. Surveys aimed at 200+ young enterprises (up to seven years old) with the potential of becoming INVs were disseminated to a wide range of innovation hubs across Europe, resulting in 40 usable responses. Five firms were then purposively selected in order to allow a further, in-depth (qualitative) investigation via online calls with CEOs or members of top management. During this stage, the quantitative results were thoroughly analyzed, thereby deepening understanding of the moderating role of organizational connectedness, which proved to be significant in the relationship between network focus and scalability. To this end, the study looked at the knowledge information flows at the activity level in the value network to highlight the mechanisms and processes in place in the business scalability path.

Findings – In the quantitative analysis, the network focus resulted in significant scalability only if moderated by organizational connectedness. The qualitative study confirmed this result, finding organizational connectedness to be a critical factor for scalability, relying on agile structures and showing high sensitivity to the impact of network embeddedness.

Technological learning and ambidexterity were found to be two instrumental factors that, when combined with network embeddedness, strengthen the process of acquiring new knowledge and information about internationalization and high-potential opportunities.

The case analysis emphasized that network management and knowledge information flows, occurring along the value network, must be analyzed against the relative phase to which the firm has evolved. Through the adoption of a phase-model approach, a better strategic posture of the firm towards network focus becomes more evident. In fact, while in the emergence phase, the identity-based network and cohesiveness are found to be predominant. In the early

growth and expansion phases, the network strategy shifts toward a calculative-based network directed at filling structural holes and reaching a globally relevant network.

Overall, the qualitative study findings emphasize the need to develop a network-based strategy to stimulate growth systematically, which in turn will facilitate the optimization of knowledge and information towards scalability. The interviewed firms viewed network focus mostly from an operational standpoint, and less from a strategic one.

Practical implications – The study's main applicable finding was the proposed adoption of a value network approach in a firm's growth strategy. The cases analyzed demonstrated that increasing internal and external connectedness strongly benefits young firms that can effectively manage resources that emerge from the network (*in primis* knowledge and information flows) towards scalability and international expansion. The implications of the findings are also pertinent to public policy that supports the internationalization of young enterprises. In particular, there is a need to recognize, at an early stage, INVs' potential and to support their strategies in network development by identifying key activities and attributes at different phases.

Research limitations and future research – The first acknowledged limitation of this study is the restricted sample analyzed in the quantitative stage. Future research should replicate the study addressing the hypotheses in a larger representative sample. The second acknowledged limitation is inherent to the formulation of the notion of network focus and the testing of a direct causal relationship vs scalability and international expansion. When examining the notion of network focus (intra-firm and inter-firm value chain coordination of activities) future research should address the idiosyncratic operational traits specified by the qualitative stage of this study.

Acknowledgments

This work was inspired by the Phoenicians, my ancestors, the master seafarers and traders who created a robust network across and beyond the Mediterranean Sea, spreading technologies and ideas as they traveled. The Phoenicians established bridges between the disparate civilizations spanning the Mediterranean and near East, facilitating the exchange of not only commercial goods, but also knowledge, culture and religious traditions. Their expansive and enduring trade network can be credited for having laid the foundations of an economically and culturally cohesive Mediterranean, which was continued by the Greeks and Romans.

The journey of developing this thesis has been as challenging as it has been inspiring. The multi-disciplinary background I have as a trained physicist, an MBA graduate and a practitioner of innovation management granted me several lenses of analysis through which to conduct this research. My passion for the research topic motivated me to read about networks in the context of multiple disciplines, including social physics, network science and business strategy. I was particularly intrigued by the opportunity, in analyzing business networks, to apply methodologies derived from physics and mathematics.

Throughout my journey of discovery, I was fortunate that my enthusiasm for the research was matched by the wise guidance of my dedicated supervisor, Professor Bogel, to whom I am deeply indebted. Professor Bogel supervised this thesis in numerous and lengthy conversations with me which supported me in conceiving how the theoretical work could be applied empirically. With his soft but steady guidance and support, Professor Bogel played a pivotal role in helping me identify the right path, both for the present research and for related studies to be conducted in the future.

I would also like to acknowledge the members of the doctoral committee for their dedicated time and effort, and for the positive feedback they gave on this research study. It is indeed an honor to receive recognition from esteemed international scholars in business and management. At the same time, I value the constructive criticism provided by the doctoral committee, which helped me to improve the quality of my work.

My deepest thanks go to Professor Del Giudice for having enlightened me about the emerging field of business knowledge management. I certainly attribute an important part of my understanding of the research done in this domain, to Professor Del Giudice.

My sincere recognition goes to Professor Calof for his insightful and scholarly advice, which helped me to take this thesis to the next level. In particular, he brought to my attention how research results can be conveyed in manageable sections to international business journal audiences. He also deserves my immense gratitude for the effort he took to participate on the committee at this difficult time.

The contribution of Professor Akbar goes well beyond the valuable advice he gave as an internal committee member. As a dedicated PhD program professor, he has been an inspiration to the doctoral program cohort, urging us to write articles from our first year and participate in international academic conferences, such as EIBA. This encouragement led me to regularly participate in EIBA and IEEE conferences, where I was fortunate to have exchanges with leading scholars in the field of internationalization, such as Professor Zucchella, whose extensive feedbacks on my work in the early stages of my PhD, I greatly value.

I must also acknowledge the contribution of the Department of Network Science at CEU in guiding this study. Specifically, I should mention the director, Professor Janos Kértéz, for taking the time to orientate me to the field and his early feedback; Dr Julia Koltai, for her valuable contribution in adapting the survey to embed the network approach; and Professor Albert-Laszlo Barabasi, for the insightful exchanges on applications of network science in business and management research.

Furthermore, I wish to thank Professor Gerald Cusack of St John University and Professor Klofsten of Linköping University for offering valuable suggestions on numerous occasions.

I also wish to extend my thanks to Mrs Ali Parry who did a splendid job in helping me with the revisions to the thesis and cleaning up editorial errors.

In this journey, I need to formally recognize the seamless, immersive exchanges made possible by the CEU ecosystem, which is a reflection of the multicultural and multidisciplinary environment that this university (and especially Budapest Nádor utca campus) has always favored. This became even more evident to me in the year that I had the opportunity to co-organize (thanks to Professor Davide Torsello) the PhD Innovation Seminar Series, which gave rise to highly formative and community-geared, scholarly events.

I extend my gratitude also to Professor Mel Horwitch who believed in me from the outset and created the opportunity for me to study at CEU.

I acknowledge the role of the visionary George Soros who was a source of inspiration to me by returning in his mature years to his home city, which he had had to flee during an earlier, darker period, to establish a university that would nurture open-society culture and advance knowledge – CEU, which has been and will remain a home for me in my Phoenician routes!

My heartfelt acknowledgement goes to my father, Adel, the entrepreneur and the engineer, who inspired me to be the person I was meant to be, to break down walls, to not deviate from my opinions, and to believe in myself! And my mother, Amira Abou Kassem, the pharmaceutical doctor and the entrepreneur, who was my first employer and professional coach!

This thesis is dedicated to my beloved husband, Fabrizio, my Phoenician journey mate!

Table of contents

List of tables

List of figures

"…the network perspective recognizes the contributions of the extended networking capabilities, shifting the attention from the single entrepreneur and organization to the dense ties and interactions occurring along the activity system of the firm and the industry international ecosystem"

Introduction

Knowledge is widely recognized by industry and academia as a unique source of a firm's competitive advantage (Jiménez-Jiménez et al., 2014; Ferraris et al., 2018). The firm's network, in turn, is gaining much attention as a nexus of study – not *per se*, but as a holder and influencer of a firm's knowledge (Prashantham and Stephen, 2011; Yoon et al., 2020). In a knowledge-based framework, the network is of fundamental importance to the firm. On the one hand, the network's structure defines the interactions among knowledge holders within the firm and between firms. On the other hand, it shapes the flow of knowledge across the firm.

It is recognized that the firm's flow of knowledge affects the capability to create and sustain competitive advantage (Caputo et al., 2019). Digitization enables firms to track, store and process information and knowledge, and also tap additional resources, which were previously difficult to access, for strategic management purposes (Cedeño et al., 2018). For instance, technology can enforce the alignment between the firm's knowledge and activity system and raise the level of organizational connectedness in the firm's value chain (network).

Adopting a network approach in the early stages of a firm's development (Scuotto et al., 2017) provides new lens through which to view the evolving organism as it moves from a static to a more dynamic state. Furthermore, the digitalization of services and increasing online accessibility are transforming economies by creating connected platforms, thus changing the rules of the game (Parker et al., 2016; Zysman, 2016). To what extent the network's evolution plays a role in a firm's growth is a legitimate question to ask, especially at an international level. It is also particularly relevant in the case of new firms that are actively leveraging digitalization (Frank et al., 2019) and the network approach to reach scalability via the connected platform economy. A new venture is faced with very tight margins when making strategic decisions about how best to allocate resources for growth. In addition, the competitive landscape requires new firms to excel in learning new technologies and exploiting new opportunities (Cavusgil and Knight, 2015).

This study aims to find evidence of the extent to which the network plays a role in the internationalization and scalability of young enterprises. The network is viewed as a holder of the firm's knowledge and information, while also constituting a key component of the coordination of value chains and the combination of the contemporary forces of technological learning and digitization.

Attempting to single out the factors impacting the building of a firm's network is a complex process. This is because a firm's network is part of the broader social, operational and technological environment and value system (Fernhaber et al., 2009). For this reason, this study

encompasses technological learning and ambidexterity alongside network evolution in its investigation of firm growth.

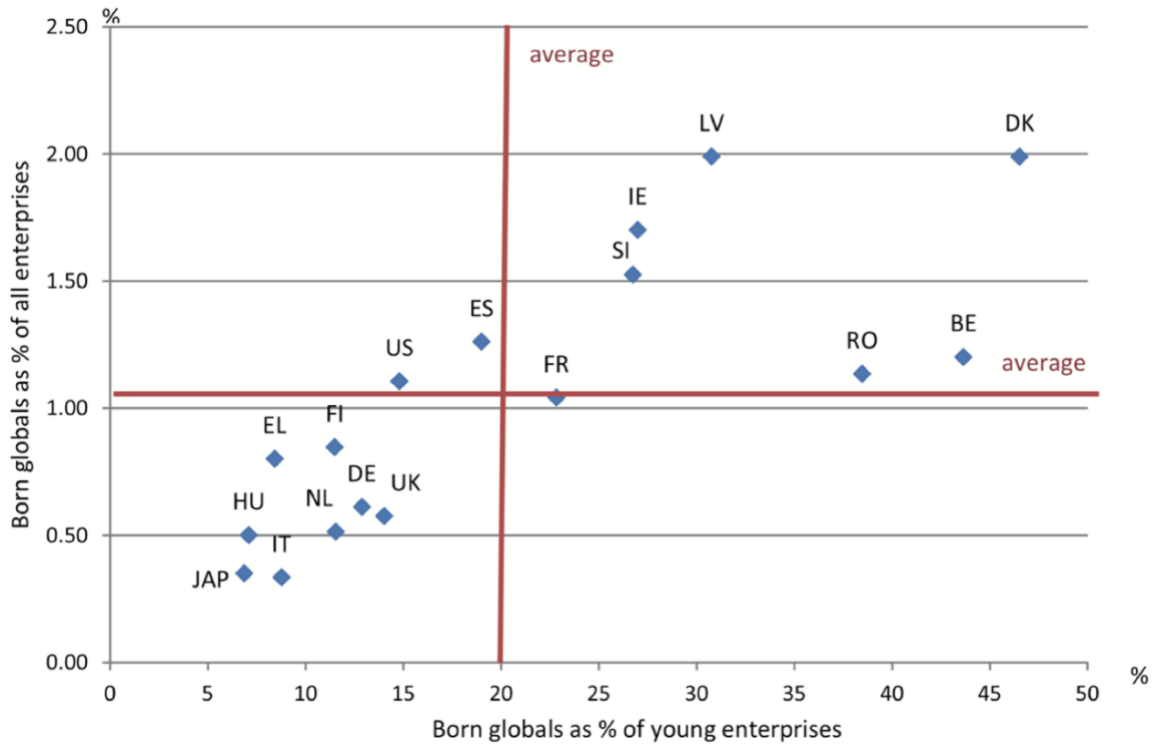
International new ventures (INVs) are firms that transform an existential idea and vision into an active business operation, serving customers in multiple countries in less than seven years (Cesinger et al., 2012). They are therefore the ideal point of focus for studying how a network boosts growth and scalability (Nielsen and Lund, 2015). In this study, we focus in particular on new, digitalized firms that are exploiting online services to reach international markets. INVs represent important drivers of innovation and economic developments across industries (Veglio and Zucchella, 2015). Their increasing importance in recent years has caught the attention of both industry (McKinsey, 2016) and academia (Brouthers et al., 2015; Hagen and Zucchella, 2014, Gabrielsson and Gabrielsson, 2013; Mort and Weerawardena, 2006).

Recent economic trends are changing the competitive landscape for firms and internationalization in general: i) the emergence of the platform economy, evidenced in increasing online accessibility; ii) digital transformation, which is giving rise to new activities such as technological learning and data-driven decision-making; iii) the expanding role of innovation-rich opportunities, which prioritize knowledge flows and learning in firms. New emerging firms, capable of capitalizing on the above trends, are well placed to experience rapid growth and international expansion. There are numerous examples of this across industries, although the focus is usually on niche services and technologies: UiPath, a small enterprise in Romania providing robotic process automation (RPA) services, began developing the technology in Bucharest in 2013 and achieved a public listing on the NYSE in May 2021, with a public valuation of US $35 billion; or Musement, which started providing a mobile touristic marketplace in Milan (Italy) in 2013 and expanded into over 70 countries with offerings in more than 1,100 cities in just five years.

On the one hand, these examples demonstrate that increasing connectedness strongly benefits young firms that can effectively manage network resources such as knowledge and information flows. On the other hand, investors, innovation actors and entrepreneurs are demonstrating growing interest in controlling and taming firms' network complexity, using networks as a strategic and systematic tool rooted in operations, as in a data-driven growth strategy.

A study by Eurofound (2012) on the "born global" (BG) phenomenon highlights that, according to available estimates, about one-fifth of young enterprises in Europe are BG. Considerable differences were found among countries: from less than 10% in, for example, in Hungary and Italy, to up to 40–50% in Romania, Belgium or Denmark. In 2008, just 1% of the total number of enterprises considered in the study were found to be born global (see Figure 1). These results provide a basis for the current research to better understand the factors that have influenced the rise of this phenomenon and the corresponding policies that could nurture and sustain its ongoing development. The study responds to the interest shown by investors, innovation actors and entrepreneurs by approaching the concept of a firm's network as a strategic and systematic tool – as may be employed in a data-driven growth strategy.

Figure (1) Born globals as a share of all young enterprises in selected EU member states, the US and Japan, 2008



Source: Eurofound (2012), *Born global: The potential of job creation in new international businesses*, Publications Office of the European Union, Luxembourg

The purpose of the present study is to advance the knowledge about the network role in internationalization and scalability of INVs. At the same time, it attempts to convey a deeper conceptual understanding by looking through a strategic lens.

This study, which is based on prior work, aims to advance empirical knowledge by answering questions about network's specificity (Soto-Acosta et al., 2018) in facilitating early internationalization goals and performance and revealing how learning occurs in new ventures (Singh and Del Giudice, 2019; Hess et al., 2016; Rialp et al., 2014). Findings were drawn from recent studies involving a systematic review of the literature to explore the network's impact on INVs' phases of growth and the relative intensity of the expansion process (Hagen et al., 2014; Sedziniauskiene et al., 2019). These studies' findings form part of the quest to clarify and elaborate on the positioning of INVs in terms of all major perspectives, particularly the network approach (Coviello and McAuley, 1999). Specifically, the study aims to address the need for a robust conceptualization of what networks are and how they impact the international growth of the firm.

The topic for the study was inspired by the debate about the hyperconnected world we live in (Siggelkow and Terwiesch, 2019b; Porter and Heppelman, 2014; Davenport et al., 2012; Friedman, 2005), connected by digital networks and online services, and also by the analyses,

concepts and theories underpinning the growing discipline of network science (Barabasi, 2003) and how it contributes to a better understanding of the management process. Such developments trigger questions about new firms: to what extent is the ideal client of a newly established firm just one click away, regardless of their geographical location? And to what extent, in a small world, is the firm's founder just 'six handshakes away' from the dream investor? This study argues that the increasing connectivity benefits those firms that control the underlying factors influencing knowledge and information flows in their networks.

In other words, the study is aimed at addressing management-related concerns that entrepreneurs, investors and managers themselves raise about the critical factors that impact fast-growing firms on their internationalization journey. The phenomenon of fast-growing firms – extensively researched under names like international new ventures (INVs), international start-ups or born global firms (BGs) – has been at the center of the latest developments in digitalization, which has become a driving force behind modern-day innovation.

The literature offers innumerable perspectives on INVs as well as theoretical frameworks – the resource-based view (RBV), knowledge-based view (KBV), relational view, Uppsala model of internationalization, and many others. However, the literature still lacks a comprehensive conceptual framework. Scholars' rich analyses of the phenomenon of INVs have helped to reveal a number of key factors, but they have not yet produced any definitive answers or explanations. Networks and moderating factors associated with knowledge-intensive industries have received relatively little attention. Thus, it is important to explore these more closely (Johanson and Vahlne, 2009; Vahlne and Johnanson 2003).

The firms we analyzed in this study all had a global vision from inception. Moreover, they all: internationalized within five years of being established; in their fifth year of operation, their sales to foreign markets reached 25% of total sales; and they operated in multiple markets (on average, three to five) within the first five years of operations (Zacharakis, 1997; Knight et al., 2004; Bell and Loane, 2010; Cesinger et al., 2012).

Using a sequential explanatory quan -> Qual design (Yin, 2018; Creswell, 2009; Edmonds and Kennedy, 2017), the research straddled two stages with an *emphasis on the qualitative side*:

Research stage (a): The quantitative analysis, which tested the conceptual framework of the factors influencing international expansion and scalability, and also validated a list of hypotheses that had been formulated based on the literature review. The quantitative analysis examined the links among three independent variables (network focus, technological learning and ambidexterity) occurring at an operational level in INVs and the firm's international expansion and scalability (dependent variables), taking into consideration three moderators (organizational connectedness, opportunity recognition and entrepreneurial alertness). The study's quantitative analysis revealed that network embeddedness was not significant for scalability and international expansion. However, it became significant when moderated by organizational connectedness. This result meant that the founders of INVs should be interviewed to probe the dynamics of this relationship more deeply. In other words, the

conceptual model posits that the more the firm is linked to an interconnected value chain, both at the intra- and inter-firm level, the greater is the extent to which the firm can capitalize on international market expansion opportunities.

Research stage (b): The qualitative analysis, which examined specific factors and results that emerged from the quantitative analysis, deepening the network evolutionary process that impact INVs' growth dynamics. In this stage, the replication of the qualitative analysis of five case studies created a better understanding of the role of organizational connectedness, which had been found (during the quantitative stage) to be a distinctive and significant factor in the relationship between network focus and scalability. The analysis was also focused on identifying the processes through which ambidexterity and technological learning play a role in boosting international expansion and scalability. To this end, we looked at the operational system of network activity to better understand the mechanisms and processes in place in the business scalability path.

The rationale for adopting this approach was that quantitative data and their analysis would provide a general understanding of the research problem (Ivankova et al., 2006), while the analysis of qualitative data would allow for in-depth analysis, refinement and interpretation of the statistical results by exploring contextual factors and pattern dynamics.

In terms of the mixed-methods approach adopted, the qualitative study expanded on the quantitative research, investigating at a granular level the following three aspects and the directions to follow: 1) *the difficulty in identifying INVs when they are still young.* The literature review showed that scholars mainly analyze INVs after those firms achieve proven success. However, there is a need to develop and test a framework to identify potential INVs in their early years (before they achieve proven success); 2) *the dynamic nature of the INVs' perspective*, which requires expanding on the validation of the factors in the conceptual model, quantitively examined, in the context of the evolving organizational structure and network over time; 3) *the flow of knowledge and information in INVs,* categorized as internal or external to the firm; the relevant type of activities (human-centered or technology-based) and the type of process (explorative or exploitative). The schematic frame, which analyzes knowledge and information flows in INVs, distinguishes between inter-firm and internal knowledge/information flows across the network, and looks at each (flow) from an activity-type and process-type perspective.

Five prospective INVs purposively selected from the quantitative sample were investigated, using a retrospective longitudinal analysis of each firm's evolution towards international expansion and scalability, from a network perspective. A phased approach was used to frame the general process shaping a firm's network evolution, international expansion and scalability of the business. Each phase represents more than mere changes over time: it also acts as a proxy for employing network resources at multiple levels to address different strategic issues (Hite and Hesterly, 2001; Aldrich and Reese, 1993), e.g., business model fit, international market accessibility and service scalability. Each phase represents a unique, strategic context that influences the nature and extent of a firm's use of the network resources in pursuing the goals of international expansion and rapid growth.

While we recognize that there is a full spectrum of factors impacting the life cycle of a firm, in this study we focused on the ones affecting the firm's early years (all sample firms are younger than seven years old) determining business growth and access to international markets. In all phases, the process involved the exploration, screening and selective use of network dyads to match the rapid growth of the emerging business in terms of international expansion.

With reference to the *difficulty to identify potential INVs in the early years*, we embraced the phase-model approach for INVs, directly referring to previous work done by Rialp et al. (2005b). These latter authors were able to establish which attributes were distinctive for an INV's path of internationalization versus the gradualist approach. The analysis considered three main dimensions: the founder's (or founding team's) characteristics, organizational capabilities and the firm's strategic focus. By emphasizing the knowledge and network aspects, the present study attempts to build on the cited model by incorporating the following factors: technological learning and value chain coordination; organizational connectedness related to the adoption of agile structures and information flows; network focus: types and evolution of the founder's and the organizational network; ambidexterity: exploration and exploitation processes involved in seizing market opportunities.

With regard to the *dynamic nature of INVs*, the phase-model approach also supports the investigation of the extent to which the evolution of the entrepreneurial and organizational networks, in their multiple forms (social network, business network, internal operational network), affects the scalability and international expansion of INVs. In this phase-model, the qualitative analysis examined the network attributes and dominant types of network and ties in each phase.

We distinguish between three different network constructs that emerge during the firm's expansion: Emergence phase (1): the *entrepreneurial network*, which is regarded as the foundational phase of an INV firm. This phase involves the social capital (network contacts) and the business configuration in terms of roles, specific attributes of the service, range of value chain activities, and market positioning; Early growth phase (2): the *consolidated (organizational) network,* which is concerned with the multiple layers of information that the firm is able to control through its internal operations and activities in the value chain. This network refers to the capacity of the firm (team, processes, procedures) to appropriate know-how from the feedback loops in the market and leverage information in order to adapt services and the business model into a structured form that allows exponential international expansion; Expansion phase (3): the *relevant global network* that the firm is able to access and exploit on its path towards international expansion and growth. This network reflects the ability of the firm to integrate its operations into international suppliers, sales channels and human resources.

In studying *the flow of knowledge and information in INVs*, we adopted an activity-based approach, articulating the information/knowledge flows and types of networks that INVs embrace as each phase progresses. For *internal flows,* we examined data-driven and human-centered activities, together with exploration and exploitation activities. For *external flows,* we analyzed the extent of optimization of the information/knowledge flows along the supply chain and within the ecosystem, combined with outbound/inbound activities. Using these dimensions

allowed us to conduct a thorough analysis of the system put in place by each venture and how this was intertwined with network attributes and knowledge/information flows.

Managers of ventures could benefit from the present study's acknowledgement of the need to enhance the firm's ability to actively manage its external network. This happens only when accumulated experiences and capabilities are interwoven with competencies, resulting in the value system being regarded as an open system able to exchange resources (both inbound and outbound). The network itself becomes more manageable when the firm can truly adopt and implement the open innovation strategy (Chesbough, 2006), although key competencies are necessary to activate this dual system of development. To this end, the present network perspective (attributes and the type of network to activate) combined with the activity system may help to elevate the strategic focus of the firm as it attaches value to key segments and locations consistent with the actual phase the firm is in.

Another implication of the study relates to business incubators and accelerators. The findings emphasize that ambidexterity (exploitation and exploration) and knowledge flows are different activities that are prevalent at different points in time (phase) and that ambidexterity is replaced by exploitation/exploration, alternatively predominant, in some groups of activities. It may be wise to establish the basis for structuring the tools to sustain knowledge management during each phase, according to a range of methodologies employed at different stages of the venture (internal/external relevance).

Furthermore, the study sheds light on another topic that is relevant for policy makers operating in the innovation ecosystem. It acknowledges the intense, external exchange – occurring in many locations, among established players and smaller, leaner and innovative ventures – which is altering the landscape and stimulating the rise of open innovation practices (Vanhaverbeke and Chesbrough, 2014). The study suggests that a conducive ecosystem favors actual exchanges between big and smaller players, both private and state-owned, which enable innovative small firms to reach masses of users and test products and services. The study suggests that, to break the local innovation path dependency, policy makers could foster the building of bridges between clusters in different regions. This could help to fill structural holes and connect initial creators and established players via various platforms. Today this role is played at an institutional level by consulates and trade fairs. Additional support from these quarters could speed up the evolution of the different phases of the network.

The study also aimed to move away from consideration of INVs in a retrospective light (with hindsight cut-off indicators), towards a more contemporary and timely examination of growth, considering the business attributes these firms idiosyncratically present along strategic dimensions.

To summarize, this study aims to provide leaders with a better understanding of how to formulate a network organizational strategy according to the different phases through which the firm evolves. Network characteristics are singled out through an activity-based approach that operationalizes network attributes in combination with technological learning and exploration/exploitation processes. This approach sheds light on the role of knowledge flows

across the network and the value system as a whole. Furthermore, the study provides investors and entrepreneurs with conceptual tools to systematically build a network-based strategy for growth.

This thesis comprises eight chapters. The first chapter provides the theoretical background, the research scope and positioning, the literature review, the research question and the contribution of the study to the literature. The second chapter explains the steps involved in the research methodology. The third chapter presents the quantitative analysis: it introduces the conceptual framework and the survey design and then discusses the results. The fourth chapter presents the qualitative analysis: it elaborates on the quantitative results, presenting tools for the case study analysis, considering the distinctive attributes of INVs, the phase-model analysis and the processes of knowledge information flows. The fifth chapter discusses five successful INVs, testing the phase-model constructs. The sixth chapter provides a retrospective longitudinal analysis of the five case studies, based on semi-structured interviews with the founders. The seventh chapter discusses the results of the qualitative analysis and draws conclusions. The eighth chapter integrates the quantitative and qualitative results, providing final conclusions, theory modification, practical implications, research limitations and recommendations for future research.

1. International new ventures: Theoretical background

This chapter delves into the history of the research topic by introducing the debate on the impact of digital transformation on internationalization and the growth of firms. The chapter then: i) defines the research unit of analysis – international new ventures (INVs) – and presents the criteria and the models defining the research sample; ii) explains the position of the research in relation to the well-established field of international business research and the emerging field of international entrepreneurship research; iii) specifies the scope of the research as a study on the role of the firm's knowledge, network and capabilities in scaling up and expanding internationally, while also explaining the network focus impact on growth when blended with technological learning and ambidexterity; iv) presents the research question and how it addresses the gaps in the literature; and finally v) presents the model and the hypotheses that the empirical part of the study is testing.

In summary, this chapter sets out to provide in-depth definitions of the key concepts and discuss the literature on which the hypotheses are built, and to operationalize the variables and link them to the indicators used in the empirical study.

1.1. Digital transformation and the early internationalization debate

The growing trend towards the digitalization of services and the launch of online platform-based ventures has increased the possibility of service providers crossing national borders by serving multiple markets and scaling internationally. However, we still know very little about how digital platform providers internationalize their services, or how they make their platforms accessible to global markets. Through this study, we add to the growing body of literature on digitally based international new ventures (INVs), examining how firms like these internationalize their services, and, more specifically, how recent technological developments have shaped firms' internationalization decisions and processes.

Digital transformation is more than just a technological shift. It modifies many sectors' business models, operations and even end-user experiences. Each interaction between the firm and its customer generates a range of data, from demographics to purchasing habits, which digital transformation enables firms to capture timeously. As is widely recognized by firms operating in the innovation frontier, the alignment between a firm's operational activities and their data analytics turns information into a powerful source of competitive advantage. It is also recognized that, in the digital age, the creation of smart products still requires the integration of online technologies with digital and physical processes (Parker et al., 2016). Emerging information and communication technologies (ICTs) are the key drivers of the digital transformation process, which manifests as, for example, information systems, big data (Jeschke et al., 2017, cloud computing (Hess et al., 2016), three-dimensional (3D) printing (Frank et al., 2019), and the internet of things (Lenz et al., 2006; Kane et al., 2015).

The emergence of business models that capture the value of the "(digital) platform" or "network economy" is a significant outcome of digital transformation. Relational networks can in fact be regarded as the relationships between agents that cooperate to acquire resources. This definition leads to the economics network approach, an interpretive model that provides a framework for analyzing the relationship between learning, innovation and networks (Del Giudice and Maggioni, 2014). ICT-enabled services transformation is based on the application of various algorithms to several activities, from consuming to satisfy basic needs, to engaging in leisure pursuits (Feldman et al., 2005). The migration of those algorithms to the cloud provides easy accessibility and creates the infrastructure on which entire platform-based markets and ecosystems operate. Platforms and the cloud become "an essential part of what has been called the third globalization" (Zysman and Kenney, 2014, p. 61).

The platform is a set of digital frameworks for online mediated social and marketplace interactions, often via apps. In ICT terms, the platform refers to a set of shared techniques, technologies and interfaces that are accessible to a broad set of users to build new offerings on a stable substrate (Zysman and Kenney, 2014, p. 63; Ramsey et al., 2005). From an internationalization perspective, what appears as a random and irrational pattern of foreign market entries by new and small businesses is rational behavior driven by opportunities learned from interactions with network partners (Yu et al., 2010; Coviello and Munro, 1995).

In the 20th century, digital transformation changed firms' perspective of internationalization to one that favors the narrative that the firm's ability to process and analyze (strategically) consumer and operations data is a fundamental building block for growth. This links the technological learning impact on organizational management to scalability potential. By increasing technological learning in firms, digital transformation introduces data-driven technologies that enable firms to flexibly respond to rapidly changing customer needs (Nielsen and Lund, 2015; Cedeño et al., 2018; Dong, 2015; Zhang et al., 2015).

Scholarly literature on international new ventures started to appear in the late 1980s (McDougall, 1989; Rennie, 1993; Oviatt and McDougall, 1994; Bell, 1995) to try and explain the rapid internationalization of small, newly established firms. Such firms have been associated with aggressive growth objectives – rapidly exploiting technological advantages, acquiring a foreign market presence and establishing ties with local sales channels to exploit emerging opportunities.

Scholarly research has been focusing on several theoretical constructs, with most drawing on two main strategic approaches: the resource-based view (Bloodgood et al., 1996; Autio et al., 2000; Zahara et al., 2000), which explains a venture's control of key assets (e.g. technology, data, knowledge and learning resources), and the network approach (Coviello and Munro, 1995; Gabrielsson et al., 2008; Ojala, 2009), which explains the competitive advantage of INVs in deploying network structures and forming entrepreneurial international ties.

In examining the fast pace of internationalization, Oviatt and McDougall (2005) propose a model with three types of firms operating across the whole spectrum of industries: i) *traditional firms*, introducing well-understood technologies to new foreign markets and showing

incremental internationalization characteristics (the Uppsala model applies to these kinds of firms); ii) *knowledge-intensive firms*, using complex knowledge to design a new product, an improved production method or more efficient service delivery – with these firms internationalizing faster than the first type and leveraging their competitive advantages to secure multiple-market access; iii) *knowledge-based firms*, developing novel, complex knowledge. To this latter typology one can add the novel category of *technology-based firms*. This study focuses on the third typology, which is mainly dependent on data technology, online CRM (customer relationship management) and CKM (customer knowledge management) activities.

1.2. Defining and exemplifying international new ventures (INVs) - Step 1

1.2.1. Definition of INVs

This study focuses on international new ventures (INVs), also known as "SMEs that internationalize rapidly at an early stage after inception" (Oviatt and McDougall, 1994, p. 49). This type of firm engages in aggressive foreign market entry, with management adopting an international perspective from the firm's earliest days. One of the first definitions of international entrepreneurship (McDougall, 1989, p. 389) sees INVs as "ventures or start-ups that, from inception, engage in international business, thus viewing their operating domain as international from the initial stages of the firm's operations". As emphasized by McDougall, these ventures pursue numerous customers in diverse market segments, developing and controlling numerous distribution channels (McDougall, 1989).

INVs are also defined as "business organizations that, from inception, seek to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries" (Oviatt and McDougall, 1994, p. 49). This definition emphasizes the strategic competitiveness that INVs can acquire from establishing a foreign market position.

The above definitions distinguish between the INV and the born global (BG) concept. Oviatt and McDougall refer to INVs as: a) young, internationalizing firms and new ventures launched in older, established multinationals; b) a range of value chain activities; and c) various entry strategies, including foreign direct investment (FDI). This definition was acknowledged by the authors who coined the term "born global" (Cavusgil and Knight, 2015). A born global was defined by Knight and Cavusgil (2005) as: a) a young company; b) the firm being the unit of analysis; and c) a firm pursuing internationalization mainly through exporting. Different types of international new ventures may be distinguished by the number of value chain activities that are coordinated and by the number of markets entered. Four types of international new ventures are proposed: 1) export/import start-ups; 2) multinational traders; 3) geographically focused start-ups; 4) global start-ups, as defined by Oviatt and McDougall (1994, p. 58).

In summary, INVs represent a broader collection of firms that internationalize at an early stage as a result of value chain coordination, including FDI, in different countries. Among these

companies, BGs are only a subset – that is, merely exporters, including types 1 and 2 of the above-mentioned categories. Therefore, the definition of INVs adopted in this study is inclusive of born global theories and research. The definition of INVs also encompasses ventures (e.g. Nespresso) that, although belonging to larger corporates, are set to enter global markets through spin-offs aimed at launching new offerings. Oviatt and McDougall (1994) proposed a theoretical framework explaining why these instantly international new ventures may be possible. Specifically, they name four necessary and sufficient elements confirming the existence of sustainable INVs: a) the presence of international transactions; b) strong reliance on alternative governance structures to access resources; c) foreign location advantages; and d) control over unique resources. These characteristics have formed the baseline of theoretical and empirical research in the INV literature.

INVs are considered to be very technology-driven or knowledge-driven. In both cases, they often operate through the internet in the modality of Software as a Service (SaaS), a model whereby software is licensed on a subscription basis and centrally hosted or complements an offline and online presence. High-tech start-ups constitute a specific category of entrepreneur that creates new digital services and products centered on the use of the web. High-tech entrepreneurs rely on existing web technologies, application programming interfaces (APIs) and cloud platforms to develop new products and services; they also distribute and sell them. They operate in a complex and fast-moving ecosystem, where networking and experimentation are paramount. They progressively shorten the time to build new web products and distribute them, compressing the time between the idea and the go-to-market. The web represents their main development tool, and they often operate independently of physical locations. INVs represent a sample of these high-tech firms and show how these firms can simultaneously establish an international presence while expanding their foreign operations.

Since the early emergence of this stream of literature, several empirical studies have been devoted to this field (Bloodgood et al., 1996; Burgel and Murray, 2000; Autio et al., 2000; Zahara et al., 2000; Gabrielsson and Kirpalani, 2004; Loane and Bell, 2006; Gabrielsson et al., 2008; Hagen et al., 2014; Ojala et al., 2018). All adopted a resource-based view (RBV) strategy, embracing knowledge- and learning-based views, from which testable hypotheses were derived. More specifically, the process of internationalization of INVs has been explored, together with four main research topics: a) new market conditions for key sectors and niche economic activities; b) technological developments in the areas of production, transportation and communication; c) the growing importance of global networks and alliances; and d) the role of entrepreneurial skills, with the founder/entrepreneur driving the early internationalizing firm.

When the phenomenon of INVs was initially recognized (Oviatt and McDougall, 1991), differences were drawn with the (then) dominant theory, i.e., the gradualist approach to internationalization – also known as the stage model of internationalization (Johanson and Vahlne, 1977, 1990, 2006). The latter generally contends that firms become international through a progressive and gradual process, long after they become established in the domestic market. This model and the associated concepts of *the chain of operations* mode and *psychic*

distance have been questioned empirically (Andersen, 1993; Madsen and Servais, 1997). The approach is criticized for being too deterministic (Turnbull, 1987; Strandskov, 1993) and because empirical evidence has found that firms may leapfrog some predicted stages. Furthermore, there is direct evidence that executives' attitudes and not necessarily objective environmental factors drive internationalization (Calof and Beamish, 1995).

A key trait of INVs is that they *simultaneously* enter several foreign markets soon after their establishment, instead of exporting *incrementally* from a strong domestic market base, as is suggested by the stage model. Moreover, the internationalization development process seems to be driven by the founder's and partners' previous international experience and network effects and/or by other customer-related factors. In the INV context, management avoids limiting activities to a single country, contrary to the view of some firms that foreign markets are purely complementary to the domestic one. The characteristics of INVs are: a) they are niche-focused, cutting-edge and technology-driven; b) they provide specialized product and service offerings; and c) they use both personal and business networks to achieve rapid global growth.

In the context of the evolutionary process that the firm undergoes in pursuit of internationalization, scholars propose three main dimensions that categorize INVs: a) founder's (or a founding team's) characteristics; b) organizational capabilities; and c) the firm's strategic focus (Rialp et al., 2005b).

The literature has not yet produced a consensus view on the operational criteria that must be met for the firm to be recognized as a rapidly internationalizing firm from inception or as a gradually oriented exporting firm (Cesinger et al., 2015). Different and somewhat arbitrary indicators have been frequently used, mostly relating to the passage of time (in years) between a firm's establishment and its export debut (Jolly et al., 1992; Rennie, 1993; McDougall et al., 1994; Zahara et al., 2000). Aspects over which scholars disagree include the intensity of export activity at a certain point in time, the scope of the foreign market and the supply of inputs, and the sale of outputs (Rennie, 1993; Knight and Cavusgil, 1996; Andersson and Wictor, 2003; Chetty and Campbell-Hunt, 2004).

The literature is, however, in agreement that INVs are firms that are young/recently created (less than seven years old) and small in size (Zacharakis, 1997), independently managed and with a presence in multiple countries. In the current study, building on operational definitions in the literature, INVs are therefore categorized in terms of three characteristics of the internationalization process: *a) Speed*: Internationalize within three to five years from inception; *b) Intensity*: More than 25% of returns from sales abroad in the fifth year; **c)** *Geographical scope*: Multiple countries (Cesinger et al., 2012).

Regarding the speed of internationalization, the literature highlights three main characteristics: a) the time between the discovery of an opportunity and the first entry into a foreign market; b) the speed of entry into the targeted countries; and c) the speed of the commitment.

Regarding the intensity of internationalization, several studies have drawn on Knight et al.'s (2004) definition of "firms [...] that internationalized on average within three years of founding and generate at least 25% of total sales from abroad" (p. 649). In addition, Bell and Loane (2010, p. 214) note that INVs are generally defined as "firms that generate more than 25% of sales from exports, serve multiple markets (typically, more than five) and internationalize within two years of formation". Even though many scholars have been keen to delineate between INVs and *staged-internationalizing firms*, the systematic literature review (SLR) comparative analysis (Cesinger et al., 2012) shows that speed and intensity have often not been operationalized under a common denominator.

Regarding geographical scope, research shows that a common meaning is attached to "multiple countries" This research effort has been developed according to this comparative explanatory framework, while also trying to reconcile the most recurrent concepts used in the field.

1.3. Scope and positioning of the research

1.3.1. Fields of study

The study of INVs lies at the intersection between the fields of international business (IB) (McDougall and Oviatt, 2000) and international entrepreneurship (IE). While the former is an established field of research that examines the forces at play among MNEs (multinational enterprises) and SMEs (small and medium enterprises) when conducting activities abroad, the latter is an emerging branch of research (Wright and Ricks, 1994) that compares entrepreneurial behavior across national borders. IE encompasses three main research avenues: a) entrepreneurial internationalization; b) international comparisons of entrepreneurship; and c) comparative entrepreneurial internationalization (McDougall, 1989; Rialp et al., 2014). Drawing on the main studies, in relation to these two streams of research, that focus on the internationalization process in INVs, the key topics (and sources) relevant to this study are as follows:

1. For the IB stream:

a) Research on the determinants of internal and environmental factors driving rapid internationalization (Knight and Cavusgil, 1996, 2004, 2005; Autio et al., 2000; Crick and Jones, 2000; Moen and Servais, 2002; McDougall et al., 2003; Bell et al., 2003, 2010; Zucchella et al., 2007; Cavusgil and Knight, 2009; Kuivalainen et al., 2012; Nowiński and Rialp, 2013);

b) Research on information seeking and organizational learning (Liesch and Knight, 1999; Autio et al., 2000; Zahara et al., 2000; Calof and Beamish, 1995; Weerawardena et al., 2007; Zhou, 2007; Fernhaber et al., 2009; Prashantham and Young, 2011);

c) Research on entry mode selection (McDougall et al., 1994; Burgel et al., 1998; Zahara et al., 2000; Shrader et al., 2000; Crick and Jones, 2000; Yip et al., 2000; Gabrielsson and Kirpalani,

2004; Freeman et al., 2006; Servais et al., 2006; Taylor and Jack, 2013; Ripollés and Blesa, 2012);

d) Research on internet-enabled internationalization (Zhang and Tansuhaj, 2007; Gabrielsson and Gabrielsson, 2011; Reuber and Fischer, 2011);

and, more recently,

e) Research on the platform phenomenon (Brouthers et al., 2015; Chen et al., 2018; Ojala et al., 2018; Parente et al., 2018).

2. For the IE stream:

a) Research on international entrepreneurial networks (business, social, personal) (Johanson and Vahlne, 1990, 2009; Bell, 1995; Coviello and Munro, 1995, 1997; Yeoh, 2000; McDougall et al., 2003; Andersson and Wictor, 2003; Sharma and Blomstermo, 2003; Pittaway et al., 2004; Harris and Wheeler, 2005; Freeman et al., 2006; Mort and Weerawardena, 2006; Coviello, 2006; Coviello and Cox, 2006; Agndal and Chetty, 2007; Zhou et al., 2007; Ojala, 2009);

b) Research on international entrepreneurial orientation (McDougall et al., 1994; Oviatt and McDougall, 1995; Knight, 2000; Knight and Cavusgil, 2004; Mathews and Zander, 2007; Zhang and Tansuhaj, 2007; Kuivalainen et al., 2007; Jantunen et al., 2008; Covin and Miller, 2014;

c) Research on the founding process (Oviatt and McDougall, 1995; Moen and Servais, 2002; Kuemmerle, 2002; McDougall et al., 2003; Rasmussen et al., 2001; Andersson and Wictor, 2003);

d) Research on international opportunity recognition, evaluation and exploitation (McDougall et al., 1994; Crick and Spence, 2005; Zahara et al., 2005; Mort and Weerawardena, 2006; Gregorio et al., 2008; Karra et al., 2008; Chandra et al., 2009, 2012; Butler et al., 2010; Kontinen and Ojala, 2011; Mainela et al., 2014);

e) Research on entrepreneur–managers' characteristics (global mindset, international vision and orientation, cognition, risk taking and proactivity) (Knight et al., 2004; Chetty and Campbell-Hunt, 2004; Nummela et al., 2009; Gabrielsson and Kirpalani, 2004; Zahara et al., 2005; Zhou, 2007; Acedo and Jones, 2007; Freeman and Cavusgil, 2007; Federico et al., 2009).

With reference to these listed studies, the present research straddles both the IB strand (covering information seeking and organizational learning, as well as internet-enabled internationalization) and the IE strand (covering international entrepreneurial networks and international opportunity recognition, evaluation and exploitation). The study's research focus is illustrated by the gray cells in Table (1).

Table (1) Research positioning with reference to the international business (IB) and international entrepreneurship (IE) themes

IB themes of research	IE themes of research
Internal and environmental determinants	International entrepreneurial networks
Information seeking and organizational learning	International entrepreneurial orientation
Entry mode selection	Founding process
Internet-enabled internationalization	International opportunity recognition, evaluation and exploitation
Research on the platform phenomenon	Entrepreneur-manager's characteristics

Source: Own elaboration

Note: Shaded cells indicate fields applying to the present study

1.4. Research goals

This study aims to find evidence of the extent to which the network plays a role in the internationalization and scalability of young enterprises. The network is viewed as a holder of the firm's knowledge and information, while also constituting a key component of the coordination of value chains and the combination of the contemporary forces of technological learning and digitization.

Since the beginning of the 21st century, the growth of the internet and online services has stimulated the early internationalization of newly established small/mid-size ventures. One of the first observations made about the INV phenomenon was its success in *controlling* rather than *owning* unique resources, especially knowledge (Oviatt and McDougall, 2005). The emergence of INVs (McDougall, 1989) has emphasized commonalities in: a) pursuing diverse market segments; b) developing high market or product visibility; and c) developing and controlling numerous distribution channels. Since the late 1970s, some IB scholars (Johanson and Vahlne, 1977; Cavusgil, 1980; Welch and Luostarinen, 1988) have directed their attention at the "incremental process emerging in smaller exporting firms to gradually internationalize to enter distant markets" (Rialp et al., 2014, p. 8).

Shifting the focus to small, rapidly internationalizing firms requires reconnecting the scaling-up dimension with the strategic focus of INVs. This study will therefore seek to investigate how the network focus affects the firm's growth and specifically the international expansion process and scalability.

1.5. Literature review and research gap

1.5.1. Theoretical framework

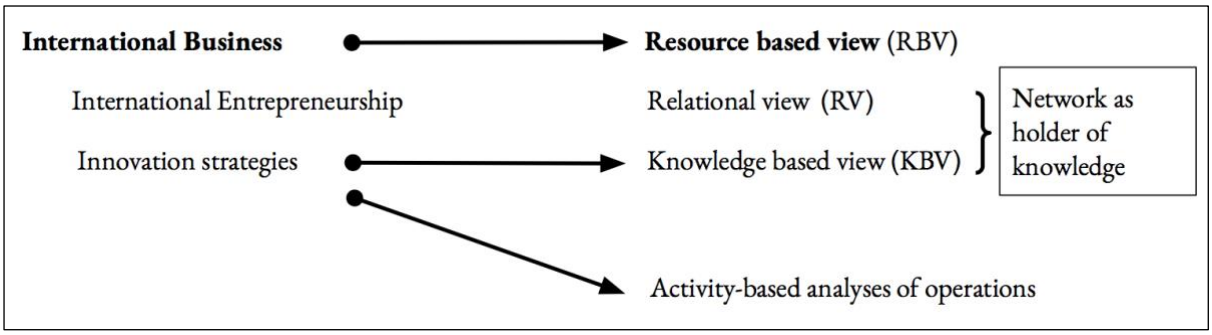
The study adopts an approach derived from the resource-based view (RBV), which is grounded in the knowledge-driven approach (see Fig. 2). The latter acknowledges the role of the network

in facilitating the flow of information and know-how that the firm can internally control (Kogut and Zander, 1992).

With reference to the resource-based view (Penrose, 1959; Wernerfelt, 1984; Barney, 1991), and the relational view (Dyer and Singh, 1998), the firm's network relationships represent critical avenues for positioning the firm's network asset within the broader context of the market. Larson and Starr (1993, p. 6) pointed out that "the network perspective recognizes the contributions of the extended networking capabilities", thus shifting the attention from the single entrepreneur and firm to the dense ties and interactions occurring within the activity system of the firm and the industry's international ecosystem.

Zott and Amit (2013) emphasize how new ventures usually innovate in areas where competition is replaced by collaborative modes of interacting through the development of new competencies and other forms of collaboration. The rationale for this is that firms tend to follow a network-centered positioning strategy, with "boundary-spanning" systems of activities centered on a focal firm. The activity-based analysis is also employed in the innovation strategies that INVs characteristically employ. The activity-based analysis values information and knowledge by processing key activities in order to coordinate and integrate across the whole system.

Figure (2) The theoretical approach of the research



Source: Own elaboration

Knowledge in INVs: Human capital, technology and the network

Knowledge in INVs is articulated in a blend of *human capital* capabilities, idiosyncratic use of *technology* and access to *networks* (Ernst et al., 2008).

Human capital: The technical, operational and managerial capacity of a firm's *human capital* is decisive, especially during the start-up phase. The firm's CEO and management team have access to virtually unlimited information and must develop a global vision for the business. This characteristic has shown how founders present niche abilities and specialized industry know-how, together with an international background and experience (Rialp et al., 2005b; Mort and Weerawardena, 2006; Hagen and Zucchella, 2014; Oparaocha, 2015).

Technology: INVs tend to be at the cutting edge, *technologically* speaking, of their industry or in terms of product design. Their products and services are not "commoditized" but rather have

unique, inimitable characteristics. Digitization is key for these firms as it allows them to cut costs by simplifying trade operations, acquiring greater access to the international market and facilitating access to business contacts, market information and alternative sources of financing (Frank et al., 2019; Dodgson, 1991; Crick and Spence, 2005).

The stage model theory of internationalization emphasizes the relationship between information acquisition and market commitment (Douglas and Craig, 1989). In this regard, the link between the information acquisition process and the internationalization strategy of INVs is worth further investigating, considering the network perspective. Before the advent of globalization, internationalization was considered contingency-based, where firms strategically and deliberately adapted to evolving circumstances in the market environment (Penrose, 1959; Mintzberg, 1979; Reid, 1983). The growing power of online data analysis compels us to analyze how the process of internationalization of INVs has shifted from being contingency-based to being structurally embedded.

Network: INVs are part of ecosystems that stimulate their development and link universities, firms and institutions, which together help them grow. Network relationships in INVs have been at the center of extended studies on the different forms of social capital, involving both informal and formal ties (Coviello, 2006; Coviello and Cox, 2006; Cavusgil and Knight, 2009). These channels connect the venture to sources of finance, markets, distribution channels, referrals and a pool of key contacts, all of which help to drive learning and internationalization.

Scholarly contributions have categorized networks into: *1) informal networks; 2) formal networks; and 3) intermediaries.* The *informal networks* relate to the social entrepreneurial interactions facilitating international expansion (Ibarra, 1993; Coviello and Munro, 1997; Coviello, 2006; Larson and Starr, 1993; Ojala, 2009; Oparaocha, 2015); the *formal networks* relate to business activities between two or more actors in the network (Adler and Kwon, 2002; Coviello and Munro, 1997; Ojala, 2009; Oparaocha, 2015); and the *intermediaries* are third parties who broker information and connect the buyers (Chetty and Holm, 2000; Oviatt and McDougall, 2005; Ojala, 2009) and sellers (Oparaocha, 2015).

1.5.2. The network perspective and the research gap

Networking competencies were identified in INVs as moderating factors to establish alliances and collaborations with suppliers, distributors and joint-venture partners in order to facilitate internationalization (Freeman et al., 2006). In the same vein, network relationships were used to leverage networking capabilities in order to identify and exploit market opportunities and support international performance (Mort and Weerawardena, 2006). “Network connections and customer information are salient because these firms often have limited resources” and distant markets, which calls for a reconsideration of the concept of psychic distance and cultural proximity (Kuivalainen et al., 2007, p. 257).

Initially, the network focus enables the founder/entrepreneur to activate their contacts to test offerings abroad. At a later stage, the business network becomes a functional lever or a platform to generate knowledge and funnel information for the firm, incentivizing interactions across

network partners (Lu and Beamish, 2001), such as suppliers and competitors, and even customers (Blomström et al., 2004; Eriksson, et al., 2001).

Overall, empirical studies have underlined the strong connection between network and entrepreneurial internationalization, pointing out how a network accelerates the internationalization process (Cavusgil and Knight, 2015). In this regard, the literature has been strongly focused on the inter-firm network (Autio et al., 2000; Sharma and Blomstermo, 2003; Freeman et al., 2006; Mort and Weerawardena, 2006; Coviello, 2006; Coviello and Cox, 2006; Angdal and Chetty, 2007; Zhou et al., 2007; Ojala, 2009; Prashantham and Dhanaraj, 2010; Vasilchenko and Morrish, 2011; Fernhaber and Li, 2013; Sedziniauskiene et al., 2019).

In summary, despite their efforts to explain the impact of these ties on entrepreneurial internationalization and on specific performance, scholars are still debating which factors are fundamental to the process. This study aims to address the research gaps arising "from lack of robust conceptualizations about what networks are and how they do impact the international growth of the firm" (Sedziniauskiene et al., 2019, p. 780). As noted by Ahmad and Dimitratos (2017), the application of the network perspective has attracted significant interest by researchers anxious to fill this gap, but the use of networks to understand the international behavior of new ventures still remains heavily fragmented. The network has often been viewed in terms of social networks or inter-firm network relations; it has rarely been addressed at the operational level, considering the internal configuration of the firm's activities and the internationalization expansion process.

1.5.3. Operational and value network in the activity system

The operational network

A first thematic line, recently reconsidered by the literature and pursued in this study, is the notion of *operational network*, defined here (from the activity system perspective) as "organizational activities" and "… the links (transactions) that weave activities together into a system..." (Zott and Amit, 2010, p. 218). As noted by Chen et al. (2021), the *operational network* perspective provides scholars with "concrete tools and a tight framework for business model design" (Zott and Amit, 2010, p. 217) by singling out activities performed by the focal firm, its partners, suppliers and customers. This study aims to close the knowledge gap in terms of how INVs build and manage an internal "operational network", which is strictly aimed at scaling up operations at a fast pace.

The set of activities that the firm directly controls by engineering its operations constitutes the firm's *operational network,* which mirrors the firm's activity system. In adopting this perspective, the study aims to articulate the managerial vision of the network as more than a resource. The notion of a network built around the supply chain of the firm is consistent with the introduction of a novel conceptual framework centering on the proposition of the *value network* (Chesbrough and Rosenbloom, 2002; Allee, 2000) (see Appendix 8).

Value capture and value creation

The value system is a framework that groups the firm's activities into categories of *value creation* and *value capture*. Chesbrough and Rosenbloom (2002) showed how value creation also involves customers and crowds, attaching greater importance to the wide array of exchanges taking place outside the firm, including the ecosystem and actual final users (Dezi et al., 2018). These works also showed how value capture can occur through inbound and outbound mechanisms, which are tightly integrated into the business model architecture adopted by the firm (also known as open business model innovation).

Chesbrough (2006) refers explicitly to the concept of building the revenue side of "architectures and systems". His analysis points to three ways to create and capture value based on technological innovation: i) incorporating the technology into the current entity's operations; ii) licensing out the technology to other firms; and iii) creating a new venture. Chesbrough places particular emphasis on mapping and testing alternative business models that the activity system can be based on, which stems from the idea that each firm can specialize in a small portion of the value chain. This acknowledges that, through division of labor, the value capture and value creation processes can be leveraged together, using resources and assets available in the ecosystem (Vanhaverbeke and Chesbrough, 2014). Thus, through the process of value creation and value capture (Lepak et al., 2007), firms build specific pathways within the industry ecosystem in order to capture and valorize the internal value.

In summary, what emerges is the emphasis placed on the inter-firm network: "the position of the firm within the value network linking suppliers and customers, including the identification of potential complementors and competitors". "The value network created around a given business shapes the role that suppliers, customers and third parties play in influencing the value captured from the commercialization of innovation. The value network increases the supply of complementary goods on the supply side and can increase the network effects among customers on the demand side" (Chesbrough and Rosenbloom, 2002, p. 534). As pointed out by Zott and Amit (2013), value becomes network related. Therefore, business model innovation is conceived as the transactional architecture between the focal firm and the rest of the players in the ecosystem. It is supported by a distinctive system of activities under the control of the focal firm.

The value network

Allee (2000) offered a new perspective on the value network, merging the value chain perspective with the specificity related to the knowledge exchanges emerging from networked enterprises. Allee points out that along a value network, a complex, dynamic exchange takes place between one or more enterprises, their customers, suppliers, strategic partners and the community. The transactions occurring in this network economy surpass the traditional view of the value chain, which is centered on goods, services and revenue. Instead, they focus attention on two other key items: knowledge value and intangible value or benefits. Knowledge value entails exchanges of strategic information, planning knowledge, process knowledge, technical know-how, collaborative design, policy development, and so on, which flow around

and support the core product and service value chain. Intangible value or benefits pertain to "exchanges of value and benefits that go beyond the actual service and that are not accounted for in traditional financial measures, such as a sense of community, customer loyalty, image enhancement or co-branding opportunities" (Allee, 2000, p. 37).

Relational networks can in fact be regarded as the relationships between agents who cooperate in order to acquire resources. This definition is associated with the economic network approach, an interpretive model that provides a framework for analyzing the relationships between learning, innovation and networks (Del Giudice and Maggioni, 2014).

A critical shift observed in the approach taken by niche players in a network economy is that as more and more products and services depend on the exchange of knowledge and information, the value of transactions and alliances extends beyond the controlled revenue-based exchanges. Knowledge and intangible value are of equal importance, with strategic partnerships relying heavily on trust and the prospective use of the value not accrued or directly transacted through monetary exchanges.

For INVs, these considerations apply especially to the internationalization process, where strategic partnerships with dominant players implicitly provide new ways of benefitting from the value created across a large and dispersed customer base.

From the value network to the value system and knowledge exchanges

Considering the characteristics of the value system, this study also aims to link the network perspective to the business model scalability concept. To explain the linkages between value network and value system, we refer to the framework proposed by Iansiti and Levien (2004). This conceptual point of reference provides categories to delineate the roles of different players operating in the IT industry ecosystem. The role played by each player is strongly connected to the array of business models available to the firm to capture value (Iansiti and Levien, 2004). As the analysis illustrates, the IT industry sees the operational network dynamics categorized by agents falling into three broad typologies: dominator, keystone and niche players. The *dominator* player consists of hubs able to control the network with the aim of extracting maximum value from the network itself. The *keystone player* (analogous to key species in an ecological context) participates in creating and redistributing value across the platform. A keystone player facilitates access to resources and values third-party contributions. The *niche player* is a small and highly specialized actor. The niche player accesses the keystone player's platform of services and contributes to the evolution of the platform. This player focuses on their own activities and on a specific, narrow domain.

The value ecosystem and integration of services between keystone players and niche firms in the network become strongly integrated and deeply rooted in the technological system, which is regionally dominant. Consequently, transactional assets at the core of the exchanges are focused on the ability of the niche player to integrate APIs and valorize autonomous data. In other words, the relational networks can in fact be regarded as the relationships between agents who cooperate in order to acquire resources. This definition provides a framework for

analyzing the relationships between learning, innovation and networks (Del Giudice and Maggioni, 2014).

A critical shift observed in the approach taken by niche players in a network economy is the acknowledgement that as more and more products and services depend on the exchange of knowledge and information (intangible assets), transactions and alliances are not only controlled by direct revenue-based exchanges. Knowledge and intangible value become equally important (as illustrated in Allee, 2000), with strategic partnerships relying heavily on trust and the prospective use of the value not accrued or directly transacted through monetary exchanges. For INVs, these considerations apply especially to the internationalization process, where strategic partnerships with keystone players implicitly provide new ways of extracting value created across a large and dispersed customer base.

1.5.4. Knowledge flows from a network perspective

A second thematic line pursued in this study is related to the firm's network, which is considered to be a lever for advancing organizational learning by intensifying the exchange of information and knowledge (Prashantham and Stephen, 2011; Sapienza et al., 2006). Organizational learning has been found to be linked to the level of cohesiveness (Brockman and Morgan, 2006) and alignments in processing internal information. This factor, labeled *organizational connectedness*, was investigated by Kelley (2009) who proposes three distinctive attributes that are present in firms that are associated with this characteristic strategic posture: i) evolving objectives that maintain a logical, strategic connection; ii) adaptive structures that meet the evolving objectives; iii) flexible processes.

Given today's competitive landscape, knowledge is increasingly being recognized as organisations' most important resource and a key source of competitive advantage. Del Giudice and Maggioni (2014) emphasize how firms must not only process information but also generate novel knowledge. While some firms focus on external sources of knowledge (Laursen and Salter, 2005), others pursue innovation by using a combination of internal knowledge sources (through research and development) and external knowledge sources (through alliances and acquisitions) (Baldwin and Clark, 2000). In tech-intensive industries, many firms try to stay flexible by concurrently developing knowledge not only in different domains but also in different geographical locations (Ahuja and Katila, 2004; Katila and Ahuja, 2002). Such firms are even open to knowledge provided by customers (Von Hippel, 1986) or suppliers (Leiponen, 2002).

With reference to internal knowledge, *technological learning* (Zahara et al., 2000) influences new venture performance in international markets in terms of breadth (ability to propose new services), depth (ability to redesign and address different segments) and speed (product development time cycle). In the traditional *gradualist approach* to internationalization, the firm tends to plan and carefully strategize market entry. However, the technological learning capacity displayed by INVs, combined with network focus, encourages the adoption of a new approach – hedging risk and uncertainty about foreign demand by setting in motion feedback

loops that continually refine the firm's offering (Parker et al., 2016). It is acknowledged that INVs need to timeously process information and knowledge to promptly internalize learning.

Data-driven technologies help decision-makers in the firm to examine, monitor and organize activities according to the feedback received through the firm's operations. By using data to drive its actions, a firm tailors and contextualizes services in a bid to meet needs and preferences. This is not only in relation to the actual offerings; it also enables the firm to investigate prospective services, reflecting a shift towards a customer-centric approach (McKinsey, 2016). Among a firm's data-driven decisions are activities connected to the implementation of IT applications, such as enterprise resource planning (ERP), supply chain management (SCM) and customer relationship management (CRM) systems, which capture and process vast quantities of data. Increasingly, these systems – which are strictly geared towards boosting efficiency and the operations' analytical capabilities – are being further extended through business intelligence (BI) applications that enable the broader employment of data-processing tools to scout for opportunities and investigate data for consumer trials. In addition, with respect to SMEs, it is becoming increasingly important to define data sources and ownership. These considerations are examined in the current study, which specifically highlights that data-driven technologies and process learning in internationalization can prompt INVs to scale up at a different pace from, and beyond the geographical scope of, traditional firms.

Ambidexterity is another key dimension that innovative, technological firms adopt to develop knowledge about their customer base. Ambidexterity highlights how firms are sometimes involved in parallel activities of exploration and exploitation. This strand of the literature (Tushman and O'Reilly, 1996) relates to the "ability to simultaneously pursue both incremental and discontinuous innovation and change" (1996, p. 24). Notably, scholars have shown how these firms are able to pursue explorative activities together with exploitative ones, with processes and structures for traditional activities centered solely on exploitation.

Different definitions (structural, contextual and sequential) of ambidexterity (O'Reilly and Tushman, 2013) exist (Birkinshaw and Gibson, 2004; Voss and Voss, 2013). INVs idiosyncratically adopt this lever to boost growth, seize new opportunities and exploit current opportunities. The literature shows how the dual mode of expansion intrinsically reconnects the contextual tension to the innovation effort of the firm on its growth path, e.g., technological innovation, organizational learning and local business adaptation (Benner and Tushman, 2001; Siggelkow and Levinthal, 2003; Koryak et al., 2018).

Firms that focus on alliances might overlook the internal potential of knowledge management (Vlas and Vlas, 2016). The latter study stressed that while ample attention has been given to different ways of separating exploitation from exploration, a better understanding may be acquired from considering the balance of alignments among three main areas of influence: internal knowledge strategies, organizational routines and network positioning (network alliances).

In this regard, fully addressing the factors related to organizational learning requires a thorough analysis of the processes in place within the firm related to ambidexterity (exploration/exploitation operations). Given that knowledge-intensive firms provide a positive and significant mediating effect in external knowledge sourcing (Vrontis et al., 2017), organizational ambidexterity becomes a salient aspect to investigate. In the online business realm, the ambidextrous capabilities of INVs become critical for enabling the firm to scale up operations and maintain an innovative edge over competitors. Voss and Voss (2013) underscore the role of strategic ambidexterity for nascent firms in implementing cross-functional exploration and exploitation in market domains and for products/services offerings. Therefore, understanding knowledge flows also involves a deeper grasp of how INVs manage the process of confronting strategic exploitation/exploration as a source of scalability of international performance.

A series of studies have focused on the firm's ability to valorize exchanges occurring at the network level (Ritter et al., 2003), examining the management of types of networks (internal and external) together with the coordination among functions (cross-relational/relationship-specific).

The external network analysis can be a source of a firm's competitive advantage, especially in innovative environments and for digitalized service offerings. Particularly in the case of smaller firms, a network approach offers information about third-party resources (often, complementary ones), allowing the sharing of expertise, learning and know-how (Lavie, 2005) – in other words, the ability of the firm to adopt open innovation strategies in order to tap into external sources of knowledge in the ecosystem (Chesbrough, 2014).

Extending this reasoning to the external network, the focus on knowledge acquisition is to achieve the coordination of activities from the supply chain and ecosystem perspective. Attention is also paid to the *outbound/inbound activities* that are coordinated by management. For example, outbound activities for explorative processes could entail testing either innovative offerings or regional market alliances with third-party vendors. Inbound activities could refer to the coordination of logistics and integration of API (application programming interface) for online platforms.

In light of the recent developments in technological research, this field appears to require further elaboration by way of proposing tools to measure the level of coordination in the network, with a focus on knowledge/information flows.

The analysis of the network with reference to *knowledge/information flows* covers all the exchanges relating to know-how, insights, data and information across the firm's value chain, which are relevant to the firm's internal operations and processes. In particular, it is important to reflect on how new knowledge is formed and exchanged across these firms (Chen et al., 2021). Innovative knowledge does not depend on "processing" objective information; "... rather, it depends on tapping the tacit and often highly subjective insights, intuitions, and hunches of individual employees and making those insights available for testing and use by the company as a whole" (Nonaka, 1991, p. 164). With the rapid processing of information in the

firm, *internal knowledge* is formed from tacit and explicit knowledge but coalesced into informal and non-exchangeable forms which we label *internal*.

As explained in recent studies, the initial notion of *tacit, unarticulated* knowledge (Polanyi, 1962) is in contrast to *explicit knowledge* (Nonaka, 1991) which comprises the structured information and know-how that can be recognized, recorded, coded, stored, accessed, and eventually shared and exchanged (Serrat, 2017). This definition is particularly important when it comes to the configuration of the business model (i.e., revenue sharing) and partnerships (non-monetary, value sharing) that the firm establishes with key players from industry. In fact, while the literature casts enough light on the forms that international networks take and the types of knowledge that flow within a firm's alliances, it still lacks a complete picture of the processes occurring within the firm during its early growth and internationalization phase.

In summary, by adopting a network perspective to understand the idiosyncratic path of internationalization and the scalability of INVs, this study highlights two main thematic lines of research: a) the first hinges on the operational network concept, which emphasizes the role of the value network in which the firm positions itself and the activity system that configures its internationalization components (value creation and value capture functions); b) the second revolves around the organizational learning that the firm is able to pursue via the network, through an articulation of factors that relate to technological learning, organizational ambidexterity and internal/external knowledge flows.

In all, the study aims to shed light on the direct influence of the firm's network knowledge management and consequently on the growth in operations (scalability) and international presence (international expansion).

1.6 Research question

To what extent do the management and evolution of organizational networks in their multiple forms (entrepreneurial network, operational network, strategy-driven network) affect the scalability and international expansion process in INVs?

Investigating this broad question, and building on prior work, this study focuses on three key aspects of international expansion and scalability of new ventures, from a value network perspective:

1) How a network focus affects the knowledge flow of the firm's organizational connectedness toward scalability;

2) How network technological learning employed by INVs boosts international growth and scalability;

3) How ambidexterity (exploration and exploitation forces) affects INVs' operations and the processes of internationalization and scalability.

1.7 The contribution of the study to the literature

This study aims to contribute to the literature on INVs by deepening the understanding of the firm's value network (intra- and inter-firm operations) as well as extending the knowledge about management and learning, thus boosting scalability and international expansion.

Based on prior work, the study aims to advance current empirical knowledge by answering questions about networks' specificity in facilitating the achievement of early internationalization goals and international performance and how learning occurs in new ventures (Rialp et al., 2014). Scholars stress the importance of obtaining data from various contexts, including developed and less-developed economies (Kiss et al., 2012) and diverse industries (such as traditional and hi-tech manufacturing and service sectors) to produce findings with substantial external validity (Rialp et al., 2014).

Given the direction of this intended contribution, the study firstly and primarily examines the role of the operational network in boosting the process of internationalization and the firm's scalability. In particular, it elaborates on an empirical analysis of the operational network and firm activity system that configures the value network internationalization components. To achieve the desired contribution, the empirical study investigates the firm's linkages with suppliers, customers and others in pursuit of organizational connectedness, in parallel to the process of international expansion and scalability.

Secondly, the study explains the management and evolution of the network in INVs, with particular reference to the ability to process knowledge and information in pursuit of international expansion and scalability. The intended contribution is linked to the organizational learning that the firm is able to pursue via the network, through an articulation of factors that relate to technological learning, organizational ambidexterity and organizational connectedness. To this end, the study aims to demonstrate empirically that data-driven technologies and process learning in internationalization can prompt INVs to scale up at a different pace from, and beyond the geographical scope of, traditional firms.

Finally, as demonstrated in the literature review, this particular field appears to require further elaboration on the proposed tools for the network management of the firm, with a focus on knowledge/information flows.

2. Methodology

To align the research design with the *research question*, we recall the aforementioned RQ:

To what extent do the management and evolution of organizational networks in their multiple forms (entrepreneurial network, operational network, strategy-driven network) affect the scalability and international expansion process in INVs?

In answering this question, the study looks at INVs in relation to: i) organizational connectedness in the dynamic evolution of the entrepreneurial network to reach an industry-relevant global network; ii) knowledge and information flows in the operational network.

Specifically, the study aims to deepen the understanding of factors impacting: 1) the network focus that affects the knowledge flows in the firm's organizational connectedness towards scalability; 2) the technological learning employed by INVs to boost international growth and business scalability; 3) ambidexterity (exploration and exploitation forces) which affects INVs' operations and processes in the scalability process of international expansion.

To answer the research question, the methodology involved 10 steps, starting in Step 1 with a literature review of INVs from a network perspective. Initially, a quantitative approach was adopted to test the general relationship between factors influencing internationalization and scalability. In Step 2, the quantitative analysis led to the design of a deductive conceptual framework identifying dependent, independent and moderating variables. Step 3 then followed with the formulation of the hypotheses. The survey design, and the sample selection and dissemination processes, were discussed in Step 4 and Step 5, respectively. The quantitative analysis of the collected data was presented in Step 6 by way of a summary of the correlation and regression analysis, together with the statistical results.

To deepen the research findings emerging from the quantitative approach, the research question was also addressed through a qualitative analysis of case studies, commencing in Step 7. Here, a complementary literature review was provided, focusing on the network dynamics of the firm, and proposing an evolutionary model of internationalization and scalability. These concepts formed the basis of the semi-structured interview design. In Step 8, the comparative, explorative cases methodology was illustrated, comprising coding and a thematic analysis of the interviews and cross-thematic discussion. The interpretation and explanation of the qualitative findings were provided in Step 9. The research concluded with the integration of the quantitative and qualitative stages of the analysis in the form of conclusions and findings in Step 10 (as illustrated in Table (2)). In this part, in accordance with Yin (2018, p. 58) and after drawing cross-case conclusions, we also provide theory modifications in order to draw conclusions from the qualitative stage about the initial theory proposed. Managerial and policy implications then follow, together with a paragraph dedicated to study limitations and future research.

Table (2) illustrates (in a step-by-step fashion) the research methodology designed to explore the themes articulated in the RQ.

Table (2) Research design: Sequential explanation quant -> Qual

Step			Procedure	Output
-		***Research stage (a)***		
1	**Quantitative**	**Quantitative conceptual model**	Literature review of INVs based on the network approach	Selection of relevant articles for the research design positioning: definition of the literature gap to fill
2			Deductive conceptual framework of factors influencing internationalization and scalability	Selection of key factors influencing scalability and international expansion
3			Hypothesis development	Matrix of hypotheses, definitions and main authors for each variable
4		**Quantitative survey design and data collection**	Survey design; cross-sectional, web-based survey (multivariate)	Analysis of the indicators and questions used in past research for the selected variables
5			Sampling definition	Dissemination to 500+ cohort of potential INVs across Europe: 40 respondents
6		**Quantitative data analysis**	SPSS analysis	Descriptive statistics, missing data, linearity, homoscedasticity, normality, multivariate outliers
		Drawing first quantitative conclusion	Analysis of coefficients	Correlation and regression findings; observation of unexpected results and factors to deepen at qualitative level
		Selecting firms from the quantitative sample for qualitative multiple-case study analysis	Purposive selection of participants for qualitative analysis	Cases (n=5)
-		***Research stage (b)***		
7	**QUALITATIVE**	**Qualitative conceptual model**	Analysis of the factors for refining the research at qualitative level: INVs' attributes; phase-model analysis of organizational connectedness, ambidexterity and technological learning; network focus and knowledge information flows	Conceptual tools to analyze the cas - studies
			Defining an evolutionary theoretical model with real-life, successful cases of INVs	Selection of target firms to identify idiosyncratic process and dynamics for INVs
			Analysis of new factors to test	Definition of the model to test
8		**Qualitative data collection**	Definition of the protocol	Online interview (#5)
			Semi-structured interviews	Text data (interview transcripts, documents)
		Qualitative data analysis – semi-structured interviews	Coding and thematic analysis	Thematic tables
			Within-case and across-case description	Similar and different themes and categories
			Cross-thematic discussion	Cross-thematic matrix
9		**Drawing conclusion on qualitative analysis**	Interpretation and explanation of qualitative analysis	Discussion of results; table with the case categorizations
		Integrating results of *research stages (a)* and *(b)*		
10		**Integration of the quantitative/qualitative results**	Discussion of qualitative and quantitative analysis and theory modification	Discussion; theory modification; policy implication; future research

The methodology research design

The methodology used referred to the mixed-methods designs of Yin (2018), Creswell and Plano Clark (2011) and Creswell (2015). As in any mixed-methods design, we had to deal with the issues of prioritization, implementation and integration of the quantitative and qualitative approaches. Thus, we had to consider which approach, quantitative or qualitative, had more relevance to our study design; establish the sequence of the quantitative and qualitative data collection and analysis; and decide where the mixing or integration of the quantitative and qualitative approaches actually occurred in our study. We also had to find an effective way to visually present the study design. Among the several methodologies available, we chose the sequential explanatory design, quan->QUAL.

The rationale for adopting this approach was that the quantitative data and subsequent analysis provided a general understanding of the research problem (Ivankova et al., 2006), while the analysis of the qualitative data allowed for the refinement of the statistical results by exploring contextual factors and pattern dynamics. Following this general approach, we gave priority first to selecting and surveying the potential INV respondents, measuring the factors assumed from a theoretical standpoint to influence the level of internationalization and scalability.

This approach was also considered suitable according to the results obtained in the first, quantitative stage. One of the main hypotheses (H2 network embeddedness and scalability) resulted as not confirmed, although it resulted as statistically significant when moderated by one of the variables chosen (organizational connectedness). This result opened an important research window: to acquire an operational understanding of the network flow of information and know-how in terms of business scalability. As emphasized in the literature (Ivankova et al., 2006; Creswell, 2009), the explanatory, sequential design approach can be especially useful when unexpected results arise from a quantitative study.

During the study, we realized that the study had to follow a quant-> QUAL model design. As explained by Creswell and Plano Clark (2011, p. 74), this methodology is used "when a researcher needs quantitative information to identify and purposefully select participants for a follow-up, in-depth, qualitative study". As a result of the first quantitative stage, we reviewed the results and level of responses that we could achieve. Acknowledging the constraints encountered during the extraordinary COVID-19 period and the low percentage of responses collected (about an 8% response rate in the survey), we ensured that the research design focused on the qualitative stage.

Therefore, the research straddled two stages, with (a) and (b) adopting a mixed-methods, sequential explanatory design (Creswell and Plano Clark, 2011; Creswell, 2015; Ivankova et al., 2006):

Research stage (a): The quantitative analysis, which tested the conceptual framework of factors influencing international expansion and scalability and also validated a list of hypotheses that had been formulated on the basis of the literature review. The quantitative analysis examined the links among three independent variables (network focus, technological

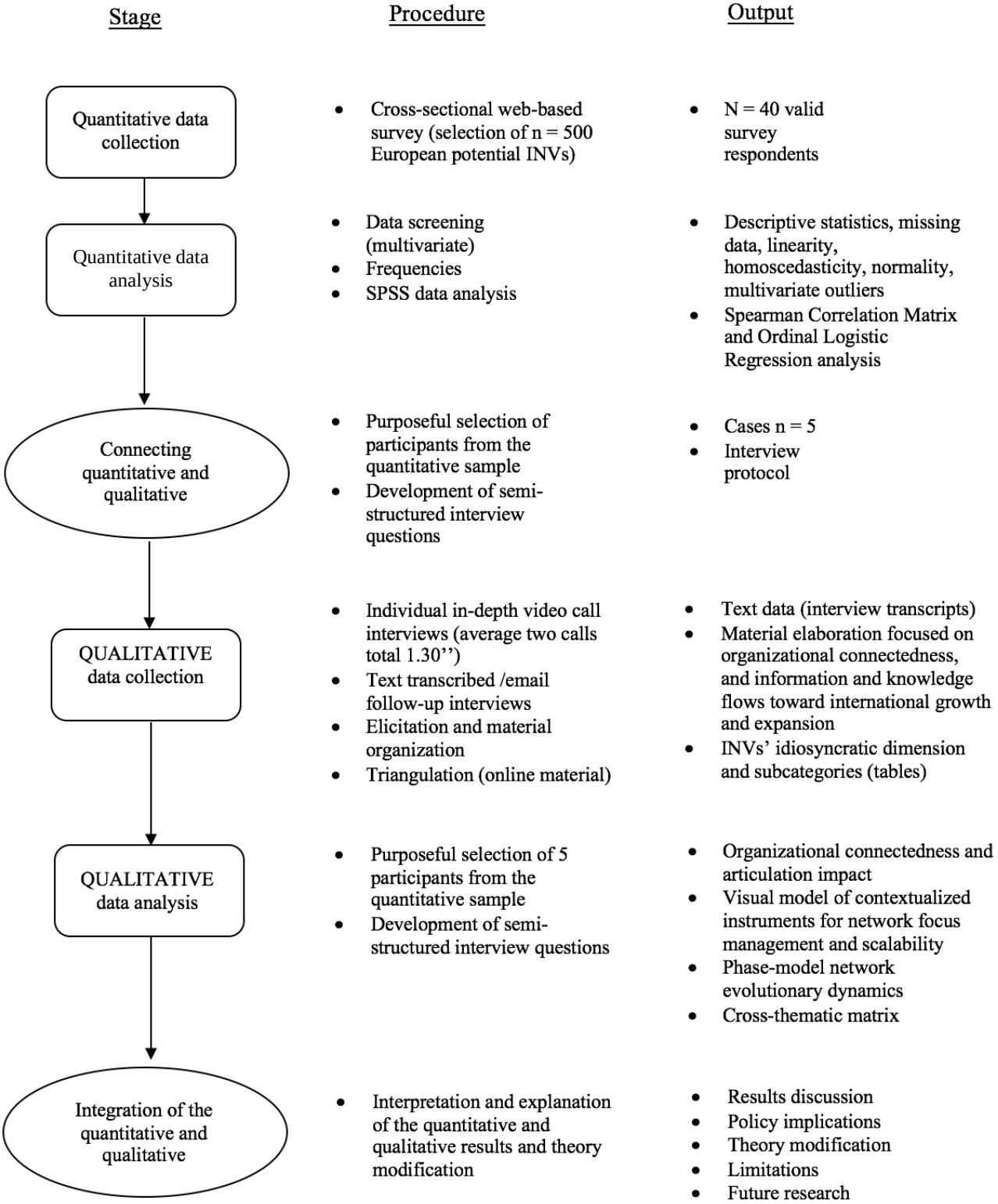
learning and ambidexterity) occurring at an operational level in INVs and the firm's international expansion and scalability (dependent variables), taking into consideration three moderators (organizational connectedness, opportunity recognition and entrepreneurial alertness).

Research stage (b): The qualitative analysis, which examined specific factors and results emerging from the quantitative analysis, thereby deepening understanding of the network evolutionary process that impacts INVs' growth dynamics. In the second stage, five case studies explored in depth the results from the statistical tests.

In this stage, the research questions addressed gave rise to a better understanding of the role of organizational connectedness, which has been found to be one of the distinctive factors driving INVs' rapid expansion. Furthermore, the qualitative analysis helped in identifying how ambidexterity and technological learning play a role in boosting international expansion and scalability.

Figure (3) below illustrates the research composite methodology articulated in phases, procedures and output.

Figure (3) Sequential explanatory design procedures, quant -> QUAL



Research stage a): quantitative stage

In the quantitative stage, the research focused on testing the significance of network factors (network embeddedness, technological learning, ambidexterity) in predicting the level of international expansion and scalability.

The sample selection for this stage started with consideration being given to potential INVs in Europe. The firms were selected through innovation hubs in Europe (incubators and accelerators) where a database of alumni and active programs constituted the basis through which innovation managers could direct the online survey, together with an accompanying email introducing the request. Appendix (7) shows the number of contacts in the initial survey dissemination phase that roughly represented each region in Europe. Each accelerator typically attracts international companies from around the world, therefore presenting, by structure, a composite provenience of its members.

Most of the innovation managers in charge of the accelerators were contacted by email and, where possible, also by telephone to explain the research purpose and the sample selection approach. The request was directed at potential INVs not older than seven years that could already begin their path of internationalization. Sample criteria, in terms of the definition adopted in section 1.2.1, referred to the three dimensions of: geographical scope, speed and intensity. All the firms had to have had a presence in multiple countries since the early years of their operation, to have internationalized within three years, and to have generated 25% of total revenue from international operations within five years. Special consideration was given to firms younger than three years, which explains why we called the sample firms potential INVs and not INVs, as they were not yet fully tested against the time criterion.

The dissemination of the survey resulted in a low response rate of about 8% (40 firms). On the one hand, the exceptionally low level of activity and, on the other hand, the intense pressure that the teams were under at this critical time both influenced the low response rate, which was expected in the light of similar studies. COVID-19 also impacted the rate of response because of the extreme difficulty experienced in establishing direct contact with the innovation centers. Moreover, privacy concerns prompted accelerators to keep most of their contacts confidential. Consequently, it was not possible to use intermediation to establish direct contact with the firms once the innovation manager had forwarded the survey request. Multiple rounds of requests were conducted via the innovation hubs' gatekeepers in order to ensure that the requests had been correctly processed. Where possible, we also operated independently, searching through the websites of the innovation centers, identifying companies that appeared to be potential matches in terms of the requested profile in order to contact them directly. In several cases, this action helped to overcome the initial resistance of the founders.

Related studies were conducted in a similar fashion, observing the factors influencing BGs on their internationalization growth path. For all these studies, the sample size – although generally slightly larger than that for the present study – was still very small, which is in line with the fact that only 1% of young enterprises are interested in achieving BG status: Bloodgood et al. (1996) studied 61 US-based, high-tech international firms; Gabrielsson and

Kirpalani (2004) studied 41 born globals from Israel and 90 from Finland; Loane and Bell (2006) studied 218 "rapid internationalizers" from Australia, Canada, New Zealand and Ireland. Given these past, influential studies on the topic, we acknowledge some limitations of the sample in the present study (particularly the exceptional circumstances produced by the COVID-19 pandemic). However, we consider the sample obtained to be representative of the general phenomenon to be probed through the quantitative analysis. Future research is, however, called for replicating the hypotheses testing with larger representative samples and deepening some of the relationships that emerged.

Research stage b): QUALITATIVE stage

On the basis of the above-mentioned methodological design, we first collected and analyzed the quantitative data so as to determine what results required further exploration in the subsequent, qualitative stage.

In this phase, the research questions that were addressed exposed more fully the role of organizational connectedness, which has been found to be a distinct driver of INVs' rapid expansion. In particular, unexpected results relating to the relationship between network focus, scalability and international expansion were thoroughly analyzed. We delved into the moderating role of organizational connectedness, which proved to be significant in the relationship between network focus and scalability. To this end, we looked at the operational system of network activity to better understand the mechanisms and processes in place on the business scalability path. Furthermore, we purposefully selected from the quantitative sample the interview candidates in the second qualitative stage, in order to explain and elaborate on the contextual factors examined in *research stage (a)*.

The selection process followed for the qualitative stage considered variations in terms of industry, level of technological sophistication (capital investment), business strategy, maturity of internationalization and geographical (country-based) spread of operations. For the latter, we looked at firms that operated across a wide spectrum of regions in Europe, observing the formation of their international network. This purposeful selection strictly followed *replication* logic (not *sampling* logic), as specified by Yin (2018, p. 55), as the correct way to interpret multiple-case design: "replication logic is directly analogous to that used in multiple experiments".

Table (3) Selection criteria for the qualitative stage using replication logic

	Industry	Geographical scope (countries of operation)	Level of technological sophistication	Business strategy	Maturity of internationali-zation
Talk-a-Bot	Enterprise chatbot/Cheqbot services (external/internal communication – SaaS)	Central Eastern Europe + Singapore	low (2 years)	B2B/B2B2C	mid
Linistry	Offsite/onsite virtual queueing (front-end operations – SaaS)	Central Western Europe	mid (2–3 years)	B2B/B2B2C	mid
SignAll	Deaf sign language translator (personal interaction services – SaaS)	Hungary and the US	high (4 years)	B2B/2O->B2C	low–mid
Pressenger	Visual content notifications (mobile marketing notification)	Spain + Germany + UK	mid (3 years)	B2B	mid
Musement	Online tickets and tours marketplace (tourism and cultural industry)	Europe + Emirates + US + Far East	low (1–2 years)	B2C/B2B2C	high

Depending on the variance associated with the criteria considered (e.g., extent of geographical scope and maturity of internationalization), each case was then viewed as a single experiment to predict similar or contrasting results, according to the set of propositions (*theoretical replication*) pertaining the models proposed (conceptual model and evolutionary phase model). At the same time, contrasting results constituted an important basis for reviewing the propositions advanced and refining each one's corresponding model.

From the 40 prospective INVs surveyed that were comparable in terms of age (less than seven years) and internationalization precocity (internationalized within the first three years), we filtered 10 companies that provided variety on the above chosen criteria. After scrutinizing the questionnaire data, desk analysis material and evident availability, we then selected five firms to interview and analyze through multiple case-study analysis.

As the focus of the research was on the rapid pace of internationalization of each firm, the nationality of the firm was not one of the selection criteria used in the replication logic. All firms geared their businesses toward the international market from inception. In addition, from an evolutionary phase-model dynamic perspective, firms' legal nature was considered a minor factor when analyzing the founders: all founding teams possessed an international network and had leveraged it since the early days of their operation by forging different levels of cooperation with foreign stakeholders: Talk-a-Bot and Linistry (Hungary) were able to benefit from a multinational network environment by partnering with leading technology players; SignAll (Hungary) was able to draw on the mother company and personal network of its founders; Pressenger (Hungary) was able to leverage an international team and develop a presence in three countries; Musement (Italy) presented its company in TechCrunch New York and

benefitted from a wide multinational network, launching operations early on in Spain and New York City.

The purposeful selection operationalized for the replication is consistent with similar studies presented in the literature that were conducted from a multiple case perspective. In this regard, some of the main studies were: Rialp et al. (2005b) examined four case studies from Spain; Hagen and Zucchella (2014) selected six case studies (four from Italy, one from Switzerland and one from Sweden); Gabrielson et al. (2008) investigated eight case studies from four countries; Gabrielson and Gabrielson (2013) investigated four cases (two from the US, one from Finland and one from Germany); Coviello and Cox (2006) focused on three case studies from New Zealand; and Kontinen and Ojala (2011) analyzed seven cases in Finland. All these studies had in common the extremely varied geographical origin of the companies, highlighting how the phenomenon is mainly investigated using a dominant replication logic that is focused more on the INV/born global definition criteria. Furthermore, the present study is distinctive – although it adopts a similar logic to that described above, with the selection focused on young enterprises not older than seven years.

Research structure and models associated with each stage

The sequential, dual structure of the research design coincides with the proposal regarding two respective models associated with each stage of the research. For the quantitative stage a) research, we proposed a conceptual framework to test the general relationship between network factors and scalability and international expansion. For the qualitative stage b) research, we proposed an evolutionary phase-model that reconsiders the variables proposed in stage a), analyzing them according to a dynamic evolutionary approach and deepening the understanding of organizational connectedness from a network perspective.

The two models can be distinguished in the following way: i) The conceptual framework is static and falls short of demonstrating the dynamics in the evolution of the network and the firm's internationalization process. However, it shows a preliminary relationship between the independent variables (IVs) and the dependent variables (DVs); ii) While the conceptual model already considers the moderating role of organizational connectedness, it cannot explain the activities related to it. From a dynamic standpoint, the phase-model expands the analysis, looking (at a granular level) at the exchanges in knowledge and information occurring at key phases in the network management. iii) All the factors presented in the conceptual model have been reconsidered in terms of the evolutionary phase-model and looked at from an operational perspective, in line with a knowledge management perspective. iv) The dynamic analyses flowing from the qualitative study address the research question, observing the evolution of the firm and the network and the information flows within the value chain.

Stage (a): Quantitative analysis of factors influencing international expansion and scalability

2.1 Literature review of INVs from a network approach – Step 1

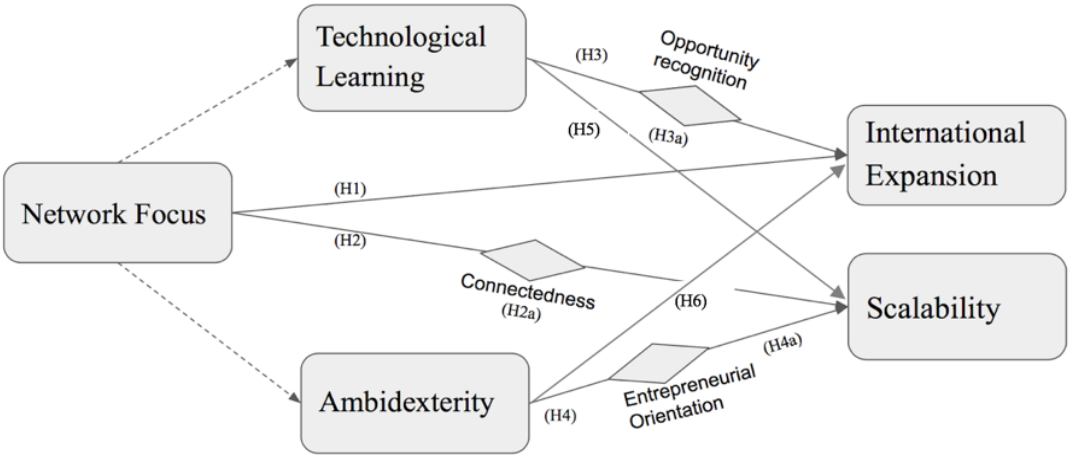
The resource (capabilities)-based view (RBV) and the relational view are the main theoretical frameworks underpinning this research. The literature review in respect of INVs adopted a network approach in categorizing up-to-date research findings and defining the gaps to be addressed.

In this framework, the adopted definition of INV is: young, recently created firms (less than seven years old), small in size (Zacharakis, 1997), independently managed and with a presence in multiple countries. Moreover, we considered the broadly accepted dimensions (Oviatt and McDougall, 1994) concerning: i) speed of internationalization – within three to five years from inception; ii) intensity – more than 25% of total sales generated abroad in the fifth year; and iii) geographical scope – multiple countries (Cesinger et al., 2012).

2.2 Deductive conceptual framework of factors influencing internationalization and scalability: Formulation of hypotheses

The choice of variables for the proposed conceptual framework was based on a thorough review of the literature concerning factors influencing the growth and internationalization of new ventures. The analysis explored scholars' definitions of each theoretical concept in relation to the variables. Indicators were then derived from definitions of the variables or from previous quantitative analyses. Figure (4) demonstrates the conceptual framework of factors influencing international expansion and scalability. With reference to the literature, the formulation of the conceptual framework was based on an analysis of the online documentation pertaining to three INVs (see Chapter 5 – Step 7).

Figure (4) Conceptual framework of factors influencing international expansion and scalability



Conceptual framework hypotheses

H1. The firm's *network focus* positively influences the degree of *international expansion.*

H2. The firm's *network focus* positively influences the *scalability*.

H2a. The higher the level of organizational connectedness, the greater the effect of the network focus on scalability.

H3. *Network technological learning* positively influences the degree of *international expansion*.

H3a. The higher the *level of* organizational *opportunity recognition*, the greater the effect of *network technological learning* on *international expansion.*

H4. *Network ambidexterity* positively influences the level of *scalability* the firm is aiming to reach.

H4a. The higher the *international entrepreneurial orientation* in the firm, the more positive the effect of *ambidexterity* on *scalability.*

H5. *Network ambidexterity* positively influences *international expansion*.

H6. *Network technological learning* positively influences *scalability*.

2.3 Survey design – Step 3

A comprehensive survey was built (and disseminated online) encompassing the theoretical concepts of the hypotheses.

The survey consisted of 51 questions organized in three structural blocks, with 40 questions related to the indicators and 11 to general information about the firm. The questions were

closed-ended, based on a 5-point Likert scale (strongly agree to strongly disagree). The survey was sent to 500 European firms and yielded 40 respondents, the majority of whom were concentrated in Hungary and Italy. Appendix (1) illustrates the survey questions' formulation. The survey questions were reviewed by a CEU statistics professor, Julia Koltai, to ensure validity and to ensure the full exhaustiveness of answers that each question could generate. The questions were pilot tested by three firms and then revised to address difficulties in comprehending certain articulated questions.

2.4 Survey sample selection and dissemination – Step 4

The survey was sent to clusters of INVs across Europe. Incubator and accelerator hubs were reached, from the major European countries. The sample population was 40 out of the 500+ surveys that were dispatched (8% response rate). The sample was not intended to represent the population of INVs but to support the theory formulation.

Data were collected over seven months (from September 2020 to March 2021) using a pre-tested interview protocol that included 51 questions based on a 5-point Likert scale, including qualitative information about the firm. The core survey items reflected the following eight composite variables (see Table (6)): international performance; business model scalability; international network embeddedness; ambidexterity; technological learning; organizational connectedness; opportunity recognition; entrepreneurial orientation. Appendix (7) provides more detail on the selection of regions covered in the sample dissemination process.

Most of the respondents were contacted personally and introduced to the main themes of the research and the aim of the survey. Personal contact was in most cases necessary for the completion of the survey.

2.5 Data collection, regression analysis and statistical results – Step 5

Data retrieved from the online survey were organized in ordinal variables and inspected for each variable (presence of outliers) through descriptive metrics. The general relationships among variables were initially tested through correlation. This constituted an ordinal bivariate regression (Spearman-based), which observed the Wald Chi square test and level of significance. Direct relationships were tested. Moderators implied the computing of transformed variables able to test the effect on a general relationship of independent and dependent variables. Results were drawn from the tests conducted and the values organized in a summary table, with values at *p* level of significance.

Stage (b): Network evolution and scalability phase-model

2.6 Defining an evolutionary model of internationalization and scalability – Step 6

The case study approach is an appropriate research strategy to use for any attempt to examine which factors dynamically impact INVs on an expansion path "in its real-life context (Yin, 1994, p. 9)". At this stage, retrospective longitudinal research was employed, as is recommended for the identification and observation of processes (Kimberly, 1976) and to collocate developments within temporal and contextual frames of reference.

A conceptual model was developed based on the evolutionary attributes of INVs, using a network approach. The model aimed to advance previous influential conceptual frameworks (Hite and Hesterly, 2001; Rialp et al., 2005b) that distinguished INVs' attributes and dynamics from the ones associated with gradually internationalizing firms (see Appendix (2)). The conceptual model was formulated following a thorough review of the INV literature, while model phases were fine-tuned in line with the evolution of representative INVs where idiosyncratic processes of growth and scalability emerged as key occurrences. The sample of representative firms (Netflix, Deliveroo, Nespresso) was selected on the basis of industry diversity, geographical origin (USA, UK, Switzerland), and ability to combine their physical and virtual presence in the market and to leverage their network resources.

To single out the distinctive features of the context in which the firm operates, this study leveraged the activity system that regulates the firm's core processes and activities. This enabled the study to pinpoint features and attributes of the information/knowledge flows that strongly characterize INVs' path towards internationalization and scalability.

2.7 Semi-structured interviews – Step 7

Comparative explanatory cases

To answer the RQ, this study addressed the question of how INVs differ from firms that gradually internationalize. According to qualitative methodologist Yin (2003), multiple case-based research may serve as a basis for empirically testing previously formulated theories or conceptual frameworks. In the comparative case study methodology, two or more cases are compared by determining a list of conditions that are believed to affect a common outcome. The comparative case study addresses the issue of "how cases are alike".

Thus, following other studies illustrating several cases of early and rapid internationalization versus more gradually oriented internationalization (Rialp et al., 2003; Hagen and Zucchella, 2014; Neubert, 2017; Ojala et al., 2018), we chose the comparative, multiple case-study method as a valuable research technique in this context. Comparative case studies are particularly useful for understanding how the context influences the success of an intervention and how the specific context can deliver the intended outcomes.

For the purpose of analyzing the case studies, we first compared each firm with the characteristics that previous research (Rialp et al., 2003) had modelled, distinguishing INVs from gradual internationalization. Adopting this approach, we also enriched the analysis by investigating the impact of ambidexterity, network embeddedness, technological learning and organizational connectedness (Appendices (2) – (5)).

This initial analysis involved scrutinizing each case against the indicators for the gradualist and INV internationalization paths. A second, in-depth analysis then followed, focusing on the longitudinal path that each case had developed. This analysis used the original phase-model to compare different cases and to apply a longitudinal analysis to three phases of an INV's development: emergent, early growth and consolidation.

Table (4) summarizes the qualitative research criteria – construct validity, internal validity, external validity and reliability – aligned to relevant case study design tactics.

Replication

A multiple case rather than a single case approach was preferred in order to use replication logic in studying pattern-matching properties among cases and rival theories.

Generalization of the results can be achieved by applying replication of both the literal and theoretical variety. Literal replication enables researchers to predict similar results (by drawing on similarities and differences within a group of cases relating to a specific, expected pattern), whereas theoretical replication allows researchers to identify contrasting results but for predictable reasons (Yin, 2003), thus marking key differences among groups of cases associated with different expected patterns.

Unit of analysis

By adopting the firm as the main unit of analysis, our empirical research was based on a systematic application of the multiple, holistic case study approach to the internationalization process, where five new European firms were first purposively chosen and then comparatively examined.

Sampling

The purposive sampling design allowed us to introduce some degree of variance in our case selection criteria by including multiple sectors (although still technology-driven) and considering different levels of technology development and upfront investment. However, to be consistent with previous research on entrepreneurial firms that are regarded as typically young and small in size (Rialp et al., 2005b), all firms in the purposive sample had to be small, independently managed and recently created (less than seven years old). These additional criteria were introduced to assure the sample firms' independence from a larger business group and their emerging status in the international marketplace.

Access to firms' archival data and key managers willing to collaborate in the study was also considered important for selecting the firm cases. This selection procedure resulted in the identification of the following five exporting ventures as cases to investigate: an enterprise chatbot (case #1), a deaf sign language application (case #2), a customer queuing management system (case #3), a visual notification engine (case #4) and a touristic virtual platform (case #5).

Period of survey dissemination

Data were collected for four months (from September 2020 to February 2021) via interviews conducted through online video channels, using a semi-structured interview format that addressed key issues relating to INVs' internationalization path.

Data collection

First, an in-depth interview was conducted with the most knowledgeable manager/s of each firm's international operation. Second, to ensure that no misinterpretations had occurred, the transcript of each interview was sent back to the manager/s a few days after the meeting. If any issues needed clarification, further meetings were scheduled. Each interview lasted between one and two hours. Third, firms' online reports and media interviews were examined.

Case study validity

The main themes shaping the interviews devolved from the phase-model relating to the evolution of the firm on its internationalization path: the early period after the INV's formation, the internationalization processes (i.e., partnerships and learning processes) and the network evolution of the firm's operations. The analysis thoroughly examined the process through which the firms validated the information/knowledge flows in their internal operations and external exchanges. The *construct validity* of each case was pursued by clearly articulating the chain of evidence supporting the questions and data collection.

Internal validity was assured through the preparation of tables and critical notes supporting the rival explanations.

Table (4) Qualitative research validity criteria

Criteria	**Case study design tactic**	**Action**
Construct validity	Detail the conceptual frameworks and derivative tables to test through multiple case study research. Establish a chain of evidence in data collection through semi-structured interviews reviewed by supervisors.	Data collection Composition
Internal validity	Clearly define the rival conceptual explanation to address (rapid internationalization versus gradual international expansion).	Data analysis
External	Use replication logic through a selection of transparent criteria	Research

validity	for the purposive sampling.	design
Reliability	Use case study protocol in data collection (semi-structured interviews, review of transcripts and tables organization).	Data collection

Source: Author's own elaboration based on the framework by Yin (2003)

External validity was assured by meeting transparent criteria for the selection of the purposive sample. To achieve a high level of *reliability*, we applied the triangulation concept during the data collection stage to ensure that different sources were used to gather data from each firm.

To meet construct validity and reliability requirements, we made use of multiple information sources to establish a chain of evidence that allowed for several perspectives on each case firm: in-depth, semi-structured interviews with entrepreneurs, founders and/or managers deeply involved in key decision-making processes in their respective firms from the latter's inception and, in particular, from the beginning of international operations. We also extracted information from firms' websites, internal documentation provided by the firms, firm brochures and other secondary data.

Case write-up

A full write-up was then done to construct the case studies, focusing on the specific characteristics of each firm. The key informants in each firm were allowed to add their suggestions and comments on several drafts of the case study to achieve construct validity. The reliability requirements were assured by following the exact protocol for each firm and by developing a complete database in the data collection phase. Regarding data analysis, we adopted a logical sequence, connecting the empirical evidence obtained from the different case studies with our rival internationalization pattern models and, later on, with the findings (pattern-matching approach).

Data analysis

The five cases were first individually described and then cross-compared to look for both literal (pattern-matching with theory within groups of cases) and theoretical (pattern-matching with theory between groups of cases) replication. This analytical approach would make it possible to transfer or generalize the results of the cases used in this study to other contexts with similar conditions (Yin, 1998).

2.8 Qualitative data analyses – Step 8

Data collected were processed and coded by organizing information into tables that synthesized the results according to the proposed phase-model. The original formulation of the proposed phase-model encompassed the longitudinal analysis of the firm and information/knowledge flows.

2.9 Drawing conclusions from the qualitative multiple-case analysis – Step 9

Based on the multiple-case analysis, conclusions were reached that specified how the general relationships tested in the quantitative stage might find support in the articulated single-case analysis. Emphasis was given to the connection between the scalability and information and knowledge flow components and the organizational connectedness variable.

2.10 Integrating the quantitative and qualitative analyses: Conclusions and findings - Step 10

Results were analyzed by summarizing key findings from the two stages of the research. The outcomes of the two methods were then compared to determine complementarities.

Having described the research methodology in this chapter, the next chapter (Chapter (3)) examines the quantitative study of the factors influencing internationalization and scalability. It starts with a literature review and presents the deductive conceptual framework, identifying dependent, independent and moderating variables. The hypotheses development and the survey design follow, and the sample selection and dissemination processes are then discussed. Finally, the quantitative analysis of the collected data is presented, with a summary of the correlation and regression analysis, and the statistical results. The chapter concludes with an interpretation of the findings.

3. The quantitative research analysis: Stage (a)

3.1 A conceptual framework of factors influencing international expansion and scalability in INVs – Step 2

Earlier theories (Johanson and Vahlne, 1977) postulated that: i) decision makers lack knowledge of foreign markets and operations; ii) long-term profit is assumed to be equivalent to the rate of growth, which depends on internal and external conditions; iii) the firm keeps risk-taking at a low level, balancing expected rewards and affordable losses.

Experiential knowledge remains central to the *Uppsala model*, which is centered on the recognition that learning-by-doing can be supplemented by other forms of knowledge acquisition, such as imitative learning from competitors, acquiring another firm (and hence its knowledge base) or making use of the knowledge of a network partner. However, networks and moderating factors of knowledge-intensive industries have received comparatively less attention. Thus, it is fundamental important to undertake more exploration in this direction (Vahlne and Johanson, 2003; Johanson and Vahlne 2009). The conceptual framework we propose is intended to close the gap in this regard (see Figure (4) in section 2.2). For instance, the framework illustrates how the scalability of the firm is directly influenced by the ability to manage network embeddedness (focus) and also by the moderated effect of factors such as organizational connectedness.

Considering the type of firms examined in this study (INVs in the online and digital industry), a firm's scalability is intrinsically linked to internationalization. In that respect, the conceptual framework aims to investigate network embeddedness (focus) together with characteristic forces behind the firm's online growth, such as technological learning and ambidexterity. All these relationships are measured in terms of the effect of the above-mentioned forces on scalability and international expansion (independent variables).

More specifically, the conceptual framework relates the firm's scalability and international expansion to the ability of the venture to maintain network embeddedness (focus) across all firm operations. In parallel, the conceptual framework is tested to validate the degree to which technological learning exerts an influence over the process of international expansion and the ability of ambidexterity to impact scalability in the direction of exploration and exploitation of foreign market opportunities.

Also in response to the gap in the literature, the study investigated the moderating factors that play a crucial role in driving the previous factors in the firm to achieve international expansion and scalability. These moderating factors are evidenced in the firm's ability to manage, at an international level: i) the *opportunity recognition* process in relation to technological learning; ii) the degree of *entrepreneurial orientation* (alertness) that the firm applies on its scalability path; iii) and the *organizational connectedness* that the firm displays in processing, analyzing operations data and linking these to actionable activities according to a network embeddedness approach.

3.2. The hypotheses development for the conceptual framework – Step 3

3.2.1. Network focus and international expansion

The study draws on the theoretical approach of the resource-based view (RBV). The latter builds on the seminal work of Penrose (1959), which was further developed by Wernerfelt (1984) and Barney (1991). The RBV focuses in particular on the internal characteristics of the firm, its resources and capabilities, to explain the profitability and value of the firm. In particular, the RBV assumes that the firm operates on the basis of cooperative types of interaction, where the resources of counterpart firms can contribute to the realization of superior performance. As pointed out by Lavie (2005), this proprietary assumption of the RBV becomes critical given the evidence suggesting that the resources of alliance partners, which are transferred via direct inter-firm interactions, have a considerable impact on firm performance.

In this line of scholarly literature, a specific stream of research has emerged to explain the influence of inter-firm relationships on the competitive advantage of firms, especially where firms do not have exclusive ownership of or control over key resources. Following this path of inquiry, Dyer and Singh (1998) explain how the use of the firm's assets characteristically extends beyond the firm, allowing for the leveraging of relationship-specific assets and inter-firm know-how. In this new approach, also known as the relational view, scholars draw attention to the specific linkages occurring between firms in terms of information flows, reflecting on the rent extracted from information flows within a network of firms (Collins and Clark, 2003).

As pointed out by Lavie (2005, the RBV cannot fully explain the process whereby firms acquire a competitive advantage when they belong to an environment that encourages frequent and multiple collaborative relationships with partner firms. His inquiry has opened up an important path of scholarly research centered on network and relational rents appropriated by the focal firm. As underlined by Lavie, the internationalization process is primarily centered on "idiosyncratic resource stocks, path dependencies, and heterogeneous communication channels" (Lavie, 2005, p. 638).

Networks have been defined as sets of connected exchange relationships among business units (Blankenburg and Johanson, 1992; Johanson and Mattsson, 1992). Halinen and Törnroos (1998) note that organizational relationships are formed in line with socially constructed and historically defined norms. Therefore, their analysis requires that consideration be given to the evolution and dynamics of the forces operating at the firm level as well as the types of activities being coordinated within the external ecosystem.

As pointed out by Dyer and Singh (1998), some resources and capabilities can be built into the relationship with important suppliers and customers. According to Un et al. (2001), the firm is considered to be an "organizational network", where the network is viewed as "relationships,

between sub-units, groups, and individuals, which [are] in turn embedded in a wider network of relationships with customers, suppliers, competitors, and other entities". This definition appears to reflect the relational view as it implies a division of the network into two sub-realms: the internal one and the external one. The internal one is formed by *corporate groups* and is particularly relevant for value creation activities. The external one is referred to as the stakeholders (sales channels and intermediary entities such as chambers of commerce) that engage with the firm and interact constantly through the production process and are particularly relevant to the firm's distribution operation (value capturing activities).

By *network focus*, we imply a dual approach that considers an inward/outward look as far as the network is concerned. On the one hand, this study considers the "in-ward look" or the ability of the firm to extensively connect to the supply chain and analyze and process data at high speed. (Data and knowledge are the two key resources that digitalized INVs exchange in the market.) This ability allows the detection of opportunities to expand demand and offerings geographically, in line with different consumer habits. On the other hand, this study considers an "out-ward look" at the inter-firm relationships occurring across the value system of the firm (Porter, 1985, 1989), including the broad range of actors, such as suppliers providing inputs to the firm's value chain activities.

This study posits that the more the firm demonstrates an interconnected value chain at the international level, the greater the extent to which the firm will be able to capitalize (at the inter-firm level) on market expansion internationally.

According to recent research (Yoon et al., 2018), the measurement of the network focus (external and internal) has been operationalized by looking at different forms of strong and close relationships, frequency of communication with international partners, coordination of activities, level of embeddedness and level of trust developed. Considering these factors, we present the following hypotheses:

H1. The firm's *network focus* positively influences the degree of *international expansion.*

H2. The firm's *network focus* positively influences the *scalability* rate.

3.2.2 Organizational connectedness

Successful ventures function by aligning their operations along the value chain and also by maintaining cohesion among geographically dispersed international locations. Kelley (2009, p. 487) coined the term *organizational connectedness* in reference to activities put in place by digitalized firms seeking radical technology-based innovations by maintaining: "1) evolving objectives strictly tied to logical strategic connections; 2) adaptive structures that shift and transform but preserve relationships with the broader organization; and 3) flexible processes ... in response to learning over time."

However, taking the terminology more explicitly to mean types of activities on an international scale, organizational connectedness comprises four main interactions: i) *cross-channeling of employees' experiences* according to coherent, contextual and engaging modes of pulling data

from the information system; ii) *data geographical orchestration*: connecting personnel, data and systems beyond local borders to continuously innovate and transform offerings to users' geographical traits; iii) *work automation* and artificial intelligence processing: optimizing business operations in order to improve customer service and internal productivity and to achieve effective digital transformation; iv) *processes simplification* in order to attain business scalability and reduce maintenance costs.

Moreover, these attributes can foster information flows within the firm and bring about alignments to: a) integrate technologies; b) streamline workflows across multiple platforms; and c) adapt customer and partner interactions across the firm's value chain system and the supply chain ecosystem. Considering the goal of international expansion, rapid innovation is aimed at enabling agile development and continuous delivery, which will shorten iterations and ensure the continuous improvement of business operations. As explained by Teece (2010), since technology has evolved to allow lower-cost provision of information and customer solutions, businesses should become more customer-centric. This development in turn requires businesses to re-evaluate the value propositions they present to customers at different points in time.

Considering the innovation efforts that firms can deploy to scale at a fast pace, an internal network focus provides the means to concentrate resources in maintaining alignment among activities and to encourage prompt and flexible adaptation to external changes.

H2a. The higher the level of *organizational connectedness*, the more positive the effect of the *network focus* on s*calability*.

3.2.3. Technological learning

Zahara et al. (2000) underscore how new ventures must manage the process of integrating the technological learning that has occurred in their international operations. Scholars (Dodgson, 1991, p. 110) emphasize the importance of technological learning, whereby knowledge (via technologies) is accumulated through the top management team building awareness about the possibility of seizing new opportunities. Scholars have found a direct and positive relationship between a firm's approach to knowledge management (KM) and its economic performance. The workforce's behavior and the firm's technological infrastructure have a direct effect on business performance. The link between human resource management and technology orientation must be established and supported through a KM strategy (Caputo et al., 2019). The literature has also paid attention to the innovative nature of leading firms to: i) collect data about current operations; ii) analyze and spot opportunities for improvements; iii) develop internal proprietary software; and iv) work with data scientists on analyzing the operations and customer behavior.

In discussing technological learning, Zahara et al. (2000) emphasize that the process yields an advantage only if the firm is able to capture, interpret and deploy its knowledge throughout its operations (Grant, 1996). This learning can play a pivotal role in differentiating a new venture

firm's product, achieving a swift introduction to the market and gaining a competitive advantage.

Assuming the firm is embedded in an activity system that is broader than the internal value chain, network technological learning is defined in this study as the technological learning of the firm applied to its evolving network – specifically, the data and knowledge that the firm are able to capture and operationalize through international expansion. This study posits that the information and data acquired by the firm about customers may constitute a source of competitive advantage, enabling the firm to differentiate and reach scale at a fast pace. As shown by Zahara et al. (2000), depth, *breadth* and speed of technological learning are positively correlated with international performance. This follows the second assumption of this study, in line with previously mentioned studies.

H3. *Network technological learning* positively influences the degree of *international expansion.*

H6. *Network technological learning* positively influences *scalability.*

3.2.4. Opportunity recognition

The ability to seize opportunities in foreign markets is becoming increasingly important for acquiring and maintaining a competitive advantage (Hymer, 1976; Zaheer, 1995; Sapienza et al., 2006). McDougall et al. (1994) argue that opportunities in foreign markets can be recognized through the application of competencies unique to entrepreneurs, involving networks and earlier experiences.

Earlier definitions have shed light on the articulated process of analyzing and turning knowledge into commitment. For example, Bhave (1994) notes that as opportunities are recognized and refined, and the business concept is identified, the commitment to the idea is converted into reality. Other authors (Singh et al., 1999) have also paid explicit attention to the sequential process of recognizing opportunities by dealing with preparation, incubation, insight, evaluation, and elaboration of data and information collected and organized.

The proactive status of the firm has also been emphasized by Shepherd and DeTienne (2005) who define opportunity recognition as being alert to potential business opportunities, actively searching for them, and gathering information about new ideas on products or services. Their model included two components represented by: i) *entrepreneurial alertness*, a component that concerns the TMT (top management team) search for opportunity in the process of serving clients and analyzing data; and ii) *prior knowledge and experience* in relation to TMT subject matter at an international level, which increases the likelihood of a person successfully recognizing and exploiting a business opportunity in the foreign market.

As has been explored and tested by Lumpkin and Lichtenstein (2005), organizational learning is positively correlated with the level of *opportunity recognition* that the firm is able to address. *Network technological learning*, acquired from the information and data that the firm can

source from its digital operations with partners and vendors, may become a critical source of new opportunities.

Considering the broader level of exchanges and information that the firm acquires from being embedded in the network, this study posits that the higher the level of organizational processes to alert people to opportunities, the greater the firm's ability to manage and process internal data on international expansion.

H3a. The higher the *level of* organizational *opportunity recognition*, the greater the effect of *network technological learning* on *international expansion.*

3.2.5. Network ambidexterity

In a comprehensive literature review of organizational ambidexterity, Tushman and O'Reilly (2013) describe three ways in which exploration and exploitation can co-exist: structural, contextual and sequential. Structural ambidexterity refers to simultaneously pursuing exploration and exploitation by using separate units within the same firm (Benner and Tushman, 2001). Contextual ambidexterity refers to achieving a balance within the same unit by nurturing adaptability, support and trust among the individuals (Birkinshaw and Gibson, 2004). Sequential ambidexterity refers to firms' ability to shift structures over time, adapting their processes by balancing conflicting alignments required for innovation and efficiency (Tushman and O'Reilly, 2013).

In order to learn and remain flexible, firms attempt to enhance their competitive advantage by developing core knowledge internally and complementing this with external partnerships (McGrath, 2001). This innovation strategy leads to collaboration and sharing of resources with other agents across the ecosystem.

This study infers that the network may represent an important arena for creating ways to innovate and exploit opportunities. In this regard, network ambidexterity is a means whereby firms adopt distinctive modes of operation to maintain an edge over competitors operating in the same arena.

3.2.6. (Business) scalability

Scalability is a relevant metric to observe because it can provide empirical support to less well-known aspects of the internationalization process. It thus sheds light on how firms may speed up their internationalization efforts.

Scalability is defined as the firm's ability to grow without being hampered by its structure-related costs or available resources (Nielsen and Lund, 2018). In dynamic terms, it is defined as the rate of revenue growth relative to the increase in costs. Practitioners, who are closer to the venture capital and tech ecosystem, have shifted their attention to the rate of growth in terms of production, users or services *per se* (Blank, 2013). Another definition associates scalability with the number of markets in which the firm is present at a certain point in time. It

is an indicator of the market share that the firm possesses in the domestic or international market.

H4. *Network ambidexterity* positively influences the level of *scalability* that the firm is aiming to reach.

H5. *Network ambidexterity* positively influences *international expansion*.

3.2.7 International entrepreneurial orientation

As emphasized in early work on INVs, founders were found to possess a global vision and international managerial commitment from inception (Rennie, 1993; Andersson and Wictor, 2003). However, the results of a study by Rialp et al. (2005b) showed that, contrary to expectations, the levels of prior international experience were found not to be different among INVs and other firms labeled as gradualist. Therefore, a relationship was inferred from the initial international orientation displayed by the firm's management and the adoption of the firm's vision and mission.

Several studies have further investigated this phenomenon, reconceptualizing it as a firm's strategic posture towards entrepreneurship formed by attitudinal and behavioral components (Anderson et al., 2014) or as a societal/cultural propensity to generate autonomous and risk-taking behaviors (Lee and Peterson, 2000). Kuivalainen et al. (2007) tried to assess the extent of the phenomenon by referring to an index of proactiveness, risk-taking and competitive aggressiveness. Kreiser et al. (2002) and Kraus et al. (2012) applied a model composed of three components: innovativeness (exploration/exploitation, product lines, changes in services), proactiveness (reactiveness to competitors, new product introductions, competitive attitudes) and risk-taking (favoring of risky projects, reactions to uncertainty). Empirical results from the Kreiser et al. (2002) study showed that, as a conceptual model, it was optimal to consider these three dimensions together rather than as one, two or three separately. Moreover, correlations among these components appeared weak, showing independence among the variables.

Relatively few studies have been devoted to investigating the empirical relationships between entrepreneurial orientation, networks and international performance. Yoon et al. (2018) tested this relationship using a sample of technology-based firms and found that international entrepreneurial orientation has a significant effect on international performance. The variables used to measure successful internationalization were innovativeness, risk-taking, proactivity and network capability.

This study posits that a higher level of entrepreneurial orientation can positively impact ambidexterity, providing the firm with ample scope for exploiting/exploring available market potential and reaching scale at a fast pace.

H4a. The higher the *international entrepreneurial orientation* in the firm, the more positive is the effect of *ambidexterity* on *scalability.*

3.3. Designing the survey – Step 4

Designing the survey started with an in-depth analysis of the empirical literature relating to each variable. Table (5) shows each hypothesis formulated, its definition and the indicators that the literature revealed concerning the complex concept to be analyzed. Table (5) provides a breakdown of the hypotheses into dependent variables and independent variables, how the survey questions measured each variable and the conceptual references for the variable definitions, or the questions tested in earlier surveys.

Table (6) expands on Table (5) by presenting the articulated questions based on the conceptual definitions proposed by the literature to measure each variable. An analysis of past validated questionnaires was used to single out the most fitting questions already tested in the past for each variable. The questions were therefore validated by triangulating the conceptual references and the previously conducted empirical research. Table (6) lists the final references that each block of questions relied on for their formulation.

Table (5) Hypotheses, variables, definitions and indicators

Hypothesis	Type of variable	Complex concept	Definition	Indicator
(H1) The firm's network focus is positively related to the degree of international expansion	Independent	Network embeddedness (focus)	The role of networks at the founder and firm level is considered a critical variable affecting the international expansion of INVs (Oviatt and McDougall, 1995; Coviello, 2006; Gabrielsson et al., 2008). This implies social ties, inter-firm relations and value chain linkages.	Inter-firm network: increase in the number of collaborations, partnerships and network alliances
				Value chain network: increase in the number of suppliers and vendors
				Network impact: intensity of the role played by networks at the founder and firm level
				Network size
				Network density
				Tie strength
				Organizational network internal
	Dependent	International expansion	The process by which an enterprise enters and invests in a foreign target country. It is mainly concerned with antecedent investment decisions about how, what, where and when firms should expand during the internationalization process (Yadong Luo, 1999). The degree of international expansion is measured by the ratio of foreign property to total property (Contractor and Kundu, 2000).	Increase in the number of non-domestic markets (countries) over time (per year)
				% of foreign direct investment over total annual investment
				Level of coordination of value chain activities in foreign markets
(H2) The firm's network focus is positively related to the scalability rate	Independent	Network focus	The role of networks at the founder and firm level is considered a critical variable affecting the international expansion of INVs (Oviatt and McDougall., 1995; Coviello, 2006; Gabrielsson et al., 2008). This implies social ties, inter-firm relations and value chain linkages.	Leveraging of personal network; use of strong ties/weak ties
	Dependent	Scalability	The firm's ability to grow without being hampered by its cost structure or available resources (Nielsen and	Increase in service growth (production, users or services) over time

			Lund, 2015).	Increase in the size of the total addressable market over time
				Increase in market share over time
(H2a) The higher the level of organizational connectedness, the greater the effect of network focus on scalability	Moderator	Organizational connectedness	Innovation-driven corporates have presented common organizational behaviors in reaching: evolving objectives; adaptive structures that shift, preserve and transform relationships; flexible processes both for the context and in response to learning over time. "...processes serve as a communication vehicle and a basis for cooperation exchange" (Kelley, 2009, p. 499).	Level of development of internal capabilities to analyze data and adapt objectives based on learning over time
(H3) Network technological learning positively relates to the degree of international expansion **(H6)** Network technological learning positively relates to scalability	Independent	Network technological learning	A base of knowledge upon which innovations can be developed. Through data-driven technologies the firm: 1) collects data about the operations phases; 2) analyzes the data to spot possible areas for improvements; 3) develops internal software to observe and analyze operations; 4) works with a data scientist to analyze the operations and customer behaviors (Zahara et al., 2000)	Use of data-driven technologies for instant improvements to the service or the offer
				Learning from data operations or CKM data
	Dependent	International expansion/ scalability		
(H3a) The higher the level of opportunity recognition, the greater the effect of network technological learning on international expansion	Moderator	Opportunity recognition	Organizational opportunity recognition: characterized by being alert to potential business opportunities, actively searching for them, and gathering information about new ideas for products or services. Two components are represented: i) entrepreneurial alertness: search for opportunity during the process of serving clients and analyzing the data; ii) prior knowledge: the information individuals have about a subject, which increases the likelihood of a person successfully recognizing and exploiting a business opportunity	Ability to leverage prior knowledge: ability individuals have relating to a subject, which increases the likelihood of a person successfully recognizing an opportunity
				Degree of entrepreneurial alertness: availability of mechanisms or processes that allow the search for opportunity while serving clients or offering products: a) gathering and analyzing operational data b) proactiveness in terms of testing new ideas and

			(Shepherd and DeTienne, 2005).	assessing potential value that can be captured
(H4) (Network) ambidexterity positively relates to the level of scalability that the firm is aiming to reach **(H5)** Ambidexterity positively relates to international expansion	Independent	Network ambidexterity	Ambidextrous organizations are able to simultaneously manage and boost exploration and exploitation operations. Exploitation: resources devoted to continuously improving the technology of the main service offering. Exploration: resources allocated for exploring new technologies or services to fulfill non-covered customer needs.	Exploration: resources allocated or processes in place for exploring new technologies or services or seizing new opportunities
				Exploitation: resources allocated or processes implemented to continuously improve the technology of the main service offering
	Dependent	Business scalability/ international expansion		
(H4a) The higher the international entrepreneurial orientation in the organization, the more positive the effect of ambidexterity on scalability	Moderator	International entrepreneurial orientation	"... reflects the firm's overall innovativeness and proactivity in the pursuit of international markets. It is associated with innovativeness, managerial vision, and proactive competitive posture" (Knight and Cavusgil, 2004). Entrepreneurial orientation (EO) is also conceptualized by Lumpkin and Dess (1996), with five-dimensional constructs entailing: the propensity to innovate and take risks, the proclivity to be proactive, competitive aggressiveness and the tendency to encourage autonomous behavior.	Propensity to innovate and take risks, proclivity to be proactive, competitively aggressive, and the tendency to encourage autonomous behavior.
				Level of the international experience of the TMT

Table (6) Quantitative model: Survey design, questions and conceptual references

Type of variables	Variable	Code	Survey question	Conceptual reference
Dependent variables	International performance	IE1	- Sales from foreign countries have been growing	Bloodgood, 2006; Kuivalainen et al., 2007; Stampfl et al., 2013; Yoon et al., 2018
		IE2	- Number of users from foreign countries has been growing	
		IE3	- Number of foreign countries in which the firm has a presence has been increasing	
		IE4	- Number of partnerships and agreements with international parties, leading to transactions, has been growing	
	Business model scalability	SC1	- Our business model enables the firm to increase revenues faster than the corresponding cost base	Hallowell, 2001; Bochmann et al., 2003; Stampfl et al., 2013
		SC2	- Our business model relies on technical infrastructure that allows the firm to rapidly serve the increasing growth in demand	
		SC3	- Our business model is adaptable to different legal regimes in the international context (IP rights and legal agreements)	
		SC4	- Our business model is consumer-oriented; the firm sets up offerings based on data-driven business analytics	
		SC5	- Our business has already reached a critical mass upon which the firm leverages scalability (network effect)	
		SC6	- Our business model can be scaled up through internationalization	
Independent variables	International network embeddedness (network focus)	INE1	- Our firm has strong and close relationships with international partners (e.g., firms with which we have existing collaboration contracts or partnership agreement)	Andersson et al., 2002; Ritter et al., 2002; Doz and Hamel, 1998; Yu et al., 2011
		INE2	- Our firm has strong and close relationships with international partners (e.g., maintaining a close relationship with firms where a collaboration/partnership agreement already exists)	
		INE3	- Our firm communicates with international partners frequently	
		INE4	- Our firm coordinates activities to form strong and close relationships with potential international partners effectively and positively	
		INE5	- An international network between our firm and international partners is well embedded	
		INE6	- Our international partners trust us	
	Ambidexterity	AMB1	- Our firm looks for creative ways to satisfy customers' needs and/or to adapt to	Tushman and O'Reilly, 1996; Birkinshaw and Gibson,

			new technologies (product exploration)	2004; Voss and Voss, 2013
		AMB2	- Our firm continuously improves products and services, and tries to reduce costs (product exploitation)	
		AMB3	- Our firm actively targets new customer groups in different countries (market exploration)	
		AMB4	- Our firm constantly surveys existing customers (market exploitation)	
		AMB5	- Our management implements cross-functional ambidexterity combining market exploration and market exploitation	
		AMB6	- Our management, although considering exploitation to be important, is more focused on market exploration	
		AMB7	- Our management, although considering exploration to be important, is more focused on market exploitation (i.e., serving existing customers)	
	Technological learning	TL1	- By using data-driven technologies, our firm collects and monitors data about the operation's activities	Zahara et al., 2000
		TL2	- Our firm analyzes data to spot possible improvements	
		TL3	- Our firm develops internal software to observe and analyze operations and patterns	
		TL4	- Our firm works with a data scientist to analyze operations and customer behaviors	
Moderators	Organizational connectedness	OC1	- Operations data analytics are used to feed in and improve operations regularly	Kelley, 2009, p. 499
		OC2	- Our firm's processes are flexible enough to swiftly adapt to learnings from users' behavior analytics	
		OC3	- Our firm's structure is adaptable to changing market needs as the firm integrates business analytics into day-to-day operations	
		OC4	- Our firm's evolving goals are communicated and spread across all the firm's units	
	(Network) opportunity recognition	OOR1	- Prior knowledge of employees, such as regional expertise or local market needs, drives our firm's search for new market opportunities	Shepherd and DeTienne, 2005 (model formed by prior knowledge and entrepreneurial alertness); Shane, 2000; Venkataraman, 1997 (prior knowledge); Ardichvili et al. 2003; Yang et al., 2017 (social network reliance)
		OOR2	- During the process of serving customers, we train our management and employees to search for new opportunities (e.g., by continuously analyzing data)	
		OOR3	- Our firm relies on data collection to make decisions about future expansion (e.g., testing similar offers in different markets at the same time)	

		OOR4	- Resources gained through business networking are essential to our firm's ability to scout for new business opportunities	
		OOR5	- We are dependent on knowledge gained from our business networks	
		OOR6	- Resources gained from the network are crucial for our future growth	
	Entrepreneurial orientation (1)	EO1	- Our firm supports employees to operate autonomously in line with the managerial vision	Knight and Cavusgil, 2004; Lumpkin and Dess, 1996; Yang et al., 2017
		EO2	- Our firm supports managers to take risks and test new ideas in pursuit of international markets	
		EO3	- Our firm adopts a proactive and competitive posture when entering new international markets	

Table (7) reports the Spearman correlation coefficients and *p* values associated with each relationship between the variables. Values with one star (*) have a *p* value significance < 5%, while values with double stars (**) have a *p* value significance < 1%.

Table (7) Spearman correlation table

		SCALABILITY	IE	NETWORK EMBEDDEDNESS	AMBIDEXTERITY	AMBIDEXTERITY led by Exploration	AMBIDEXTERITY led by Exploitation	Technological learning	Organizational connectedness	Opportunity recognition	Entrepreneurial orientation
SCALABILITY	Cor.Coef	1	.416**	0.258	0.199	0.176	.397*	.496**	.419**	-0.025	0.235
	Sig. (2-tailed)	.	0.008	0.108	0.219	0.277	0.011	0.001	0.007	0.877	0.144
IE	Cor.Coef	.416**	1	0.182	.325*	.465**	.500**	.391*	.400*	0.041	0.221
	Sig. (2-tailed)	0.008	.	0.26	0.041	0.003	0.001	0.013	0.011	0.8	0.171
NETWORK EMBEDDEDNESS	Cor.Coef	0.258	0.182	1	0.193	0.229	0.225	0.279	0.193	.319*	0.113
	Sig. (2-tailed)	0.108	0.26	.	0.234	0.155	0.162	0.082	0.232	0.045	0.486
AMBIDEXTERITY	Cor.Coef	0.199	.325*	0.193	1	.597**	0.241	.415**	.606**	0.26	.389*
	Sig. (2-tailed)	0.219	0.041	0.234	.	0	0.135	0.008	0	0.106	0.013
AMBIDEXTERITY led by Exploration	Cor.Coef	0.176	.465**	0.229	.597**	1	.487**	0.294	.413**	0.104	.511**
	Sig. (2-tailed)	0.277	0.003	0.155	0	.	0.001	0.065	0.008	0.524	0.001
AMBIDEXTERITY led by Exploitation	Cor.Coef	0.127	.456**	0.177	.387*	.547**	.336*	0.122	0.162	0.303	.386*
	Sig. (2-tailed)	0.434	0.003	0.275	0.014	0	0.034	0.454	0.317	0.057	0.014
EXPLOITATION	Cor.Coef	.397*	.500**	0.225	0.241	.487**	1	.441**	.314*	0.046	0.107
	Sig. (2-tailed)	0.011	0.001	0.162	0.135	0.001	.	0.004	0.049	0.777	0.509
TECH LEARNING	Cor.Coef	.496**	.391*	0.279	.415**	0.294	.441**	1	.546**	0.226	0.005
	Sig. (2-tailed)	0.001	0.013	0.082	0.008	0.065	0.004	.	0	0.161	0.976
Organizational connectedness	Cor.Coef	.419**	.400*	0.193	.606**	.413**	.314*	.546**	1	-0.032	0.295
	Sig. (2-tailed)	0.007	0.011	0.232	0	0.008	0.049	0	.	0.843	0.065
Opportunity recognition	Cor.Coef	-0.025	0.041	.319*	0.26	0.104	0.046	0.226	-0.032	1	0.069
	Sig. (2-tailed)	0.877	0.8	0.045	0.106	0.524	0.777	0.161	0.843	.	0.671
Entrepreneurial alertness	Cor.Coef	0.235	0.221	0.113	.389*	.511**	0.107	0.005	0.295	0.069	1
	Sig. (2-tailed)	0.144	0.171	0.486	0.013	0.001	0.509	0.976	0.065	0.671	.

3.4. The survey sample selection and dissemination – Step 5

The sample comprised 40 international ventures that had been contacted from Hungary, Italy and other European countries (e.g., Portugal, France, Germany and the UK) from September 2020 to February 2021. After the survey had been sent, a round of calls was made to solicit answers. Most of the ventures were contacted personally (e.g., CEU ILab). The sample represented a diverse mix of firms operating in different sectors and running different types of business (B2B or B2C).

Country	**N of ventures**	**Percent**
Hungary	17	42.5%
Italy	13	32.5%
Other EU countries	10	25%
Total	**40**	**100%**

The firms were selected from several industries, the most well represented being the information technology (IT) industry with many of them belonging to the SaaS (Software as a Service) technology sector.

Main industry of operation	**N of ventures**	**Percent**
Agriculture, hunting, forestry and fishing	3	7.5%
Community, social and personal services	2	5%
Education	1	2.5%
Financial, insurance, real estate and business services	5	12.5%
Manufacturing	4	10%
Telecommunications and information technology	14	35%
Tourism	5	12.5%
Wholesale and retail trade	6	15%
Total	**40**	**100%**

Most of the questionnaires were completed by top management, CEOs and founders (87.5%), thus ensuring the reliability of the answers provided.

Role of the respondent	**N of ventures**	**Percent**
Top management	23	57.5%
CEO	6	15%
Founder*	6	15%
Middle management	3	7.5%
Business intelligence unit	2	5%
Total	**40**	**100%**

The speed of internationalization showed, as most of the ventures in the sample were able to internationalize by the third year (90%). Only 10% began to internationalize in the fourth and fifth years. *The founders in most cases occupied other positions.

Speed of internationalization	N of ventures	Percent
1st year	11	27.5%
2nd year	7	17.5%
3rd year	18	45%
4th year	2	5%
After the 5th year	2	5%
Total	**40**	**100%**

The degree of internationalization showed that more than 65% of the respondent ventures had internationalized in more than three countries. 35% had internationalized in three or less.

Degree of internationalization	N of ventures	Percent
2 countries or less	6	15%
3 countries	8	20%
4 or 5 countries	11	27.5%
6 to 10 countries	7	17.5%
More than 10 countries	8	20%
Total	**40**	**100%**

More than 45% of the firms in the sample had already reached the threshold of having 25% of their revenue coming from foreign countries.

Intensity of internationalization	Frequency	Percent
More than 25% of revenue from foreign countries	18	45%
Less than 25% of revenue from foreign countries	22	55%
Total	**40**	**100%**

Most of the firms had been founded between four and seven years earlier (2014 and 2016). 15% of the sample represented younger firms, having been founded three or two years earlier. Only two had been founded less than two years earlier.

When the firm was founded	Frequency	Percent
Up to 7 years ago	14	35%
5 years ago	10	25%
4 years ago	8	20%
3 years ago	3	7.5%
2 years ago	3	7.5%
Less than 2 years ago	2	5%
Total	**40**	**100%**

Most of the firms operated in the B2B market (82.5%).

Type of market commercialization	Frequency	Percent
B2B	33	82.5%
B2C	7	17.5%
Total	**40**	**100%**

Knowledge-based respondents had been operating as technology-based services. Knowledge-based respondents accounted for those ventures that were able to provide clients with specialized consultancy services (e.g., data analysis).

Type of specialized service provided	Frequency	Percent
Knowledge-based services	12	30%
Technology-based services	28	70%
Total	**40**	**100%**

Most of the ventures provided standalone, online offerings (52%). Multisided marketplaces were frequently found (17.5%). 15% of respondents were hardware dependent.

Type of offering	Frequency	Percent
Standalone, online offering (web/app/software license)	21	52.5%
Based on online, multisided marketplaces (e.g., matching platforms)	7	17.5%
Hardware-dependent (e.g., Homepod)	6	15%
Embedded in the full-service pack	1	2.5%
Training	1	2.5%
Other	4	10%
Total	**40**	**100%**

The size of the firms showed a diverse sample with most of the categories equally distributed.

Size of the firm (number of employees)	Frequency	Percent
More than 50	6	15%
Between 20 and 50	10	25%
Between 11 and 20	8	20%
Between 5 and 10	10	25%
Less than 5	6	15%
Total	**40**	**100%**

3.5. Results discussion – Step 6

Correlation analysis results

A Spearman's rank-order correlation was initially run to assess the bivariate relationship between the value of the variables reporting answers from all 40 ventures surveyed, using a 5-point Likert scale. Table (7) above shows the results obtained, with one star marking the .05 *p* value and two stars the .01 *p* value.

3.5.1. Results table

Following this initial result, an ordinal regression analysis was performed. Table (8) below sums up the correlation and regression values found for each hypothesis.

Table (8) Correlation and regression values found for each hypothesis

		DVs					
		Scalability			International expansion		
IV	Network embeddedness	H2			H1		
		correlation	n.s.		correlation	n.s.	
		regression	n.s.		regression	n.s.	
Moderator	Organizational connectedness	H2a					
		regression	s	Wald Chi2 (1) = 5.198, *p* = .023; B=1.178			

IV	Ambidexterity	H4			H5		
		correlation	n.s.		correlation	s.	Rs= .325*
		regression	n.s.		regression	s.	Wald Chi2 (1) = 4.858; *p* = .028; B=0.828
	Ambidexterity led by exploration	correlation	n.s.		correlation	s.	Rs= .465**
		regression	n.s.		regression	s.	Wald Chi2 (1) 8.196; p .004; B =1.631
	Ambidexterity led by exploitation	correlation	s.	Rs= .397*	correlation	s.	Rs= .500**
		regression	s.	Wald Chi2 (1) 5.801; p .016; B =1.069	regression	s.	Wald Chi2 (1) 8.501; p .004; B =1.373
Moderator	Entrepreneurial orientation	H4a					
		regression	s	Wald Chi2 (1) 7.506; p .006; B =1.007			

IV	Technological learning	H6			H3		
		correlation	s.	Rs= .495*	correlation	s.	Rs= .391*
		regression	s.	Wald Chi2 (1) 10.145; p .001; B 1.269	regression	s.	Wald Chi2 (1) 5.637; p .016; B = .868
Moderator	Opportunity recognition				H3a		
					regression	s.	Wald Chi2 (1) 3.985; p .046; B .133

Legend: n.s. = not significant; s. = significant

3.5.2. Hypothesis testing

A cumulative odds ordinal logistic regression with proportional odds was run to determine the effect of (IVs) network embeddedness, ambidexterity and technological learning on (DVs) scalability and international expansion in INVs in Europe. Specific moderators such as organizational connectedness for network embeddedness, entrepreneurial orientation for ambidexterity and opportunity recognition for technological learning were also tested.

H1 *Network embeddedness's (focus)* influence on *international expansion* **does not result as confirmed**. Correlation coefficient results are statistically not significant.

H2 *Network embeddedness* and *scalability* **do not result as statistically significant**; therefore, the relationship between them is not confirmed.

H2a *Organizational connectedness* **<u>does</u> result in a moderate** relationship between *network embeddedness* and *scalability.*

Therefore, *network embeddedness (focus)* results in a variable not capable of being singled out and capturing a significant covariance in the variables of international expansion and scalability. However, the moderating factor, *organizational connectedness*, appears to play a crucial role in unleashing the potential of the network focus.

H3 *Technological learning's* influence on *international expansion* **<u>does</u> result as statistically significant**.

H3a *Opportunity recognition* **<u>does</u> result in a moderate** relationship between *technological learning* and *international expansion.*

H6. *Technological learning* **<u>does</u> result** in a positive relationship with *scalability.*

Technological learning emerges as an important factor that influences *scalability* and *international expansion.* While for *scalability* its relationship results are stronger $\chi2(1) = 10.145$ than *international expansion* $\chi2(1) = 5.637$, its effect results are weaker; its effect results also remain weaker when moderated by *opportunity recognition* $\chi2(1) = 3.985$.

H4 The *ambidexterity* and *scalability* **relationship shows mixed results**. The *ambidexterity led by exploitation* results are significant. Other forms of ambidexterity results are not significant – neither with correlation nor regression.

H4a Entrepreneurial orientation **<u>does</u> moderate** the influence of *ambidexterity* on *scalability*.

H5. *Ambidexterity* **<u>does</u>** influence *international expansion*.

Ambidexterity is an important factor that relates *scalability* and *international expansion*.

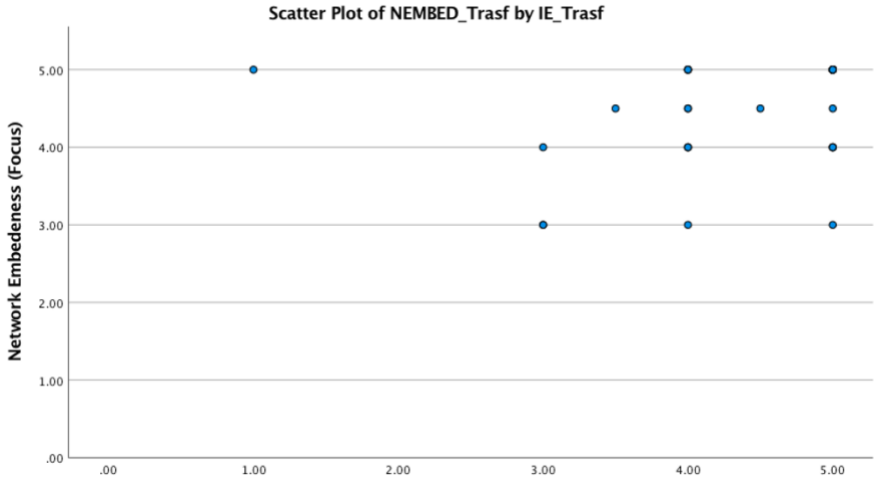
The odds for *international expansion* recognize a stronger effect than *scalability*.

Ambidexterity led by exploitation results are the only type that are statistically significant in both IVs. In particular, with reference to the *scalability* factor, *ambidexterity led by exploitation* is enhanced by the moderating factor of entrepreneurial orientation: $\chi2(1) = 7.506$ (moderated) $> \chi2(1) = 5.801$ (alone).

Following a detailed correlation and regression statistical analysis:

H1. The firm's *<u>network embeddedness (focus)</u>* **<u>does not</u>** result as a significant influence of the degree of *<u>international expansion.</u>*

A preliminary analysis shows the relationship to be monotonic, as assessed by the scatterplot below.



The Spearman correlation table (Table (7)) shows a not significant value of *p* (.182). The ordinal logit regression shows similar results with a Wald $\chi 2(1) = 1.360$, $p = .243 > .05$

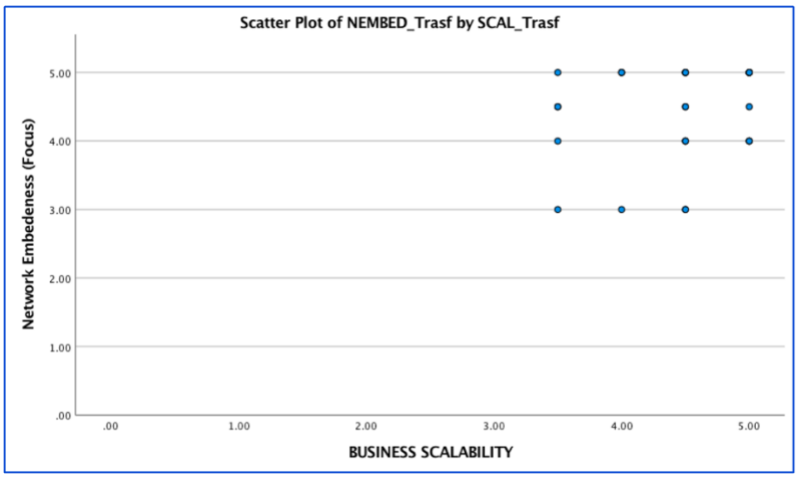
Therefore, the **H1 results are not statistically significant; hence not confirmed**.

H1 does not result as confirmed.

H2. The firm's *network embeddedness (focus)* positively relates to *scalability*.

The correlation table analysis shows that the *p* value is not significant, with a *p* of .108 > .05 and a correlation coefficient of .258.

A preliminary analysis shows the relationship to be monotonic, as assessed by the scatterplot below.



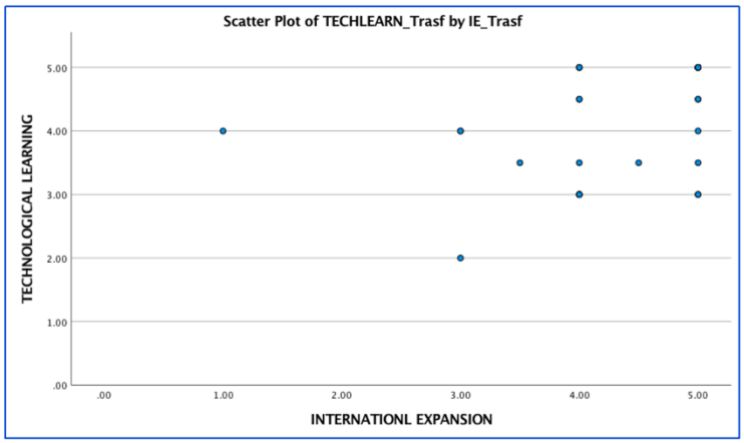
Confirming the Spearman correlation table, running an ordinal logit regression shows that *network embeddedness is not associated with* a statistically significant influence on *scalability*, Wald $\chi 2(1) = 2.719$, $p = .099 > .05$.

H2 does not result as statistically significant; therefore, the relationship between *network embeddedness* and *scalability* is not confirmed.

H3. *Technological learning* positively relates to the degree of *international expansion*.

The correlation between *technological learning* and *international expansion* shows a positive Spearman coefficient with r_s = .391 and p =.013 (<.05).

A preliminary analysis shows the relationship to be monotonic, as assessed by the scatterplot below.



Running an ordinal logit regression shows that *technological learning* has a statistically significant effect on the prediction of *international expansion*, Wald $\chi 2(1) = 5.367$, $p = .018 < .05$.

The Pseudo R-Square shows a Nagelkerke value of .159.

Pseudo R-Square	
Cox and Snell	0.148
Nagelkerke	0.159
McFadden	0.059

H3 Testing the relationship between *technological learning* and *international expansion* shows that a correlation coefficient validates the existence of a positive relationship between the two variables; an ordinal regression **confirms** significant effects of *technological learning* as a predictor of *international expansion*.

H3 results as confirmed.

H4. *Ambidexterity* positively relates to the level of scalability that the firm is aiming to reach.

The survey distinguished ambidexterity as led equally by exploration and exploitation or led by a prevalent action on exploration or exploitation. Therefore, the answers relating to the variable ambidexterity have been transformed into three variables: *ambidexterity, ambidexterity led by exploration and ambidexterity led by exploitation*.

The correlation coefficient shows only that "*ambidexterity led by exploitation*" resulted in significance in its *p* value associated with a Spearman r_s of .397.

Running an ordinal regression shows a significant value for *ambidexterity led by exploitation*. The test of parallel lines rejects the null hypothesis which states that the slope coefficients in the model are the same across response categories.

Test of parallel lines				
Model	-2 Log likelihood	Chi-Square	df	Sig.
Null hypothesis	23.768			
General	18.245b	5.523c	2	0.063

							95% confidence interval	
Parameter estimates		Estimate	Std. error	Wald	df	Sig.	Lower bound	Upper bound
Threshold	[SCAL_Trasf = 3.50]	2.8	1.89	2.194	1	0.139	-0.905	6.504
	[SCAL_Trasf = 4.00]	3.613	1.918	3.55	1	0.06	-0.145	7.372
	[SCAL_Trasf = 4.50]	5.378	2.032	7.006	1	0.008	1.396	9.361
Location	EXPLOITA_Trasf	1.069	0.444	5.801	1	0.016	0.199	1.938

Link function: Logit.

H4 results are partially confirmed as not being generalized to all three types of ambidexterity tested. However, *ambidexterity led by exploitation* results as significant with a coefficient of 1.069. For a 1 unit increase in the *ambidexterity led by exploitation*, *scalability* is expected to change by 1.069 in the ordered log-odds scale.

H2a. The higher the level of *organizational connectedness*, the more positive the effect of *network embeddedness* on *scalability*.

Network embeddedness does not have any valid correlation with the variable scalability. *Organizational connectedness* has a positive, significant correlation with the scalability factor. *Network embeddedness* and *organizational connectedness* are not associated with significant correlation values.

Running an ordinal logit regression shows that *organizational connectedness* has a statistically significant effect on the prediction of *scalability*, Wald $\chi 2(2) = 5.198$, $p = .023 < .05$.

The B coefficient equal to 1.178 shows that an increase in organizational connectedness is associated with an increase in the odds of scalability, with an odds ratio of 1.178 Wald $\chi 2(1) = 5.198$, $p = .023 < .5$.

H2a results as confirmed. *Organizational connectedness* **moderates** the relationship between *network embeddedness* and *scalability.*

H3a. The higher the *level of* organizational *opportunity recognition*, the greater the effect of *technological learning* on *international expansion*.

The correlation between *technological learning* and *international expansion* does appear to be significant, with a Spearman coefficient of .391 (*p* .013 < .05). However, *opportunity recognition* presents no significant correlation coefficients – neither with *technological learning* nor *international expansion*. The Chi-Square test confirms the relationship between the two variables, *technological learning* and *international expansion*, associating a significant *p* (> .001) for a Pearson Chi-Square value of 64.314.

Chi-Square tests (technological learning and international expansion)	**Value**	**df**	**Asymptotic significance (2-sided)**
Pearson Chi-Square	64.314a	25	< 0.001
Likelihood ratio	46.708	25	0.005
Linear-by-linear association	3.467	1	0.063
N of valid cases	40		

To test the moderation effect, an *interaction variable* was computed, obtained by combining *opportunity recognition* with *technological learning* (IV). The ordinal regression between the interaction variable and *international expansion* (DV) showed a statistically significant effect of the interaction variable on the prediction of *international expansion:* Wald $\chi 2(1) = 3.985$, $p = .046 < .05$.

Parameter estimates							**95% confidence interval**	
		Estimate	**Std. Error**	**Wald**	**df**	**Sig.**	**Lower bound**	**Upper bound**
Threshold	[IE_Trasf = 1.00]	-0.765	1.286	0.354	1	0.552	-3.285	1.755
	[IE_Trasf = 3.00]	0.259	1.182	0.048	1	0.827	-2.057	2.574
	[IE_Trasf = 3.50]	0.482	1.173	0.169	1	0.681	-1.818	2.782
	[IE_Trasf = 4.00]	2.338	1.223	3.657	1	0.056	-0.058	4.735
	[IE_Trasf = 4.50]	2.666	1.239	4.629	1	0.031	0.237	5.095
Location	Interaction_OPRECxTECHLEARN	0.133	0.067	3.985	1	0.046	0.002	0.265

Opportunity recognition **does confirm H3a** moderating the relationship between *technological learning* and *international expansion.*

H4a. The higher the *entrepreneurial orientation* in the organization, the more positive the effect of *ambidexterity* on *scalability.*

Entrepreneurial orientation associates positive and significant correlation values with *ambidexterity*, *ambidexterity led by exploitation* and *ambidexterity led by exploration*. However, running a linear regression model (ordinal logistic) for the *scalability* factor (dependent variable) calculated in relation to ambidexterity tested how entrepreneurial orientation (alertness) is impacted by the *interaction variable* (transforming entrepreneurial

orientation with ambidexterity). Results show a statistically significant *p* value (.006 < .05) for the *interaction variable* (entrepreneurial orientation x ambidexterity) with a B coefficient of 1.007.

Parameter		B	Std. Error	95% Wald confidence interval		Hypothesis test		
				Lower	Upper	Wald Chi-Square	df	Sig.
Threshold	[SCAL_Trasf=3.50]	4.216	2.4353	-0.557	8.99	2.998	1	0.083
	[SCAL_Trasf=4.00]	5.043	2.4415	0.258	9.829	4.267	1	0.039
	[SCAL_Trasf=4.50]	6.986	2.5505	1.987	11.984	7.502	1	0.006
AMB_Trasf		0.38	0.4233	-0.45	1.209	0.805	1	0.37
Entrepreneurial orientation Trasf		1.04	0.5282	0.005	2.076	3.879	1	0.049
Interaction_EALERTxAMB		1.077	0.3931	0.307	1.847	7.506	1	0.006

Dependent variable: SCAL_Trasf,
Model: (Threshold), AMB_Trasf, EALERT_Trasf, Interaction_EALERTxAMB

Therefore, **H4a results as confirmed**. An ordinal logistic regression with proportional odds was run and determined a significant effect of entrepreneurial orientation combined with ambidexterity in predicting scalability.

H5. *Ambidexterity* positively relates to *international expansion.*

Correlation coefficients show a statistically significant relationship between ambidexterity and international expansion. Running an ordinal logit regression shows a statistically significant value for ambidexterity with a Wald $\chi 2(1) = 4.858$, $p = .028 < .05$.

Parameter estimates							95% confidence interval	
		Estimate	Std. Error	Wald	df	Sig.	Lower bound	Upper bound
Threshold	[ZIE_Trasf = -3.61253]	0.146	1.575	0.009	1	0.926	-2.941	3.233
	[ZIE_Trasf = -1.41668]	1.145	1.49	0.591	1	0.442	-1.775	4.065
	[ZIE_Trasf = -.86772]	1.367	1.484	0.849	1	0.357	-1.541	4.275
	[ZIE_Trasf = -.31875]	3.298	1.552	4.513	1	0.034	0.255	6.34
	[ZIE_Trasf = .23021]	3.648	1.572	5.383	1	0.02	0.566	6.729
Location	AMB_Trasf	0.828	0.376	4.858	1	0.028	0.092	1.565

H5 results as confirmed.

H6. Technological learning positively relates to scalability.

The correlation value presents a strong coefficient of .496.

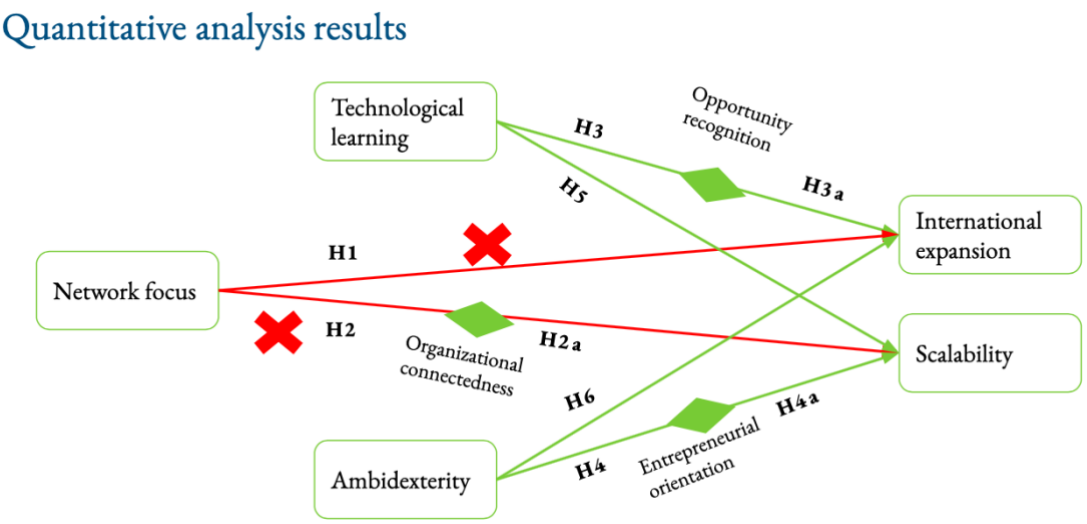
Running an ordinal logit regression shows a statistically significant value for technological learning with a Wald $\chi 2(1) = 10.145$, $p = .001 < .05$.

Parameter estimates							95% confidence interval	
		Estimate	Std. Error	Wald	df	Sig.	Lower bound	Upper bound
Threshold	[SCAL_Trasf = 3.50]	3.181	1.549	4.215	1	0.04	0.144	6.218
	[SCAL_Trasf = 4.00]	4.057	1.587	6.541	1	0.011	0.948	7.167
	[SCAL_Trasf = 4.50]	5.984	1.763	11.52	1	0.001	2.528	9.439
Location	TECHLEARN _Trasf	1.269	0.399	10.145	1	0.001	0.488	2.051

H6 results as confirmed.

3.5.3. Discussion of the results

Figure (5) Quantitative analysis results



The results presented above show the relationships from the model that were empirically tested to be statistically significant. As demonstrated by the ordinal regressions, two of the IVs (technological learning and ambidexterity) have a direct, significant influence on international expansion and scalability. Given the context and unit of analysis chosen here (European INVs not older than seven years), we conclude that these two factors are of predominant importance to the activities conducted by high-technology firms. Ambidexterity in the form of parallel actions of exploration and exploitation is shown to be significant for both IVs, although *ambidexterity led by exploitation* is shown to be the only variable that is statistically significant for scalability. Moreover, technological learning appears to play a significant role in a firm's rapid expansion and growth.

The findings indicate that engaging in more activities aimed at understanding contextual demand traits will enhance a firm's ability to enter multiple new overseas markets simultaneously.

In contrast to the above findings, network embeddedness is shown as not significant in terms of the direct influence on scalability and international expansion. This result could be interpreted as being the result of the complex layers and sub-factors that influence the direct relationship between this factor and the IVs. In fact, in analyzing the moderating impact of organizational connectedness, we found that it significantly influences the relationship between network embeddedness and scalability. This result could be taken as confirmation that network factors exert their power only through the medium of intermediate activities. Organizational connectedness – which we have operationalized in adaptive structures that shift, preserve and transform relationships, combined with flexible processes to enhance communication – highlights the importance of these management tools and functions to valorize the effect of the network. The qualitative stage of this research will be important for clarifying some aspects relating to this factor.

Our findings also lend support to the other moderating factors: *opportunity recognition* and *entrepreneurial orientation.* While the former hypothesis predicted a positive, moderating effect on the relationship between technological learning and international expansion, the latter indicated a positive moderating effect on the relationship between *ambidexterity and scalability*.

Both these hypotheses have been found to be statistically significant. We argue that in addition to unleashing the use of lean and diverse management tools (ambidexterity) and boosting activities that rely on data-driven analysis, simultaneous international expansion can benefit from the application of an entrepreneurial approach spread across all layers of management, together with the adoption of a proactive posture towards experimentation. Furthermore, in the qualitative stage of the research, an analysis of the internal and external knowledge/information flows across the value system will play a critical role in highlighting the specific contribution of these factors.

To add depth to the findings from the quantitative study discussed in this chapter, the research question is also addressed qualitatively in Chapter (4) in a comparative analysis of five case studies. The chapter starts with a complementary literature review focusing on the network dynamics of the firm. First, the attributes that distinguish INVs from gradually internationalizing firms are identified, and then an evolutionary model of internationalization and scalability is proposed. These concepts constitute the foundations of the semi-structured interview design. Following a comparative explorative case methodology, the cases are matched against three phases of the network evolution phase-model: entrepreneurial network (emergence), consolidated firm network (early growth) and relevant global network (expansion). Finally, we elaborate on the findings by interpreting and explaining the qualitative research results.

4. The qualitative analysis of business cases – Stage (b)

4.1. Theory-based framework of the qualitative analysis – Step 7

The qualitative analysis is envisioned to investigate the research question at an operational level, closely examining the activity system in the selected case studies to identify the extent to which the management and evolution of organizational networks, in their multiple forms (entrepreneurial network, operational network, strategy-driven network), affect the scalability and international expansion of INVs.

To this end, the empirical qualitative study aims to: first, deepen the understanding of the role of the firm's organizational connectedness towards scalability; second, through the use of interviews, delve into the role of other influencing factors, such as technological learning and ambidexterity (exploration and exploitation forces), in INVs' operations and pursuit of internationalization and scalability. The qualitative analysis will expose the role of organizational connectedness in the evolving firm network in reaching the global network.

The quest for a better understanding of the role of organizational connectedness, as a distinctive factor in INVs' rapid expansion, is indicated both in the literature and in the quantitative results. The quantitative study results indicated that one of the main hypotheses (H2 network embeddedness and scalability) resulted as not confirmed, although the same variables' relationship resulted as statistically significant when moderated by organizational connectedness. This result opened an important research window: to understand the knowledge and information flows in the operational network of the selected firms in terms of scalability.

The qualitative, empirically based explanation of the quantitative results aims to look at the operational and value network in the activity system in order to identify the mechanisms and processes in place on the business scalability path. The analysis will investigate the activity system as well as the ambidexterity and technological learning contribution in boosting international expansion and scalability. *Acquiring an understanding of organizational connectedness requires an in-depth analysis of the changing objectives, the adaptive structure and the agile operations of the firm in an activity-specific context.*

In terms of the mixed-methods approach adopted, the qualitative study expands on the research, investigating at a granular level the following three aspects and the directions to follow:

1) *The difficulty in identifying potential INVs when they are still young.* The literature review showed that scholars mainly analyze INVs after those firms achieve proven success. However, there is a need to develop and test a framework to identify INVs in their early years (before they achieve proven success).

2) *The dynamic nature of the INVs' perspective*, which requires expanding on the validation of the factors in the conceptual model, quantitively examined, in the context of the evolving organizational structure and network over time. Although the survey results identified the moderating role of organizational connectedness in scalability, the analysis remained limited

when it came to capturing the time dimension in the context of the rapid development and internal structure of INVs. In this regard, the qualitative analysis expands on the quantitative analysis by focusing on the network evolutionary process. Specifically, it depicts a model that demonstrates each phase in the evolution of the firm's network. In this phase-model, the qualitative analysis examines the network attributes and dominant types of network and ties in each phase; the types of knowledge/information flows and network evolution phases; the evolution of the network from the entrepreneurial stage to the organizational connectedness stage; the type of network that leads to scalability in a global context; and those characteristics of the firm's network that accelerate scalability.

3) *The flow of information in INVs,* categorized as internal or external to the firm; the relevant type of activities (human-centered or technology-based) and the type of process (explorative or exploitative). The schematic frame, which analyzes knowledge and information flows in INVs, distinguishes between inter-firm and internal knowledge and information flows across the network, and looks at each (flow) from an activity-type and process-type perspective.

4.1.1. Retrospective longitudinal case study analysis

The firms on which we prepared case studies were prospective INVs, up to seven years old, and focused on technology, knowledge and digitalization. The firms were characterized as follows: they had internationalized within five years of inception; in their fifth year, they were generating 25% of their sales from foreign markets; and they were operating in multiple markets (on average, three to five in the first five years). The ventures investigated were in Europe.

The analysis focused on three main elements: a) the type of attributes that INVs possess in pursuit of their distinct internationalization paths; b) the dynamic transformation of the network from the entrepreneur to an extended organizational asset projected to meet identified international market demand; and c) the information/knowledge flows and their effects on the value network along the growth-geared internationalization and scalability path.

4.2. Theoretical framework of the case study analysis

4.2.1. Distinctive attributes of INVs

The extant literature has not reached any agreement on the operational criteria by which a venture can be recognized either as a rapidly internationalizing firm from inception or as a gradually expanding exporting firm (Hagen and Zucchella, 2014). Building on the definition provided in Chapter (1), we analyze in depth the main traits that distinguish the internationalization approach of INVs from the traditional gradualist internationalization approach. In this regard, we articulate the attributes that INVs display along their evolutionary path and not simply at a particular point in time (e.g., the fifth year).

Building on the prior work of Rialp et al. (2005b), this study focuses on four key aspects relating to the international expansion and scalability of new ventures: a) technological learning driving growth according to demand feedback and value chain coordination; b) organizational connectedness relating to the adoption of agile structures able to shift, preserve and transform relationships; use of information/knowledge processes as a communication vehicle and a basis for cooperation exchange; c) network focus: evolution and forms of the founder's and organizational network; d) ambidexterity in seizing market opportunities.

This chapter aims to articulate and extend three main dimensions previously theorized by Rialp et al. (2005b) that influence the process of expansion of INVs: i) the founder's (or founding team's) characteristics; ii) organizational capabilities; and iii) the firm's strategic focus. In Table (9), the key attributes relating to each dimension are drawn from the original framework and highlight some notable characteristics mentioned in the literature in the years following the framework's original conceptualization. For "founder characteristics", Rialp et al. (2005b) proposed the attributes of managerial vision, prior experience and networking. To these we add two more attributes: the type of relationship among founders and the industry relationship.

Regarding the type of relationship among founders, social network theories have shown how weak ties among colleagues and friends are important in the inception phase (Sasi and Arenius, 2008; Zain and Ng, 2006; Zhou et al., 2007). The industry relationship is an extended, more mature reflection of the founder's characteristics. Nonetheless, it is important to emphasize the founder's vision, which is derived from the mature attitude to work and experience that led the entrepreneur to spot a gap in the market. An extra attribute, *network embeddedness (focus)*, has been introduced acknowledging those authors (Oviatt and McDougall, 1995; Coviello, 2006; Gabrielsson et al., 2008) who considered the critical role played by industry networks (i.e., social ties, inter-firm relations) in INVs' international expansion drive.

"Organizational capabilities" comprise the attributes of *market knowledge commitment, intangible asset control* and *value creation*. With the introduction of the new attributes of *ambidexterity* and *technological learning*, it is necessary (in the case of ambidexterity) to indicate the parallel activities of exploration and exploitation that innovative firms engage in on their growth path. The literature on high-tech firms supports the hypothesis that INVs, as innovation-driven organizations (Neubert, 2017), are heavily involved in supporting both these expansion processes. The second attribute, *technological learning*, relates to the digital services and high-tech products that power INVs' internationalization processes. INVs make extensive use of data-driven technologies that promote and support users' reachability and engagement, satisfaction and visibility in the foreign market. By using these technologies, the firm adopts fast feedback loops that support technological learning paths.

"Strategic focus" relates to the extent and scope of internationalization, the selection and coordination of operations with foreign customers, and the firm's strategic posture/degree of flexibility.

Table (9) illustrates the construct of expected patterns associated with INVs versus the gradualist behavioral models of export-based internationalization.

Table (9) Expected attributes of INVs versus gradualist behavioral models of internationalization

	Attribute	INV theory	Gradualist approach
Founder's characteristics	Managerial vision	Global/international vision from inception; search for a big market to commercialize the business.	International market gradually pursued
	Prior experience	High level of experience in the industry; international experience in MNEs or international ecosystem.	Low level or absent
	Type of relationship among founders	Weak ties among friends, colleagues and agents in the same professional arena.	Members hired in various ways
	Industry relationship	Mature experience in spotting niche gaps or emerging trends; advanced technical knowledge and know-how about the industry.	Experience in the sector but with no particular innovation strategy to develop and roll out
	Industry network embeddedness	Strong use of personal and business networks at local and international level.	Use of direct network with a particular emphasis on the local one
Organizational capabilities	Market knowledge and commitment	Superior internationalization knowledge at inception.	Slow development of international knowledge
	Organizational connectedness	Evolving objectives; adaptive structures that shift, preserve and transform relationships; flexible processes both for the context and in response to learning over time; processes that sustain communication as a basis for cooperation and information exchange.	Dominant structure with the traditional chain of command and hierarchical exchange of information
	Unique control of intangible assets	Knowledge process management; technological product innovation; data collection and processing.	Availability of intangible assets not crucial for the firm's growth
	Technological learning	Employment of data-driven technologies; collection, analysis and development of proprietary software.	Low level usage of data-driven technology; is not focused on the internationalization purpose
	Value creation sources	Leading-edge technology products, technological innovativeness and quality leadership.	Less innovative and leading-edge nature of products and services
	Ambidexterity (exploration and exploitation mechanisms)	Exploitation: resources devoted to continuously improve the technology of the main offerings/services. Exploration: resources allocated for exploring new technologies or services to fulfill non-covered customer needs.	Focus on one line of development: generally exploitation
Strategic focus	Network focus	Strong focus on networks which are a critical variable affecting the process of international expansion; implies social ties, inter-firm relations and value chain/value network linkages.	Limited focus on networks which are considered a complementary resource not essential to the firm's growth
	Extent and scope of international strategy	Niche-focused, highly proactive international strategy developed (from inception) for geographically spread, leading markets around the world.	More reactive and less niche-focused international strategy
	Selection and coordination of operations with foreign customers/clients	Narrowly defined customer groups with strong customer orientation and close, direct customer relationships.	Intermediaries are in charge of foreign relationships
	Strategic posture	High level of flexibility in the business model; agile management; short cycles of testing the markets; extreme flexibility in adapting to rapidly changing external conditions.	Limited flexibility to adapt to a sudden change in market conditions and circumstances

Source: Own elaboration based on Rialp et al. (2005b) formulation. (Shaded cells contain original attributes used by the authors.)

4.2.2. A model for the firm's network evolution and scalability

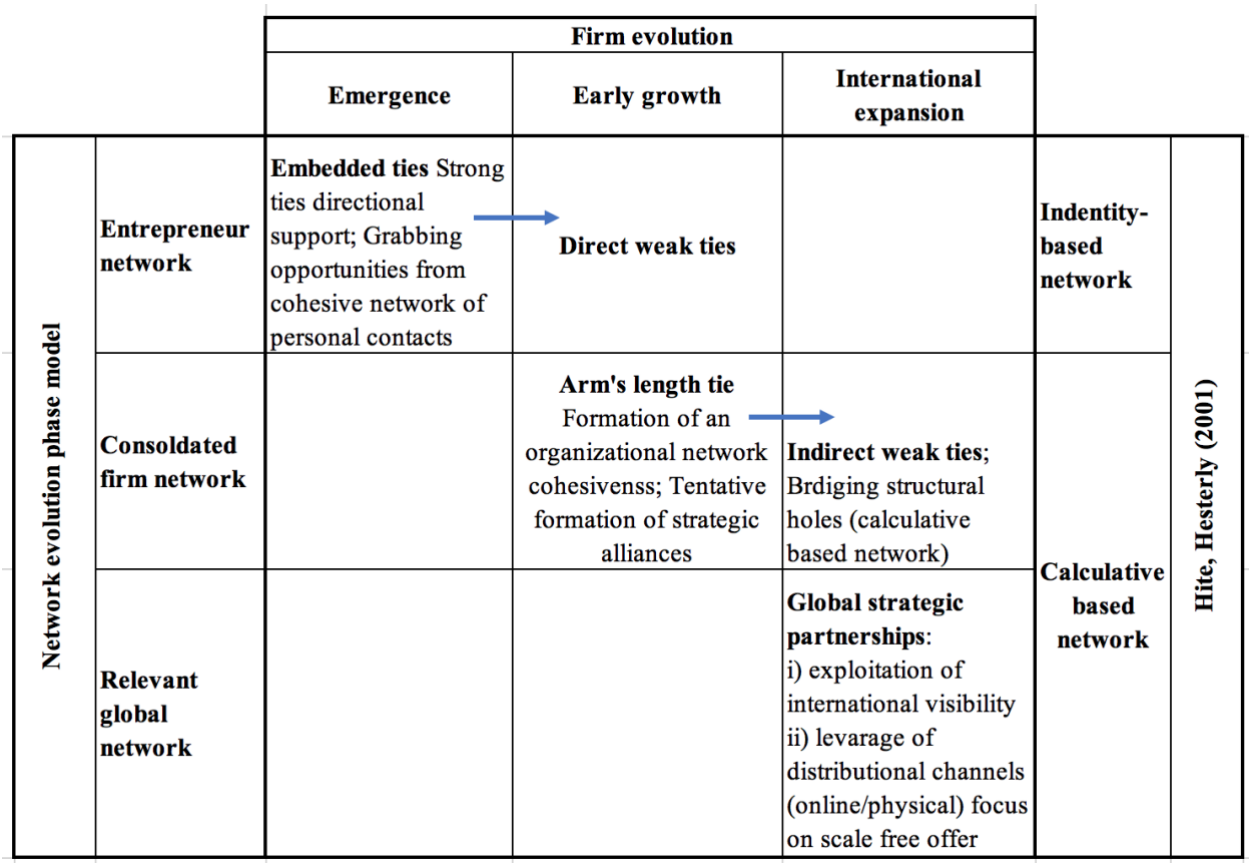
Although there is broad agreement about the importance of networks to firms that internationalize at an early stage, there is considerably less agreement as to which network characteristics are most advantageous for a firm's growth and which network-related factors lead to rapid internationalization.

On the one hand, several studies show that firms that show rapid growth tend to leverage a cohesive network of embedded ties with entrepreneurs (Larson and Starr, 1993; Hite, 1999). On the other hand, as firms dynamically progress from the start-up stage to early growth and international market entry, they require new tools and structures to sustain their growth momentum and to leverage their strategic network. Hite and Hesterly (2001) proposed the notion of an *arm's length* and *calculative-based* network, which is a network developed by the firm on the basis of its strategic intent and organizational ties. Thus, firms drawing on their network resources may evolve in a regular and strategically oriented way. Figure (6) expands on the above concepts, illustrating how the international network of organizational ties is formed.

Thinking of the network in this way, together with the firm's resources, suggests that a dynamic approach is required. This may help to reconcile two distinct network attributes: the cohesive embeddedness network and the calculative-based network. On the one hand, the *cohesive embeddedness* network relies mainly on the strong and weak ties of the entrepreneur. On the other hand, the *calculative-based* network refers to the organizational network that is characterized by different clusters of contacts capable of filling structural holes, if necessary, e.g., to access foreign markets. While the former (entrepreneur-based) is driven by the exploitation of personal contacts and social business relationships which are strongly rooted in the network cohesiveness of the founders, the latter (strategy-driven) connects different, unrelated networks, which aid the firm's expansion (e.g., Aldrich and Reese, 1993; Larson and Starr, 1993; Hite and Hesterly, 2001; Yu et al., 2011).

In examining the *organizational network,* we use the definition of Hite and Hesterly (2001, p. 277) who refer to the *egocentric network of a firm* as a "set of direct, dyadic ties and the relationships between these ties, with the firm at the center of the network as the focal actor". Using this definition enables us to keep a dual perspective aimed at evaluating both the *network dyads* (single relationship between the venture and other firms) and their aggregation into a larger organizational network with the venture at its center.

Figure (6) Firms' evolution and network types (identity or calculative-based network)



Source: Own elaboration based on Hite and Hesterly (2001)

Assuming the aforementioned propositions, we developed a model where general conditions are specified − analogous to knowledge management dynamics (Hedlund, 1994) − distinguishing three levels of firm dynamics relative to the network: the *entrepreneurial* network (personal and team-based), the *consolidated* network (also labeled organizational formation or network crystallization in Larson and Starr, 1993) and the *relevant global* network (inter-organizational exchanges), which is necessary to scale up rapidly and drive the exponential growth of the firm.

The evolution of the firm's network follows a three-phase, dynamic approach. While a phased approach clearly has limitations, it is nevertheless useful in framing the general course of the firm's evolution and ongoing change over time, particularly during the dynamic early stages of the firm's development. Each of the firm's phases represents more than mere changes over time; rather, it constitutes a proxy for employing network resources at multiple levels and addressing different strategic issues (Hite and Hesterly, 2001; Reese and Aldrich, 1995), e.g., business models, international market accessibility and service scalability. Each phase represents a unique, strategic context that influences the nature and extent of a firm's use of network resources in working towards the goal of international expansion and rapid growth. While we recognize that there is a full spectrum of factors influencing the life cycle, we focus specifically on those factors that affect the early growth of the firm and its access to

international markets. Across all phases, the process involves the exploration, screening and selective use of network dyads to match the rapid growth of the emerging business offerings of the firm with a view to international expansion.

In *Phase (1),* the entrepreneur starts with a global vision and capabilities that are strongly connected to past experience and to an accessible, personal network. In this phase, entrepreneurs use their formal and informal personal networks to establish the foundations of the firm, choosing the right people and structuring roles to support the key activities of the firm. In the view of scholars (Hite, 1999; Larson and Starr, 1993), this phase is marked by dyadic ties stemming from longstanding, pre-existing relationships which are characteristically grounded in a close and cohesive network.

Also in *Phase (1),* the entrepreneur's vision, expertise and capabilities are shaped into an organizational structure, testing key features according to the entrepreneur's network insights, know-how and controllable resources. Specifically, the network resources deployed in this phase make way for key operating activities, including staffing, defining core services and initially positioning the product/service along the value chain (e.g., distribution channels or leads within the market itself).

In *Phase (2),* the firm's potential becomes dependent on the presence of organizational connectedness, which allows the creation of a learning path within the international stream of operations (here digitization often becomes a key driver). This is supported by the technological learning lever. Organizational connectedness is pursued by focusing on information and knowledge flows across the firm, while also establishing external linkages across the whole ecosystem. In this phase, founders test the service and adjust it by matching its features to the market demand. Characteristics of this phase are repetitive feedback loops from the market aimed at validating and improving the firm's operations. The firm's offering is tested, the business model is finetuned and the market demand is validated. The greater the organizational connectedness, the better the alignment of operations to the network ecosystem. Also in this phase, the firm inspects its operations and configures resources in order to reach operational effectiveness, both within the country and in other regional markets. Innovation programs and incubator network contacts are an essential part of this phase.

Running in parallel (in Phase (3)) to the development of an initial network of domestic and international clients in Phase (2), the venture starts to conduct a systematic inspection of data to reveal levels of demand. By setting up a process of technological learning from the markets' best responses, the data help to refine the offering and identify the key features that constitute potential hits in terms of market demand. Considering the Pareto 80/20 rule (which states that for many outcomes, roughly 80% of the consequences come from 20% of the causes), the firm selects and prioritizes the 20% of those features of the offering that generate 80% of the revenue or trigger 80% of the attention.

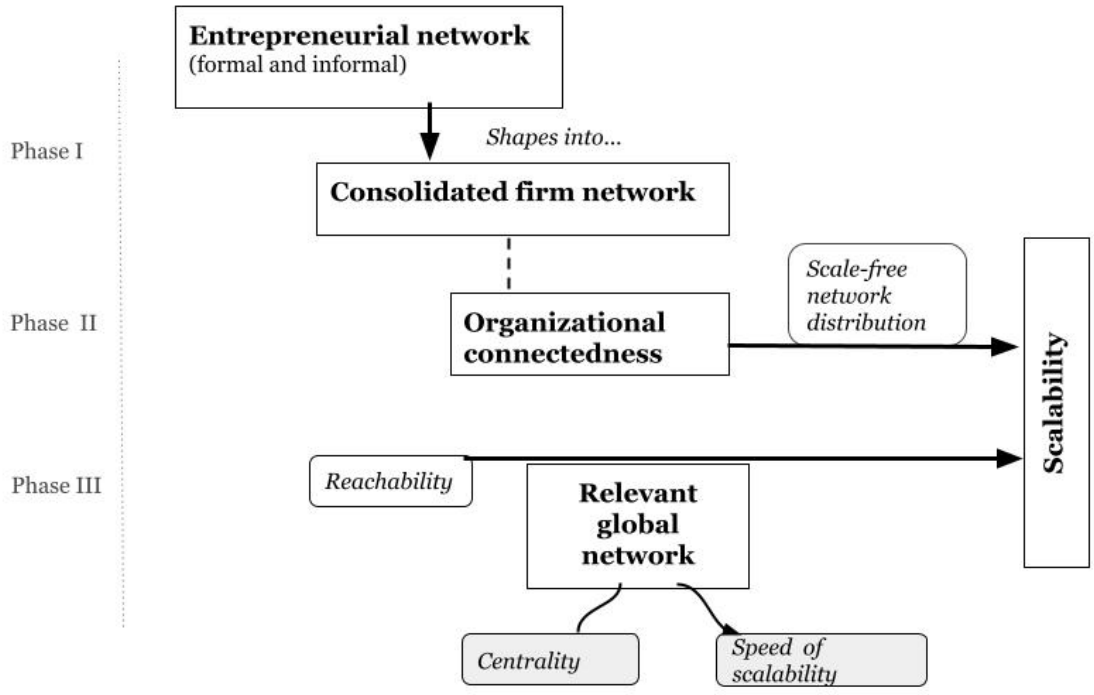
In *Phase (3),* the firm pursues international growth by establishing linkages with international players with a view to exploiting an industry-relevant global network. The scalability of the firm's offering relates to the capacity to benefit from physical factors and resources that the

firm draws on from an existing industry-relevant network with an international presence: distributional channels, qualified human resources, industry suppliers and marketing channels. In this phase, partnership agreements with keystone players are essential for setting in motion the network effect and driving growth.

This phase is the most delicate in the internationalization process as the venture begins to establish its presence abroad or engage in business transactions with foreign clients on a continuous basis. Keystone players from the industry often constitute regional marketing hubs (e.g., Central Eastern European countries, Western Europe, the Far East, etc.) which expose the venture to licensing or reselling opportunities. In this phase, too, technology-driven activities are focused on processing and analyzing data and spotting scale-free distribution in response to demand.

A stepping-stone in this phase is testing the *scalability potential* of the firm, which is the ability of the business model to generate revenue at a global level. This attribute is heavily dependent on the speed of achieving a high level of centrality in the market in which the offering is distributed. Another feature of this phase is the capacity of the venture to scale up the business without encountering major structural constraints of either a financial or operational nature. Often in this phase agreements with international players or the acquisition of an important asset create the need for the venture to redefine the business model with a view to making it lean and easily scalable for the market in question. Figure (7) illustrates the phase-model of network evolution and firm scalability, and the propositions that link the entrepreneurial network, the consolidated firm network and the relevant global network to firm scalability.

Figure (7) Model of network evolution and firm scalability



Source: Own elaboration

Propositions

Proposition 1: Entrepreneurial network formation

An emerging firm gradually formalizes the entrepreneurial interpersonal network into routines and procedures, turning them into inter-organizational ties that result in information and resource-exchange relationships between organizational entities. INV entrepreneurs are born with a vision to tap global needs and opportunities, and possess the personal networks, skills and managerial capabilities to address key challenges that they may encounter.

Proposition 2: Organizational connectedness

INV firm potential is dependent on internal connections established via various characteristic dynamics. The degree of connectedness is tied to the presence or emergence of a scale-free distribution/power system within value chain operational loops. Connections are operationalized by processing information stemming from internal operations, weighing up priorities and exploiting hub-dominated, scale-free distribution.

Proposition 3: Reachability of a relevant global network

The ability of INV firms to exploit scalability is dependent on the ability to reach a relevant global network.

Proposition 4: Speed of scalability and centrality

The speed of scalability is proportional to the time needed to achieve (industry-based) central positioning.

4.2.3. Information/knowledge flows in the firm's value system

In this section, we analyze the notion of the value system, explained in section 1.5.3., in order to shed light on the knowledge and information flows occurring at a strategic level within the network, which drive market entry and firm growth. To the best of our knowledge, this perspective is novel and helps to pinpoint critical activities and idiosyncratic processes that INVs pursue in order to keep knowledge protected and undisclosed, while also creating external alliances to boost growth.

As illustrated in section 1.5, the present study adopts an activity-based perspective, combining the analyses of the evolution of the network resources (controlled by the venture) with the exchanges of information and knowledge derived from internal and external operations. The analysis sheds light on key activities that boost growth and enable the firm to leapfrog towards international scalability.

The following section will introduce some original conceptual tools that have been elaborated on in order to analyze the five INV case studies. First (a), we reflect on the distinction between implicit and explicit (articulated) knowledge/information flows, according to the different phases of the network evolution process. Second (b), we look at the coordination of international activities within the value network (internal and external) pursued through a combination of technological learning and ambidexterity factors.

a) Types of knowledge/information flows in the evolving network: internal or articulated

In order to contextualize the analysis of each case according to the phase that the firm has reached in terms of its network management, we offer two distinct perspectives on information/knowledge flows. The concepts of tacit and unarticulated knowledge (Polanyi, 1962, Nonaka, 1991, Serrat 2017) were introduced in section 1.5.4.. This type of knowledge/information is called *internal*, as opposed to *articulated* knowledge/information which refers explicitly to external exchanges. *Internal knowledge/information flows* refer to all the exchanges relating to know-how, insights, and data and information occurring across the firm's value chain which are relevant to the firm's internal operations and processes. Considering the rapidity with which information is processed, we consider *internal knowledge* to be formed by tacit and explicit knowledge but coalesced into informal and non-exchangeable forms, which we label *internal*.

Recalling the network evolution of the venture, we distinguish among three different network constructs emerging during the firm's expansion (see Table (10)):

- The *entrepreneurial network* associated with the foundational phase of an INV firm. This is usually characterized by the global vision of the founding entrepreneur and their capability to turn their personal network (technical know-how, industry expertise, qualified human resources and relevant contacts in the industry ecosystem) into an organizational asset. This phase entails the development of social capital (network contacts), as well as the configuration of the business in terms of roles, specific attributes of the service offerings, the range of value chain activities and the firm's market positioning.

- The *consolidated (organizational) network* generating multiple layers of information that the firm is able to control through its internal operations and its activities in the value system. This network relates to the capacity of the firm (team, processes, procedures) to appropriate know-how from the feedback loops in the market and to leverage information in order to structure its services and business model to allow exponential international expansion.

- The *relevant global network* that the firm is able to access and exploit in pursuing its international growth path. This physical network reflects the ability of the firm to integrate into international supply, sales and distribution channels, while also optimizing human resources.

Table (10) shows how the firm evolves along its internationalization growth path, maneuvering through the knowledge/information flows across the different levels of the networks that the firm builds. The matrix shows how the notion of a network calls for a dual perspective: internally by adapting and shaping the firm's offerings to suit the market and externally by defining an articulated set of information and knowledge exchanged across the industry value system.

Table (10) Types of knowledge/information flows and network evolution phases

	Entrepreneurial network	**Consolidated network**	**Relevant global network**
Internal information/ knowledge flows	Vision of the firm's positioning and design of the strategic activity system Roles designed, matching competencies and expertise Expertise niche focused on the distinctive features of the service offered to the market	Data-driven technology analysis and know-how feedback loops employed to align the services to hubs of demand Agile management systems/routines Short cycle of feedback loops of activities	Data analysis of key players to establish partnerships and reselling agreements Use of data technologies to tap exponential trends in growth in demand
Articulated information/ knowledge flows	Offering for prototype testing: first trial Intangible asset coding and the innovativeness of the proposal Know-how on testing the new offering in niche segments	First alliances with keystone players on determining market interest in the offering Quality standards and technology New data collection on operations in the market Market analysis of clients and segments	Licensing of software/service use Integration of APIs and accessibility to a distribution network Agreements for testing premium services as integrated offerings Collection of data on websites, community, customer satisfaction and unfulfilled wants

Source: Own elaboration

b) Types of activities and processes in the value network: tracing ambidexterity and technological learning in internal and external knowledge and information flows

As the focus of this study is restricted to digitalized INVs, the analysis concentrates on the network established internationally through the activity system of the firm. The framework sheds light on the types of process implemented in the value network: opportunity recognition, entrepreneurial orientation and the strategic posture that the firm adopts (explorative or exploitative).

It is important to note that Ritter et al. (2003) proposed a model to examine the management of different types of networks (internal and external) together with the coordination thereof among functions (cross-relational/relationship-specific). The current study proposes an expansion and further elaboration of the Ritter et al. (2003) model, first by presenting the analysis comparing internal and external types of networks, and second by examining the explorative/exploitative types of processes (ambidexterity).

Table (11) presents the internal network in terms of the level of coordination of activities along the value chain and the type of process implemented (explorative/exploitative). Thus, the firm may coordinate activities in terms of the explorative process of analyzing and managing data-processing technologies (e.g., research into high-potential demand hubs) or the exploitative process (e.g., building proprietary network channels and algorithms to manage service delivery and logistics).

Table (11) Internal network and type of process (ambidexterity) (example of activities)

Level of coordination along the value chain	**Data-driven technologies**	Searching for hubs with niche demand and high potential for growth	Building proprietary network channels for service delivery
	Human-intensive activity-based	Coordinating marketing and service attributes to satisfy consumer preferences	Managing and building innovative logistics and network arrangements
		Explorative	**Exploitative**
		Type of process	

Source: Own elaboration

Digital and online start-ups have the advantage of managing operations via short cycles of testing and validating internal processes and user experiences. With innovation being one of the main drivers of scalability, technology firms are heavily involved in shaping information and knowledge flows across the firm, ensuring that activities develop market-friendly service features. Running parallel to this, the firm coordinates exchanges with external actors, optimizing flows of information and knowledge while deploying and finetuning its international strategy. This mission is achieved through the employment of data-driven technologies, together with agile management processes characterized by short testing cycles of the value chain.

Technology firms are distinctive in that they are able to benefit from iterations of fast-run cycles of market testing, providing feedback data and learning-based information/knowledge flows. In particular, ventures in the technology domain look for unique datasets on which to train their machines. Sometimes they try to come up with new ways to parse weaker signals on scalable offerings that other firms cannot detect in the midst of market noise. Tables (11) and (12) synthesize information/knowledge flows as processes that are explorative or exploitative.

A distinct (and traditional) way of conducting operations is to focus on *human-driven interaction* during the firm's first implementation cycle when it is vital to understand the new context in a flexible or elastic manner. This operational approach is strongly tied to the notion that a firm relies on human capital – evidenced in mature capabilities and core competencies – to build its competitive advantage.

Exploration activities are concerned with the firm's tendency to explore a new market or technology and to engage in radical innovation. Exploitative activities, in contrast, are concerned with capturing value from current operations, with a view to growing the business and increasing profits through a larger-scale operation.

The external network analysis can be a source of a firm's competitive advantage, especially in innovative environments and for digitalized service offerings. Particularly in the case of smaller firms, a network approach offers information about third-party resources (often, complementary ones), allowing the sharing of expertise, learning and know-how (Lavie, 2005)

– in other words, the ability of the firm to adopt open innovation strategies in order to tap into external sources of knowledge in the ecosystem (Chesbrough, 2014).

Considering the inter-firm cross-relational relationships and agreements, Table (12) looks at the *outbound/inbound types of activities* that are coordinated by management. For example, outbound activities for explorative processes could entail focusing on testing either innovative offerings or regional market alliances with third-party vendors. Inbound activities could involve coordinating logistics and integrating APIs (application programming interfaces) for online platforms.

Table (12) External networks and type of process (ambidexterity) (example of inbound/outbound explorative/exploitative activities)

Level of coordination along the supply chain and ecosystem	**Outbound**	Testing innovation offerings by bundling Regional market alliances with selected third-party vendors	Marketing and sales agreements with mass market distributors Alliances with MNEs for completing complementary offerings
	Inbound	Coordinating logistics and operations, and platform API Externalizing activities for regional adjustments (language and regulation) Coping with production operations: changing all inputs to ready them as outputs	Managing logistics efficiency network arrangements Building alignments among TMT and regional points of sale
		Explorative	**Exploitative**
		Type of process	

Source: Own elaboration

Explorative activities related to *data-driven operations* often feature in research on hubs of demand. For example, Netflix continuously searches for a few products that lead the demand in different regions. Often the analysis of such valuable data is difficult and possible only with the repetitive and intensive use of data-driven tools (i.e., machine learning or artificial intelligence/AI).

In the case of *exploitative activities* led by *data-driven technologies*, the focus is on analyzing the main players that have substantial market share and control most of the distribution channels. These activities are considered to be an important asset when entering new markets as valorizing indirect weak ties can be useful when setting out to identify leads.

The *human-intensive activities* related to *explorative activities* mostly entail the coordination of services and operators across different markets. In this regard, a distinctive goal is to maintain a flexible and ready-to-change approach to valorizing preferences, cultural traits and emerging trends among consumers from the markets in question.

The *human-intensive activities* related to *exploitative activities* focus on managing, building and developing new relationships within the logistics network as a whole. Across different regions, the distribution of services/products is often dependent on clients/consumers having unobstructed access to complementary features that enhance revenue and brand visibility (e.g., a consumer loyalty plan). It therefore becomes necessary to establish partnerships and monitor the user base to detect any constraints that might hamper the full experience of the service/product in question. Table (12) shows how, depending on the direction of information/knowledge flows (outbound/inbound) in the value system, the firm conducts its operations for the purpose of exploration or exploitation.

Outbound activities (inside-out), oriented towards *exploration* of a new offering, are directed at testing the service through bundling and building a network of agents through reselling agreements. *Outbound activities (inside-out),* oriented towards *exploitation* of the actual offering, are directed at establishing marketing and sales agreements with mass-market distributors, forming alliances with MNEs and selling complementary data or service features to third-party firms (i.e., segmented advertising).

Inbound flows (outside-in), focused on *exploration* or the processing of information and knowledge from *outside-in,* entail logistics coordination and optimization (with several of these processes having been put in place by food delivery firms, e.g., Deliveroo), crowdsource marketing for regional adjustment, changing or replacing inputs or improving quality features. An outside-in open innovation, for example, is being open to improvements via platform users' feedback and co-creative activities.

Inbound flows (*outside-in*), focused on *exploitation,* entail logistics optimization and enhancing service distribution or visibility, performing strategic alignments of the top management team (TMT) according to regional points of sale (PoS) insights, and selecting business models according to the region/country in question and strategic partner dominance.

This chapter discussed the theoretical foundations of and conceptual frameworks for the qualitative case study analysis. It identified attributes that differentiate INVs from gradualist, international firms. Thereafter, it introduced a phase-model of the network evolution, comprising the emergence (entrepreneurial network) phase, the early growth (consolidated firm network) phase and the expansion (relevant global network) phase. Finally, it elaborated on a framework that investigates internal and external information and knowledge flows from a value network perspective, thereby helping to deepen the understanding of the role of ambidexterity and technological learning.

The interviews and the case study analysis will be presented against the backdrop of these three frameworks in Chapter (6). The next chapter, Chapter (5), will first test the phase-model analysis by analyzing successful INVs, using online materials and published interviews with the founders.

5. Investigating successful cases of INVs using the network evolution phase-model

This chapter aims to investigate INVs that are already well poised to successfully expand internationally. By combining the literature review with a qualitative examination of real-life business cases, the present study sets out to refine and support the proposition of the model in Figure (7) which represents the organizational evolution of the firm on its internationalization journey. In particular, the model aims to unveil the idiosyncratic factors that distinguish the organizational connectedness adopted by INVs in their pursuit of scalability and international expansion.

The discussion covers interviews, business cases and company reports relating to three different types of INV: i) a new venture that could internationalize in 12 countries within five years of inception (Deliveroo); ii) a venture within a multinational that was a proper INV entity (Nespresso); and iii) a "born-again global firm" (Bell et al., 2003) that achieved global expansion later in its lifespan once it had reinvented its business model in the face of a radical technological shift in the market (Netflix). The latter case sheds light on those firms that do not experience international activity at low levels – only when some exogenous factors impact the firm (e.g., online streaming technology), which rapidly open up a path towards international expansion. All three cases are distinct examples of the dynamic path followed by INV firms.

5.1. Overview of the three business cases

The three cases offer multiple opportunities for comparison across three different industries: video entertainment (Netflix), instant coffee (Nespresso) and online food delivery (Deliveroo). Despite the diversity of the industries, all three firms experienced exponential international growth when exploiting their online network operations.

For example, after launching its e-commerce platform in 1998, Nespresso recorded a sustained expansion of its clientele, with an annual growth rate higher than 30%. Nespresso grew from 180,000 subscribers in 1996 to 2.2 million subscribers in 2006. Netflix went through a similar pattern of growth after introducing its online platform in 2007 and entering the international market in 2010. From then on, Netflix's customer base entered a period of sustained expansion, with an annual growth rate in excess of 80%, year on year, and with user numbers growing from about 13 million in 2010 to 118 million in 2018. Deliveroo, a start-up that was just five years old, was able to leverage its online ordering platform to expand its presence into 12 countries within four years. Sales also picked up strongly, with 2016 seeing sales growth of more than 600% over the previous year. Notwithstanding the importance of these figures for Deliveroo, they should be seen within the context of several rounds of investment that boosted firm expansion. For example, more than US$275 million of investment reached the firm only during the fifth round of investment in 2017.

In essence, the three cases illustrate how the model discussed in section 4.2.2 is representative of the characteristic dynamics observed in INVs' internationalization and exponential growth.

Case # 1

Deliveroo, a web- and app-based food delivery service, experienced a strong expansion powered by multiple regional acquisitions of local players and re-engineering of operations through superior logistics and online technologies. Capital investment in technology was able to quickly boost returns by exploiting the scalability of a dense, intertwined web of bricks-and-mortar small shops in need of logistics services. Will Shu, who founded Deliveroo in 2013, had worked as an analyst in the private investment banking field, which had given him access to various sources of investment at an early stage from which to build his personal network.

The Deliveroo platform is now active in 12 countries and 120 cities, and accounts for 35,000 partner restaurants. From inception, the start-up founder and investors recognized an untapped global need. As reported by an early-stage investor, H. Kanji (London Business School, 2017): *"The company ... recognized that this demand was global, and it expanded internationally quickly. All of this attracted the attention of great investors, which gave it the resources to make the flywheel work even faster. The lesson for all start-ups is to be not afraid of scaling."*

Entrepreneurial network: Applying the phase-model in Figure (7) to Deliveroo shows that in Phase (1), the entrepreneurial network was transformed into an important financing lever which gave a strong boost to geographical expansion and technological superiority. Over the three years from 2014 to 2017, Deliveroo raised (in six rounds of investment) about US$859.6 million.

Organizational connectedness: Another founding pillar of Deliveroo's expansion was the use of relevant metrics by streams of internal data, as depicted in the second stage of the phase-model. As explained by the firm's VP Engineering, D. Webb (Pudwell, 2017): *"Data is used in three main ways, the first of which is to support team decisions [...] Experimentation helps us understand product changes we make. [...] Graphs help our operations team understand and react to trends and agents all across the business are running queries on our dataset 24 hours a day. [...] The second way Deliveroo uses data is to support algorithmic decisions, as machine learning models need to be constantly re-trained to ensure that they are running on the most up to date and relevant information. [...] The third and final use of data is arguably the most vital to Deliveroo's success: using data to provide real-time operational monitoring. [...] Our dispatch engine [...] is constantly calculating and recalculating the best combination of riders to orders. It does this using predictions for rider travel time, food preparation time, etc. and we calculate that using machine learning models which are trained on our historical data"* (Pudwell, 2017).

This approach is strongly supportive of the phase-model case, where internal structural organizational connectedness becomes a driver of scalability. In this regard, the significant moderating role played by organizational connectedness appears to be strongly rooted in the operations that the company selects to direct its growth path. Scalability becomes highly correlated with the level of data analysis that the company maintains for its key operations.

Reachability of a relevant international network: Phase (3) of the model (reaching a relevant network and having scalability potential) was a challenge that Deliveroo had to face in terms

of the fleet of drivers to be assembled in each location. This distinctive value chain problem was resolved by exploiting IT infrastructure capabilities. As stated by founder Shu: *"We could actually build a delivery fleet without investing in a lot of customized equipment. It is really the smartphone and the tablet that allow this business to exist"* (Pupic, 2016). The relevant network was in this case built by means of IT, tapping into the spare capacity of people available to perform the delivery task in each geographical area. Table (13) provides a synthesis of the phase-model network evolution and scalability potential of the three successful business cases (Deliveroo, Netflix and Nespresso).

Table (13) Phase-model network evolution and scalability potential (Deliveroo, Netflix and Nespresso)

Business case	**Phase (1): From entrepreneur to organizational network**	**Phase (2): Organizational connectedness Potential of power law distribution**	**Phase (3): Reachability of a relevant global network**	**Scalability potential**
Deliveroo A delivery start-up founded in 2013 with a presence in 12 countries after 4 years	Investors recognized from inception an untapped global need. The entrepreneur used his personal network to attract early financial investment.	Structured a machine learning system to process and improve the performance of the localization of riders and restaurant locations. There was timely control over orders/delivery. Organizational connectedness in the distribution of drivers (potential power law over drivers versus city location: 80% of sales came from 20% of locations).	Established a new network of supply drivers with a global presence via IT systems. This newly established network allowed the firm to operate on a global scale.	Automation of processes (fleet hiring contracts, vendors' rule of engagement). Infrastructure level (ads, mass user contacts, marketing exploiting users` data on sales).
Netflix Faced a technology shift (from DVD delivery to online streaming). In January 2007, Netflix started streaming online videos. In 2016, it launched services globally in 130 countries. By 2017, more than 50% of subscribers were	Had the vision to apply a high-performance digital infrastructure to leverage the emerging users` "web culture". The entrepreneur used his personal network built during his first venture: a software company that was	Structured a data system algorithm capable of learning and improving the proportion of user demand and limiting the number of titles offered. Organizational connectedness in selection of user titles (potential power law over	Online streaming became a source of global expansion through the acquisition and distribution of videos and movies to the broad public, featuring top-tier series (e.g., House of Cards, 2013). Developed a	Automated processes, partnering with tech mobile firms LG, Samsung, Apple in integrating apps. At the infrastructure level, for local offerings the firm partnered with platform channels, global consumer and electronics partners.

international.	focused on broad debugging operations.	titles versus regions: 80% of revenue came from 20% of titles).	global network of local movie producers.	
Nespresso An instant coffee business targeting households. Was established in 1986 as an independent company: Nespresso SA – part of the Nestlé Group. With the establishment of Nespresso Club, it grew from 2700 members in 1990 to 250,000 in 1997. By 2018, it had a presence in 66 countries.	Had a vision to build a business that taps into the 1 billion-strong global market of household coffee consumers. Clear expertise in building a global brand, which influenced their ability to launch "Nespresso Club".	Orders (mail, operators, fax, website) are placed and processed by the system. Organizational connectedness over coffee blends/local preferences (potential power law over blends versus regions: 80% of revenue from 20% of blends).	Consumers are reached through Nespresso Club (sales partners turn buyers into members). Globally relevant network of third-party machine producers with points of sale spread across major cities.	Automated processes (vendors of machines, licensing of retailers, brewers, coffee mix suppliers). At the infrastructure level: Nespresso Boutiques + third-party retailing chains.

Case # 2

Netflix, an entertainment corporation engaged in streaming of media and online video-on-demand (VOD), has gone through a strong expansion in recent years, turning DVD clientele into new, online customers.

Entrepreneurial network: From the entrepreneur standpoint (Figure (7) – Phase (1)), the founder, Hastings, was able to benefit greatly from his personal network which he had built during his first venture: a software company that focused on broad debugging operations. When exiting that company, he was able to leverage the technical connections he had established, shifting part of the former social capital into a new business domain based on DVDs and online orders. The new venture had a vision to apply a high-performance digital infrastructure which could leverage the emerging "web culture". This initial stage created an opportunity to employ enough experts to work on an algorithm that could target content and mine internal data.

Organizational connectedness: The new venture's vision and operations gave rise to an organizational value chain that was intricately connected via metrics, with data providing feedback on users' experiences (Figure (7) – Phase (2)). The online search function enabled the technology to provide a bottom-line impression of large-scale economies unleashed through online demand. The demand for movies is a good example of power law, where a few titles covering a restricted range of movies and series are the most demanded by a large number of people. As a histogram, power law would be depicted as a continuously downward sloping curve, implying that many people who demand the same content coexist with a large number of independent viewers with very local demand (Anderson, 2006). The latter phenomenon explains how, despite global expansion, Netflix has been able to offer its online service by marketing a limited number of frequently selected titles.

By exploiting the internal information provided on what users watch, algorithms can predict whether new content will be successful (superior information about the network of viewers). The founder Hastings pointed out: *"We are still a relatively small company employing 2500 dedicated people. We have to make sure we are focusing our engineering and content acquisition following the data we get from consumers"* (Corvin, 2016). Titles are based on users' segmentation profile and purchasing data and are also mediated by a personalized video-recommendation system based on ratings and reviews. On the one hand, this internal connectedness has enabled the firm to tap global needs while still satisfying highly differentiated regional demands via links with local distributors (weak ties). On the other hand, the global potential is not sufficient to stimulate a feasible growth path at a global level.

Reachability of a relevant international network: As emphasized by Whiteley (Corvin, 2016, the activation of the firm's central position in the industry through superior performance has laid the foundation for its ability to reach a global network of local operators and distributors. *"We are in a lucky position that many companies want to work with us."* Achieving this status is typical of a *scale-free network* where the firm is given preference on the basis of the ties it has formed with external agents. Global expansion has been possible because of established partnerships with global consumer electronics partners, such as Virgin, Com Hem, LG, Samsung and Apple (Corvin, 2016). Scalability potential is therefore assured on the basis of user needs, power law distribution and the reachability of a relevant network.

Case # 3

Nespresso, a coffee brewer, was the brainchild of Eric Favre, an employee of Nestlé, who invented, patented and introduced the Nespresso instant coffee system, initially without significant success. Nespresso SA was established only 10 years later as a separate entity from Nestlé. By the end of 1987, the firm was struggling to meet its targets. A new entrepreneur was hired as "a different management style was needed" (Killing, 2003). Nespresso is also considered to be a case study in intrapreneurship. As reported by Berssenbrügge (Filou, 2006), who was CEO at Nespresso from 2001 to 2007, *"intrapreneurship is part of the appeal of the CEO position at Nespresso: it was international and had the advantages of working for a start-up within a large group".*

Entrepreneurial network: Jean-Paul Gaillard was appointed the new CEO, with his track record including the launch, in Europe, of the Marlboro Classic brand, a men's clothing line for Philip Morris. The experience he had gained in building a new brand community (Marlboro country, high-end casual outfits) gave him a solid base of know-how to frame a new distribution strategy for an international company. Soon after his arrival, he radically changed the existing B2B commercial strategy targeting households by launching the "Nespresso Club community" (Markides and Oyon, 2000), along with a whole new distribution model where the business was heavily dependent on telephone and online sales. Nespresso Club was more pervasive in cities than in countries, with a strong presence in strongholds where the coffee culture had already been diffused (Canning, 2009). Furthermore, there was a strong commitment to growing sales from SFr150,000 to SFr1 billion within 10 years. These initial developments were consistent with Figure (7) – Phase (2) where CEO Gaillard put in place personal resources

that drew on the methodologies, know-how and networks that had been used extensively in his previous occupation.

Organizational connectedness: Phase (2) was also reached through mechanisms that prompted the firm to start monitoring customer choices. New Club members were tracked closely on the assumption that long-term consumption habits were formed in the first few months of usage. Club established a preferential channel, with customers benefitting from 24-hour customer service via mail, phone, fax and email. Notably, the Club user base established the organizational level of connectedness between firm and users through a process of internal data control (receiving orders online/telephone/email/fax and building a user profile database and tracking system for each purchase at an individual level). Establishing this organization–customer contact allowed for the efficient and prompt control of users' choices and feedback in each local market, which was also employed in new blend proposals. In addition, Club channels were integrated with the physical distribution of third-party vendors of Nespresso machines, which focused on particular cities with a coffee culture. This latter layer created the potential for reaching the relevant network for global scalability (Figure (7) – Phase (3)).

Reachability of a relevant international network: First-tier machine producers were involved, together with regional players. *"As part of a new multi-partner trade approach offering broader distribution, new machine partnerships are forged in Switzerland, France, Benelux, USA"* (company website). Therefore, the organizational network could benefit from licensing machine production and the retail function to many big manufacturing players. Capsules, however, were distributed exclusively via the Nespresso retail chain, favoring the strong ties with customers and compiling a database of their tastes and personal purchases. The link between machine distributors and Club members was designed to transform each new purchaser of a Nespresso machine into a new Club member.

5.2. Analysis and discussion of the business cases

The investigation of the underlying factors that link an INV firm's network to scalability confirmed the main phases depicted by the proposed model, as illustrated in section 4.2.2. The analysis encompassed distinctive entrepreneurial and organizational factors related to network properties.

This first analysis could initially confirm some items that emerged from the model proposal. Data retrieved on the three cases supported the hypothesis that INVs' entrepreneurs are born with a vision to satisfy a global need and possess personal networks/skills to address the core challenges in such a process.

Phase (2) of the model focused on the concept of organizational connectedness. The firm's growth potential was closely examined in the light of the number of connections that the firm established with suppliers and users through the characteristic operational dynamics of processing information. INVs' connectivity also helps them to boost their performance and gain superiority in the industry within a short period, and to acquire a central position (hub).

Phase (3) tested the scalability concept and dealt with the techniques employed by INV firms to reach a wide and strategically relevant global network. As discussed earlier, although this element (i.e., a global network) is crucial for establishing a physical global presence, ties and frequency of exchange vary from case to case, thus impacting the speed of growth. Sometimes the network must be established anew (i.e., the pool of drivers connected by Deliveroo's IT platform) or relationships must be forged with third parties in multinational distribution channels. The speed of scalability has resulted in a factor that that been given less attention in the present analysis, depending on both the centrality and the relevance of the network.

All three firms adhered to Phase (1) of the model, beginning their internalization paths through entrepreneurs who had already possessed a personal network, which was then turned into an organizational network.

Regarding Phase (2), the ability to spot and capitalize on global needs and opportunities emphasizes how INV firms' scalability is strongly based on online organizational connectedness. In this regard, all three firms seemed to direct their offerings towards identified niche offerings, which were in turn connected to regional markets. Their organizational networks of online operations could unleash important information flows on user behavior. INVs' potential could accordingly be exploited by seeking out power law distribution characteristics of key value chain nodes.

The three INVs also fulfilled the requirement of reachability of a relevant global network among those physically deployed at a regional level, e.g., the drivers for Deliveroo, the third-party machine producers for Nespresso and the local movie distributors for Netflix. The reachability factor is critical for creating the nexus of firm-specific capabilities connected to international network distributional channels. However, there was no definitive link between speed of scalability and the sample of firms analyzed.

In this chapter, we investigated business cases that successfully implemented the network evolution phase-model proposed in Chapter (4). The next chapter (Chapter (6)) will present five business cases created out of the results of semi-structured interviews with the founders. The cases are analyzed systematically, delving more deeply into the organizational connectedness role in scalability and the information and knowledge creation mechanism that is largely the result of technological learning and ambidexterity.

6. Business cases based on interviews with founders – Step 8

The purposive sampling design allowed us to introduce some degree of variance in our case selection criteria by including multiple sectors (although still technology-driven) and considering different levels of technology development and up-front investment. However, to be consistent with previous research on entrepreneurial firms that are regarded as typically young and small in size (Rialp et al., 2005b), all firms in the purposive sample had to be small (in terms of number of employees), independently managed and recently created (less than seven years old). Access to firms' archival data and founders willing to collaborate in this study was also considered an important attribute in selecting the business cases. This selection procedure resulted in the identification of the following five international new ventures as cases to investigate: an enterprise chatbot (Talk-a-Bot), a deaf sign language application (Linistry), a customer queuing management system firm (SignAll), a visual notification engine (Pressenger) and a touristic virtual platform (Musement).

For each of the five firms, semi-structured interviews were conducted which gradually engaged the respondent on the research scope and purpose. Before the interview, each firm was first invited to compete the online survey. Then a list of the interview questions was sent to the founder. The average duration of each interview was 90 minutes and, in some cases, it was split into two sessions. The conversation was preceded by the screening of online documentation and previously published interviews with the founders. Appendices (1) – (4) provide the thematic coding of the content for the five firms interviewed.

Each business case starts with a general introduction, a value proposition and the firm's main technological features. This is followed by a section on the network development, a longitudinal analysis of the growth phases, and the knowledge and information flow analysis of the activity system. Finally, conclusions are drawn on the relevance of the factors in terms of how they influence internationalization and scalability, according to the conceptual framework variables.

6.1. Talk-a-Bot: Retrospective longitudinal analysis

Based on interviews conducted on 17th December 2020 and 20th January 2021 with Akos Deliaga, founder and CEO of Talk-a-Bot (transcript quotations are labeled with the initials A.K.).

6.1.1. Introduction of Talk-a-Bot

Talk-a-Bot was established in Budapest (Hungary) in 2016 as a B2B chatbot provider enterprise, specializing in the automation of internal communication (with employees) and external communication (with customers). The firm was established by an incubation program in the CEU ILab in 2016 and has received three rounds of investment totaling Euro 2.3 million. The firm was established by four founders, all with extensive experience in IT and business

development. One of them had already worked for a multinational IT company (Hewlett-Packard). At present (2021), the venture has a workforce of 26. Talk-a-Bot has three offices – one in Budapest (the home base), one in Warsaw and another one in Singapore (which at the time of the interview was not operational).

In terms of its growth path, the venture started as a chatbot enterprise and soon (in 2017) became a recognized co-sell partner of Microsoft. The venture initially based its business operation in Hungary but also quite rapidly began exploring other territories, like the Asian market (Singapore). This was the result of a previous professional contact of one of the founders and an international accelerating program (TechStars-Rakuten accelerator) that Talk-a-Bot joined in 2018. Following this program, the venture became a Rakuten/Viber preferred enabling partner. In 2019, the firm was able to launch a new product, Cheqbot, which targeted internal information systems. In 2020, the firm had already internationalized in five countries (Bulgaria, Ukraine, Poland, Austria and Singapore).

The venture's revenue growth was solid, doubling every year from the first to the third year of operation. Sales in the fourth year were stable as the firm launched its new product, Cheqbot, whose final development had required intensive effort in the third year. The fifth year saw the firm growing again. In 2020, sales from abroad were less than 25% of total sales. However, management estimates that the firm will generate more than 25% of total sales from foreign countries in 2021.

Value proposition, main features and technology

The mission of the firm is on *"automating communication, turning digital business conversations into secure, app-like services for both customers and employees".*

The firm's value proposition is to conduct recurring, repetitive communication tasks via bots, providing time-efficient and affordable communication services instead of human resources, e.g., the bots answer frequently asked questions (FAQ) from customers. Bots are software applications programmed to automate the execution of certain tasks, which means running programs according to instructions without any human interaction. The uniqueness of the offering, as described on the firm's website, originates in the framework's flexibility to be seamlessly integrated with different enterprise systems. The technology uses open-source tools such as artificial intelligence (AI), natural language processing (NLP) and machine learning integrated into Viber software and Microsoft Messenger.

The service supports more than 100 native languages and provides over 30 integrable function modules on a proprietary framework. The experienced and tested data-driven technology allows the firm to tailor content communication at an 85–95% rate of accuracy.

Talk-a-Bot provides two main services: a chatbot service focused on external communication in response to users' FAQ; the Cheqbot service focused on internal communication at corporates with high-frequency exchanges along the supply/production chain.

Customized chatbot service

This service involves customized bots responding to the cultural, geographical and business needs of each client. This customization feature provides human-led, intensive work in the design of unique features for characters, communication styles and avatars, but also content management services.

Modular Cheqbot service

Following a developmental phase that ended in 2019, the firm devised a new service, called Cheqbot, focusing on internal communication among clients. Using chatbots, this tool creates a bridge between physical workers and their employers. As described by Siggelkow and Terwiesch (2019b), in an age of *continuous connection*, chatbot strategies help to fulfill the need for automation and provide a timely and secure channel for internal communication.

The Cheqbot service is designed to exploit an emerging niche market segment with lower competition, with a partially standardized offering: content is customized by technology (AI, machine learning) but software modules remain standard.

6.1.2. Network evolution and international expansion

***The entrepreneurial network* – Phase (1) (Emergence):**

The entrepreneurs had a vision from inception of launching a global business. The founding team was created out of the personal network (mostly weak ties) of entrepreneurs with a complementary set of competencies. The entrepreneurs' relationship with CEU and the Innovation Lab enhanced the initial network formation. The first chatbot was conceived in the CEU Innovation Lab and then tested in the accelerator programs in the US (San Francisco TechCrunch) and Asia (Rakuten Viber – TechStars in Singapore).

i. Inception and founders' network

From the entrepreneurs to the organizational formation: The firm was envisioned by four people who mostly had weak ties or relationships. One founder pulled the team members together: executive MBA classmates, family members, and campus and sports team acquaintances. Upon its establishment, the firm drew on the past experiences and complementary expertise of the members. Most of the members were professionals from the same industry. Although possessing complementary expertise, they had their own specific experience in related jobs (two members had their own software company and had already had seven full-time jobs dealing with bots; a third member was the lead developer for a main player in the computing industry; and a fourth member was a marketing specialist).

The initial idea for the firm was born out of industry-specific, technical know-how and insights into emerging trends (evidenced in the interest shown by a NASDAQ executive in an interview with Forbes in 2016) and nurtured by the MBA program entrepreneurship course. The firm was launched via the incubation program of the CEU Innovation Lab. Most of the founders had more than six years of experience in the industry.

ii. The international expansion vision

The search for the right technology to develop was driven by the previous multinational experience of the founders who had worked in the cloud solutions arena. Their collective experience led to a strong focus being given to technology-supported services and their vision to build a service that was widely integrated across different platforms.

The initial vision: The vision of the firm from the beginning was to operate globally.

"The team, which started in April 2016, is already shooting for the world market from Nádor Street. We want to build global know-how; we want to work with big brands" (Forbes interview, December 2016). The venture based its business operation initially in Hungary but also quite rapidly began to explore other regions, like Singapore. The latter stemmed from previous working experience and an international accelerator program that had happened to take place in that area (Singapore).

The vision today: The vision today remains a global one, although the firm only indicated their desire, during the entrepreneurial journey, for the right product to scale up to a global level. The intended geographical growth is two-fold: domestic and regional expansion; and global expansion.

For domestic and regional markets in close proximity, a chatbot is a good base product. The firm is able to continue boosting the service through various sales channels.

"For example, by the Azure market we got many 50+ clients from different sectors. At the same time, we recognized that relying on that product only was not possible to scale it up globally and become a unicorn. There were difficulties in providing customization and making the business model scalable at a fast pace."

For the purpose of global expansion, the strategy of the firm was to push for the development of a new product, Cheqbot. This new service is designed to automate and digitalize corporate internal communication. It is an emerging, niche market segment with lower competition and where some standardization is possible: content is customized through the use of technology (AI, machine learning) but software modules remain standard. This latter feature is key to being able to distribute the service in multiple markets, with fewer of the typical constraints associated with customization.

The consolidated (organizational) network – **Phase (2) (Early growth):**

From the beginning, the founders implemented a short cycle of value chain optimization by reviewing operations using open-source tools: machine learning, AI and NLP. The firm introduced a strict data privacy policy but required access to information from clients to enable them to directly scrutinize the quality of conversations and user satisfaction levels. Periodically quality surveys and analyses were conducted to monitor the relative success of the bots' usage. The Microsoft partnership agreement provided an established network of international re-selling opportunities for the validated business offering.

Participation in the international Rakuten accelerator program gave the firm access to the established international networks of TechStars and Rakuten Viber. On the one hand, this step enhanced and boosted previous local linkages of the founders in the Asian region, creating the opportunity to establish a subsidiary in Singapore. On the other hand, the international context strengthened ties with European industrial players (Viber and Microsoft) and paved the way for expanded business dealings in the neighboring countries of Poland, Austria, Bulgaria and Ukraine.

iii. The organizational network formation

The Innovation Lab program of the CEU helped the firm to form a partnership with a leading proprietary player in the instant messaging platform domain – Rakuten Viber. The firm rapidly acquired the status of "Rakuten Viber preferred enabling partner". This step was particularly important, both domestically and in the Central and especially Eastern European regions where Viber applications were very widespread and visible. Running parallel to this step, the firm seized the opportunity to establish a partnership with Microsoft and in 2017 became a co-sell partner. Microsoft was a key conduit for entering the European market and allowed the testing of the product alongside the new Azure cloud solutions.

In the first three years, the firm caught the attention of important regional clients (Erste Bank, Heineken, Bosch and Nestlé) by leveraging its partnerships with keystone players, e.g., Rakuten Viber (preferred enabling partner in 2016) and Microsoft (prioritized co-sell partner in 2017). These developments increased the visibility of the firm in Central Eastern Europe (CEE), reinforcing ties with strategic partners for further geographical expansion but also enabling the firm to explore market demand in the southern Asian region (via a Singapore subsidiary). This evolution in institutional and industrial support also created linkages with financial investors, thus bringing new sources of funds to the firm (in 2018) to explore opportunities and accelerate growth.

Table (14) below illustrates the chronological evolution of the network with reference to the key partners/clients that facilitated the relational exchange and the establishment of operations in different countries/regions. In particular, it pinpoints the firm's strategy for acquiring new international clients from the early growth stage onwards. In this regard, the firm has mainly adopted a strategy that relies on the creation of partnerships and innovation programs.

"Our clients are acquired mostly via partnerships (Viber and Microsoft Messenger); Azure now is the new thing. Previously we tried many corporate innovation programs that are actively looking for new companies, new ideas. We try to adopt these programs. We go for paid pilots or revenue-based partnerships. We don't give anything for free and we always ask our clients to pay for the technology. For example, in Poland the first client came from an Innovation program, from a private health care company."

It is worth highlighting that the firm was able to start its internationalization journey in its second year of operations – the result of the partnership agreement with Viber. However, as

this was part of the initial testing stage, it was essentially a campaign that did not turn into an ongoing, durable relationship with the client.

Table (14) Chronological network evolution with reference to key partners and clients

Year	**2016**	**2017**	**2018**	**2019**	**2020**
Partner/ client	Viber Rakuten – preferred enabling partner	Microsoft prioritized co-sell partner	Nestlé	Microsoft	Viber
Network broker	Direct contact via social media	TechStars, Rakuten Viber Singapore	Innovation program contest	Regional manager, strong ties with investors	n.a.
Operating countries/regions	CEE	CEE, Eastern Asia	Switzerland	Austria, Poland	Ukraine, Bulgaria

Regarding the internal operational network, Talk-a-Bot does not appear to have developed an internal value chain in view of the nature of the service:

"Our value chain is pretty short; we have direct relationships with our clients, and we get direct feedback where we are successful. We have limited reliance on suppliers. We sell our intellectual property. Differently from Deliveroo which is an intermediary firm relying on the quality of the contents, in our case we are practically creating the whole value ourselves and passing it to the clients directly."

This feature has become a very distinctive feature of the firm and has relevance in terms of knowledge flows.

"We do check and validate our knowledge management with our clients. It is imperative for us to know how. It is part of our contract that we closely protect the data of our clients, so we don't take ownership of personal data. In all the contracts we ask for the anonymized data and their feedback for the use of know-how development. We did that from the first contract until the last one we signed today. In all the contracts we tell our clients that we are getting know-how throughout their experience. It is something we focus on a lot."

The above comments also emphasize the strategic posture that the firm has adopted in the area of entrepreneurial alertness, which is useful when incorporating insights from clients.

"This is a very core part of product strategy. We are very market driven and the feedback of our clients has a very quick feedback loop to our product."

The firm tried to leverage a relationship with a foreign intermediary, but this effort proved not to be sustainable.

"We actually tried to have a foreign intermediary. There are many companies that do what is called soft landing for start-ups like market validation or lead generation. We tested a few of them but it was not successful."

The relevant global network – **Phase (3) (Expansion):**

The firm has evolved on the basis of strong and cohesive arm's-length ties. The network expansion process has not been calculative but rather driven by the recognition of an opportunity to exploit in a path-dependent fashion. A new shift towards an internally managed network is needed for the next, upcoming phase.

Strategic ambidexterity has been pursued by exploiting the initial chatbot service and exploring the potential of a new service in different regions in a more innovative way, targeting a niche market segment.

iv. Consolidating the international expansion process

Strong ties: The firm has grown through its reliance on strong, selective ties. Countries like Bulgaria and Ukraine are not obvious choices. Yet Viber is the strongest in these markets. Microsoft's Azure partnership and Rakuten Viber allowed market entry in many different countries. The Rakuten Viber partnership attracted international projects at the beginning of the second year of operation.

The market share in chat platform space is very strong in Bulgaria and Ukraine – even stronger than Microsoft Messenger is in those countries. Having a strong strategic partner in the form of Viber, which is very strong in other markets, is an advantage for Talk-a Bot.

Microsoft's co-sell agreement (2017) relied on a strong relationship with its representative, which facilitated the co-sell service to other countries.

"*In fact, given that Hungary is in the same sub-region of Poland, actually the Microsoft regional manager could control both countries. The Poland opening of a subsidiary was related to an investment which pushed the company to aggressively enter the new country to fulfil the terms of the agreement. Therefore, it is crucial even in an alliance such as the one with Microsoft that what matters is the person with strong ties because it is possible to use his network to exploit opportunities in the neighboring countries of his region.*

"Austria expansion also was led by the contact with one of our investors who had a company in Austria and that company could support us to kick off sales. Austria market did not require the opening of a subsidiary." (A.D.)

The same happened in the case of Singapore where an investment contract created the need to open a subsidiary which resulted in the acquisition of new clients within a nine-month period. The firm pursued and activated local contracts with business developers in the Ukrainian (2019) and Bulgarian (2019) markets. By the end of 2020, the most important international markets in terms of sales were Poland, Austria, Ukraine and Bulgaria. The proportion of international sales to total sales is forecast to top 25% during 2021.

Weak ties: As pointed out by one of the founders: "*The most obvious weak ties group are our clients and we invest in their references, we try to ask for referrals, testimonials, invite our*

clients to conferences, speak on our behalf, we actively use unconsciously all this. If you have a bank as a client, it is easier to get a second bank and if this bank is happy then it is easy to have a referral. References are the best." (A.D.)

In trying to leverage weak ties, the firm tried to establish reseller partnerships from the very beginning, thinking that there could be synergies between chatbots and marketing campaigns. The experience was that until the firm was able to build a recognized reputation with enough references, it did not find the proposed marketing services attractive.

v. The scalability path

The rate of growth of the chatbot service was very strong from the first to the third year of operation, at about 100%. In the fourth year, the firm geared most of its efforts towards the development of a new business offering, the "Cheqbot", which started being marketed at the end of that year. In the current year, these two types of service have enjoyed growth of about 30%. In terms of the growth trajectory, an important factor is referrals by clients who have reacted positively to the service and proposed the establishment of the subsidiary entity in Poland. More generally, the business model scalability is of a dual nature: one is domestic and regional, and one is global. As far as the domestic market and neighboring regions are concerned:

"*For the domestic and regions in the proximity, chatbot is a good base product. We can boost our sales channels. For example, by Azure market we got many clients from different sectors. At the same time, we recognized that relying only on that product was not possible to scale it up globally and become a unicorn." (A.D.)*

They encountered difficulties in providing customization and making the business model scalable at a fast pace. As far as global expansion is concerned:

"*For this strategy we developed a new product, Cheqbot: it is aiming to automate and digitalize the company internal communication. It is a new niche emerging market segment with lower competition and standardized in its offer: content is customized by technology (AI, machine learning) but software modules remain standard. This latter feature is the key one that can allow the distribution in multiple markets with less constraints based on customization." (A.D.)*

6.1.3 Distinctive attributes of INVs in Talk-a-Bot

As illustrated in section 4.2, the qualitative analysis of the case studies begins by considering the attributes (over and above the cut-off indicators of speed, scope and breadth of internationalization) that distinguish INVs from more traditional gradualist internationalizing firms. Appendixes (2) – (5) summarize INVs' attributes according to the three dimensions of founder characteristics, organizational capabilities and strategic focus.

- *Founder characteristics*: Talk-a-Bot displayed all the characteristics specified. As discussed in the case, network embeddedness, managerial vision and prior experience emerged as distinguishing features at the foundation stage.

- *Organizational capabilities*: Talk-a-Bot displayed all the attributes listed. In particular, organizational connectedness, technological learning and ambidexterity were characteristics of the firm, as discerned from decisions taken in response to feedback from the market, the advancement of a new product (Cheqbot), and client and customer feedback on their user experiences.

- *Strategic focus:* Talk-a-Bot displayed all relevant attributes. Network focus and narrowly defined customer orientation emerged as highly distinctive features in the company's internationalization process.

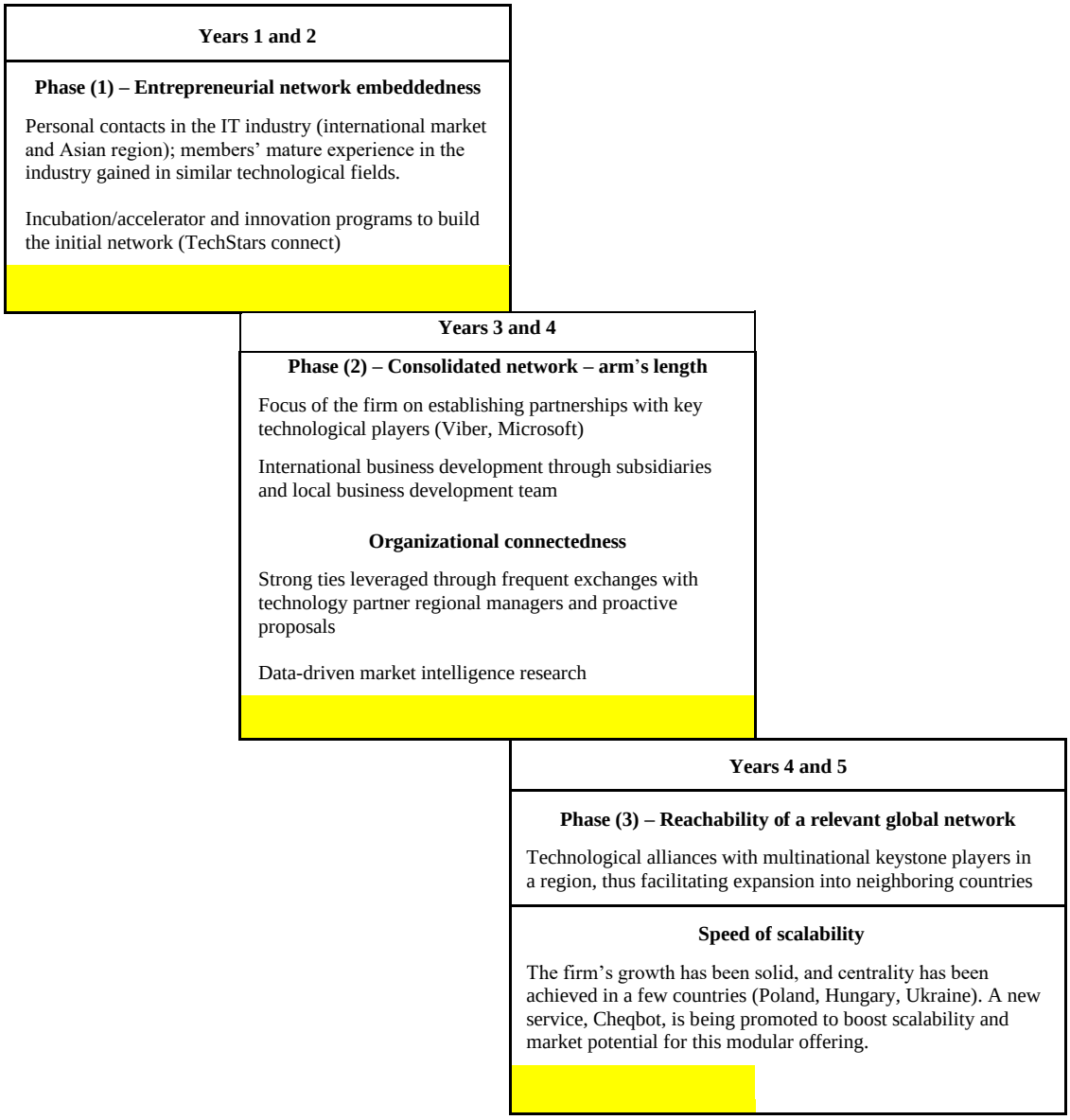
6.1.4. A model for the firm's network evolution and scalability

Talk-a-Bot is an example of how a B2B technological service can be oriented. In this regard, the chart below shows how Talk-a-Bot has performed during the three phases in terms of the network evolution and scalability phase-model.

In Phase (1), the founders exploited their accumulated experience and network embeddedness in the multinational IT industry – particularly bot solutions.

Phase (2) showed how the network was consolidated in the design of an activity system in the international market through subsidiaries, business developers and reselling agents. The firm established a strong presence in a few foreign countries by focusing on leading technology partners, Viber and Microsoft. Information and knowledge flows and activities within the value chain were coordinated directly through an intensive human exchange and data-driven analysis. Ambidexterity was key to the development of the right solution for business scalability. A new product solution was developed to differentiate and allow the firm to grow exponentially without excessive customization constraints.

Phase (3) has seen the firm exploiting the regional network dominated by the respective leading technology players (e.g., Hungary, Austria, Poland – Microsoft; Ukraine, Bulgaria, Singapore – Viber). The firm is working towards achieving centrality in the CEE region and is pushing the market in order to harness the new Cheqbot service. In 2021, using the new, cutting-edge technology of Cheqbot, the firm is aiming to become more central in this segment as well.



Talk-a-Bot was the result of the CEU ILab participating in the incubation program. The four founders realized they could each benefit from a wide range of IT contacts in the IT industry. Two of the founders had previously headed up start-ups using bot technology. The third founder was able to draw on his international contacts in the multinational ecosystem linked to his previous employer (Hewlett-Packard). The fourth founder's contribution stemmed from his experience in marketing.

Table (15) summarizes the two phases in which Talk-a-Bot successfully navigated the phase-model. The initial, emergence phase was dominated by identity-based ties where the founders could exploit personal contacts in the IT industry ecosystem and the international arena. Through the initial incubation program and together with continuous iterations in corporate innovation and accelerator programs, the firm was able to progress to an *organizational network, with arm's-length ties*. While in Phase (1) the firm internationalized by recognizing

opportunities and following international developments, in Phase (2) (2018–2019) the venture started to adopt a calculative-based approach, focusing on strategic orientation towards markets where Microsoft and Viber enjoyed market dominance.

Table (15) Firm's evolution and types of network and ties (Talk-a-Bot)

Firm evolution	**Emergence**	**Early growth**
Types of network	***Identity-based network*** CEU EMBA, personal professional relationships, Hewlett-Packard	***Calculative-based network*** Bulgaria and Ukraine expansion based on Viber network strengths *Indirect weak ties*: Austria expansion
Types of ties	***Embedded ties*** Innovation programs TechStars accelerator program Singapore funding opportunity Network building based on partners from CEU ILab	***Arm's-length ties*** Microsoft-preferred reseller partner Viber-preferred enabling partner *Direct weak ties:* client referrals, conferences and innovation events Strategy oriented towards technology partners' market dominance
Network evolution phase-model	**Phase (1)** *(Entrepreneurial network)*	**Phase (2)** *(Consolidated firm network)*

Table (16) illustrates the three phases of the network evolution phase-model and types of information/knowledge flows.

In *Phase (1)* (2016–2017), *internal information/knowledge flows* were primarily focused on determining the venture's position in the domestic and international markets, in line with the competitive landscape in each country. Each founding member's 10 years of experience in the IT sector constituted a distinct advantage for the development of a superior technological system capable of competing internationally.

The *articulated knowledge/information flows* centered initially on the search for alliance partners, prototype testing and the innovativeness of the firm's commercial proposal. In this phase, the venture tried to establish contact with foreign intermediaries as an entry strategy for testing the offering in foreign countries. The test was done for the purpose of *"what is called soft landing for start-ups like market validation or lead generation. We tested a few of them, but it was not successful"* (A.D.). What worked, however, was participation in many innovation programs where the firm would be paid to test its product and roll out the technological features on offer. At the end of the first year, the firm formed an alliance with Viber (preferred enabling partner) and at the beginning of the second year, it formed another one with Microsoft (prioritized co-sell partners).

Table (16) Network evolution phase-model and types of information/knowledge flows (Talk-a-Bot)

	Phase (1) Emergence (Entrepreneurial network)	Phase (2) Early growth (Consolidated network)	Phase (3) Expansion (Relevant global network)
Internal information/ knowledge flows	High-level qualifications on the part of each founder and accumulated expertise in the industry. Self-reliance in terms of technological competencies and business development skills. Founders possessed a niche proposition concerning the business offering and technological attributes of the service. Core competencies in bot technology and international competition.	The firm employed data-driven technologies in line with the quality of the service, depending on feedback from final users. The firm implemented a rapid feedback loop to align the service to an agile management system. Short cycle of value-driven activities. No intermediaries or direct relationship with clients.	The firm analyzes and structures proposals to leverage technology partners' networks (Viber and Microsoft). The firm analyzes market data in neighboring countries in order to accelerate expansion and establish partnerships and reselling agreements. The firm programs further extension of its network according to a "calculative" expansion strategy.
Articulated information/ knowledge flows	The firm initiated ties with several institutions (accelerators, incubators, TechStars start-up association) in order to tap domestic and international market needs. Other stakeholders from the industry were reached via **corporate innovation contests and soft-landing programs**. The **alliance with Rakuten Viber** commenced at the end of the first year and the alliance with Microsoft from the second year. These alliances boosted the product's profile and served to **immediately test the technological offering** and its distinctive features.	The **design of the strategic activity system was revised to meet the scalability potential**. A second service (Cheqbot) was introduced, based on knowledge learning, for a modular, scalable offering. Information and knowledge flows with clients were mainly funneled through the **platform analytics tools**. Complementary data and support were provided through direct exchange. Establishment of subsidiaries in Singapore and Poland. Negotiation of reselling agreements.	Frequent exchanges and active presence in the industrial innovation ecosystem. The firm maintains a constant presence at innovation conferences and sectoral fairs. The firm is seeking to enhance and strengthen its physical sales network. Similar to the CEE region, the firm is actively **closing structural holes and securing access to an international strategic partnership with Western European countries**.

At the beginning of *Phase (2)* (2018–2019), the firm had acquired a consolidated network comprising several stakeholders from the domestic and international ecosystems. In Phase (2), Talk-a-Bot, which was now well-placed to seek new innovation opportunities in order to test and enhance the quality of its technology, participated in the TechStars–Rakuten accelerator in Singapore. At the end of the program, the firm received investment funds to launch a subsidiary in Singapore. Entering the international arena provided another means to identify new opportunities. During Phase (2), data-driven technologies and agile management techniques were employed to support the *internal information/knowledge flows.* In this phase, *articulated*

knowledge/information flows focused on the design of an activity system capable of delivering the business model's scalability. The highly customized offerings provided under the chatbot service were restructured to provide a second, modular product that was better geared to rapid scaling in the international market.

Phase (3) of an extended expansion (2020–) commenced after the launch of the chatbot service. At present, the firm is busy strengthening the technological partnerships that served to valorize the new technological service launched in 2020. At the same time, the firm is aiming to acquire a more central position in the countries in which the technology partner is dominant (e.g., Viber in Ukraine and Bulgaria).

6.1.5 Information and knowledge flows in the firm's value system

The information and knowledge flows were analyzed considering the ambidexterity processes and the activity-based principles (data-driven technologies or human intense) described in section 4.2.

Ambidexterity was employed both in the emergence phase (Phase (1)) and the early growth phase (Phase (2)). The articulation of the two parallel activities of exploration and exploitation was crucial for achieving the right business model relative to the phase and targeting the right client segment. This type of activity configuration also impacted the testing and development of the platform technology's key features. Exploration activities have been geared towards seeking new client segments or services (e.g., innovation programs, the Nestlé technological contest). Exploitation activities have been geared towards harnessing client referrals and stakeholder weak-ties contacts.

In Phase (3) of stable expansion, Talk-a-Bot engages in activities that are mostly driven by exploitative operations. The latter are coordinated on the basis of activity-based principles that involve the deployment of the right commercial strategy to market the Cheqbot service.

Data-driven technologies: Internal knowledge and information optimization has taken place through the application of data-driven technologies linked to the use of the technology platform, which generates data on user satisfaction levels and back-end analytics. The analysis of these data has been mainly explorative. From an exploitative perspective, data and knowledge insights have spurred improvements in users' interactions, thereby enhancing the quality of such interactions. This has turned out to be a very distinctive feature of the firm and is also relevant in the case of knowledge flows.

"We do check and validate our knowledge management with our clients. It is imperative for us to know how. It is part of our contract that we closely protect the data of our clients, so we don't take ownership of personal data. In all the contracts we ask for the anonymized data and their feedback for the use of know-how development. We did that from the first contract until the last one we signed today. In all the contracts we tell our clients that we are getting know-how throughout their experience. It is something we focus on a lot."

Human-intensive activities have focused on leveraging business developers' feedback loops by way of a commercial response. Exchanges have concerned the request for and design of the most-needed features for each client in a particular segment and industry. These insights have later been converted into proposals for the *exploration* of new module features.

The importance attached to this factor by the founders also emphasizes the strategic posture that the firm has adopted in relation to the team's entrepreneurial alertness when processing insights from clients.

"This is a very core part of product strategy. We are very market driven and the feedback of our clients has a very quick feedback loop to our product."

The firm tried to leverage a relationship with a foreign intermediary, but this effort turned out not to be sustainable**.** Parallel *exploitation processes* have been actively pursued in response to hubs of demand for the product, according to different regions and geographies. These activities have been underpinned by close relationships with clients. Table (17) synthesizes the internal flows of knowledge and information and the type of process, indicating the natural ambidexterity of the data-driven activities and human-intensive activities.

Table (17) Internal knowledge and information flows and ambidexterity

Knowledge and information flow optimization	**Data-driven technologies**	Use of data-driven technologies to understand users' most-requested features, clients' needs and technological gaps	Use of data to boost the qualitative interaction between clients and the satisfaction of end users
	Human-intensive activity-based	Business intelligence on data usage and module features (Cheqbot)	Analytics system and hubs of potential demand, i.e., categorizing modules and offerings based on geographies
		Explorative	**Exploitative**
		Type of process	

Inbound exploitative exchanges regarding the integration of the Azure or Viber messaging technology: Similar *inbound explorative* processes have been implemented to create feedback loops and data processing for the service deployed (i.e., privacy, security issues, marketing app features).

Outbound explorative activities concerned exchanges with founders in the TechStars connect hub: *Outbound exploitative* exchanges have involved formulating proposals and innovative solutions with Viber/Microsoft regional managers. Table (18) synthesizes the external flows of knowledge and information and the type of process, indicating the natural ambidexterity of the inbound and outbound activities.

Table (18) External knowledge and information flows and ambidexterity

Optimization of information/knowledge flows along the supply chain and within the ecosystem	**Outbound**	"TechStars connect" hub exchanges	Viber/Microsoft regional managers' exchanges to maximize the integration of products at the local level through their channels of distribution
	Inbound	Market insights. Solutions based on key features crafted from clients' requests	Maximization of the product based on an analysis of the most-requested features/modules and key performances
		Explorative	**Exploitative**
		Type of process	

Source: Own elaboration

6.1.6 Conclusion

Based on the qualitative analysis conducted through the triangulation of available data, we can summarize the key results pertaining to each variable that was analyzed quantitatively at the aggregate level using the survey mechanism.

Talk-a-Bot successfully progressed through Phases (1) and (2) of the firm's growth path. Phase (3) is still incomplete, calling for further action to achieve full INV status.

In order to accelerate its growth, Talk-a-Bot needs to fill structural holes in Western markets and exploit the new modular service, Cheqbot. The firm is using data-driven analysis in its pursuit of scalability. Increased automation and data-driven technology have become critical ingredients in sustaining growth and arriving at a scalable solution. In the current phase, the venture is also looking to acquire greater centrality in the niche technological segment of chatbots. Enhancing the firm's position in the ecosystem can also raise brand awareness and accelerate the rate of adoption and referrals from other clients.

Talk-a-Bot has been pursuing international expansion at a fast pace with a similarly strong scalability rate, although constrained by B2B inherent factors (i.e., technology agreements with leading technology players in each region). Network embeddedness was found to be highly relevant in terms of the impact on scalability and international expansion. The leveraging of the technological network of dominant players (Microsoft and Viber) has created opportunities to internationalize the activity.

Technological learning was employed in observing the user's adoption of new features and learning of the potential modules to be structured to allow faster scalability. Opportunity recognition was also found to be relevant, moderating the choice of international expansion, supporting the decision to enter new markets or maintaining export-led value chain coordination.

Ambidexterity was found to be an important factor, especially in Phase (1) and Phase (2) where the firm was strongly geared towards testing its product at an international level in order to find a modular, scalable business model. Ambidexterity led-by-exploitation activities characterized the beginning of Phase (3), where the firm is currently positioned.

Organizational connectedness – see Appendix (3) – details the evolving objectives (several innovation programs), adaptive structure (opening of subsidiaries in several countries) and flexible processes in response to learning overtime (short value chain and direct feedback) that characterizes the firm's value system activities.

The case demonstrates consistency with the research hypotheses articulated in the general model. To understand these results, a detailed description follows, together with insights from the interviews.

Scalability
After four years of technological developments, Talk-a-Bot was able to devise a modular model for international expansion based on a B2B niche proposal. This variable has been assessed as having strong relevance.

International expansion
The expansion path has reached five international markets that are heavily tied to two main regions. The expansion has relied on the development of strong ties with multinational technology players and corporate leaders in innovation in the international ecosystem. The new (current) phase is highly dependent on the ability to strategically connect new clusters of demand when entering different international regions. This variable has been assessed as having strong relevance.

Technological learning
Technological learning has been assessed as having strong relevance, with an intense focus on designing superior technological features and meeting customers' needs and wants.

Network embeddedness
Network embeddedness has been shown to have very strong relevance as a driver of expansion. Further actions need to be taken to fill structural holes in the network and complete the path of expansion into the Western EU region.

Ambidexterity
Ambidexterity (exploitation and exploration) processes have been shown to have very strong relevance in the first two phases. In the current phase, activities are mainly directed at exploitation. Key results have been acted upon through the development of a parallel service.

Opportunity recognition
Opportunity recognition (moderating technology learning and international expansion) has been shown to have strong relevance. Data required to make decisions for the purpose of

expansion remained limited until business intelligence started playing a leading role in revealing the technological features requested by clients.

Organizational connectedness

Organizational connectedness (moderating network embeddedness and scalability) has been fundamental in ensuring continuous alignment with the strategic focus of the international expansion drive. This variable was assessed as having very strong relevance.

Entrepreneurial orientation

Entrepreneurial orientation (moderating ambidexterity and scalability) has been assessed as having very strong relevance in adjusting the business model scalability by designing a parallel, less-customized service with a modular structure.

6.2. Linistry: Retrospective longitudinal analysis

Based on the interview conducted on 8th January 2021 with Zsigmond Kovari, founder and head of business development at Linistry (transcript quotations are labeled with the initials Z.K.).

6.2.1. Introduction of Linistry

Linistry is a digital-queuing technology firm that was established in 2016 in Budapest, Hungary by a group of individuals. The firm operates in the IT sector – specifically the Software as a Service (SaaS) segment. The firm's core service is a customized queuing system tailored to the specific needs of the client. This system makes it possible to manage customer queues via mobile phone. The customer can check in either onsite or remotely and an app will notify the customer of the waiting time. The firm's business model is B2B – in particular, B2B2C – allowing, on behalf of the client, direct management of a virtual queuing service for the final users.

The firm's home base is in Budapest and comprises a team of six employees (2020 figure). The venture was founded by four members, all colleagues in the same multinational company (Microsoft) who leveraged their extensive experience in the international market (more than 15 years each). The firm launched its commercial operation in 2017, starting out as a provider of queueing services to the events industry, which hosts big events such as the Sziget Festival (an international musical event held in Budapest) and Gamesco (an international trade fair on games held in Cologne). In 2018, Linistry made inroads into the banking industry and in 2019, approached the retail industry in order to target retail franchises (e.g., hairdressing and electronics).

By 2020, the firm's international expansion drive had led to it having a presence in four countries in Europe (Germany, Switzerland, Austria and Estonia), besides having pivoted projects in Africa and Malaysia. Its revenue growth has been stable over the years and is highly

correlated with international expansion. In 2020, about 20% of the firm's revenue was derived from other countries, although in the short term, foreign sales are projected to dominate.

Value proposition, main features and technology

Linistry is a B2B2C technological service application that targets firms needing to manage massive customer exchanges through frontline operations. The online system automatically directs the customers by assigning electronic or personal queuing channel orientation, enhancing the management of the exchange with customers. The service is focused on building a state-of-the-art digital queuing solution, thereby enhancing customer loyalty and boosting sales for clients.

Linistry adjusts existing front-line operations, allowing customers to operate a digital queueing system. The firm's value creation is centered on the customer portal. A dashboard (decision-making support tool) offers information on performance and tracks decision-making support. The technology also provides intelligence notifications through alerts, priority management and intelligent learning algorithms. The leading feature resides in the data collection system. Customer data are recorded and shown on the client analytics dashboard and feedback is collected via an integrated survey engine.

The service also enhances brand accessibility features. For example, the platform offers personalized advertisements via user interfaces, which correspond with the brand image on location and on mobile devices. The service proposes multiple ways of organizing queuing: a built-in application, a webpage without an application, a chatbot and a ticket dispenser. The system provides opportunities for credit card use and other chip/magnetic card identification.

6.2.2. Network evolution and international expansion

The entrepreneurial network **- Phase (1) (Emergence):**

The firm started with a global vision and, following some initial steps, narrowed its focus to European countries. The nature of the business (B2B2C) means that it takes a long time to establish a relationship with a client. In addition, the technological asset took four intense years to develop. Kovari, the CEO of Linistry, stated:

"*It is only now that we have the good product to roll it out easily, we believe. In this sense, we are very different from a very typical start-up. We don't scale up that fast. In this sense, we need 12/18 months for developing a contract with a large client, e.g., a large bank, a telco company.*"

i. Inception and founders' network

The firm was started by four colleagues working in a multinational company in the IT industry (Microsoft). The firm was born following a project on digital transformation which enabled the founders to recognize a growing trend in the use of virtual queueing, using digital technology. The founders were all able to benefit from the international business know-how they had

accumulated in the multinational IT environment (more than 20 years collectively). Moreover, the multinational IT ecosystem provided an important asset in the form of social network capital (Putnam, 1995).

ii. The international expansion vision

The firm has expanded into four countries, although there are multiple clients in Hungary. In the foreign countries, there is one client per country.

"We have made pretty aggressive improvements in terms of the product and the industry. We started with smaller companies in Hungary in the events space. We were serving events with virtual queuing. And then we moved to slightly bigger companies: hairdressers' franchising in Hungary and media market providers. Then we moved to Unicredit bank and other banking customers. The first two years were characterized by us growing the product and making it available for larger companies and larger customers. This all mostly in Hungary. Recently we have started to make the international expansion more conscious. We have recently closed the deal with Mediamarket Austria (electronics retailers) and now we are working with them to expand in Germany, Switzerland and some other subsidiaries they may have across Europe. Our international strategy is now to find international clients in Hungary and then expand into some foreign countries within those customers (e.g., Mediamarket, Unicredit, Vodafone)."

The firm is serving as a technology provider to Gamescom, a large, German game event organizer (in Kohln).

Initial vision: Asia and Europe were the two countries targeted in the beginning. According to Kovari:

"We looked at the Asian market and Europe, but then we concentrated just on Europe." The reason for the international expansion was related to *the size of the Hungarian market: "If we were in the US, we might have remained in the US market given the size. Our business model allows us to serve customers no matter where they are located without additional costs."*

The vision today: The vision remains that of a global company, but the service is not scaling like a search engine.

"As a B2B firm we face a complex round of negotiations. Today our market ambition is limited to Europe. We need to be very specific also about which countries to go to. Countries have different approaches to the digital solutions, and we have to pick the right one that fits our offer."

***The consolidated (organizational) network* - Phase (2) (Early growth):**

The firm oriented its expansion towards a network of indirect weak ties with partners relying on brokers. The firm exploited weak ties from the entrepreneurial network embeddedness in the industry.

"We used to work with many companies let's say 70, and usually these partner companies you have a relationship with them but every six months. Some of these companies emerged interested in what we do, and we have been talking to them and we found foreign representation in Austria, some had representation to a German customer. Then we could start to speak to people whom they introduced to us. From an earlier business relationship, we were developing these opportunities. It usually starts as indirect, medium ties. In most of the cases the partners we are working with we had no direct relationship with them earlier."

iii. The organizational network formation

The network was neither dense nor dispersed. The venture maintained a network of partners connected via a portal through which they shared information and knowledge among members. Management tried to build the community of partners with a view to creating density. At the same time, each member/agent was a transactional partner, responsible for their own market. Members did not overlap; instead, they maintained a boundary of detachment in the business that each controlled.

"The first customer was in Malaysia in Kuala Lumpur, but it was not so strategic. Then we had an Estonian customer in the region. Then came Germany and later Austria and Switzerland. At the moment the most important countries in terms of revenue are Hungary, Germany, and Austria."

The chronological evolution of the network is referenced to the key international partners and clients, as demonstrated in Table (19).

Table (19) Chronological network evolution with reference to key partners and clients

Year	2016	2017	2018	2019	2020
Partner/client		Malaysia		Estonia	Germany, Austria, Switzerland

The firm adopted a structured approach to business development after first trying to develop an organic commercial strategy through an internal distributional effort:

"The main strategy has been multi-folded. First, we decided to target specific countries and clients (e.g., banks, financial institutions of a certain size). Then we bought a database, we selected all relevant banks, and then we started to approach them with direct mails with special companies dedicated to B2B sales via direct email campaigns. This did not work."

In Phase (2), the firm embraced the strategy of partnering with B2B resellers.

"Secondly, we had an approach of setting up international partners asking them to find clients and explaining the product. This works in two ways. Partners go to clients with whom they already have a business relationship. This is the most suitable option. Partners that already

have business relationships with potential customers put forward the proposal to these clients and then see how the relationship develops. Another way the partner can act is to leverage personal relationships contacting potential customers and putting forward the proposal.

"After this first contact, our major objective is to start a pilot with our potential customer. Once we can convince them of the pilot we usually can come up as the winner of the deal since there is a lot of investment from the commercial side to start the pilot. As you can imagine, introducing a new management solution, which we sell, is a complex decision, and it involves many departments: marketing, business, legal, IT, security departments. That's why they have to think if they want to start something like this. So, everyone has to think twice if they want to start something like this."

***The relevant global network* - Phase (3) (Expansion):**

The firm has evolved on the basis of its dispersed network of weak ties (arm's length). The network expansion was initially not calculative but rather driven by the recognition of an opportunity. Only in this phase (fourth year), after having finalized the development of the technology, is the firm strategically targeting selective industry segments to expand in the international arena.

iv. Consolidating the international expansion

Strong ties: The firm has, since the very beginning, been growing on the basis of a few strong and weak ties.

"*We had tried at least 40 strong ties with many dead ends. Few got some offspring. It is important to explain the product well in order to give the opportunity to resell and present comprehensively the product. We need to find the type of partner that our product fits their proposal. We tried many small, medium, large partner companies. But this is a journey through which you find who is the typical and ideal partner to work with.*"

Strong ties (i.e., people who can be specifically named) had one common feature: "*Most of the partners we established an efficient and strong work relationship with had some Hungarian connections. They were either a representation of a Hungarian company or an international company that has a Hungarian leg. By the Hungarian representation in Hungary, we had the contact abroad."*

Weak ties: As argued by Kovari, the previous multinational experience created embeddedness for each partner in the IT ecosystem. These contacts acted as a linchpin for spreading, by word of mouth, Linistry's activities in foreign countries.

"We used to work with many companies let's say 70, and usually these partner companies you have a relationship but them every six months. From some of these companies emerged interested in what we do, and we have been talking to them and we found their interest in connecting us to foreign representation: some had their subsidiaries in Austria, some introduced us to a German customer. Then we could start to speak to people whom they

introduced to us. From an earlier business relationship, we were developing these opportunities."

v. The scalability process

The venture has experienced and pivoted several business models, testing them in a composite range of industries in order to find the right path towards scalability. The business is now growing at a rapid pace but not exponentially, given the length of the procurement process.

"At the end of the technical engagement of the client company, the procurement department comes in and it usually evolves as a tender procedure whether some other competitors besides us can apply. The process usually takes 18–24 months to complete. It is very structured and for this, it is slow to grow.

"*We started to work on events, and we were thinking we would be the service providers of events. Then we figured out that events are not a good industry because we cannot make a living and we cannot scale the business model from events done once a year. It requires a lot of preparation, and it is not sound in terms of business perspective.*

"Then we decided to work with customers that do continuous operations like retailer customer Mediamarkt. Again, this brought a big change in the business model. Then we figured out that we need to work not only with Hungarian customers but also customers that have international legs (international subsidiaries, representations). Then we started to work with Unicredit, Vodafone, Herste Bank and others, to go international. Now we are learning the international perception of German and Austrian. We were thinking that we can sell to Austria directly. Then we learned that as a Hungarian company we cannot sell to Austria directly even though we tried and that's when we hired an Austrian partner to do business in Austria for us. And then we were able to do contracting business in Austria.

"So, we started with banking but now we are experiencing some limitations in the banking industry and now we are changing focus toward the retail industry. But the retail industry has some other specifics. Now we also experience smaller companies/SMEs sector small and medium-size industries because we had some success there. So, it is always a kind of changing of your target group and changing what you are selling. We thought we would be a mobile queuing company using our phones as devices for virtual queueing and then we figured out we had to do the classic onsite queueing (e.g., bank with a queuing machine) and then we are doing that as well in the last two years.

"Every time there is something new to the products you need to see the response from the customers."

Pareto 80/20 rule in operations: Considering the Pareto 80/20 rule (which states that for many outcomes, roughly 80% of consequences come from 20% of the causes), the firm pinpointed an important factor relating to the level of activity and successful performance associated with the partners' network.

"We have a network of roughly 80% of our partners that are dormant and 20% active. We have a network of partners, but they are unequally active and successful. This might be a sign that we are at the beginning of our journey of internationalization. We have to replace some dormant partners. Some after six months, one year become passive. Some companies find business success. Building a network in our experience, it is not like you talk with 10 companies and all start to generate revenues."

"The company did not observe internal hubs of revenues or workload. The revenue is very distributed across the client base. Among let's say out of 10 customers pretty big the revenue base depends on six of them. Regarding the workload, I have to think if there are internal hubs, but I can't identify any hubs, at this point, for the workload."

6.2.3 Distinctive attributes of INVs in Linistry

Appendices (2) – (5) summarize how well Linistry fared in terms of the three dimensions of founder characteristics, organizational capabilities and strategic focus.

- *Founder characteristics*. Linistry displayed all characteristics specified, i.e., prior experience, network embeddedness of the founders (multinational Microsoft experience) and managerial vision (niche focus on target clients).

- *Organizational capabilities*. Linistry displayed most of the specified characteristics, i.e., market knowledge and commitment, organizational connectedness, and strong control over intangible assets and ambidexterity mechanisms. The one exception was technological learning which was not at an advanced stage at the company, indicating that the network expansion process was not driven by data-rich technologies.

- *Strategic focus*. Linistry displayed network embeddedness and a flexible strategic posture. However, the coordination of operations with clients was instead based on indirect ties with partners' intermediaries. This latter characteristic was not in keeping with the typical INV structure.

6.2.4. A model for the firm's network evolution and scalability

The chart below shows how Linistry has performed during the three phases illustrated in the network evolution phase-model in Figure (7). In Phase (1), the founders exploited their mature experience and network embeddedness in the multinational environment and IT industry.

Phase (2) saw the consolidation of the network through the formation of a network of reselling partners. The firm established a strong presence in a few foreign countries by focusing on key clients and industries. Information and knowledge flows and activities among partners were coordinated via a portal designed to boost connectivity and density.

Phase (3) has seen the firm reach clients through a wide network of branches across a number of countries in CEE. The firm has observed an increase in sales in these countries although the

pace of growth generally remains stable. The firm has reached a central position only in the banking industry in Hungary. In 2021, the firm is aiming to become more central with additional clients, such as Vodafone (telco) and Mediamarket (IT distributors), especially in Germany, Austria, and Switzerland.

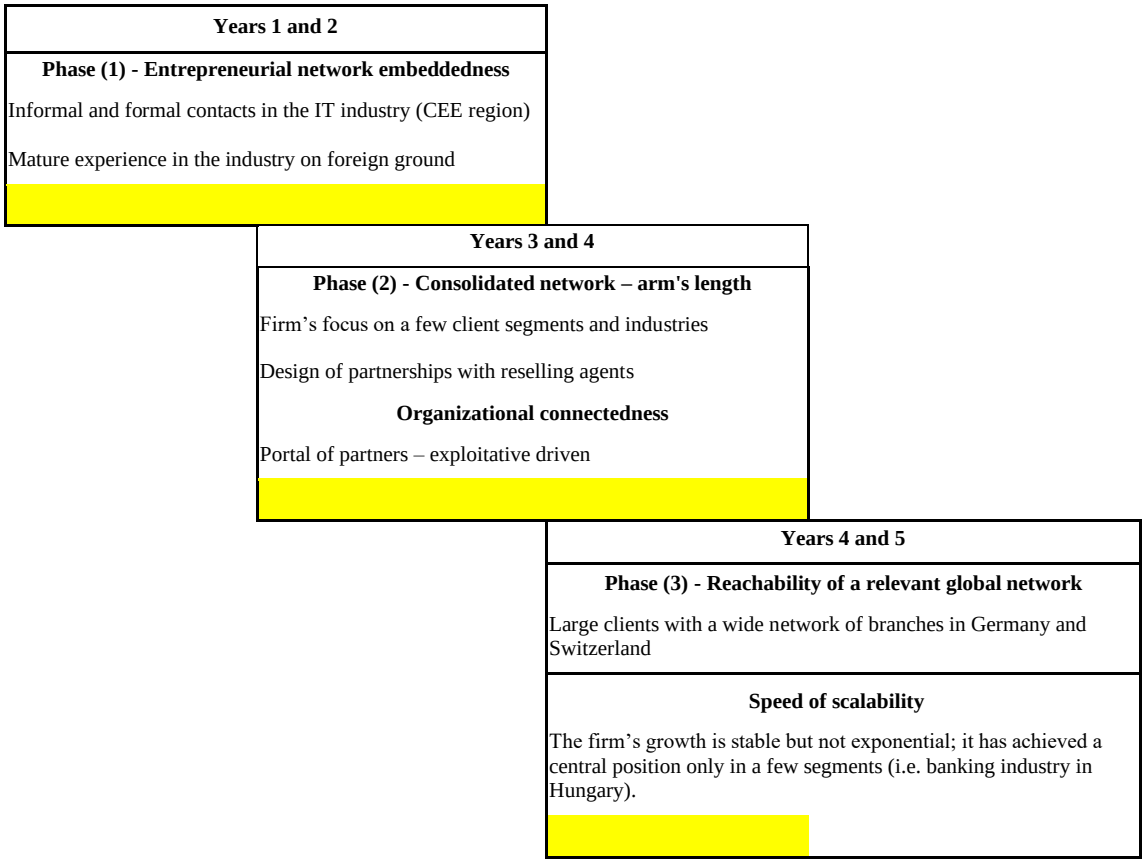


Table (20) summarizes the main features of the network development underpinning Linistry. Utilizing the network evolution and scalability phase-model illustrated in Figure (7) and analyzing the *entrepreneurial network* in respect of the *internal knowledge/information flows*, the founders were able to benefit greatly from the accumulated know-how in the multinational ecosystem and the information emanating from a wide range of international suppliers. The mature experience of the founders enabled them to direct their efforts towards the development of a niche technology targeting a growing trend in the corporate adoption of mobile solutions.

The *articulated knowledge/information flows* were based on an activity system relying on a network of partners and indirect relationships with clients.

Table (20) Network evolution phase-model and types of knowledge/information flows (Linistry)

	Phase (1) Emergence (Entrepreneurial network)	Phase (2) Early growth (Consolidated network)	Phase (3) Expansion (Relevant global network)
Internal knowledge/ information flows	Competencies and expertise aligned to assigned roles Expertise in IT business development and international settings	Internal exchanges relying on a sparse network of partners Agile management systems (business model industry requirements) A short cycle of activities with exploration per industry for a selection of client segments	Analysis and preparation of business cases to facilitate client engagement and acquisition
Articulated knowledge/ information flows	Vision of the firm centered on the European market Design of the strategic activity system on foreign ground: activities based on a network of partners and indirect relationships with clients	Partnerships aligned to niche segments and scalable service components Activation of linkages with keystone players	Information content presentation Material and process engineering of the installation phase Exchanges with keystone players in the targeted industry (banking, electronic retailing, etc.) Leveraging of the international network of key clients (via franchises or subsidiaries) based on referrals and ease of compliance with regulations and technological features

After Phase (1), the network turned into a *consolidated one* (arm's length), relying on a sparse network of agent partners. *Internal knowledge/information flows* were managed by agile management systems, short cycles of activities and internal exchanges among the network of agents. The *articulated knowledge/information flows* were supported by the activation of linkages with keystone players in the key industry (e.g., banking), favoring international players in the region (i.e., Unicredit). The activity system on foreign ground harnessed reselling partners' know-how and leveraging ongoing relationships with major players in the targeted industries.

Phase (3) (Expansion) has focused on the reachability of a *relevant global network*. In this phase, activities surrounding the processing of *internal knowledge/information flows* have focused on the preparation of informative material in order to streamline and automate the installation of the technology. *Articulated knowledge/information flows* are concerned with the procedural capacity of the agents to conduct qualitative presentations for lead players in foreign countries and remotely automate the technical installation and procurement management system (a fully remote-controlled banking service was launched in Africa in 2020). Other,

complementary activities are concerned with the management of referrals across the main clients' ecosystem.

Table (21) shows the types of network formed in the two different phases of the firm's evolution, i.e. *emergence* and *early growth.* In Phase (1), pertaining to the *emergence of the firm,* the founders were able to leverage their personal network which was heavily embedded in the IT multinational industry in Hungary and Eastern Central Europe. In Phase (1), the network was based on both strong ties and an extensive web of indirect weak ties. Opportunities were grabbed. In Phase (2), pertaining to the *early growth of the firm,* the firm was more strategically orientated and a calculative-based network was formed. The firm shifted its focus to different segments and industries. The arm's-length network gradually grew, reaching keystone players in the fourth year, with the firm now (in its current, fifth year) focusing on leveraging branches with subsidiaries or foreign branches.

Table (21) Firm's evolution and types of network and ties (Linistry)

Firm evolution	**Emergence**	**Early growth**
Type of network	***Identity-based network*** Strong ties related to high-tech multinational industry	***Calculative-based network*** Industry-based (i.e., banks, electronic retailers, small retailers) segments spread across the regional international network (i.e., Germany, Austria, etc.)
Type of ties	***Embedded ties*** Embeddedness of the founders in a multinational industry ecosystem – Hungarian-based Indirect weak ties with previous collaboration contacts	***Arm's-length ties*** Long-term relationships built with established players in the international arena (Germany, Austria, Switzerland)
Network evolution phase-model	**Phase (1)** *(Entrepreneurial network)*	**Phase (2)** *(Consolidated firm network)*

6.2.5 Information and knowledge flows in the firm's value system

The information and knowledge flows were analyzed in terms of the ambidexterity processes and activity-based principles (data-driven technologies or human intensive) described in section 4.2.

Linistry operated through ambidexterity in both the emergence phase (Phase (1)) and early growth phase (Phase (2)). The articulation of these two parallel activities has been crucial for achieving the right business model and target client segment. These activities have also impacted the testing and development of key features of the platform technology.

In Phase (3) or the stable expansion phase, Linistry's activities have mostly been driven by *exploitative operations* coordinated according to activity-based principles. Right now, *"it is more exploitative than explorative the way it is working. You hear a problem that one customer*

encountered and then you explore if this problem is also relevant for other segments of customers".

Internal knowledge and information optimization have been based on *data-driven technologies* primarily related to the use of data on the technology platform: satisfaction of the users and back-end analytics. The analysis of these data has been mainly *explorative*. On the *exploitative side*, data and knowledge insights have spurred improvements in users' interactions with the technology features.

Human-intensive activities have focused on leveraging the network partners' activities and their rates of success. On the *explorative side*, exchanges to understand the complementary features of each client's segment and industry have been proposed. In parallel, automation has been pursued in order to streamline the installation phase and partners' presentation processes. Table (22) synthesizes the internal flows of knowledge and information and the types of processes, indicating the natural ambidexterity of the data-driven and human-intensive activities at Linistry.

External exchanges have occurred principally as *exploitative processes* in an *inbound* direction. The collection of information on problems and constraints experienced by one client has been readily tested for application to other clients or countries (i.e., privacy, security issues, marketing app features).

Table (22) Internal knowledge and information flows and ambidexterity

Optimization of knowledge and information flows	**Data-driven technologies**	Use of data-driven technologies to understand technological features (security, back-end analytics, privacy, etc.) and boost complementary features	Use of data to increase interactions with users
	Human-intensive, activity-based	Partner-based, understanding key features of the activity of partners' networks: in-depth exchange on needs and potential added features from each sub-industry	Automating processes for initial presentation and installation procedures
		Explorative	**Exploitative**
		Type of process	

Outbound exploitative activities have been concerned with the degree of information aggregated from the different countries that are open to the whole network of partners, aimed at facilitating sales and faster installation. *Inbound explorative activities* have been limited, given the nature of B2B model. Market insights and business intelligence data have been used for testing the proposal/release of new technical features on a large scale. *Outbound explorative activities* have not been practiced very much and are limited to supporting partners streamline regulatory and technical issues, thereby making business cases for similar cases in similar industries.

Table (23) synthesizes the external flows of knowledge and information and the type of process indicating the natural ambidexterity of the inbound and outbound activities and human-intensive activities at Linistry.

Table (23) External knowledge and information flows and ambidexterity

Optimization of information/ knowledge flows along the supply chain and within the ecosystem	**Outbound**	One-to-one relationships with partners. Support and assistance provided for information on similar cases and clients in the industry/region.	Collection of information on the partners through a portal to boost knowledge and information sharing, thereby maximizing mutual knowledge and cohesiveness.
	Inbound	Market insights. Solutions based on key features crafted from clients' requests (e.g., banks – physical and virtual queuing, not only virtual).	Collection of information from single clients and formulation of solutions for a larger base.
		Explorative	**Exploitative**
		Type of process	

Source: Own elaboration

6.2.6. Conclusion

Linistry has successfully progressed through Phases (1) and (2) on the firm's growth path. Phase (3) is still incomplete, which calls for further action in order to achieve full INV status.

To accelerate its growth, Linistry needs to fill structural holes in Western countries. In parallel, more data-driven analysis is required from a customer standpoint. In this regard, increased automation and data-driven technologies are required to sustain and boost scalability. Continuing to pursue centrality in key industries can also raise brand awareness and accelerate the rate of adoption and referrals from other clients.

It is important that sizeable retail chains, banking corporates or telco operators remain key clients in order to boost technology adoption and shorten procedural, regulatory and security constraints (exploiting the technology implementation efforts across the full range of departments).

Based on the interviews we found that international expansion and scalability were strongly relevant to this case study. However, technological learning was found to have weak relevance, while network embeddedness and ambidexterity were found to have very strong and moderate relevance, respectively. The moderating factor of opportunity recognition was found to have weak relevance, like technological learning. Organizational connectedness and entrepreneurial orientation were both assessed as having very strong relevance.

Specifically, ambidexterity (exploitation and exploration) appeared to be very relevant in the first two phases, with a positive relationship with scalability and international expansion, although in the current phase activities have been focused on exploitation. Further actions in terms of exploration seem necessary in order to valorize assets (data on user interactions) and

leverage reselling partners' activity rates. Organizational connectedness remains strong, but it requires continuous improvement in order to boost connectivity. Its role in the relationship between network embeddedness and scalability remains strongly relevant.

Network embeddedness emerged as a factor driving expansion. Continuous actions remain necessary in order to fill structural holes in the network and to complete the path of expansion in the Western EU region.

Technological learning appears to be limited, given the B2B restricted access, which calls for continuous alignment with knowledge/information activities. Human-intensive activities must be supported by data-driven technologies in order to fill market gaps and align the venture's expansion efforts to the most requested features of each industry.

To shed more light on these results, a detailed description follows, including insights from the interviews. The systematic analysis of the interviews and the case study in general also aimed to measure (in a robust, qualitative assessment) the degree of relevance to the firm of the variables in the conceptual framework that influence scalability and international expansion in INVs.

Scalability

After four years of technology developments, the Linistry venture has been finetuning a scalable business model that has already expanded into four countries (by the fourth year). Its expansion is now gaining momentum, benefitting from a big client network spread across the same region through other subsidiaries or branches. However, the international expansion remains focused on the European region. This factor has been assessed as having strong relevance.

International expansion

The expansion path has been strongly geared towards the formation of a distribution channel comprising an indirect network of partners. Its success relies on the network connections with big clients that was initially started by the partners and was later enhanced through the reliability of the technological and service features. This factor has been assessed as having strong relevance.

Network embeddedness

The business operations were heavily related to the embeddedness of the partners and later to the embeddedness of the firm to the industry network. This factor has been found to have very strong relevance.

Technological learning

The use of technological learning has largely been confined to the analysis of back-end data from clients' users. The employment of data has been for the purposes of security features and analytics, with limited use on the sales side, which has been confined to a B2B-restricted number of clients. It is only in the current phase that this factor has been growing in importance. Until this phase, this factor has been found to have weak relevance.

Ambidexterity
This feature has been very prevalent in the expansion drive, led principally by the exploitative process of automation and installation. Exploration has been geared towards the implementation of new features in different segments and industries. This factor has been found to have moderate relevance.

Organizational connectedness
Internal connectedness has been based on the synergistic use of knowledge and information from the network of partners. Channels of exchange with clients have been structured through the analytics platform. Knowledge and information exchange among partners has driven the search for new client segments. Moreover, better information flows and updates raise the prospects of success and activity among the pool of reselling partners. This factor has been found to have very strong relevance in moderating the relationship between network embeddedness and scalability.

Entrepreneurial alertness
More experiments conducted in how to meet demand have raised the quality of the product and the features embedded in the technology. Better testing has also at times addressed unarticulated wants from the client base. In this regard, a proactive posture combined with a strong capacity to satisfy new wants or fill gaps is a case in point. This factor has been found to have very strong relevance in moderating the relationship between ambidexterity and scalability.

Opportunity recognition
This factor has been assessed as having weak relevance in moderating the relationship between technological learning and international expansion. In particular, given the particular structure of the business in the early growth phase, the firm has not drawn on data as the primary resource for expansion purposes. Nonetheless, it has conducted activities in market intelligence analysis to progress commercially towards niche industries that could add momentum to its international expansion.

6.3. SignAll: Retrospective longitudinal analysis

Based on the interviews conducted on 8th and 26th January 2021 with Mihaly Pinter, chief strategist officer/CSO of SignAll (transcript quotations are labeled with the initials M.P.).

6.3.1. Introduction of SignAll

SignAll was founded in 2015 in Budapest by two entrepreneur experts in video technology.

SignAll aims to provide users with technology that employs machine vision and artificial intelligence to translate sign language into spoken languages in real time. Through its application (PC and mobile), it enables instant and seamless communication between the deaf

and hearing person. The firm was born to fill a gap in the market in sign language translation. For the first three years, the venture was a project of Dolphio Technologies, an international IT firm with headquarters in Hungary, specializing in machine-vision technologies and machine learning on industry 4.0. In 2018, SignAll became an independent entity as a spin-off project of Dolphio Technologies.

The founders were two senior executives from Dolphio: Zsolt Robotka, with 14 years of R&D experience in computer-vision technologies and a PhD in applied mathematics, and János Rovnyai, with 17 years of experience managing an international R&D company specializing in computer-vision technologies. The technology development was capital-intensive and covered an extended period: three years for the desktop version and two years for the mobile version. The first pilot was conducted in 2018. The project initially applied for EU funds (2015) and later received two rounds of investment in 2016 (Euro 2 million) and 2018 (Euro 2 million), respectively. The firm started to test its technology from Hungary but decided to focus on the most widely used sign language: the American Sign Language (ASL). In 2019, the technology was extended to several installations at US universities. Despite the success of this first round of the technological application of ASL, the firm's vision is to operate at a global level. To date, the firm's most important assets are its software technology and the data collected: the firm's proprietary database contains 300,000 annotated videos of 100 users using over 3,000 signs from ASL. The database was collected through a partnership with Gallaudet University in Washington DC in the US, a university which offers courses specifically for deaf students.

After having tested and utilized the application at American universities in 2019 and 2020, the firm finalized the development of its mobile app at the end of 2020, launching it commercially in January 2021. SignAll's software can recognize ASL, though not yet at the speed at which native signers communicate. Its algorithm can translate signs into written English, allowing a hearing interlocutor to respond with the help of speech-to-text software. The desktop version relies on pointing three cameras at a signer wearing special motion-tracking gloves (The Economist, March 2021). The app could remove this key constraint with a glove-free option and the single camera of a mobile phone. At this stage, SignAll's emphasis is on translating sign language into text or speech. Translating in the other direction poses greater difficulties. However, the mobile application could allow the firm to accumulate enough data to make the sign-recognition algorithm also capable of recognizing other sign languages, especially the European ones. This could easily open a very large market for the venture.

The venture at this stage is not profitable and growth can be measured only in terms of users and points of installation. The SignAll case is an important example of how a capital-intensive technology venture develops through various stages of internationalization. Today, in 2021, the firm is present in more than 10 states in the US. It has also established a subsidiary in the US. A competitive advantage of SignAll in the industry is its ability to collect user experience data which it then aggregates through its agreements with US universities. The size of the data archived is more than 20 times that of the next-largest size.

Value proposition, main features and technology

The SignAll technology translates ASL (American Sign Language) into written English and displays it as a chat dialogue. There are two monitors: one for the deaf user and one for the hearing user. SignAll started to pioneer the first automated sign language translation solution based on computer vision and natural language processing (NLP) to enable everyday communication between people with normal and impaired hearing. As the solution uses AI technology, it relies heavily on the accuracy of sign recognition, which is possible only after a massive data collection effort. SignAll invested significant resources in creating the world's biggest sign language database.

6.3.2. Network evolution and international expansion

***The entrepreneurial network* – Phase (1) (Emergence):**

The capital-intensive, technology-grounded service of SignAll focused initially on the collection of sufficient quantities of data needed for the machine-learning technology. By the end of the first year, the project financial planning (PFP) was presented to the investors, and it was estimated that the product would be ready for the implementation of the go-to-market strategy by the end of the third year.

"At the third year then the board decided that the product was not ready enough and needed further improvements, requesting a second round of investment. Now this is the time that we have a product, and we are going to market it. So, the first period was longer than anticipated in creating our proof-of-concept product. The first round was pointed toward a desktop equipment; the second round was focused on the mobile application features." (M.P.)

In Phase (1), SignAll utilized the contacts of Dolphio and also built a team of 25 people, including three deaf people. The team reflected a diverse set of competencies, from visual learning to deaf cultural specialists. Phase (1) in SignAll's development was dominated by technological learning from users' feedback. Ambidexterity was present, especially with regard to the formation of the foreign network in the US. Explorative activities were performed in engaging users and developing features, together with exploitative ones aimed at increasing the number of universities interested in testing the technology once ready.

***The consolidated (organizational) network* – Phase (2) (Early growth):**

In Phase (2), the ambidextrous approach was pursued. From a technological standpoint, SignAll advanced the software in order to produce a mobile phone app that could turn the technology into a glove-free version that was single-camera dependent. From the exploitative perspective, activities were performed to obtain users' feedback from the desktop version which was distributed to university early adopters of the service. During this phase, the recognition of partnerships from the ASL Association was crucial, as was the consensus gained from deaf advisors who considered the service ready for spreading across universities and for

use in courses across multiple states in the US. (In 2019, eight US states had already been reached).

Regarding explorative activities:

"*When we started, the first block was to create a big database at the beginning. And we needed to put a lot of working effort in it and, after all, we could ask the market and targeted segments if they like or not. We had positive results, but we had to tackle some problems due to Covid, and we are now very keen to come up with our latest version of mobile app. This is a huge evolution, because we were forced to create something that could be run on a mobile app with hardware integration. It is a mobile application that is able to recognize your finger spelling. It is not the only one in the market, but it is the only one that is able to recognize real signs not statics." (M.P.)*

Regarding the exploitation phase, M.P. specified:

"*There are anyway some segments that don't need the mobile application but just our technique and knowledge built in. Some were big TV production producers, for example. Small TVs can be a good target for this kind of software. We have another equipment for businesses and universities especially ASL lab. It substitutes the practice period. People can use our equipment for the time to teach and learn the sign languages using our equipment for improving their sign skills. For the business part this allows us to reach all the universities that are having this ASL teaching courses. ASL training is strongly tight to the professors which are almost all part of the ASL Association. In this way, targeting the ASL Association it is possible to reach all the universities that are having ASL schools in the US. We started something that proved to be bigger than expected and we had to churn it a bit. We need to get back to the market now."*

It is important to recognize a distinctive feature of the firm's exchange with the external environment: the ability to integrate the community in two directions – not only as an indirect channel of marketing and sales but also as qualitative service improvements led by the deaf users' insights.

"Exactly, this is the way to have the best sources. If you do your job, you will just make the sales. But if you do your job by their suggestion, you will also understand what signs work and what not; what is changing over time. Sign language is a proper living language as much as spoken ones and it needs continuous updates." (M.P.)

These relationships were mediated by weak ties that connected most of the activities between ASL advisors, professors at US universities and the students.

***The relevant global network* – Phase (3) (Expansion):**

Phase (3) started with the launch of the app mobile version, which is dependent on the degree of adoption by individual communities:

"*The adoption is not driven by states but by communities. You cannot do the penetration in the normal way that you first check from a gradual expansion in the neighboring states but by having a test on the communities and how they are ready to embrace and adopt the product. This latter path is what is giving us a kind clue of how the penetration will go." (M.P.)*

Furthermore, SignAll has indicated that it will pursue other markets besides the US. According to M.P.:

"The structure of this knowledge and technology is good enough to implement other sign languages, spoken languages. We have so many patterns from which we created so much fix for other sign languages, given some improvement to make, of course. We have very good relationships outside the US. We have some European countries: Korea, Emirates, India, Australia. These can be a target country."

Opportunity recognition and entrepreneurial orientation remain two fundamental features across SignAll's management and network partners.

6.3.3 Distinctive attributes of INVs in SignAll

Appendices (2) – (5) summarize how SignAll fared in terms of the three dimensions of founder characteristics, organizational capabilities and strategic focus.

- *Founder characteristics:* SignAll's founders displayed prior international experience, strong industry network embeddedness and global managerial vision.

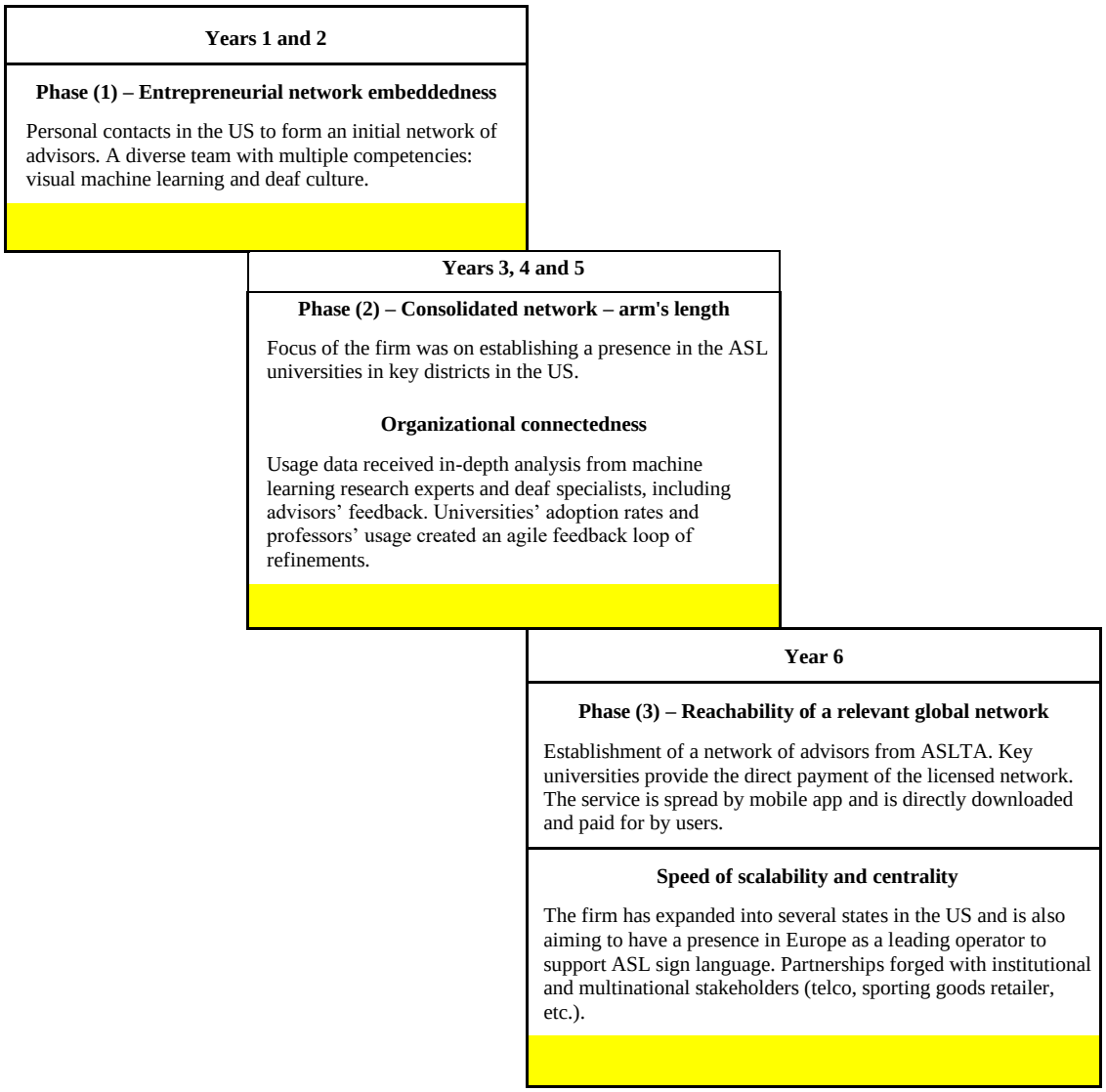
- *Organizational capabilities:* SignAll displayed many INV attributes, such as organizational connectedness and leading-edge value creation. However, characteristics more typical of the gradualist approach were also detected, particularly the limited use of technological learning and data-driven decisions and the use of the ambidexterity mechanism. Regarding the latter attribute, SignAll's recent introduction of a dual mode of service (app + desktop) might shift the strategy more towards the parallel use of service exploitation and exploration.

- *Strategic focus:* SignAll displayed all the INV attributes in this regard.

6.3.4. A model for the firm's network evolution and scalability

In *Phase (1) (2015–2018), internal information/knowledge flows* were primarily focused on the development of the firm's technology. Given the capital-intensive nature of the project, Dolphio, a Hungarian technology provider, applied for EU funds to develop a prototype. The firm successfully received the funds and used them to conduct a proof-of-concept on the basis of which further investment was requested to develop a marketable technology. The know-how in machine vision recognition and motion capture allowed the firm to devise roles and internal objectives to develop the technology and formulate the right strategy to acquire a critical mass of data.

Articulated information/knowledge flows were centered on the establishment of links with ASL Association members and universities. Professors and other members of the association acted as linchpins in university courses and among students. Consulates, in turn, acted as catalysts for the formation of institutional linkages. Drawing on a wide web of international contacts, especially those of the founders and key people at Dolphio, the venture was able to acquire a competitive position in the ASL market. The strategic choice to focus on ASL sign language was made at an early stage when the firm was searching for a mass market.



Phase (2) (2018–2020) saw SignAll become an independent venture supported by an agile management system and a short cycle of activities designed to test the technology platform. From an internal perspective, the firm directed all its resources at implementing its technology in several universities in order to acquire feedback and data on its usage. Externally, the venture first focused on the deaf community, using the chat product. Only later, when positive feedback was obtained, did the focus also include hearing bodies (ASL education).

Phase (3) (2021) has seen the firm recently release the glove-free, mobile app version of its software. This new product has also changed the business model from B2B and B2O (business to business/organizations) to B2C (business to consumers). As a result, users will be able to pay directly for the license to use the app. Sometimes students pay for the download and sometimes the university pays for it.

Table (24) illustrates the type of knowledge/information flows (internal or articulated) along the network evolution phase-model for SignAll.

Table (24) Network evolution phase-model and type of knowledge/information flows (SignAll)

	Entrepreneurial network	**Consolidated network**	**Relevant global network**
Internal knowledge/information flows	Competencies and expertise aligned to assigned roles Expertise in motion capture recognition technology	Data-driven technologies based on feedback loops (usage data on hardware and software) Analysis of the business models Agile management systems A short cycle of activities	Analysis of usage data to establish further partnerships and reselling agreements with relevant institutions in Europe and other countries, with institutions adopting ASL sign language (media companies, foreign universities, support operators)
Articulated information/knowledge flows	Vision of the firm and design of the strategic activity system on foreign ground Activation of linkages with institutional stakeholders (consulates and associations) in the industry	Partnerships aligned towards niche segments and scalable service components Frequent exchanges with professors, universities and communities and active presence in the institutional ecosystem	Actions to advance the degree of centrality of the firm across the industrial network – app presence and focus on the software

The emergence (first) phase was dominated by entrepreneurial personal contact (identity-based). Strong ties played a crucial role during this phase. The first US advisor who was reached belonged to the non-profit sector and was a professor at Detroit University.

The early growth (second) phase rapidly adopted a calculative-based network approach centered on the ASLTA (American Sign Language Teachers Association) universities network. The adoption campaign was given momentum by school districts and local regional communities. This network rapidly became an arm's-length one, which involved advisors and professors spreading news of the firm by word of mouth. Table (25) illustrates the type of network (identity- or calculative-based) and the type of ties (embedded or arm's length) in the firm's evolution from Phase (1) to Phase (2).

Table (25) Firm's evolution and types of network and ties (SignAll)

Firm's evolution	Emergence	Early growth
Type of network	***Identity-based network*** Advisor-based and ASLTA	***Calculative-based network*** School districts, universities and communities
Type of ties	***Embedded ties*** Embedded ties from the founders at Dolphio, the technological ecosystem and personal contacts	***Arm's length ties*** Professors and ASLTA members – now shifting to the web via use of the app
Network evolution phase-model	**Phase (1)** *(Entrepreneurial network)*	**Phase (2)** *(Consolidated firm network)*

6.3.5 Information and knowledge flows in the firm's value system

Table (26) summarizes the developments that the firm has gone through on its knowledge and information development path. Technological learning led by data-driven activities was mostly present during its explorative process. In the current phase, the mobile app will continue to require intensive use of data-driven technologies.

Human-intensive activities were explorative in Phases (1) and (2), focusing on marketing activities and assuring attributes for deaf and hearing bodies. In Phase (3), the exploitation of the current technology has highlighted the importance of penetrating the community through marketing and involving institutions and private stakeholders. Table (26) synthesizes the internal flows of knowledge and information and the type of process indicating the natural ambidexterity of data-driven and human-intensive activities at SignAll.

Table (26) Internal knowledge and information flows and ambidexterity

Knowledge and information flow optimization	**Data-driven technologies**	Technological hurdles: understanding which signs are most reproducible in other languages. Building course packs to be offered to multiple markets that are independent from ASL. **SignAll 2021**	Building proprietary technology based on data from users' interactions. **Previous steps**
	Human-intensive activity-based	Coordinating marketing and service attributes to satisfy deaf and hearing bodies' requests (apps and training courses for hearing bodies were developed based on field experimentation). **Previous steps**	Managing and building a network of advisors and partners (schools and universities). Social impact, student training and teacher support. **SignAll 2021**
		Explorative	**Exploitative**
		Type of process	

Table (26) shows how SignAll integrates its activity system by performing a wide range of actions in the value system of the industry in which it operates. Exploitative outbound processes

are particularly relevant for the direct social impact that the business could have on deaf bodies (technological refinement of features and reliability). Explorative outbound optimization is related to hearing bodies in terms of the time involved in training, supported by the course technology provided. Inbound activities have focused on the marketing of the service throughout communities: explorative actions to reduce hurdles associated with installation and local assistance. Exploitative know-how processes are related to brand awareness and the reliability of the service provided.

Table (27) synthesizes the external flows of knowledge and information and the type of process indicating the natural ambidexterity of inbound and outbound activities at SignAll.

Table (27) External knowledge and information flows and ambidexterity

Optimization of information/ knowledge flows along the supply chain and within the ecosystem	**Outbound**	Establishing relationships with professors and universities to allow them to reduce training time for students and make the teaching more interactive, thereby creating a win-win situation.	Requiring feedback and services for deaf bodies based on the core service (e.g., sign translation and subtitles). Building a business with a social impact brand for the community as a whole.
	Inbound	Understanding hurdles associated with the installation of hardware equipment. Creating know-how abroad by building a network of reference people able to assist universities with installation and support. Collecting insights from communities on key features of particular signs as a living language.	Spreading awareness of the app among communities. Spreading the importance of adopting the app for training purposes.
		Explorative	**Exploitative**
		Type of process	

Source: Own elaboration

6.3.6. Conclusion

Based on the interviews with the founders, we found international expansion and scalability to have weak and moderate relevance, respectively, in this case study. In addition, technological learning and ambidexterity were assessed as having moderate relevance, while network embeddedness has very strong relevance. Similarly, organizational connectedness has strong relevance. In this case study, it appears that opportunity recognition is not significant enough to warrant an assessment of its relevance at this stage of development. Entrepreneurial orientation has weak relevance in respect of ambidexterity and scalability.

To better understand these results, a detailed description follows, together with insights from the interviews.

The systematic analysis of the interviews and the case study in general also aimed to measure (in the qualitative assessment) the degree of relevance to the firm of variables in the conceptual framework that influence scalability and international expansion in INVs.

Scalability

After five years of technology developments, SignAll was able to conceptualize and develop the business model for international expansion. Initially the hardware component would not allow rapid expansion. However, the development of an app capable of capturing sign gestures has allowed the firm to achieve exponential growth at an international level. The quantity of data stored and processed gives the firm superiority over competitive technology. This variable has been assessed as having weak relevance.

International expansion

By the fourth year of operation, the firm had expanded to about 10 states in the US. According to M.P.:

"Before Covid, the second half of 2019 was the first period when we came out with ASL application. During the last three months of 2019 we had about 10 universities. In 2020 we received more than 60/70 inquiries to have this equipment, but we could not set it up abroad. Covid is impacting our business in the first months of 2021 as well."

This variable has been assessed as having moderate relevance.

Network embeddedness

Network embeddedness has been a strong driver for the firm. From an initial reliance on the founders and Dophio, the network became arm's length through the establishment of more than 20 partnership agreements with universities. The partnership with Gallaudet University led the way for boosting brand awareness and creating a network of advisors. This variable has been found to have very strong relevance.

Technological learning

Technological learning was strong in Phase (1) because it was necessary to devise the right technology. Phase (2) saw the processing of feedback from the usage data, but it has not yet resulted in a clear boost in international expansion and scalability. To this end, the data analysis flowing from the recent app launch (in the first months of 2021) will shed light on this relationship effect. This variable has been assessed as having moderate relevance.

Ambidexterity

Ambidexterity (exploitation and exploration) processes have been found to be critical for the venture's development, although only moderately relevant to international expansion. However, *ambidexterity-led exploration* has played an important role in inducing the firm's readiness to develop the mobile app in response to market needs and to adapt the offering to be software-driven in reaction to the COVID-19 contingency. Similar to *technological learning*, the parallel path of developing the desktop and mobile versions has not yet produced clear

results in terms of *international expansion* and *business scalability*. This variable has been assessed as having moderate relevance.

Opportunity recognition

The measurement of *opportunity recognition* is not significant in the case of *technological learning* and *international expansion.* The venture has not yet reached a level of scalability and expansion to warrant measuring this factor. This factor is therefore not available in the current state of the analysis.

Organizational connectedness

Organizational connectedness was found to be very relevant to the relationship between *network embeddedness* and *scalability*. Tight information flows between advisors, technology specialists and professors have contributed to the design of the final product that the firm is now able to market. This variable has been assessed as having strong relevance.

Entrepreneurial orientation

Entrepreneurial orientation was found to have weak relevance in moderating the relationship between *ambidexterity* and *scalability*. Although the firm has implemented entrepreneurial orientation practices at all management levels, the extent of scalability reached is not yet sufficient to provide a clear conclusion about the effect on this relationship. Overall, this variable has been assessed as having weak relevance.

6.4. Pressenger: Retrospective longitudinal analysis

Based on the interview conducted on 14th January 2021 with Zsolt Szegner, founder and CEO of Pressenger (transcript quotations are labeled with the initials Z.S.).

6.4.1. Introduction of Pressenger

Pressenger is an innovative type of mobile notification content which is delivered to boost engagement and assure a holistic user experience. Pressenger offers a spectacular, animated notification format that is very effective in capturing users' attention and encouraging them to be more active. This service was considered for the international market from the very beginning. It targets two specific segments: i) sports market players, sports clubs and teams that wish to independently connect with their fans; and ii) sports market sponsors who need to reach their target group more effectively.

The firm was founded in 2014 and is based in Szombathely, a small, ancient town in the north-east of Hungary near the border with Austria. The team was built around friends and family and stemmed from the international relationships enjoyed by the three founders at inception, with Spain, Germany and England constituting the primary target markets. The founders possessed competencies in sports communication and mobile application developments.

The establishment of the firm was assisted by four founding members and one company as an angel investor and consultant. The company achieved market validation and maturation of the product into the global market through the interest and investment of a domestic seed fund (Conor Seed Capital). The firm's international visibility was later enhanced after being admitted into the Hiventure accelerator program. This served as a launching pad to reach global players and as a platform to ensure that the goals set out in the business plan were achieved. Pressenger then gained visibility in Europe by participating in Sport Thinkers 2018 of the GSIC (Global Sports Innovation Center) powered by Microsoft (GSIC) (an accelerator in Madrid, Spain focused on sports). In this contest, Pressenger became one of 11 innovators that brought new solutions to the sports digital transformation arena. After that experience, the firm started to test its service with Spanish firms (Levante Club) and later began a collaboration with BVB (Borussia Dortmund Club) and the Fite.tv digital video streaming service (dedicated to combat sports programming).

In 2019, the firm entered into a partnership agreement with an international communications agency, Dentsu. This development was crucial for the firm as it was able to reach a global network with international visibility for the sports sector. In 2020, the firm was integrated into the official app of BVB, thereby becoming the major client in Europe.

Besides Hungary, Pressenger now also has an international presence in Spain, Germany, the UK and the US. The activity system deployed includes foreign intermediaries and sales representatives in the UK and Spain. Furthermore, it is also a foreign strategic partner for key markets (Spain, the US and Germany).

Value proposition, main features and technology

The firm offers a B2B SaaS developed on the basis of API which allows app "owners" to send animated, rich push notifications to their users. The content of the notification is highly innovative and provides a GIF (a data-driven animation or banner for a holistic notification experience). Pressenger provides a customized solution to improve conversion rates, user engagement and ad revenue. Its distinctive innovative feature is the capacity of the app to send notification images directly to the lock screen. The back-end platform provides client analytics by monitoring interaction experiences and engagement, with detailed statistics on the campaign/notification performance.

6.4.2 Distinctive attributes of INVs in Pressenger

Appendices (2) – (5) summarize how Pressenger fared in terms of the three dimensions of founder characteristics, organizational capabilities and strategic focus.

- *Founder characteristics:* Pressenger displayed many of the relevant features. An international (global) managerial vision, the type of relationship between the founders (located in several countries) and network embeddedness (one of the founders brought an extensive network in the sports industry) were all attributes in evidence at the firm.

However, not all founders had prior experience in the field in question; instead, they had diverse experience acquired in multiple fields of innovation.

- *Organizational capabilities:* Pressenger displayed most attributes, i.e., commitment, organizational connectedness, strong control over intangible assets and ambidexterity mechanisms, and strong technological learning. An exception was that only one founder had market knowledge in the IT arena.

- *Strategic focus:* Pressenger displayed all relevant attributes, including network embeddedness and a flexible strategic posture.

6.4.3. A model for the firm's network evolution and scalability

***The entrepreneurial network* – Phase (1) (Emergence):**

In *Phase (1)* (2014–2017), *internal information/knowledge flows* were primarily focused on the development of the technology product. The founders were knowledgeable about mobile technology and focused on the idea of developing a call app that could send mood messages by conveying them as images to the call recipient. The partners possessed diverse experience gained in different fields: design thinking, open innovation, sports communication and IT development. The chief technology officer (CTO) brought extensive experience of the blockchain industry and IT product development. This initial skillset had a common layer based on the town benefitting from the diversity of expertise and the international background of each partner.

Articulated information/knowledge flows were centered on the establishment of links with financial investors who guided the firm towards accelerators with an international reach and specialized focus. The financial base in Phase (1) was critical in order to pivot alternative versions of the product and finally select the one that promised the highest return from the market and from investors.

***The consolidated (organizational) network* – Phase (2) (Early growth):**

Phase (2) (2018–2019) saw Pressenger step into the international arena by participating in the Hiventure accelerator program and Sport Innovation contest in Spain. One of the founders had an extensive network in the sports industry and put it to work in the exploration of international partnerships. Entrepreneurial alertness among the founders and management was directed at looking not only to sales intermediaries and distributors but also to strategic partnerships. In this phase, besides defining the distinctive features of the service and its position within the industry, the firm started to test the product with actual partners (Levante, Spain and BVB Dortmund, Germany) and entered into a partnership with communications agency, Dentsu.

***The relevant global network* – Phase (3) (Expansion):**

Phase (3) (2020–) began with an official partnership deal with BVB as the official provider of visual notifications in the app. During this phase, the firm has been able to reach the

international stage by trying to expand rapidly into another country, the UK, which represents a big market for sports fan clubs. Table (28) illustrates the type of information/knowledge flows (internal or articulated) along the network evolution phase-model of network evolution and scalability.

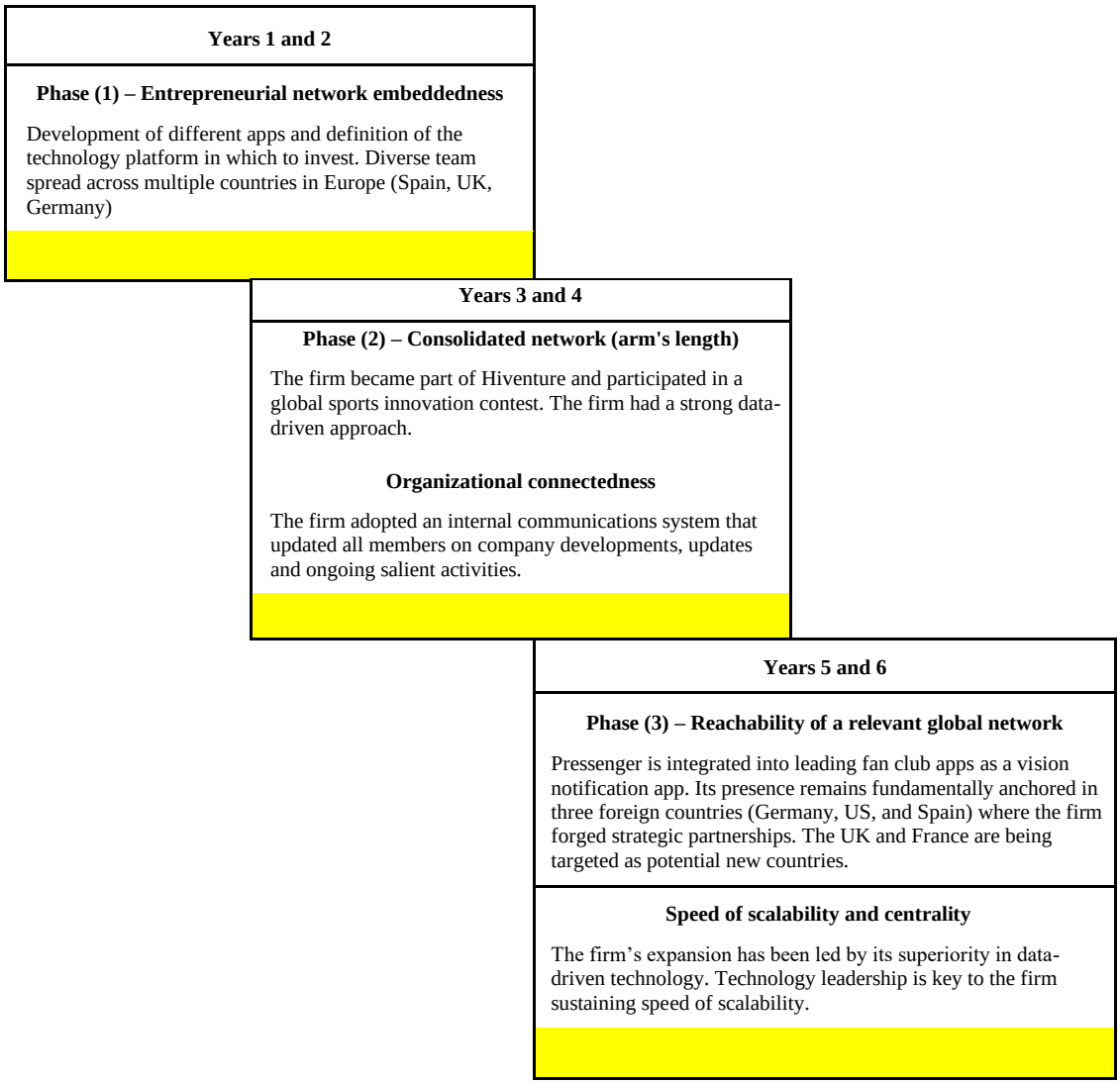


Table (28) Network evolution phase-model and types of information/knowledge flows

	Entrepreneurial network	**Consolidated network**	**Relevant global network**
Internal knowledge/ information flows	Competencies and expertise focused on technological developments. Diverse skillset allocated in terms of the design of	Data analysis of users' feedback on partners (sports club) from GSCI contest. Mapping strategic partners and specialized	Data-driven analysis for continuous innovation to maintain the firm's leadership position on the technology side of the solution provided.

	an innovative communications product.	sports events (e.g., Microsoft).	
Articulated information/ knowledge flows	Product presentation to investors. Fundraising from angel investor and seed investor.	Forming international partnerships with sports clubs and international communications agency (i.e., Dentsu).	Reaching mass-market data usage from BVB Dortmund Club, (Germany) and Levante Club (Spain).

The Pressenger case reveals a particular path of expansion where the first/emergence phase was dominated by personal contacts and an identity-based approach, especially in connection with venture funds (angel investor and seed fund). Strong ties played a crucial role during this phase. Embedded ties were particularly entrenched in the IT ecosystem and the sports communications industry. However, while in Phase (1) founders and management focused on the product definition only, in Phase (2) the firm could deploy its arm's-length network connections. Accelerators and the international contest exposed the firm to a more calculative-based network led by strategic partnerships in Spain, Germany and US.

Table (29) illustrates the type of networks (identity- or calculative-based) and the type of ties (embedded or arm's length ties) employed during Pressenger's evolution.

Table (29) Firm's evolution and types of network and ties (Pressenger)

Firm's evolution	**Emergence**	**Early growth**
Type of network	***Identity-based network*** Venture funds (angel fund and seed fund)	***Calculative-based network*** Penetration of GSCI regional markets through communications agencies
Type of ties	***Embedded ties*** Embedded ties in the IT industry and sports communications	***Arm's length ties*** Network built on accelerators and specialized partnerships (Microsoft, sports institutions and market players)
Network evolution phase-model	**Phase (1)** *(Entrepreneurial network)*	**Phase (2)** *(Consolidated firm network)*

6.4.5 Information and knowledge flows in the firm's value system

The firm has shown its knowledge and information flows to be particularly focused on data-driven technologies when defining the right features to ensure that the product is able to maintain an innovative edge with its niche offering. Scalability remains strongly associated with the capacity to sustain technological superiority.

In the same fashion, international expansion is highly dependent on the ease of use of the app to be embraced by other industries besides the sports industry. Human-intensive activity has been directed at the communications industry, with partnerships being struck with international agencies and contents and news being actively shared.

Table (30) synthesizes the internal flows of knowledge and information and the type of process indicating the natural ambidexterity of the data-driven activities and human-intensive activities at Pressenger.

Table (30) Internal knowledge and information flows and ambidexterity

Knowledge and information flow optimization	**Data-driven technologies**	Technological developments Sports improvements based on data-driven, science-based, pre-defined triggers or scenarios	Data analysis of mass users, campaign stats and comparisons
	Human-intensive, activity-based	Communication activities for new markets and operators	Exchange with market intermediaries and agents
		Explorative	**Exploitative**
		Type of process	

Table (31) sums up how Pressenger was able to integrate its activity system while pursuing a restricted portfolio of actions in the industry in which it currently operates. The firm mainly operates on the basis of inbound knowledge gained from data acquisition through user engagement and interactions. Table (31) synthesizes the internal flows of knowledge and information and the type of process indicating the natural ambidexterity of inbound and outbound activities at Pressenger.

Table (31) External knowledge and information flows and ambidexterity

Information/ knowledge flow optimization along the supply chain and within the ecosystem	**Outbound**	***Not defined***	***Not defined***
	Inbound	Exploring new sectors besides sport. Search for partners with which to test the technology.	Sports industry exploitation in several countries.
		Explorative	**Exploitative**
		Type of process	

6.4.6. Conclusion

Based on the qualitative analysis conducted through the triangulation of data available, we now summarize (below) the key results for each variable analyzed quantitatively at an aggregate level by means of the survey.

From the interview with the founders of Pressenger, we found international expansion and scalability to have strong relevance to this case study. Technological learning and network embeddedness both have very strong relevance. In contrast, ambidexterity shows moderate relevance. Opportunity recognition and organizational connectedness have been found to have very strong relevance to this case. Entrepreneurial orientation aligned with ambidexterity has

been found to have moderate relevance to this case. The growth path of Pressenger has been strongly affected by the leveraging of its technological learning activities. Network embeddedness in the sports industry has played a critical role in acquiring subjects for testing. Ambidextrous operations are in place to attract the attention of new industries.

Overall, the case demonstrates consistency with the research hypotheses articulated in the general model. A detailed analysis of each factor appears below.

The systematic analysis of the interview and the case study in general is also aimed at measuring (in a qualitative assessment) the degree of relevance to the firm of variables in the conceptual framework that influence scalability and international expansion in INVs.

Scalability
After six years of technology developments, Pressenger was able to develop a business model for international expansion. More than 25% of sales are generated abroad. The firm has adopted a lean structure and manages its operations digitally from multiple European locations. This factor has been assessed as having strong relevance.

International expansion
The firm was able to make inroads with strong sports players in the two years after its international launch. Pressenger succeeded in filling the structural hole between the European network and the US by tapping an international hub of sporting entities. Its European presence is supported by its diverse team spread across Europe. This factor has been assessed as having strong relevance.

Network embeddedness
Network embeddedness has become a very strong driver for the firm. Building on the reliance on strong ties in Phase (1), the firm was able to build its own ecosystem network that was deeply embedded in the sports communications industry. This factor has been assessed as having very strong relevance.

Technological learning
Technological learning has been the strongest driver behind the firm attaining its status as a leading push notification service provider. Its solution emphasizes interaction and engagement features. This factor has been assessed as having very strong relevance.

Ambidexterity
Ambidexterity (exploitation and exploration) processes were present in Phase (1) when the firm devised multiple versions of its mobile technology app: from a calling app with mood content messages to a push notification app. In Phase (2) and Phase (3), the venture focused on exploitation. Overall, this factor has been assessed as having moderate relevance.

Opportunity recognition
Opportunity recognition has been very strong in moderating *technological learning* and *international expansion.* The venture has leveraged its capabilities and competencies in analyzing data. This factor has been assessed as having very strong relevance.

Organizational connectedness
Organizational connectedness has been shown to have strong relevance in the relationship between *network embeddedness* and *scalability*. Tight information flows between investors, technology specialists from accelerator programs and multinational technology players have contributed to the sustainable design of the final product that the firm is now able to market. This factor has been assessed as having very strong relevance.

Entrepreneurial orientation
Entrepreneurial orientation has been shown to have moderate relevance in the relationship between *ambidexterity* and *scalability*. Although the firm had implemented entrepreneurial orientation practices across all levels of management, scalability seemed to be reached through industry-focused technical know-how and expertise. However, entrepreneurial explorative activities in other arenas have been deployed in parallel to the marketing efforts channeled at a granular level in the sports industry. This factor has been assessed as having moderate relevance.

6.5. Musement: Retrospective longitudinal analysis

Based on the interview conducted on 3rd January 2021 with Paolo Giulini, co-founder and offer and business developer executive of Musement (transcript quotations are labeled with the initials P.G.).

6.5.1. Introduction of Musement

Musement was established in 2013 in Milan, Italy by four founders who identified a gap in the market in offering users the convenience of digitally booking and buying tickets to visit popular local cultural attractions in countries around the world. The firm built a proprietary technology in the form of a virtual marketplace that connected actual visitors with museums, institutions and event organizers.

The technology's algorithms, which are constructed from data collected, provided users with tailor-made suggestions and access to experiences in multiple languages at an international level. In addition, the firm developed an API-free integration facility (non-negotiated integration) that allowed the inclusion on the platform of a range of venues with which the firm did not have any commercial agreements.

The founders were colleagues from an Italian telco company (Fastweb) who used to work together on video-on-demand (VoD) Internet Protocol TV (IPTV) content. All founders had international experience in business development in an online environment. The firm

principally operates a B2B business model, receiving commission from the tickets and services sold on the platform (15–25% of the face value) or indirectly via B2B2C agreements.

The firm opened its doors in October 2013 after an initial round of angel investment of Euro 950,000. In April 2014, the platform came online. In 2015 and 2016, the firm received further rounds of seed investment for the amounts of Euro 5 million and Euro 10 million, respectively. In 2017, the firm acquired a Dutch technology company, Triposo, and by 2018 it had a presence in 70 countries, with 35,000 products offered in 1100 cities. In 2018, the firm was acquired by the TUI Germany group. The present case provides an important example of what was entailed in walking the path towards international expansion and full scalability. In 2014, the firm's staff complement was 14 people and by 2018, before acquisition, it had grown to about 50. The firm has a branch in Spain (Barcelona), one in Dubai and one in New York City.

Value proposition, main features and technology

The firm's main focus is efficient distribution. In order to rapidly scale the business, the firm developed a *state-of-the-art* platform technology and harnessed data processing spurred by the unique mass of behavioral data it could collect. The main challenge facing the firm on its expansion path has been how to lower customer acquisition costs across all channels (AdWords, social, affiliation, direct B2B deals) in order to meet the margin required for a single transaction and for the average customer lifetime. The firm's strategy has been to make the cultural and touristic experience friction-less, scaling the portfolio offering and making it an efficient source of supply.

6.5.2. Network evolution and international expansion

***The entrepreneurial network* – Phase (1) (Emergence):**

Musement provides a B2B2C technological service in the touristic and cultural industries. The chart below shows how the firm has performed during the three phases, as illustrated by the phase-model of network evolution and scalability. In Phase (1), the founders exploited their cumulative experience and network embeddedness in the telco industry managing content rights for TV streaming.

"We started our company from the beginning to be global. This was inherent in our initial mindset. Italian market was too small for a very capital-intensive marketplace. We started in Italy because we have had very well-established relationships, and also my partners, but we started also from outside. We first presented our company in TechCrunch New York, not because we wanted just to collect money from the USA, but also we wanted to be immediately present in other countries. Furthermore, the industry was also in its early years of online service offerings.

"I remember when I called the museums and theme parks in the world and at the first talks, they were a bit surprised and wanted to understand and know our position in the value chain, but it was all just in the very first calls. After six months/one year everything changed

dramatically. So, all the value chain and actors were really very well web connected. We used to go before Covid to the trade shows, the two most important being the ITB in Berlin (www.itb.com) and WTM (wtm.com) in London, and I had relationships with suppliers, competitors, intermediaries. It was a very dense network." (P.G.)

At the same time, it was very important to understand which items should form part of the offering for an average cultural tourist. This question prompted more in-depth analysis, all supported by data behaviors collected through pivoting towards new offerings.

"At the beginning, the first client bought from New York City an Uffizi ticket and he wrote us: 'Can you also provide a Chianti wine tasting?' A wine tasting ... This was very shocking for me. What does it mean a cultural product? Was it just a museum or opera theatre? Or we can also provide other products from other thematic areas. This started to make our offer broader." (P.G.)

These considerations emphasize that the business had been steered from the beginning by data-driven decisions based on explorative activities across the industry. Through the highly explorative tests that were conducted, the venture was able to frame and design its distinctive value activity system. The firm employed mostly explorative operations coordinated via activity-based principles, e.g., coordinating marketing and service attributes to satisfy consumer preferences.

***The consolidated (organizational) network* – Phase (2) (Early growth):**

Phase (2) demonstrated the consolidation of the network with a wider footprint in the touristic value chain.

"*We tried to make some broader offerings. We started just as a ticket provider, then we started to sell guided visits, then we started to also add food and wine products, and then the sports events. On the one hand, we tried to make our offer broader, on the other side we tried to develop new technology in order to act in the value chain.*" *(P.G.)*

Organizational connectedness has shaped the firm's activity system. It was very important to achieve information flows internally among its staff and management and externally with its partners and fundraisers. These operations were supported by information technology tools.

"*We had two information tools that made possible for the company to exchange data very broadly. It was very easy for everyone to know what was going on in the company. Almost all of the information was shared among all employees and just the financial part of the company was open just to us as co-founders and leadership team and the investors. For the information for outside, we had what we call business platform where all our suppliers can have the access to this business platform, and they can collect all the data they need to have for their business. How many businesses are sold, redemption, booking windows, all this kind of information." (P.G.)*

During the extended expansion phase, the firm also encountered hubs of demand of customers' behaviors.

"Top products were absolutely following the Pareto law paradigm of 80%/20%. Sometimes we had an even stronger relationship: the demand was focused on 10% of the products connected to 90% of revenues. At the same time, we had also to collect more of the content because you could not stay focused on your customers' data analysis, but you have also to follow what your competitors are doing. So, from one side we knew very well that Uffizi Gallery and Sagrada Familia in Barcelona were the most important products that made our 90% of the sales. But we also knew what "Get-your-guide", one of our most important competitors, was collecting. When we got the investments from our fundraisers, we had always to explain that from one side we had to be very good on the sales side, on the other hand, we had to be very good, as much as our competitors in our offer range. Yes, we had top sellers but on the other side we also invested in the "long tail" structure of the business. There is a dual track, parallel procedure: top sellers and long tail at the same time. Of course, here we are talking about revenues and not profitability." (P.G.)

***The relevant global network* – Phase (3) (Expansion):**

Phase (3) has seen the firm enhancing its presence in key markets by gaining exclusive agreements as the ticket provider concessionaire:

"*So, we started not to be a pure distributor but trying to be a ticket-in-platform. We started to have one step back in the value chain and establish a direct connection with the museum in order to be not one of the several distributors but the only one who can provide the service." (P.G.)*

In this phase, the venture's ambidextrous approach has been characterized by exploitation, while maintaining a parallel developmental process characterized by the processes of exploration and exploitation.

"*We invested since the beginning in exploration and exploitation. This is the very first period of the start-up. When we arrived at the very critical position you have to make a choice and we faced it when we have been acquired. And also, as HR there is an explicit request from the people asking to be in the double track of both processes: that's what people of start-up love to do." (P.G.)*

This approach coupled with *technological learning* has allowed the venture to reach centrality in multiple markets for European travelers: from the US and the Emirates to eastern markets, especially China.

6.5.3 Distinctive attributes of INVs in Musement

Appendices (2) – (5) summarize how Musement fared in terms of the three dimensions of founder characteristics, organizational capabilities and strategic focus.

- *Founder characteristics:* Musement displayed all the characteristics specified, i.e., prior experience and a strong knowledge of the niche market to be exploited, an international (global) managerial vision, the type of relationship among the founders (located among several countries), network embeddedness (extensive network in the cultural European industry), and prior experience in the field through having worked in a leading technological company operating in telco sector.

- *Organizational capabilities:* Musement displayed all the relevant organizational characteristics (evolving objectives, adaptive structure, flexible processes), while technological learning and ambidexterity mechanisms were also very much in evidence.

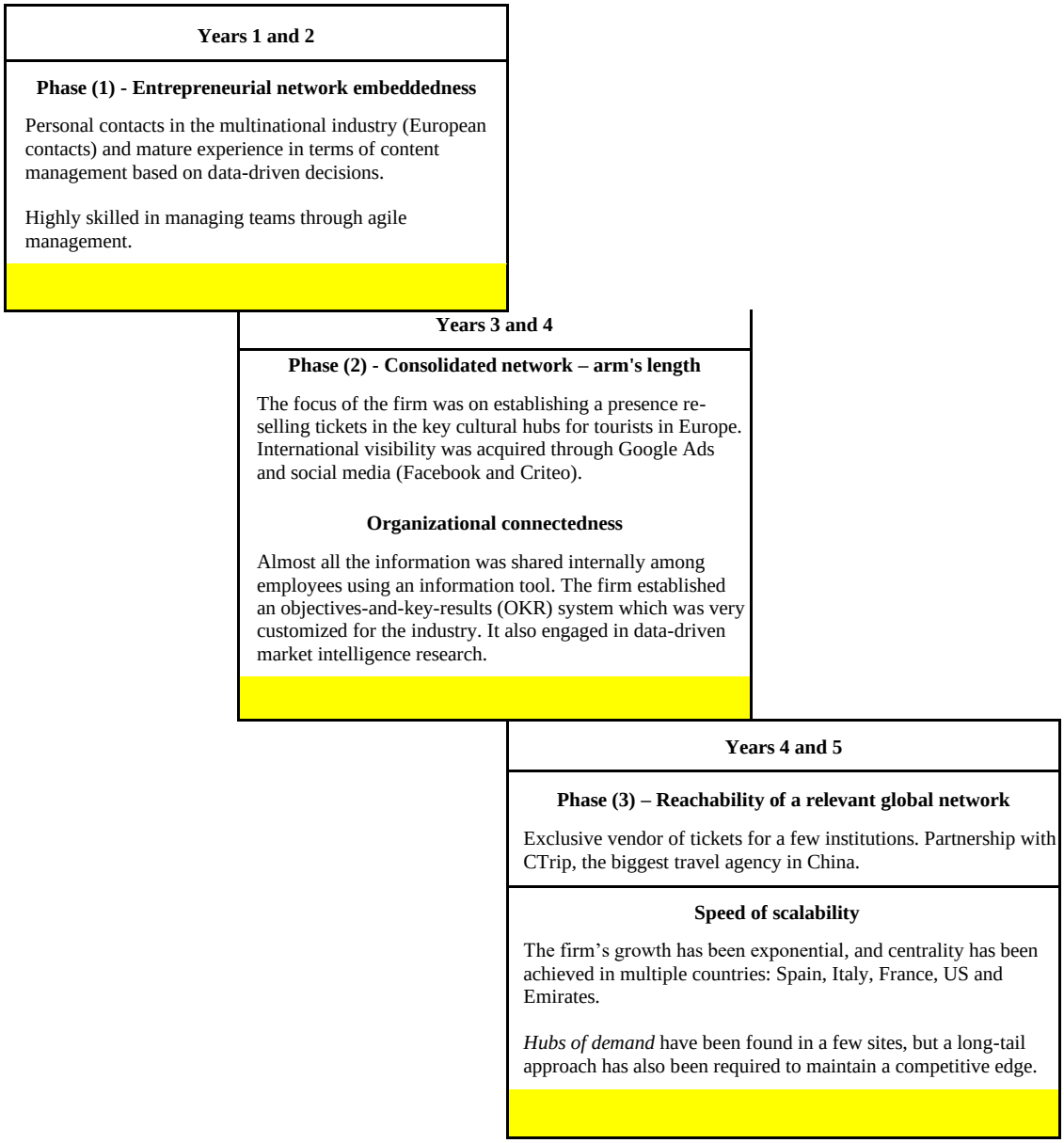
- *Strategic focus:* Musement displayed all the specified attributes, i.e., network focus and a niche-focused international strategy driven by a narrowly defined customer group and customer relationship orientation, a strategic posture that reflected flexibility in the business model, short cycles of market testing and a strong ability to adapt to rapidly changing conditions.

6.5.4. A model for the firm's network evolution and scalability

Network development at Musement has been a key strategic goal since the early days. The firm's ambition to internationalize from the beginning has been evident in the firm's vision:

"We first presented our company in TechCrunch New York, not because we wanted just to collect money from the USA, but also we also wanted to be immediately present in other countries." (P.G.)

In Phase (1), given the entrepreneurial network, *internal knowledge/information flows* were organized around data management which was the most important core competency that the founders possessed. In Phase (2), a consolidated network emerged. This activity was also *articulated* in the establishment of a business intelligence unit, with five people working on data acquisition and processing. An internal system of data/information sharing was introduced. All team members could access the venture's data, with only limited access to key financial statistics that were largely reserved for management and investors. The global network has been analyzed by analytics tools from Google Ads, social networks and other marketing platforms (e.g., Triposo).



Articulated information/knowledge flows were initially based on the entrepreneurs' reliance on data. The firm succeeded in acquiring a *global network*, establishing relevance and centrality in the web search for bookings for major cultural sites in Europe. Table (32) illustrates the type of knowledge/information flows as internal or articulated in each phase of the network evolution model.

Table (32) Types of knowledge/information flows in the firm's network in the three phases

	Entrepreneurial network	Consolidated network	Relevant global network
Internal knowledge/information flows	Strong knowledge of the cultural and touristic industry. Data management on content as core competency of the founders.	Internal system in place for sharing data and information among teams. Management has continuous access to data and base their decisions on the processing of such data.	Google analytics. Technology platform and marketplace analytics tools. Triposo technology.
Articulated information/knowledge flows	Business intelligence unit: five people working on data acquisition and processing.	Reporting tools between management and business units. Agile management through autonomous and independent decision-making. A/B testing decision. procedures.	Direct ticketing reports, third-party social advertising tools (i.e., Google Ads, Facebook) and retargeting ones (i.e., Criteo).

Table (33) below sums up the network formation for Musement. In the initial emergence phase, the venture relied on a widely dispersed, personal international network, based on ties straddling institutional contacts and trade fair players. A calculative-based network was pursued in the early growth phase, with international expansion, based on data-driven decisions. Arm's-length ties were able to be developed through branch openings in New York City, Dubai and Barcelona. Table (33) illustrates the type of network (identity- or calculative-based network) and the type of ties (embedded or arm's length ties) employed during Musement's evolution.

Table (33) Firm's evolution and network types (Musement)

Firm's evolution	**Emergence**	**Early growth**
Type of network	***Identity-based network*** Widely spread across Europe's and Italy's cultural industries.	***Calculative-based network*** Expansion led by the business intelligence unit (data-driven analysis of demand and supply).
Type of ties	***Embedded ties*** Founders built a cohesive and dense web of relationships by leveraging institutional contacts. In parallel, an organic network was created by leveraging international trade shows.	***Arm's-length ties*** Establishment of local teams around the world (US, Dubai, Spain).
Network evolution phase-model	**Phase (1)** *(Entrepreneurial network)*	**Phase (2)** *(Consolidated firm network)*

6.5.5 Information and knowledge flows in the firm's value system

Table (34) synthesizes the internal flows of knowledge and information and the type of process indicating the natural ambidexterity of the data-driven activities and human-intensive activities at Musement.

Along the different phases, information was used more for explorative than exploitative purposes. Adopting a retrospective perspective, exploitation was mostly employed for the purpose of collecting data, and for processing and measuring data for services already in existence. Exploration was aimed at identifying new paths to explore and perhaps changing the direction of the innovation needed for the firm. Musement adopted this approach by using data-driven tools (information system tools) and elaborating on the data via its business intelligence unit and establishing local branches in different locations which acted as catalysts for touristic demand at an international level.

Table (34) Internal knowledge and information flows and ambidexterity

Knowledge and information flow optimization	**Data-driven technologies**	Musement (pursuing new product offerings and broadening the basket of offerings). Long-tail behavioral focus.	Business intelligence unit + Triposo technology to provide personalized content and offerings.
	Human-intensive, activity-based		Musement (leveraging the online hubs of demand and offline teamwork).
		Explorative	**Exploitative**
		Type of process	

Embracing the broader perspective that also included the ecosystem, the firm's optimization of knowledge flows also involved coordinating activities with external parties. With reference to Chesbrough's open innovation concept, inbound information from the ecosystem may become part of the supply chain offering. It is less common using the information in the outbound mode when proposing challenges inside-out towards the ecosystem when trying to design new solutions.

In this regard, Musement played an inside-out (outbound) role when it had to develop APIs that would allow third parties to have free integration. This technical development made it possible to add to the platform many new services, together with a variety of suppliers. At the same time, Musement operated in an exploitative mode while also valorizing and harnessing the presence in a few places, optimizing demand and value chain flows (e.g., Uffizi ticket planning and a tour guide service). Inbound open innovation is often used only for very specific components of the value chain. In contrast, outbound open innovation tends to be more broad-based and used across a range of activities, since technology departments can come with requests for data on many operational aspects. Using its proprietary platform technology, Musement was able to harness the data acquisition and processing throughout the growth phase.

Table (35) synthesizes the internal flows of knowledge and information and the type of process indicating the natural ambidexterity of the inbound and outbound activities at Musement.

Table (35) External knowledge and information flows and ambidexterity

Optimization of information/ knowledge flows along the supply chain and within the ecosystem	**Outbound**	Musement (new services and suppliers through API-free integration).	Musement (suppliers and third parties for service valorization via platform and API integration).
	Inbound		Musement (acquiring and processing data).
		Explorative	**Exploitative**
		Type of process	

6.5.6. Conclusion

Based on the qualitative analysis conducted through the triangulation of data available, below is a summary of the key results in respect of each variable analyzed quantitatively at an aggregate level through the survey.

The analysis shows very strong relevance of all the variables: dependent variables (DVs), independent variables (IVs) and moderators. As emphasized in the interview, the growth path was heavily affected by the firm's organizational connectedness, technological learning and ambidextrous operations. Musement has demonstrated a robust pace of international expansion and scalability, according to the results achieved in 2018 by which time the firm had a presence in 70 countries with 35,000 products offered in 1100 cities.

From the interview, we found that international expansion and scalability have strong relevance to this case study. Moreover, technological learning, network embeddedness and ambidexterity were shown to have very strong relevance. In line with technological learning, the moderating factors of opportunity recognition, organizational connectedness and entrepreneurial orientation were assessed as having very strong relevance. A detailed analysis of each factor follows.

The systematic analysis of the interview and the case study in general was also aimed at measuring (in a qualitative assessment) the relevance to the firm of the variables in the conceptual framework that influence scalability and international expansion in INVs.

Scalability

After six years of technology developments, Musement was able to develop a modular model for international expansion based on a B2B2C technology platform catering to tourists' demand for cultural experiences. The platform triggered exponential growth at an international level just after reaching the critical mass needed to maintain a diverse offering, which is deeply rooted in each location, e.g., a presence in Barcelona, Florence, Rome, Milan, New York City, etc.). This factor has been assessed as having very strong relevance.

International expansion
After seven years, before acquisition, the firm has expanded into 70 countries and more than 110 cities. The expansion has relied on an initial embedded network from the founders. A more calculative-based expansion followed through branch openings led by highly focused, data-driven analysis. API integration was a key feature in reaching a critical mass in several regions. This factor has been assessed as having very strong relevance.

Network embeddedness
Network embeddedness has been a strong driver for the firm. From being personal in nature, the network soon became arm's length on the strengths of trade fairs and the acquisition of the platform in the search centrality on Google. Partnerships with Far Eastern countries could have mediated the growth. This factor has been assessed as having very strong relevance.

Technological learning
Technological learning has been strong and led by the business intelligence unit. The founders' data management skills have shaped the firm's core competencies in analyzing data and processing information. This factor has been assessed as having very strong relevance.

Ambidexterity
Ambidexterity (exploitation and exploration) processes have proved to be critical for the venture's development in more than one phase. Ambidexterity led by exploitation has become prevalent in the mature phase, although exploration remained a key feature in the firm's background. This factor has been assessed as having very strong relevance.

Opportunity recognition
Opportunity recognition has appeared to moderate *technological learning* in *international expansion*, which has been coupled with agile management techniques and a bottom-up decision-making approach. Data has remained the leading factor in approaching decisions. However, it remains crucial to analyze how new offerings can meet the cultural demand, especially with human-intensive activities continuously changing over time. This factor has been assessed as having very strong relevance.

Organizational connectedness
Organizational connectedness has been shown to moderate network embeddedness and scalability. Several information systems have been adopted, together with cross-unit access to data and know-how in regions into which the firm has expanded. This factor has been assessed as having very strong relevance.

Entrepreneurial orientation
Entrepreneurial orientation moderating *ambidexterity* and *scalability* has served to significantly adjust the business model and the market offering. A/B testing and lean management techniques have been used extensively at different staff and management levels. This factor has been assessed as having very strong relevance.

7. Results and discussion of the qualitative data analysis – Step 9

7.1 Results for the five case studies with reference to the INV distinctive network attributes

In addition to examining the attributes distinguishing INVs' evolution from the gradualist approach in terms of founder characteristics, organizational capabilities and strategic focus, as framed by Rialp et al. (2005b), this study extended the framework to encompass the network approach. The attributes of the dimension *founder characteristics* were extended to encompass "industry relationship", "type of relationship among founders" and "industry network embeddedness". The attributes of the dimension *organizational capabilities* were extended to encompass "organizational connectedness", "technological learning and "ambidexterity". The attributes of the dimension *strategic focus* were extended to encompass "network focus".

The interviews and the analysis examined proposed attributes, drawing the following conclusions from the empirical results.

Founder characteristics

The proposed network-approach attributes are "type of relationship between founders" and "industry relationships". The first attribute is justified on the basis that weak ties among founders are characteristic of a common intent and commitment to grow at a global level. The gradualist approach can employ more traditional means, such as enlisting consultancy or agency services to find the skills required. The attribute of "industry relationship" indicates that most founders of INVs possess in-depth knowledge of the sector. They have developed specific ideas aimed at innovating or introducing new niche features. The gradualist approach has a less specialized management profile requirement.

All cases presented INV attributes, except Pressenger which presented a team with heterogeneous industry experience.

Organizational capabilities

The attributes of "organizational connectedness", "technological learning" and "ambidexterity" apply to the INV and gradualist framework. The interview analysis highlighted the relevance of these attributes when describing INV activities – especially those firms operating online, as all the cases confirmed. However, technological learning was found to be not yet relevant for two of the five cases examined. This attribute must also be observed in relation to the extent of service development that the firm could achieve. In two cases, the firms were starting out on the expansion phase. Ambidexterity was found not to be fully present in only one of the cases.

Strategic focus

The proposed attribute of "network focus" was found to be relevant for INVs in the five cases examined. This attribute, which has formed the core of the present research, was also found to be relevant in other empirical literature. Almost all the attributes were found to be present in the five cases. Only one characteristic relating to "coordination of activities with foreign clients" was not confirmed in the case of Linistry, as it depended on the firm's business model and the technology adopted.

Overall, all five cases seemed to possess almost all of the INV attributes and therefore can be regarded as having met the requirements under the network approach.

Appendix (5) synthesizes the results, showing that the five case studies possessed most of the features identified in the empirical work of Rialp et al. (2005b), which distinguishes INV evolution from the gradualist approach.

7.2 Results for the five case studies in the context of the network evolution phase-model and scalability

The network evolution phase-model proposes three phases in network evolution towards scalability and internationalization: entrepreneurial network, consolidated firm network and relevant global network.

In *Phase (1),* the *entrepreneurial network,* the entrepreneur starts with a global vision and capabilities that are strongly linked to previous experience and an accessible personal network. In this phase, the entrepreneur uses their formal and informal personal networks to establish the foundations of the firm, which entails finding the right people and structuring their roles to ensure the efficient execution of the firm's activities. As indicated by various scholars (Hite, 1999; Larson and Starr, 1993), this phase is marked by dyadic ties stemming from pre-existing, longstanding relationships, characteristically composed of strong, embedded ties within a network high in cohesion.

The interviews and the systematic analysis confirmed that in all the cases, the entrepreneur started with a global vision and capabilities that were strongly connected to previous experience and the necessary competencies for (new) business development. All the entrepreneurs used their international formal and informal personal networks to establish the foundations of the firm, with the right people and roles assigned for the performance of the key activities. It is worth mentioning that industry-relevant international capabilities were the common trait among all the founders.

Proposition 1 of the proposed phase-model is confirmed, as all the INVs interviewed displayed similar attributes in turning a personal network into a consolidated organizational one.

In *Phase (2),* the *consolidated organizational network,* the firm's potential is dependent on the presence of *organizational connectedness* which allows the creation of a learning path within the international stream of operations. Here digitalization often becomes a key driver and

enabler as the presence of *technological learning* is fundamental to this phase. Organizational connectedness is pursued by focusing on information and knowledge flows in the firm and establishing external linkages across the whole ecosystem, which goes hand in hand with technological learning.

Proposition 2 states that INV firms' potential is dependent on internal connections established via characteristic dynamics. The degree of connectedness is tied to the presence or emergence of scale-free distribution within the value chain's operational loops. Connections are operationalized to process information stemming from internal operations, to weigh up and prioritize decisions, and to exploit hub-dominated, scale-free distribution.

In the *consolidated organizational network* phase, founders test the service and adjust it by matching its features to market demand. In this phase, the firm inspects operations and configures resources to achieve operational effectiveness, both within the country and in other regional markets. Innovation programs, the prevailing context and incubator network contacts are an essential part of this phase. The main characteristics of the *consolidated organizational network* phase are the validation and improvement of the firm's operations in repetitive market feedback loops. Here the firm's offering is tested, the business model is finetuned and market demand is validated. In this regard, the greater the organizational connectedness, the more the operations will be aligned to the network ecosystem.

Four cases demonstrated very strong organizational connectedness relevance.

Running parallel to this in the *consolidated organizational network phase*, the venture begins to conduct a systematic inspection of data on demand patterns. By setting up a system of *technological learning* on the basis of market responses, data help to refine the offering and single out the key features that constitute potential hits in the market.

Three cases confirmed this pattern, excluding Linistry and SignAll, which limited the use of this resource in the consolidation phase in view of the restricted number of clients allowed by a B2B type of business.

In Phase (2), the model suggests that the firm begins to detect the presence of scale-free networks or power law distributions. The reference to scale-free networks points to key traits associated with these distributions: growth and preferential attachment (Barabasi, 2003). Firstly, growth occurs when new nodes continually join an existing system, over an extended period of time (e.g., the World Wide Web, which has grown by billions of web pages over the past 10 years). Secondly, preferential attachment refers to a new node preferring to connect with another node which already has a certain number of established links. Thus, there is a high probability that more and more nodes will link to that one that already has many links. These two phenomena have been found relevant in explaining why the demand for single services or products may drive exponential growth. These observations were simplified for the interviewees by asking them about the Pareto law phenomenon.

The Pareto law also falls into the category of power law distribution. In the case of power law distribution, many small events coexist with a few very large ones. (This is very different from the bell curve type where the curve peaks at certain levels with quite small differences in the tails). Considering the Pareto rule of 80/20 (which states that for many outcomes, roughly 80% of consequences come from 20% of the causes), the firm selects and prioritizes the 20% of the offering's features that generate 80% of the revenue or attract 80% of the attention.

Linistry pinpointed an important factor: the level of activity and performance success is linked to the partners' networks. 80% of the revenues were generated from 20% of the active partners.

Musement in turn found very strong evidence of the presence of a Pareto relationship, as more than 80% of revenue was generated from 20% of the cultural experiences offered.

Proposition 2 is not confirmed in all cases, as it depends on the level of maturity of the INVs. However, it was shown to be a characteristic phenomenon of advanced INVs that are highly sensitive to technological learning, feedback loops and agile management.

In *Phase (3),* the *relevant global network,* the firm seeks international growth by establishing linkages with international players looking to access relevant global networks. Partnership agreements with keystone players are essential for activating the *network effect* and driving growth. Keystone players from the industry in question often constitute regional market hubs and connect the venture to licensing or reselling opportunities in the market, e.g., Central Eastern European countries, Western Europe, Far East, etc.

All the cases achieved this objective. Talk-a-Bot established partnerships with leading technology players, such as Microsoft and Rakuten Viber; Linistry formed long-term relationships with influential clients from different industries, with branches spread across Europe (banking, electronic retailing); SignAll formed a virtuous partnership with the most important American sign language association (ASLTA), which provided a direct link to associates (professors) and members (universities) in the US; Pressenger partnered with major teams in Germany and Spain; and Musement formed partnerships with key cultural sites in Europe (Sagrada Familia in Barcelona) and acted as an exclusive vendor of tickets.

Nonetheless, the hypothesis relating to reaching scalability needs a mention. Just three of the cases analyzed reached full scalability: Musement, Talk-a-Bot and Pressenger. Meanwhile, SignAll and Linistry, although having reached the relevant network, are still at the beginning of this phase.

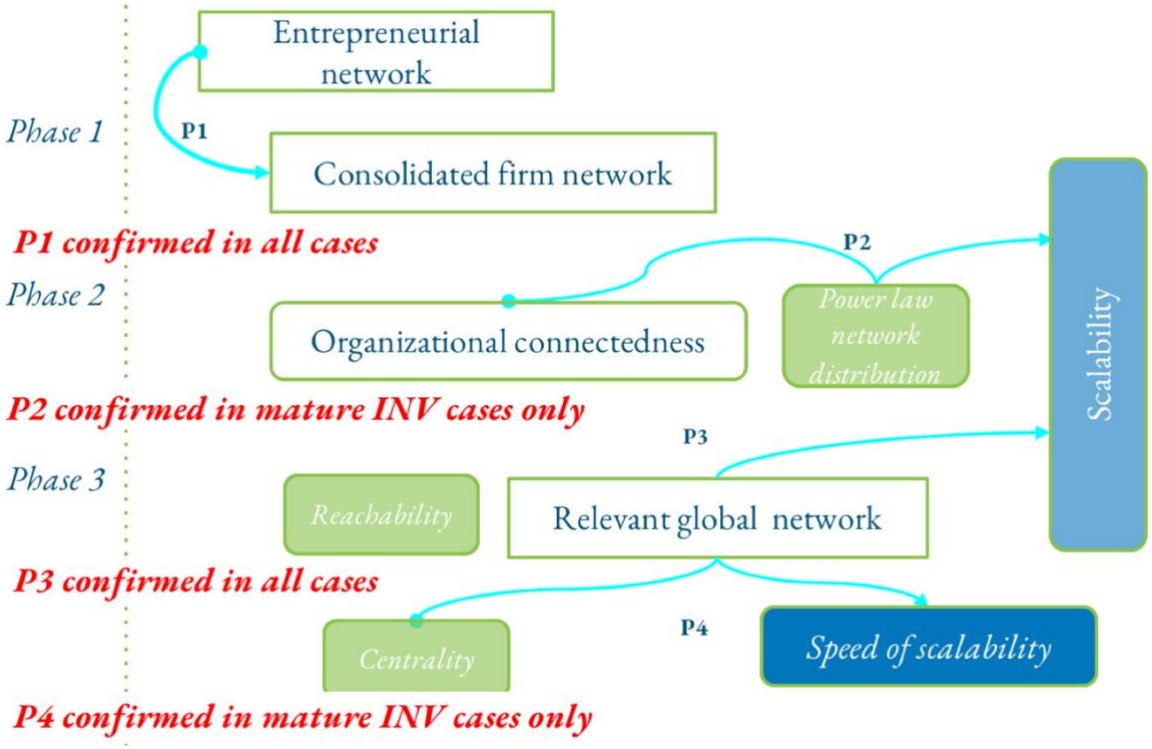
A stepping stone in the *relevant global network* phase is the test of the *scalability potential* of the firm, which is dependent on the ability of the business model to generate revenue at a global level. This latter attribute is correlated with the ability to scale up the business without inducing major financial and operational constraints. The speed of scalability was found to be heterogeneous in the five case studies: Talk-a-Bot achieved rapid scalability after having found a new business model, allowing for the fast scalability of its operations; Linistry is still constrained by a business model that requires a long sales process, although it is working on

automating processes and shortening the installation phase; Pressenger achieved rapid scalability; and SignAll has recently launched an app that will target B2C segments, thus accelerating the adoption rate by final users.

Proposition 3 is confirmed in all five cases – showing that scalability potential has been met by reaching relevant global partners – although different speeds have been recorded.

Proposition 4 is confirmed in all five cases – showing that the degree of centrality positively relates to the speed of scalability that the firm is able to achieve. A particular example is Talk-a-Bot penetrating the eastern region of Bulgaria and Ukraine in line with the dominance and centrality of Rakuten (Talk-a-Bot's technology partner in those markets). In a similar fashion, once Musement was able to gain centrality as a hub of touristic searches on Google (e.g., Dubai search for travel destinations in Europe), its scalability grew exponentially.

Figure (8) Visual presentation of the results of the phase-model propositions in all the cases



7.3 Results for the dominant type of network and ties in each phase

In order to arrive at a deeper understanding of the network evolution in the case studies, the analysis incorporated the type of network, distinguishing between an *identity-based* and a *calculative-based network.*

The research found that an *identity-based network* strongly impacted the inception and emergence phase of all ventures.

In Phase (1), the *entrepreneurial network,* all of the founders of the ventures interviewed fulfilled the typical characteristics of INVs, relying on international experience (mostly rooted in their multinational background), a cohesive and dense network, and niche-focused capabilities. This initial stage is strongly embedded in personal (*mostly strong*) ties, driven by dyadic relationships enjoyed by the entrepreneur and centered on past experiences. *Strong ties* (normally less than 20) refer to relationships that are durable, trusting and involve emotional exchanges. The partners are also reliable and flexible when it comes to maintaining the relationship. Embeddedness appeared in certain cases of indirect weak ties (Talk-a-Bot, Linistry, Pressenger) in relation to the start-up ecosystem (TechStars), accelerators, innovation programs and international contests. In other cases, direct weak ties played a stronger role (SignAll, Pressenger, Musement) in relation to institutional stakeholders, venture capitalists and international fairs/trade shows.

In Phase (2), the *consolidated (firm) network*, as the firm evolves and begins to form the organizational network (arm's length), network connections (although still based on socially embedded ties) start to incorporate a wide, dense and cohesive set of relationships from the industry ecosystem in which the venture operates. *Direct weak ties* become crucial: relationships that, although involving limited interaction, are formed without brokers/intermediaries (e.g., incubators, angel investors, institutions, customers, suppliers, complementors and businesses).

Phase (2) involves the early growth of the firm in the international market. During this phase, INVs begin to evolve towards a more balanced network, characterized by embedded ties and sparse ties (mostly direct weak ties) in line with an arm's length organizational arrangement. In this phase, ventures are more path-dependent than part of an intentionally managed network. These traits were observed in all the cases except Musement which also intentionally sought to establish branches to penetrate distant networks (e.g., the Asian market), entering into a partnership with a leading foreign agency and opening two offices – one in Dubai and one in New York City.

Passing from a cohesive embeddedness to a sparse network requires the ability to manage structural holes, i.e., the ability to connect distant markets by establishing ties with clusters not reachable even via weak ties. Indirect weak ties are often employed together with partnerships and institutional channels (trade fairs, chambers of commerce, consulates). *Indirect weak ties* are defined as relationships between people that do not know each other, where a third party (broker or linchpin) acts as an intermediary to stimulate a cross-border relationship.

Several of the cases showed that the most critical step facing the firms was making the transition from a path-dependent to a more intentionally driven network strategy.

In Phase (2), the cases studied often continued to rely on embedded ties. The shift to a more calculative-based network started to become apparent in most INVs, although at different

paces. Some demonstrated a more strategic intent in the management of the network: Talk-a-Bot leveraged its technology partnerships with Microsoft and Viber; Musement opened branches in foreign locations to strengthen local institutional ties (i.e., Barcelona and New York City); and Linistry targeted keystone clients in the greater Central and Eastern European region. Others relied more on direct weak ties to drive growth and scalability: SignAll exploited ASLTA, thereby benefitting from a wide network of universities spread across the US; and Pressenger harnessed the partnerships and visibility gained from an international niche-focused contest for the industry. In most cases, arm's length contacts started to drive international growth immediately, i.e., generally from the second year.

Phase (3), the *relevant global network,* is characterized by the reachability of *global partnerships* that allow the venture to take advantage of the partner's distribution channels and market visibility. The phase also features the ability to fill structural holes. Few of the INVs analyzed were able to fill structural holes and secure more diverse clusters of clients. Musement was able to implement this strategy successfully, thanks to an aggressive marketing campaign on Google Ads, focusing on a few leading hubs of cultural tourism demand in Europe.

The Linistry and Pressenger cases revealed the obstacles that a B2B business faces in attempting to expand at a fast pace. The business model they adopted and the type of network relationships they had meant that they were confined to a semi-gradualist approach. In order to effectively implement a calculative-based network strategy, these firms must solve the problem of establishing new relationships in distant regions.

Drawing on this evidence, when a business is B2B and transactions depend on client introductions, the use of a network approach is effective only in the emergence and early growth phases. For the expansion phase, this strategy is less effective, given the limited number of strong ties and direct weak ties that a firm can have. In the face of these hurdles to foreign-market entry speed and scalability, the firm should be aware of such constraints when designing the expansion strategy, especially when considering the critical shift from Phase (2) (early growth) to Phase (3) (expansion).

This observation shows a first critical result: *Firms' network management capabilities differ in terms of the rate at which they are able to shift from path-dependent to more intentionally managed networks.* This is influenced by several factors: business-related (e.g., type of business: B2B; B2B2C; etc.), network types (sparse or cohesive networks), type of ties (direct weak ties; indirect ties), predominant driving influences (technological or institutional), and activity-related (e.g., distributional, communication and marketing, assistance and support).

Talk-a-Bot's strategy to introduce a new service offering (Cheqbot) was implemented to also allow for the exploitation of distant markets requiring less physical presence and the maintenance of a modular offering. Although this firm has just started Phase (3) of extended expansion, it has so far consistently met the requirements to become a full INV.

Linistry's strategy for Phase (2) was based on indirect weak ties. The firm is progressively shifting toward an intentionally driven approach, as evidenced in the CEO mentioning the

partnership with keystone players from the electronic retailing industry. With this agreement in place, the firm can be expected to penetrate the European market by riding on the back of its partner's network and finding new bridges into other markets in Europe. Linistry, too, has displayed the attributes of an INV on its network evolution path.

SignAll has relied heavily on the network embeddedness associated with Dolphio (the mother company) and the two founders. It established its arm's-length network by entering into foundational agreements with the ASLTA and Gallaudet University. Phase (2) was dominated by a path-dependent network formation approach, underpinned by university affiliations. The new app and the shifting of the business model to a B2C type will determine the new rate of growth for the firm. The venture has just entered Phase (3) and has not yet laid out a plan for its intentionally driven network. We consider SignAll to still be in a transition phase.

Pressenger has exploited the network embeddedness of its team located in several European countries. In Phase (2) the firm was strongly dependent on strong ties and on weak ties with the venture capital investors in the innovation contest in Spain, where the venture was able to affirm its brand on the international stage. The firm showed a strong path dependency and, although strategically directed towards key markets, the nature of its transition to an intentionally managed network is still not clear. Challenges remain: the successful organic growth it could achieve must be sustained through continuous technological developments and marketing investment, which might require additional partnership with key players at an international level. The firm has demonstrated several characteristics of the INV network formation process, although the shift towards a calculative-based network strategy remains somewhat uncertain.

Musement succeeded in managing the shift from embedded, identity-based ties to a calculative, arm's length network. Its success has been driven by the use of aggressive marketing campaigns combined with data-driven decisions regarding which countries to enter and how to penetrate the network. Its speed of growth and capacity to realize its planned calculative-based strategy are evidenced in the firm's ability to expand exponentially and reach 70 countries in just four years. Structural holes have been filled with the help of international agencies in the case of distant cultural markets, such as in Asia. The firm displays all the characteristics of an INV, thus fully supporting the model's propositions.

7.4 Knowledge and information flows in the value system

Internal knowledge/information flow

In terms of internal knowledge/information flows, *data-driven technologies* were used for *explorative* activities to understand market demand, boost complementary features, compose new content offerings, spot areas for improvement and observe long-tail behaviors.

Knowledge/information flow optimization for *exploitation* was concerned with improving qualitative users' satisfaction levels, increasing the rate of engagement and interaction, building

proprietary data, and planning mass marketing campaigns and business intelligence activities in search of demand hubs.

Most of the firms employed data-driven technologies for explorative activities in Phases (1) and (2). In Phases (2) and (3), these capabilities shifted towards exploitation activities. Linistry and SignAll have not yet been able to benefit from data-driven exploitation activities as they have only just started Phase (3).

Human-intensive activities for *exploration* were employed to generate business intelligence on clients' behaviors and partner-based insights for new market entry, coordination of marketing services and communication activities.

Human-intensive activities for exploitation involved categorizing offerings based on geographies (cultural personalization), improving features to automate installation processes, building local networks, identifying advisors and partners, engaging in exchanges with market intermediaries, and leveraging hubs of demand onsite and offsite.

These activities were characterized by ambidexterity mainly in Phases (1) and (2). In Phases (2) and (3), most activities were directed at exploitation.

Drawing on the previous observations, we can make summarize that:

i) Data-driven technology is mostly used for explorative activities. Those ventures that can use it for exploitation purposes are the ones that are able to fully enjoy the advantages from such use.

ii) Human-intensive activities are present both in exploration and exploitation. Those firms that can balance their use for ambidextrous purposes are the ones that are better able to secure an international presence.

External knowledge/information flows

The optimization of information/ knowledge flows along the supply chain and within the ecosystem was characterized by *explorative outbound activities* relating to sharing contacts and insights from the start-up network, dyadic relationships with partners and sharing mutually beneficial knowledge, egocentric network relationships aimed at improving technological interaction, and integrating partners' services via API.

Exploitative outbound activities were concerned with direct exchanges with technology partners, collecting and sharing information and know-how with regional selling partners, searching for partners, and API integration.

Inbound explorative activities considered pooling market insights and clients requests, understanding technological hurdles and exploring new industries.

Inbound exploitative activities included market analysis of the most requested features, generalizing solutions for a larger base of clients, processing feedback to raise market awareness, and acquiring and processing data.

External knowledge/information flows showed that outbound activities were still very closely related to stakeholders already involved in the firm's value system. Open innovation (e.g. innovation contests) were employed by INVs, especially for the purposes of building the network and testing the product. Outbound ambidexterity was related to the entrepreneurial alertness and opportunity recognition capabilities of the firm's management. Inbound ambidexterity was mostly used in Phase (1) and Phase (2) and focused on collecting market insights and technological feedback. Phase (3) is being driven by exploitation, processing external data and integrating services (APIs).

Drawing on the previous results, we can make the following observations:

iii) The more an INV is able to establish an active presence in its value system, the higher the level of opportunity recognition and entrepreneurial alertness it is able to convey to the management on foreign ground.

iv) The more an INV is able to increase its speed of entry into foreign markets, the more it becomes necessary to integrate external services (APIs) to boost external data processing.

8. Integrating the quantitative and qualitative analyses – Step 10

8.1. Conclusion

Knowledge is widely recognized by industry and academia as a unique source of a firm's competitive advantage (Birkinshaw and Hagstrom, 2000). In this context, the current research examined the firm's network as an important nexus of study – not *per se*, but as a holder and influencer of a firm's knowledge. The study aimed to find evidence of the extent to which the network plays a role in the internationalization and scalability of young enterprises. While the network is viewed as a holder of the firm's knowledge and information, it is also acknowledged to be a key component in the coordination of value chains.

Specifically, the study contributes to the literature by addressing the research gaps arising from, first, a lack of robust conceptualizations about what networks are and how they impact the international growth of the firm and, second, the absence of the application of the network perspective in seeking to understand the international behavior of new ventures. Although the network has often been viewed by scholars in terms of social or inter-firm network relations, it has rarely been addressed at the operational level, which relates to the firm's internal configuration of activities and its internationalization expansion process.

To address the complexities surrounding knowledge exchanges in the operational network, and with reference to the value system (creation and capture), the study introduced the emerging concept of a value network. The shift in the emphasis of the analysis from the value system to the value network aimed to encompass comprehensive knowledge exchanges in the operational network and at activity level. This conceptual shift was essential for enhancing comprehension of the internationalization process of INVs, where strategic partnerships with keystone players imply the creation of new ways of extracting value already present across a large and dispersed customer base. Understanding knowledge flows (internal and external, tacit and articulated) also involves acquiring a deeper grasp of how INVs manage the process of confronting strategic exploitation/exploration in relation to activities and technologies deployed in their value network. Specifically, the deployment of data-driven technologies and process learning during internationalization prompts INVs to achieve scalability both at a different pace to and beyond the geographical scope of traditional firms.

In all, this research shed light on the direct influence of the firm's network knowledge management and consequently on the growth in operations towards scalability and internationalization. Specifically, the study addressed the following question: to what extent do the management and evolution of organizational networks in their multiple forms (entrepreneurial, operational and strategy-driven networks) affect the scalability and international expansion process in INVs?

From a value network perspective, the study focused on arriving at an explanation of specific relations, such as the influence of organizational connectedness on scalability, and how

network technological learning and ambidexterity (exploration and exploitation forces) affect INVs' operations and the processes of internationalization and scalability.

By adopting a network perspective, this study focused on two main thematic lines of research in the literature: a) the first hinges on the operational network concept which emphasizes the role of the value network in which the firm positions itself and the activity system that configures its internationalization components (value creation and value capture functions); b) the second revolves around the organizational learning that the firm is able to pursue via the network, through an articulation of factors that relate to technological learning, organizational ambidexterity and internal/external knowledge flows.

The research design adopted a mixed sequential methodology with an emphasis on the qualitative stage. It started with the collection and analysis of the quantitative data to determine what results required further exploration in the subsequent, qualitative stage, via interviews. In this second stage, the research progressed into an in-depth analysis of the role of organizational connectedness, which has been found to be one of the distinctive factors driving INVs' rapid expansion. In particular, the qualitative stage thoroughly analyzed the unexpected results in the relationship between network focus, and scalability and international expansion. To this end, by conducting a retrospective longitudinal analysis, the study looked at the operational system of network activity of five firms belonging to the quantitative sample with a view to better understanding the mechanisms and processes in place in the business scalability path.

More specifically, in the quantitative stage, the study proposed a conceptual framework that framed the preliminary relationship between the network focus, technological learning and ambidexterity in firms' internationalization and scalability. This framework was validated in a limited sample of 40 surveyed firm. While the network focus and scalability relationship was found to be not significant, the same relationship became significant when moderated by the role of organizational connectedness. Similarly, ambidexterity proved to be significant only in the relationship with international expansion, while in the relationship with scalability it was significant only for ambidexterity-led-by-exploitation and when moderated by the role of entrepreneurial orientation. A deeper understanding was required in the subsequent, qualitative stage. Technological learning was found to be significant both in terms of scalability and international expansion. A key role was identified for adopting an opportunity recognition posture in mediating technological learning and international expansion.

Following the mixed-methods approach, the qualitative study expanded on three aspects derived from the results of the quantitative study, which required further clarification on the relationship between network focus, scalability and international expansion: 1) *The difficulty in identifying potential INVs when they are still young*. The study addressed the need to develop and test a framework to identify INVs in their early years (before they achieve proven success), by extending the INVs' distinctive attributes to encompass network attributes, such as organizational connectedness, industry network relationships and network focus; 2) *The dynamic nature of the INVs,* calling for further elaboration on the validation of the conceptual model in the context of the evolving organizational structure and network over time. The study proposed a phase-model to capture the time dimension in the context of the rapid development

and internal structure of INVs; 3) *The flow of information and knowledge in INVs*. The analysis reconsidered knowledge and information according to internal or external relevance, type of activities (human-centered or technology-based) and the type of process (explorative or exploitative).

The qualitative stage investigated the activity system as well as the ambidexterity and technological learning contribution to boosting growth. This stage focused on explaining the operational and value network in the activity system in order to indicate the mechanisms and processes in place in the business scalability path. A particular emphasis was given to organizational connectedness, which required an in-depth analysis of the changing objectives, the adaptive structure and the agile operations of the firm in an activity-specific context.

The link between the conceptual framework and the phase-model was evident as all the factors presented in the conceptual model were reconsidered in terms of the evolutionary phase-model and looked at from an operational perspective, in line with a knowledge management perspective. Thus, the retrospective longitudinal analyses derived from the qualitative study helped to address the research question, observing the evolution of the firm and the network as well as the information flows within the value chain.

The qualitative findings, based on the phase-model attributes of INVs or gradual internationalization paths, found the five cases to be consistent in terms of the distinctive patterns of international new ventures. The in-depth analysis of the network evolution found that INVs specializing in technology or knowledge services are highly dependent on the effective management of the network across three different phases of a firm's development: emergence, early growth and expansion.

The findings emphasized how the identity-based network strongly impacted the inception and emergence (entrepreneurial network) phase of all ventures. Secondly, the findings distinguished between firms able to rapidly shift from path-dependent (identity-based) to intentionally driven (calculative-based) organizational network management. While network cohesiveness characterized the first two phases, with a reliance on strong ties and direct weak ties, sparse networks and indirect weak ties have been very distinctive of Phase (3), where firms, expanding at a rapid pace, must succeed in filling structural holes.

Network factors also affected the design of the firm's activity system, both for inbound and outbound knowledge/information flows. In particular, ambidexterity and technological learning (in data-driven activities) were found to influence the degree of international expansion and scalability, taking into consideration the corresponding phase and the state of development of the business model. Outbound exploration processes dominated in the first two phases, while inbound exploitation processes emerged as characteristic of the expansion – Phase (3).

The findings highlight the need to develop a network-based strategy to stimulate growth systematically, which in turn could facilitate the optimization of knowledge towards scalability.

Specifically, we found that knowledge and information flows are highly sensitive to the impact of network embeddedness. However, most of the firms interviewed considered this factor from an operational standpoint, without attaching very much strategic weight to it. It is evident that INVs valued networks for the foundation and early growth stage. Furthermore, they integrated network-based actions into their value systems. However, the activities integrated into the network appeared to be more path-dependent than intended. These results could point to a lack of widely agreed models on how to employ networks in the different phases of the new firm's growth process. In a way, it is left to the founder or CEO to decide and assess how and when to deploy network strategies. These considerations contrast with other strategic disciplines where existing protocols, pathways and indicators can be used to systematically measure founders' success in advancing different aspects of the firm.

Adopting an activity-based perspective allowed us to address the network construct by looking at the implied contribution of each activity.

In the emergence – phase (1), the analysis showed that network embeddedness relies heavily on cohesive networks (identity-based). In this phase, the ecosystem context in which the firm and the founders set up their business determines the speed of growth and the potential to test the emerging service. In the early growth – phase (2), the firm broadens its network and starts to operate through the contacts it is able to create through its arm's-length network. However, these ties are often direct weak ties and do not offer a bridge into distant markets. In order to connect to distant markets and leapfrog from phase (2) to phase (3) – simultaneously expanding into multiple markets – an intentionally driven network approach has been found to be necessary. Structural holes must be filled, indirect weak ties activated and sparse networks valorized by favoring internal flows of information. Organizational connectedness becomes a critical factor to implement as the firm must employ agile structures, while also relying on the outbound/inbound use of resources. Exchanges might be optimized by drawing on available resources originating in collaborative exchanges within the whole value system. Technological learning and ambidexterity help to strengthen the process of acquiring new knowledge and processing information about high-potential opportunities uncovered through international market exploration and exploitation activities.

According to this conceptual framework, ambidexterity and technological learning become two instrumental factors that, when combined with network embeddedness, allow the firm to speed up the pace of internationalization and enhance the efficiency of the operation. In other words, the right combination of these factors within the activity system is what makes a firm sufficiently well-equipped in a competitive landscape to succeed in scaling up internationally.

8.2. Theory modification

The qualitative stage addressed important questions pertaining to INVs. The first objective was to deepen the understanding of the unexpected result of a not-significant direct relationship between network focus, scalability and international expansion. The second objective was to

uncover the inner relationships between network focus and scalability through the moderating factor of organizational connectedness.

The conclusions reached have highlighted that the following points must be considered when modifying the theory underlying the quantitative stage: i) the sample selection of INVs should include not only cut-off indicators (i.e., breadth, depth and scope of internationalization) but also dimensional attributes that better describe the strategic potential of INVs during the first years of expansion (first seven years); ii) the network embeddedness should be articulated by examining intra-firm and inter-firm value chain coordination of activities; iii) control variables should be added when positioning the firm in the corresponding phase of expansion in which it currently runs its operations; iv) in accordance with the phases, management should also be be apprised of the strategic management of the network in relation to the types of network ties that they could activate through the different phases of expansion; v) similar reasoning applies to ambidexterity, which has been found to be relevant – although with varying predominance in the two processes (exploitation and exploration), which corresponds with the phase reached by the firm.

In particular, while we found that, in most of the cases interviewed, INV management could observe the direct relationship between operational network focus vs scalability and international expansion, the general relationships in the network focus were perceived by respondents to be more generic, often not capturing the value system designed and implemented in line with the firm's strategy. Refinements to organizational connectedness must also include information and knowledge flows, distinguishing between data-driven technologies and human-intensive activities.

Overall, the theory requires greater emphasis on the strategic role that the network focus in INVs plays in relation to the information and knowledge flows that the firm processes and generates. Distinguishing between internal and external in the operative network also helps in distinguishing between value creation and value capture processes.

8.3 Practical implications

8.3.1. Managerial implications

This study should provide leaders with a better understanding of the process of developing a network organizational strategy according to the different phases through which the firm evolves. Network characteristics are singled out in an activity-based approach that operationalizes network attributes in combination with technological learning and exploration/exploitation processes. This approach sheds light on the role of knowledge flows across the network and the whole value system. The findings from this research provide a base on which policy makers can build a supportive ecosystem for entrepreneurship. Moreover, this research provides investors and entrepreneurs with metrics with which to systematically formulate a network-based strategy for growth.

Managers of ventures could benefit from the present study's acknowledgement of the need to enhance the firm's ability to actively manage its external network. This happens only when accumulated experience and capabilities are interwoven with competencies and the value system is viewed as an open system able to exchange resources, both inbound and outbound. The network itself becomes more manageable when the firm can truly adopt and implement an open innovation strategy, although key competencies are necessary to activate this dual system of development. To this end, the present network perspective (attributes and type of network to activate) combined with the activity system may help to elevate the strategic focus of the firm, thereby valorizing key segments and locations consistent with the actual phase through which the firm is passing.

Another implication of the research concerns business incubators and accelerators. The findings emphasized the role of ambidexterity (exploitation and exploration) and knowledge flows, which are different activities that are prevalent at different points in time (phase), and how ambidexterity is replaced by exploitation/exploration, alternatively predominant, in some groups of activities. It could be important to sustain knowledge management in each phase according to a range of methodologies employed by the ventures at different levels (internal/external relevance).

The phase-model attributes also draw attention to some key characteristics that could help to attract funds for institutions to evaluate the potential of ventures becoming INVs or more traditional gradualist firms. Embracing the proposed integration framework of Rialp et al. (2005b) may help to articulate a taxonomic analysis of the firm which looks at the latter in an original or novel way by considering dynamic aspects (past and future). As we have seen in the business cases analyzed, it is not the possession of all attributes that makes the firm fit into one or other category, but rather the overall prevalence found in the three main blocks of analysis (founder, organization, strategic focus).

Furthermore, as we have seen with Musement, giving timely consideration to opening an office in a foreign country can also be evaluated against a checklist-type grid. This allows for the meeting of the previous requirements, enabling the firm to reinforce its presence locally only after obtaining the necessary information and knowledge from several sources in its operational network. In this sense, the opening of a branch should also be evaluated against an explicit objective in the network management strategy. As we have noticed in more than one business case analyzed (Talk-a-Bot, Linistry), financing is often a precondition for testing the local market, but the tight window of time given to develop a market often fails to consider the time needed to build a relevant local network with a dominant partner. As we learned from the Talk-a-Bot case, the penetration of a market (Ukraine and Bulgaria) can be greatly facilitated through the formation of a strategic partnership (Viber).

8.3.2. Policy implications

The research also sheds light on a topic that is relevant to policy makers operating in the innovation ecosystem. The intense, external exchange occurring in many locations among established players and smaller, leaner and more innovative ventures is changing the landscape

and stimulating, more than ever before, the growth of open innovation practices. The research suggests that a conducive ecosystem favors actual exchanges between big and smaller players, both private and state-owned – creating opportunities for innovative small firms to reach masses of users and to test products and services. To break the innovation local path-dependency, the research suggests that policy makers could facilitate the creation of bridges between clusters in different regions. This action could help to fill structural holes and connect initial creators and established players via platforms. Today this role is institutionally played by consulates and trade fairs. Further support in this direction could hasten the process and speed up the transition through the different phases of network evolution.

As described in the literature review INVs are distinguished by a blend of network, human resources and technology. From the research conducted, we draw some policy conclusions flowing directly from the investigation. We also draw a distinction between the *whats* and *whys* that policy makers could address when taking action.

The conventional approach, also embraced by the Eurofound (2012) study, adopts industry structure analyses, focused on the "*whats of competitiveness".* In other words, what is it that makes one country more suited than another for fostering the emergence of INVs? New *whats* have been uncovered by new trends, and policy makers have been exhorted to adapt regulations to these new trends. Given this perspective and with reference to the three factors specified above, some key issues relating to these aspects are as follows:

Starting with the *network,* the Eurofound (2012) study pinpointed, from the external factors that foster the emergence of INVs in a country, the presence of global networks together with the associated growth of enterprise clusters where open innovation and public–private research and development cooperation are supported. The latter element was found to be highly consistent with the qualitative case studies analyzed here. It emerged that institutional nodes constitute an important link between young, emerging firms and technological giants operating at the regional level. All five INVs analyzed were able, via incubators, accelerators, innovation programs or institutional representatives, to establish direct exchanges with leaders in the respective fields. The Pressenger case showed how sectoral clusters, organized in terms of industry innovation challenges, could bring together larger and smaller firms. This case also showed that what matters are the ties between the country institutions and the respective industry leaders. Global networks reduce the need to establish a physical presence in a country; instead, direct connection can be made with industry leaders and innovation pillars. In fact, global networks are sectoral and therefore attract clients and players from a regional or continental level, pooling expertise from diverse fields.

Regarding the role of *technology*, it was observed that growing trends are manifested in international market demand for specialized, high-quality products and advances in process technologies. In such cases, countries may choose to focus on the development of specialized technologies in a few industries. Online technologies are not enough to build and sustain an international network. Open innovation and open business models become possible only when two parties are able to connect with each other and build mutual trust. Supporting the initial matching of multinationals and INVs (also called a soft landing) is not enough, and institutions

must also support INVs in driving and sustaining the scalability process. For instance, private agents or intermediaries could help emerging firms to unveil new technologies in the market without the risk of being copied by multinationals.

Given the founders' composite technical specialization and international background and experience, a dedicated policy should also be crafted for *human resources*, which constitute a distinguishing characteristic of INVs. Attracting talent and favoring the localization and physical presence of these enterprises within innovation districts (e.g., with special taxation regimes) could foster valuable exchanges with universities and other technical centers, thereby providing a channel for high-potential firms to get in contact with founders and their colleagues.

Yet, with all the attention being given to understanding the issues of localization, industry focus and firm capacity building, the *whys* seem to have gone largely unanswered: *Why* do some young firms seem able to continually achieve new levels of scalability and internationalization while others seem able to only operate regionally on a medium scale? *Why* do some firms present strategic, competitive characteristics that enable them to compete internationally in their early years without a domestic market base?

To answer to the *whys*, the present research focused on the fact that INVs, still in their early years (less than seven years old), are distinguishable from other types of companies that follow the gradualist approach. On average, at national level, just 1% of young enterprises out of the total number of firms are INVs. Therefore, pinpointing unique traits in terms of human resources (founder characteristics), organizational capabilities and strategic focus can help to reveal the high potential of this small percentage of firms – both as employers and as contributors to GDP. The study aimed to move away from consideration of INVs in a retrospective light (with hindsight cut-off indicators), towards a more contemporary and focused look at the strategic and business attributes that these firms idiosyncratically present as they proceed along their internationalization and scalability journey.

Therefore, the adoption of indicators that can track the potential of INVs at a very early stage could, for instance, shift the attention towards (further) boosting growth and away from acknowledging it as an achieved goal. In fact, the earlier the recognition of the nascent business potential, the more rapidly the company should progress on its international expansion path. We believe this study contributes to developing a better understanding of the attributes of these types of firms. As described in the proposed model, which advances the Rialp et al. (2005b) theoretical framework, distinguishing INVs' attributes shows that network management is a key attribute that varies through the different developmental phases of a firm.

For instance, recognition of the growth phase that the INV is passing through requires the application of different tools to manage the strategic network (e.g., bridging structural gaps or recognizing the need for greater network cohesiveness). The idiosyncratic path of internationalization followed by INVs also highlights the fact that the value network operates as a holder of knowledge and information. This characteristic is what makes INVs distinctive, which includes their capacity to be innovative and to use balancing structures to process novel

information and exploit/explore new markets. Policy makers should pay particular attention to this component of the value system, strengthening those links that enable INVs to access and harness the forces of globalization.

8.4 Limitations and future research

Putting the findings from this study into the proper perspective, several limitations need to be pointed out.

First, the quantitative study focused on a relatively small sample, with the responses indicating the skewing of data collection towards a few of the innovation hubs of the European countries contacted. This limitation, which was exacerbated by the impact of Covid-19, should be acknowledged calling for a replication of the quantitative hypotheses, testing with more emphasis on the sample representativeness. However the geographical scope of internationalization must maintain a diversity of operations, already present in the sample here selected, favoring the reach of INVs operating through a wide spectrum of regional and distant countries. The methodological design of the research, through its qualitative stage emphasis, explored and delved into some of the contextual limitations encountered in the quantitative stage. Its contribution brought to attention important points to embed in the theory modification and hypotheses formulation in replicating the analysis.

The limited number of respondents (40 firms) used in the quantitative analysis stemmed from the fact that access to INVs was generally difficult determined by sensitivity in the typology of data collected and privacy concerns. Furthermore founders and top managers were under severe pressure due to the unprecedented circumstances in which they found themselves, which prompted them to keep the time allocation short. Respondents had to be contacted personally in most cases so that they could be informed and reassured about the data-collection process and the purpose of the questionnaire. During the interviews, more than one respondent asked to skip questions about network formation and operations data, as these were both perceived as strategically sensitive. In a future study, the collection of data might still consider to maintain the dual level of both a survey and personal interviews (with a restricted sample) in order to achieve the correct balance in the information supplied, while also paying attention to data sensitivity.

Second, our qualitative analysis was based on a retrospective longitudinal analysis, which could not take into account the path-dependency and time-horizon developments in the decisions taken by the firm. An in-depth analysis of network management requires a thorough understanding of the time-related maturation of the decisions taken by the firm. As emphasized by Calof and Beamish (1995), by not looking at firms longitudinally, it is difficult to determine what made a firm move to the next phase of development. Similar research (Hagen and Zucchella, 2014) has been successfully conducted but only for older, more established firms. A new and novel study could delve into young enterprises (older than three years and younger than seven years) after they have taken the critical step of advancing their network strategies from the second (early growth) phase to the third (expansion) phase.

Third, this study was based on the idea that INVs are potentially recognized in the early years through their strategic internationalizing posture and an idiosyncratic use of the network as a holder of knowledge and information. This conceptualization requires a stricter operational definition in order to coalesce scholars' contributions towards the nexus of knowledge flows and network operational management. Besides the need to embark on this effort, we acknowledge the shortcoming of the present research in turning qualitative observations into quantitative indicators. This limitation also emphasizes the need to improve our operational indicators, as is also discussed in other studies (Sedziniauskiene et al., 2019; Kuivalainen et al., 2012), so that the INV phenomenon can be operationally studied in the future. Quantitative network indicators and metrics could also be analyzed in the light of aspects pertaining to the expansion process (phase 3) – with the emergence of power law distribution – including preferential attachment and continuous growth.

Fourth, with reference to the modeling hypotheses, in order to break down and operationalize the network focus construct, future research could explore the impact of other strategic factors that are able to moderate the relationship between network focus, scalability and international expansion. Dezi et al. (2021) highlight the role of antecedent external embeddedness and knowledge management in achieving ambidexterity and performance in Italian SMEs. Following this direction, attention could be given to the role of network embeddedness as an antecedent in explaining the relationship between international expansion and scalability. Further research may also deepen the understanding of the role of network embeddedness in influencing both the dependent variables (international expansion and scalability) and the independent variables, such as technological learning and ambidexterity.

9. Appendices

Appendix (1) Generic features of the interviewed firms

	Talk-a-Bot	**Linistry**	**SignAll**	**Pressenger**	**Musement**
Year of inception	2016	2016	2015	2014	2014
Industry	Open-source software tools/mobile app	SaaS/mobile app	SaaS/mobile app/platform	Content notification	Marketplace for tickets and tours
Main service	Enterprise chatbot	Customer queuing management system	Deaf sign language application	Visual notification engine	Ticket selling service
B2B/B2C	B2B + B2B2C	B2B + B2B2C	B2B/B2O moving to B2C	B2B + B2B2C	B2C and B2B2C
Website	https://talkabot.net	https://landing.linistry.com	https://www.signall.us	https://pressenger.com	https://www.musement.com/uk/
Number of founders	4	4	2	3	4
Type of founders	Individuals	Individuals	Individuals	Individuals/organizations	Individuals
Number of employees	26	6	26	About 11–15	About 50
Main activity/feature of the service	Chatbot	Mobile app for virtual queueing	Mobile app x ASL sign language	Mobile notification content	Mobile tourism marketplace
Regional offices	Budapest, Warsaw and Singapore	Budapest/Hungary	US, Hungary	Budapest/Hungary	Milan/Italy

Mission	"Automating communication, we turn digital business conversations into secure, app-like services for both customers and employees. By creating meaningful conversations, we change your firm's internal and external communication to a fast, effective and a simply better experience." (from the firm's website)	Building a state-of-the-art digital queuing service to enhance customer loyalty and boost sales for clients. The customer receives information concerning the time and date of the service.	A breakthrough technology that translates sign language into spoken languages. Thus, it enables instant and seamless communication between the deaf and hearing person.	Innovative mobile notification content delivered with the most engaging appearance possible for a holistic user experience. Pressenger provides a customized solution to improve conversion rates, user engagement, organic growth and ad revenue.	Provides tailor-made suggestions and access to experiences in every language and every country around the world.
Main features	AI, NLP, machine learning integrated on Viber software and Messenger.	Channel optimization of customer service (queueing) between *electronic* and *personal* (physical) methods following a predetermined logic, thus contributing to efficient customer service.	Mobile app technology tracks hand shapes, skeleton movements and facial expressions to identify signs accurately.	GIFs, data-driven animation and banners for a holistic notification experience.	Mass offers of tourist activities and online booking and ticketing for leading tourist attractions.

Distinct technological features	Supports 100+ native languages; over 30 integrable functions/ modules on proprietary framework; customized bots based on geographical, cultural and business needs of each client.	Real gatekeeper: with the ability to manage customers, according to their needs, between personal and electronic channels of customer service. Multiple ways of queuing built into an existing application, on a webpage, in a chatbot, at a ticket dispenser and even without a digital device with on-location assistance. The system provides the opportunity for credit card usage and other chip/magnetic card identification as well.	A team of linguists inform the technology for a grammatically correct translation of combinations of movements. Many others have tried but not succeeded. "Data is king" for deep-tech AI solutions. SignAll invested significant resources in creating the world's biggest sign language database (20 times bigger than the second largest).	The only SaaS service that enables apps to send animated and/or static, hand designed or data-driven notifications. Has the highest opening rate on the market using animated push notifications. It combines automation with science and bespoke design. It creates new digital assets and drives more traffic to existing ones. It builds interaction into the notification, generating a dynamic response option rather than "Openapp".	Personalized travel content and booking options for its users across multiple vertical channels – from guided tours and museums to food and wine, and spa and wellness options – and also across multiple touching-points.
Milestones	2016: CEU Innovation Lab established 2017: Microsoft alliance co-sell partner 2018: Euro 1 million investment 2019: New product release: Cheqbot 2020: Internationalized in five countries	2017: Event official provider: Sziget and Gamescom 2018: Banking industry 2019: Retail industry 2020: Internationalization in four countries in Europe	2016: Euro 2 million investment 2018: First pilot 2019: Euro 2 million investment + multiple installations throughout the US 2020: New mobile app Beta	2015: First product release 2017: GSIC award 2018: First statistical data from La Liga (Levante GCIS), BVB, Fite.tv 2019: Reached a relevant global network Applecaster's; Zapp platform 2020: BVB deal with major client	2014: Platform online + Euro 650,000 initial seed investment; 2015: Euro 4 million investment 2016: Euro 10 million investment 2017: Acquisition of a Dutch technology company, Triposo 2018: 35,000 products offered in 1100 cities; acquired by TUI Germany group

Appendix (2) Attributes of the founder/s of the interviewed firms

	Talk-a-Bot	Linistry	SignAll	Pressenger	Musement
Characteristics of the entrepreneurs	Four partners: two had direct experience in chatbot development.	Four founders	Two founders: one an economist and one a mathematician.	Three founders: diverse experiences	Four founders
	The other two partners had marketing and operations experience. They understood that there was an emerging trend.	Founders worked on digital transformation projects prior to starting the venture. They observed the expanding market and recognized the need for a permanent, technology-driven solution to the queueing problem.	Founders did not have a clear understanding of the gap. Their initial idea was found randomly through entrepreneurial alertness in recognizing an opportunity surrounding a nascent need in the market.	The founders were knowledgeable about technology and had the idea to develop a call app that could send mood messages in the form of images to call recipients.	Founders had a very niche proposition regarding making the cultural industry more accessible to users.
Prior experience of the partners	Multinational experience in business development; start-up experiences of two of the founders; marketing preparation experience.	Colleagues from the technology industry: Microsoft	Colleagues from the Dolphio and IT software development firm; IT development; Internet 4.0; motion capture technology.	Diverse experience from different fields: design thinking, open innovation and technology.	Experience in VoD IPTV content management; technological expertise in data management.
Background	Founders had weak ties with the future CEO.	Founders were colleagues from the same industry.	SignAll is a spin-off of Dolphio, a leading software development company in Budapest, Hungary, founded by Zsolt Robotka and Janos Rovnyai. Dolphio is mainly focused on machine learning and Internet 4.0.	Different backgrounds of the founders. The CTO had extensive experience in the blockchain industry and IT product development.	Founders were colleagues at Fastweb in a BU focused on content management acquisition.
	More than 10 years of experience. The team was assembled by one of the founders who attracted other members.	More than 20 years of experience overall.	More than 10 years of experience.	More than 10 years of experience.	More than 15 years of experience each.

Managerial vision	Global from the beginning.	Going international but with a targeted strategy; the B2B market needs time and implies gradual expansion.	Aiming for a big market for the product, they chose the US as the biggest market for ASL.	Global from the beginning. Internationalization at the firm was driven by capitalizing on available opportunities.	Global from the beginning
Type of relationship among partners	Friend, family, mixed	Colleagues from Microsoft	Colleagues from the mother company, Dolphio.	Family and friends	Colleagues
Industry relationship	Multinational experience (Hewlett-Packard) and IT development.	Multinational employees (Microsoft) with extensive experience.	International experience as a Deloitte consultant.	Founders had niche knowledge of communication in the sports industry and were seeking a new engagement with their audiences via mobile apps.	Possessed in-depth knowledge of the cultural industry.
Network industry embeddedness	Direct network from the previous place of work; Hewlett-Packard ecosystem.	Extensive network from Microsoft partners, suppliers.	Strong international network given the extensive operations of Dolphio.	Extensive network in the sports industry via one of the founders and the formation of a network in a sports context in Spain.	Direct access to an international and extensive European network of cultural actors.

Appendix (3) Organizational capabilities: Dimensions and attributes of the interviewed firms

	Talk-a-Bot	Linistry	SignAll	Pressenger	Musement
Market knowledge and commitment	**Market knowledge:** The CEO, as a lead developer for Hewlett-Packard, accumulated extensive experience in managing a business in a foreign country.	**Market knowledge:** All founders had extensive experience in international operations, coming from the Microsoft ecosystem.	**Market knowledge:** Both founders could benefit from the internationalization experience of the Dolphio mother company (spin-off).	**Market knowledge:** Founders had experience in the communications and technology fields.	**Market knowledge:** Founders possessed in-depth experience in content management and data management.
	Market commitment: The vision of the firm was global from the beginning. According to Ákos, in a Forbes interview in December 2016: "The team, which started in April 2016, is already shooting for the world market from Nádor Street. We want to build global know-how, we want to work with big brands."	**Market commitment:** "We started with a vision of a global company, but you must also start with something very specific in locations as our service is not scaling like a search engine online. Being a B2B service, our firm faces a complex round of negotiations. Today our market ambition is limited to Europe."	**Market commitment:** The firm envisioned the US as a market to target for the mass of users of ASL. From the beginning, the firm needed to develop a big database to run machine learning and AI tools.	**Market commitment:** The venture had the vision from inception of being a global company serving customers everywhere.	**Market commitment:** The venture started as a global company: the initial pitch was the TechCrunch of New York 2014.
Organizational connectedness	**Evolving objectives:** In the emergence phase, the firm tested several countries by participating in innovation contests and soft-landing programs. In the early growth phase, the firm broadened its focus	**Evolving objectives:** The firm started in the events market, then shifted to the banking industry, then big retailers, etc. The market response led the firm to change its structure and business model.	**Evolving objectives**: The firm started with applications just for the deaf; then saw that there was also a large need to give attention to hearing bodies to learn the language. Later the firm understood the need for a mobile support tool and	**Evolving objectives**: Based on the statistics and data analysis, the firm proposed key services for customized notifications.	**Evolving objectives:** The firm started with ticketing and later incorporated tourist attractions, such as entertainment events like wine tasting, etc.

	from a chatbot service line to a Cheqbot service to boost growth.		developed the mobile app.		
	Adaptive structure that transforms relationships: The firm opened subsidiaries when needed to fulfil internationalization investment objectives (e.g. Singapore, Poland). This was followed by a nine-month period of supervision for each new subsidiary. For other test countries, reseller partnership agreements were concluded.	**Adaptive structure that transforms relationships:** The firm adapted in response to the market. "Then we learned that as Hungarian company we cannot sell to Austria directly even though we tried and that's when we hired an Austrian partner to do business in Austria for us."	**Adaptive structure that transforms relationships:** The firm could elastically employ technical resources, drawing on the Dolphio personnel base to develop the sign recognition technology. For testing the distribution, the firm built a US structure based on existing relationships and needs to maintain close relationships with the specific universities running ASL courses.	**Adaptive structure that transforms relationships**: From the award of GSIC Global Sports Innovation Center (GSIC), the firm started to grab opportunities and operate from a wider base where needed (Spain) and Germany (Dortmund).	**Adaptive structure that transforms relationships:** The main structure was built around a business intelligence team. Small BUs were built in other location such as the NYCity branch.
	Flexible processes in response to learning overtime: "Short value chain. We produce our service. We receive direct feedback... This is part of our strategy and the feedback loop of our users is direct from our clients. We have a very short circle of operations and data analysis."	**Flexible processes in response to learning overtime:** "If we hear a problem that one customer encountered and then we explore if this problem is also relevant for other segments of customers." "The firm progresses the internationalization by learning from constraints and envisioned opportunities. Yes, even to who we are selling it is	**Flexible processes in response to learning overtime:** The firm bases its distributional strategy on the built-up network (personal network of the founders and advisors in the first year). It has always had a strategy for finding its target segment and reaching them.	**Flexible processes in response to learning overtime**: Data-driven analysis of user engagement (visualizations) and user experience (interaction, time spent on app).	**Flexible processes in response to learning overtime:** Data-driven technology is used to tap demand from different segments and niche products. Data are used to proceed with markets and marketplace features. Agile management with A/B testing is used as the foundation of management decisions.

		changing all the time. Not only the product but also the target customers group is changing along the way."			
	Processes sustaining communication: "We closely protect the data of clients (GDPR compliance); clients are owners of their data, but we ask for anonymized data for checking the satisfaction of the user direct interaction."	**Processes sustaining communication:** The firm has built a network of partners connected via a web portal where it shares information and knowledge. The firm tries to build a community of partners, fostering density.	**Processes sustaining communication:** (Internal/external) examples: newsletters, portal, internal meetings, departmental meetings. The firm is a sponsor of the ASLTA. The newsletter is sent via the association, which is more reliable.	**Processes sustaining communication:** Partners/clients/employees communicate through a collaborative platform.	**Processes sustaining communication:** Communication takes place through a platform that allows all members to share data, while management has access to selected streams of financial data. Third parties can also access the platform for revenue-related data and invoices.
Unique control of intangible assets	**Control over knowledge management processes:** Tech ability of Cheqbot, chatbot developments and state-of-the-art technology.	**Control over knowledge management processes:** Queuing algorithm technology.	**Control over knowledge management processes:** "Data is king" for deep tech AI solutions. SignAll invested significant resources in creating the world's biggest sign language database (20 times bigger than the second largest). "Knowledge and technology are good enough to implement other sign languages."	**Control over knowledge management processes:** Control over customizable, image-driven notification algorithm; generating a dynamic response option rather than "Openapp".	**Control over knowledge management processes:** The main asset is the technological marketplace infrastructure and the firm's extensive presence therein.
Technological learning	**Spot improvements based on data:** The firm checks and validates its knowledge	**Spot improvements based on data:** The firm uses data to spot features of interest and also malfunctioning	**Spot improvements based on data:** The innovation technology effort is all focused on	**Spot improvements based on data:** "Data-driven, science-based, pre-defined visual	**Spot improvements based on data:** A data intelligence unit was established to analyze

	with its clients. It is imperative for the firm to collect know-how. As part of the firm's contractual obligations, it closely protects the data of its clients but does not take ownership of personal data. In all contracts, clients are asked for anonymized data as well as their feedback for the purpose of know-how development.	areas in the system. It looks at key trends in usage and patterns in data. It does not employ very sophisticated algorithms, but it does a review from time to time. Being a B2B operation, the firm does not yet have a mass of customers to provide ideas on product features.	data: "We went to the US in 2016 and had the first collaboration with local universities. In this way we could get patterns and samples collaborating with the guiding universities."	content that is compiled automatically and sent out based on specific pre-defined triggers or scenarios."	content, supply offerings and demand requests. Onsite teams were formed to address specific issues related to the local matching process and resolve frictions in the platform matching.
Value creation sources	**Leading edge technology:** Cheqbot technology	**Leading edge technology:** Virtual queuing technology	**Leading edge technology:** Sign recognition technology with a unique database	**Leading edge technology:** Content notification technology	**Leading edge technology:** Technological leader in the market with its no-negotiation API infrastructure; Triposo technological acquisition for personalized user experience
	Innovativeness: Modular software	**Innovativeness:** Provides an online gatekeeper service channeling customers between physical and virtual queueing	**Innovativeness:** Mobile app for ASL sign recognition	**Innovativeness:** Images directly to the lock screen	**Innovativeness:** First mobile application for planning visits to main tourist attractions

	Quality leadership: Feedback loop from clients monitoring the interaction experience	**Quality leadership:** Gathering of customer data and customer feedback with an integrated survey engine	**Quality leadership:** Machine learning, AI and NLP algorithm to perfect the technology	**Quality leadership:** Analytics from monitoring client interaction and engagement	**Quality leadership:** Ease of use and content creation; market matching
Ambidexterity (exploration and exploitation mechanisms)	**Explorative operations:** Via innovative corporate programs or contests, with some services being tested in different segments and geographies (i.e. Singapore).	**Explorative operations: new segments and industries:** Middle/small retailers; mainly human intensive. They spot opportunities for improvement.	**Explorative operations:** Chat for deaf bodies first and service for hearing bodies later. Market analysis and understanding of other regional sign languages for which the technology could be adapted as a new development.	**Explorative operations:** Chasing of opportunities to implement the technology in other similar industries, relying on images.	**Explorative operations:** Wide adoption of explorative modes in all operations, such as maintaining a wide reach for the offering versus that of competitors.
	Exploitative operations: Mostly by exploitative operations coordinated via activity-based principles, e.g., managing and building networks in a foreign country (e.g., Poland).	**Exploitative operations:** Operations from clients acquired in Germany and Austria are being extended to other subsidiaries.	**Exploitative operations:** The firm is now focused on the exploitation of the mobile application in communities surrounding the main universities that run ASL courses.	**Exploitative operations:** Expanding clients in the soccer industry by working with supporting managers.	**Exploitative operations:** The main sites generate 80% of revenue for the firm.

Appendix (4) Network strategic focus in the interviewed firms

		Talk-a-Bot	Linistry	SignAll	Pressenger	Musement
Network focus	**Organizational network (collaboration, partnerships, institutional linkages)**	The firm was highly embedded in the start-up ecosystem by TechStars connect. It also leveraged the use of the CEU ILab network. Moreover, from the early days the firm participated in start-up innovation contests and innovation partnership programs, building an extensive network in several foreign countries.	No institutional agreements: just a minor collaboration with CEU.	The firm created a network of advisors in the sign languages in the US. It also created linkages with universities with curricula and courses on ASL. The firm has close ties with the ASL Association and participates in main events as a technology sponsor.	The firm created a network in the soccer industry by participating in a leading technology contest which gave it access to the industry ecosystem.	The firm created institutional linkages with partnerships as the exclusive ticket provider. Another collaboration was with the Asian market in view of the different cultural context.
	Value chain network (strategic partnerships, suppliers and vendors)	10 partnership agreements signed. Viber Rakuten Microsoft prioritized co-sell partner; Viber preferred enabling partner. Built a relationship with Microsoft regional manager for Central Eastern Europe. Short value chain: a few intermediaries.	20 partnership agreements signed. The firm built a large and cohesive network of partners in several foreign countries.	Between 20–40 partnership agreements signed. ASLTA is one of the main institutional associations of which SignAll is a part. Advisor partnerships that allowed a close relationship and the official adoption of SignAll equipment at university level.	Ticketmaster, Applicaster partnerships (main communications agencies); Dentsu (one of the largest media companies in the world) strategic agreement.	Partnership in Asia with CTrip, the biggest travel agency in China.
	Network density/sparsity	Sparse network.	Sparse network of partners, although the initial boost of cohesiveness came through a virtual partner portal.	Sparse network of advisors and international leads in the US.	Dense network of partners in the sports industry.	Dense network as everyone in the industry knows each other.

	Strong ties	Five strong ties supporting the strategic development of internationalization.	A few Hungarian-related partners.	About 20 strong ties (5 for each person)	Hungarian ties based on sports industry.	More than 20 strong ties per founder as each could count on an extensive network.
	Weak ties	Direct weak ties: client referrals and participation in conferences and presentations; reselling partnerships.	Indirect weak ties from the previous international ecosystem.	Direct weak ties from the ASLTA.	Direct weak ties.	Direct weak ties.
	Network information/ knowledge flows	Mainly inbound data from users' feedback; Cheqbot analysis of modules' features requested.	Data from the user and client market (region and industry) behavioral traits; knowledge exchange among partners in different countries.	Mainly inbound knowledge from data acquisition from users.	Mainly inbound knowledge from data acquisition on user engagement and interactions.	Mainly inbound knowledge from data collection; suppliers' optimization of information from integrated services; some outbound collaboration such as a project with regulators to design new rules.
Extent and scope of international strategy	**Niche-focused**	The firm focused initially on innovation programs and contests in the international market. Later it narrowed its focus to key clients based on the spread of geographies of strategic partners (Microsoft and Viber).	The firm narrowed its focus to key client segments (banks, big retailers, hairdressers) based on the results of the initial market analysis. In particular, for internationalizing their business, they sought players that also had a leg in foreign markets.	The firm focused on the ASL market and targeted universities that already had ASL courses. The firm allowed these institutions to use their equipment for the learning period, thus creating a bond with the firm for future developments of the technology.	The firm targeted an international hub of innovation in the specific industry (sports) (GSCI), which could introduce the service to technology partners (i.e. Microsoft organizer of the event) and commercial partners (communications agencies).	The firm first targeted key markets in Europe: UK, Spain, France, Italy. These were the most requested sites for travelers. Demand was tapped from multiple hubs across continents: NYC, Abu Dhabi, Asian market.

	Highly proactive international strategy	The firm started by opening subsidiaries in Singapore and Poland.	The firm built a network of local reseller partners in foreign countries.	The firm started by founding a subsidiary in the US and creating a network of universities in four states.	The firm entered into strategic partnerships with communications agencies with a global network.	The international strategy was strongly linked to advertising on the social media channels.
	Geographically spread lead markets	Several international markets from Central Eastern Europe. The Asian market was tested as well.	Several foreign markets, starting with Austria, Germany and Switzerland.	Texas and Arizona were the first two states targeted, followed by states from the east and west coasts. Business was driven by universities, districts and big-city communities.	There was an early market focus on Spain and then Germany (BVB).	A selection of mainstream tourist attractions in European countries constituted the supply base to which market demand was matched. Network hubs of demand influenced the decision regarding the foreign base (i.e., NYC).
Selection and coordination of operations with foreign customers/ clients	**Narrowly defined customer groups**	Selected sectors (banks, retailers).	Selected clients with international legs.	Deaf bodies and hearing bodies.	Soccer teams/industry.	Main tourist attractions and long-tail offerings.
	Close or direct customer relationship	Direct relationships with clients; direct access to user database.	Indirect but close relationships with clients (customer assistance); direct access to user database.	Direct analysis of the user experience.	Direct relationships with clients; customized content; direct access to analytics of the user base.	Direct relationships with clients (i.e., museum institutions and foundations); direct relationships with users (e.g., assistance).

Strategic posture	**Flexibility to changing conditions**	Highly proactive in changing in response to trends in the industry (e.g., from chatbot to Cheqbot); different types of reseller partnerships, depending on the country.	Highly flexible in adapting to different industry segments: events; banks; big retailers; small and medium retailers.	The firm shifted its equipment-based posture focused on deaf bodies to one leaning more towards hearing bodies.	Highly flexible in adapting technology features to clients' developmental trajectory.	Market changes and trends were followed very closely, with competitors' offerings always being assessed. Technological changes introduced to maintain superiority in the market.
	Business model adaptability	Adaptability of the business model from chatbot (highly customized) to Cheqbot (module-based).	The firm targeted industry segments that could boost its expansion efforts abroad, leveraging its network of subsidiaries with a physical presence (Austrian and German partners).	The firm's business model started with a licensing contract with universities, which required an annual fee. It is now moving towards the addition of a direct user licensing fee via an app.	The business model was initially geared toward sports, but it was then broadened to include other segments.	The business model was adapted to also include, for example, a bookshop merchandising line.
	Automation of processes	Content is customized using technology (AI, machine learning) but software modules remain standardized.	Automation of material for presentation of the service and processes to start the service. (It has been run completely remotely from Hungary to Africa.)	Communication materials and introductions to courses via brochures have been replaced by a mobile app.	Notification technology features have leveraged automation as a core feature of the offering.	A seamless automation process introduced: from the ticket-less feature to the acquisition of Triposo technology, an app that can personalize the offering based on the search activities of the client.

Appendix (5) INV versus gradualist approach in the interviewed firms

Key dimension	Attribute	INV theory	Gradualist approach		Talk-a-Bot	Linistry	SignAll	Pressenger	Musement
Founder characteristics	**Managerial vision**	Global/international vision from inception; search for a big market in which to commercialize the business	International market gradually pursued		INVs	INVs	INVs	INVs	INVs
	Prior experience	High level of experience in the industry; international experience in MNEs or international ecosystem	Limited degree or absent		INVs	INVs	INVs	GRAD	INVs
	Type of relationship among founders	Weak ties among friends, colleagues, agents in the same professional arena	Members hired in various ways		INVs	INVs	INVs	INVs	INVs
	Industry relationship	Mature experience in spotting niche gaps or emerging trends; advanced technical knowledge and industry know-how	Experience in the sector but with no particular innovation strategy to develop		INVs	INVs	INVs	INVs	INVs
	Industry network embeddedness	Strong use of personal and business networks at local and international level	Use of direct network with a particular emphasis on the local one		INVs	INVs	INVs	INVs	INVs
Organizational capabilities	**Market knowledge and commitment**	Superior internationalization knowledge from inception	Slow acquisition of international knowledge		INVs	INVs	INVs	GRAD	INVs

	Organizational connectedness	Evolving objectives; adaptive structures that shift, preserve and transform relationships; flexible processes both for the context and in response to learning over time; processes that sustain communication as a basis for cooperative exchange.	Dominant structure with traditional chain of command and hierarchical exchange of information.		INVs	INVs	INVs	INVs	INVs
	Unique control of intangible assets	Knowledge process management; technological product innovation; data collection and processing.	Availability of intangible assets not crucial for the firm's growth.		INVs	INVs	INVs	INVs	INVs
	Technological learning	Employment of data-driven technologies; collection, analysis and development of proprietary software.	Limited use of data-driven technology; is not focused on the internationalization purpose.		INVs	GRAD	GRAD	INVs	INVs
	Value creation sources	Leading-edge technology products, technological innovativeness and quality leadership.	Less innovative and leading-edge nature of the products and services.		INVs	INVs	INVs	INVs	INVs
	Ambidexterity (exploration and exploitation mechanisms)	Exploitation: Resources devoted to continuously improving the technology of the main service offerings.	Focus on one line of development: generally exploitation.		INVs	INVs	GRAD/INVs	INVs	INVs
		Exploration: Resources allocated to explore new technologies or services to fulfill unmet customer needs.			INVs	INVs	INVs	INVs	INVs

Strategic focus	**Network embeddedness (focus)**	Strong focus on networks which are considered a critical variable affecting the international expansion process; implies social ties, inter-firm relations, and value chain, value network linkages.	Limited focus on networks which are considered a complementary resource not essential to the firm's growth		INVs	INVs	INVs	INVs	INVs
	Extent and scope of international strategy	Niche-focused, highly proactive international strategy from inception developed in geographically dispersed lead markets around the world.	More reactive and less niche-focused international strategy.		INVs	INVs	INVs	INVs	INVs
	Selection and coordination of operations with foreign customers/clients	Narrowly defined customer groups with strong customer orientation and close, direct customer relationships.	Intermediaries are the ones in charge, with foreign relationships.		INVs	GRAD/INVs	INVs	INVs	INVs
	Strategic posture	High flexibility in the business model; agile management; short cycles of testing the markets; extreme flexibility to adapt to rapidly changing external conditions.	Limited flexibility to adapt to sudden changes in market conditions and circumstances.		INVs	INVs	INVs	INVs	INVs

Appendix (6) Glossary

Activity system: This is a set of interdependent organizational activities (purposively woven) centered on a focal firm, including those conducted by the focal firm, its partners, vendors or customers, etc. (Zott and Amit, 2010).

Ambidexterity: Ambidextrous organizations are able to manage and simultaneously boost exploration and exploitation operations.

- Exploitation: Resources are devoted to continuously improving the technology of the main service offering.
- Exploration: Resources are allocated to exploring new technologies or services to satisfy unmet customer needs.

Arm's-length ties: These are similar to market ties (Powell, 1990; Uzzi, 1996) and, in contrast to embedded ties, can be defined as functioning "without any prolonged human or social contact between parties".

Articulated knowledge/information flows (also labeled explicit knowledge): These depart from the notion of Polanyi (1962) and comprise all processes entailing knowledge and information that are relevant to the external activities in which the firm engages. They comprise the structured sets of information and know-how which can be recognized, recorded, coded, stored, accessed, and eventually shared and exchanged.

Calculative-based network: This refers to the network developed by the firm based on its strategic intent and organizational ties (Hite and Hesterly, 2001).

Consolidated (organizational) network (Phase (2) – Early growth): This concerns the multiple layers of information that the firm is able to control through its internal operations and activities in the value system. This network relates to the capacity of the organization (team, processes, procedures) to appropriate know-how from the feedback loops in the market and leverage information in order to adapt the service and the business model into a structured form that allows exponential international expansion.

Embedded ties (also labeled cohesive embeddedness): These are entrepreneur-based and refer to the strong and weak ties that the entrepreneur can personally leverage.

Entrepreneurial network (Phase (1) – Emergence): This refers to the foundational phase of an INV firm. It is usually characterized by the global vision of the founding entrepreneur and their ability to turn their personal network (technical know-how, industry expertise, qualified human resources, relevant contacts in the industry ecosystem) into an organizational asset.

Identity-based network: During the emergence phase of the firm, the social network of the entrepreneur is virtually synonymous with the firm's network, as network ties initially exist at the interpersonal level (Hite and Hesterly, 2001).

Internal knowledge/information flows: These refer to all the exchanges of know-how, insights, data and information that occur across the firm's value chain and are relevant to the operations and processes within the firm.

International new ventures (INVs): These are business organizations that, from inception, seek to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries (Oviatt and McDougall, 1994, p. 49). The distinctive attributes of INVs are: a) Speed: Internationalize within three to five years from inception; b) Intensity: more than 25% of returns from sales abroad in the fifth year; c) Geographical scope: multiple countries (Cesinger et al., 2012).

Network evolution phase-model: This model proposes three phases in the network evolution for scalability and internationalization: entrepreneurial network, consolidated firm network and relevant global network. It highlights distinctive attributes of the network in reachability, centrality and scale-free distribution to scalability.

Network focus (also labeled network embeddedness): The role of networks at the founder and firm level is considered a critical variable affecting the process of international expansion of INVs (Oviatt and McDougall, 1995; Coviello, 2006; Gabrielsson et al., 2008). This implies social ties, inter-firm relations and value chain linkages.

Organizational connectedness: Innovation-driven corporates have presented common organizational behaviors in reaching evolving objectives; adaptive structures that shift, preserve and transform relationships; flexible processes both for the context and in response to learning over time. "... processes serve as a communication vehicle and a basis for cooperation exchange" (Kelley, 2009, p. 499).

Organizational network: This is captured in the definition by Hite and Hesterly (2001, p. 277) which points to the egocentric network of a firm as a "set of direct, dyadic ties and the relationships between these ties, with the firm at the center of the network as the focal actor". This definition implies that in the analysis of the business cases, a dual perspective was adopted, directed at evaluating both the network dyads (single relationship between the venture and other firms) and their aggregation into a larger organizational network having the venture at its center.

Relevant global network (Phase (3) – Expansion): This refers to the already existing network that the firm is able to access and exploit on its international growth path. This physical network is related to the ability of the firm to move towards the international distribution of the service, using human resources, suppliers and sales channels.

Scalability: This refers to the firm's ability to grow without being hampered by cost structures or available resources (Nielsen and Lund, 2018). It includes an increase in service growth

(production, users or service) over time, an increase in the size of the total possible market, and/or an increase in market share over time.

Technological learning: Using data-driven technologies the firm: 1) collects data about the operational phases; 2) analyzes the data to spot areas for improvement; 3) develops internal software to observe and analyze operations; and 4) works with a data scientist to analyze operations and customer behaviors. (Zahara et al., 2000)

Appendix (7) Hubs of innovation contacted for the quantitative sample selection

Hubs of innovations contacted	**Number of contacts**
Northen Europe (Sweden, Netherlands)	50
Rockstart (Amsterdam)	
LiU Sweden (Linkoping University) 10 contacts	
Jönköping tech Accelerator 20 contacts	
West-Southern Europe (Italy, Switzerland, Spain, Portugal, France)	295
TheVentureCity (Madrid)	
TIM WCAP (Madrid)	
101startups (Barcelona)	
Masschallenge.org - Switzerland	
Lausanne (EPFL innovation park)	
TIMWCap Accelerator; (italy)	
Lventures-Luiss enlabs (Rome)	
Scale IT (Italy)	
Startupbootcamp (italy)	
Startup business (italy)	
StartupItalia (italy)	
Italian Angels for growth (italy)	
Unibocconi (italy)	
Bright Pixel (Lisbon)	
starquest-capital (Paris)	
Central - Eastern Europe (Germany, Estonia, Romania, Poland, Hungary)	155
BLOCKROCKET Accelerator (Frankfurt am Main) (20 contacts)	
Angelsbootcamp Berlin 2.0 (15 contacts)	
eLab 2020 - Germany (10 contacts)	
Tehnpol (Tallin - Estonia)	
Tech Accelerator (CLUJ-NAPOCA), Bucharest - Romania	
Fiware (Poznan-Poland)	
CEUIlab - Budapest	
OTPlab - Budapest	
BNLstart - Budapest	
Tic-cee - Budapest	

Appendix (8) Firms' activities and definitions of value system concepts

Concept	Authors
Firm's activities "Primary activities are those involved in the physical creation of the product, its marketing and delivery to buyers, and its support and servicing after sales. Support activities provide the inputs and infrastructure that allow the primary activities to take place".	Porter (1985), *Harvard Business Review*
Firm's value chain and value system "A firm's value chain is a system of interdependent activities, which are connected by linkages. Linkages often create trade-offs (...) A firm's value system includes a larger stream of activities, such as the value chains of suppliers who provide inputs to the company's value chain."	Porter (1985), *Harvard Business Review*
Activity system This is a set of interdependent organizational activities, [purposively weaved] centered on a focal firm, including those conducted by the focal firm, its partners, vendors or customers, etc.	Zott and Amit (2010), *Long Planning*
Ecosystem "Within the dynamic capabilities framework, the environmental context recognized for analytical purposes is not of the industry, but that of the business ecosystem – the community of organizations, institutions and individuals that impact the enterprise and the enterprise's customers and suppliers."	Teece (2007), *Strategic Management Journal*
Open innovation "Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively."	Chesbrough (2006), *Harvard Business Press*
Value network "Any web of relationships that generates both tangible and intangible value through complex dynamic exchanges between two or more individuals, groups or organizations."	Allee (2003), Butterworth-Heinemann Press

Source: Adapted from Abdulkader et al. (2020)

10. Bibliography

Abdulkader, B., Magni, D., Cillo, V., Papa, A. and Micera, R. (2020). Aligning a firm's value system and open innovation: A new framework of business process management beyond the business model innovation. *Business Process Management Journal*, Vol. 26, No. 5, pp. 999–1020. https://doi.org/10.1108/BPMJ-05-2020-0231

Acedo, F.J. and Jones, M.V. (2007). Speed of internationalization and entrepreneurial cognition: Insights and a comparison between international new ventures, exporters and domestic firms. *J World Bus*, 42(3), 236–252.

Adler, P.S. and Kwon, S.W. (2002). Social capital: Prospects for a new concept. *The Academy of Management Review*, 27, 17–40.

Agndal, H. and Chetty, S. (2007). Social capital and its influence on changes in internationalization mode among small and medium-sized enterprises. *Journal of International Marketing*, 15(1), 1–29.

Ahmad, S. and Dimitratos, P. (2017). *The Wiley Handbook of Entrepreneurship*. New York: Wiley-Blackwell.

Ahuja, G. and Katila, R. (2004). Where do resources come from? The role of idiosyncratic situations. *Strategic Management Journal*, Volume 25, Issue 8–9 in Special Issue: The Global Acquisition, Leverage, and Protection of Technological Competencies, August–September 2004.

Aldrich, H. and Reese, P.R. (1993). Does networking pay off? A panel study of entrepreneurs in the research triangle. In N.S. Churchill et al. (Eds.), Frontiers of Entrepreneurship Research, Center for Entrepreneurial Studies, Wellesley, MA (1993), pp. 325–339.

Allee, V. (2000). Reconfiguring the value network. *Journal of Business Strategy*, 21, 36–39. 10.1108/eb040103.

Allee, V. (2003). *The future of knowledge: Increasing prosperity through value networks*. Amsterdam: Butterworth-Heinemann.

Andersen, O. (1993). On the internationalization process of firms: A critical analysis. *Journal of International Business Studies*, 24, 209–231. 10.1057/palgrave.jibs.8490230

Anderson, C. (2006). The Long Tail: Why the future of business is selling less of more. New York: Hyperion Books.

Andersson, S. and Wictor, I. (2003). Innovative internationalization in new firms: Born global – the Swedish case. *Journal of International Entrepreneurship*, 1, 249–275. 10.1023/A:1024110806241

Andersson, U., Forsgren, M. and Holm, U. (2002). The strategic impact of external networks: Subsidiary performance and competence development in the multinational corporation. *Strategic Management Journal*, 23, 979–996. 10.1002/smj.267

Anderson, N., Potočnik, K. and Zhou, J. (2014). Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management*, 40. 10.1177/0149206314527128

Ardichvili, A., Cardozo, R. and Ray, S. (2003). A theory of entrepreneurial opportunity identification and development, *Journal of Business Venturing*, 18, 105–123. 10.1016/S0883-9026(01)00068-4

Autio, E., Sapienza, H. and Almeida, J. (2000). Effects of age at entry, knowledge intensity and imitability on international growth. *Academy of Management Journal*, 43, 909–924. 10.2307/1556419

Baldwin, C. and Clark, K. (2000). Design rules volume I: The power of modularity. *The Academy of Management Review*, 10.2307/259400

Barabasi, A.-L. (2003). *Linked: How everything is connected to everything else and what it means for business, science, and everyday life*. Perseus Book Group, Jan 2003 ISBN: 978-0-452-28439-5

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. doi:10.1177/014920639101700108. ISSN 0149-2063. S2CID 220588334

Bell, J. (1995). The internationalization of small computer software firms: A further challenge to "stage" theories. *European Journal of Marketing*, Vol. 29, No. 8, pp. 60–75. https://doi.org/10.1108/03090569510097556

Bell, J., McNaughton, R. and Young, S. (2003). Towards an integrative model of small firm internationalization. *Journal of International Entrepreneurship*, 1, 339–362. https://doi.org/10.1023/A:1025629424041

Bell, J. and Loane, S. (2010). "New-wave" global firms: Web 2.0 and SME internationalization. *Journal of Marketing Management*, 26, 213–229. 10.1080/02672571003594648

Benner, M. and Tushman, M. (2001). Exploitation, exploration, and process management: The productivity dilemma revisited. *The Academy of Management Review*, 28, 10.5465/AMR.2003.9416096

Bhave, M. (1994). A process model of entrepreneurial venture creation. *Journal of Business Venturing*, Vol. 9, Issue 3, 1994, pp. 223–242, ISSN 0883-9026, https://doi.org/10.1016/0883-9026(94)90031-0

Birkinshaw, J. and Gibson, C. (2004). Building ambidexterity into an organization. *MIT Sloan Management Review*, 45.

Birkinshaw, J. and Hagstrom, P. (2000). *The flexible firm*. New York: Oxford University Press.

Blank, S. (2013). Why the lean start-up changes everything. *Harvard Business Review*, 91, 63–72.

Blankenburg, D. and Johanson, J. (1992). Managing network connections in international business. *Scandinavian International Business Review*, 1(1), 11–12.

Blomström, M., Graham, E. and Moran, T. (2004). The impact of foreign direct investment on development: New measurements, new outcomes, new policy approaches. Institute for International Economics, Washington DC, 2004.

Bloodgood, J.M. (2006). Venture adolescence internationalization and performance implications of maturations. *International Journal of Entrepreneurial Behaviour & Research*, Vol. 12, No. 2, 2006, pp. 67–84.

Bloodgood, J., Sapienza, H.J. and Almeida, J.G. (1996). The internationalization of new high–potential U.S. ventures: Antecedents and outcomes. *Entrepreneurship Theory and Practice*, 20(4), 61–76.

Bochmann, G.V., Wong, J.V., Evans, D., Lau, T.C., Bourne, D., Kerherve, B., Salem, M. and Haiwei, Y. (2003). Scalability of Web-based electronic commerce systems, in *IEEE Communications Magazine*, Vol. 41, No. 7, pp. 110–115, July 2003. doi: 10.1109/MCOM.2003.1215647

Brockman, B. and Morgan, R. (2006). The moderating effect of organizational cohesiveness in knowledge use and new product development. *Journal of the Academy of Marketing Science*, 34, 295–307. 10.1177/0092070306286707

Brouthers, K., Geisser, K. and Rothlauf, F. (2015). Explaining the internationalization of i-business firms. *Journal of International Business Studies*, 47, 10.1057/jibs.2015.20

Burgel, O. and Murray, G.C. (2000). The international market entry choices of start–up companies in high–technology industries. *Journal of International Marketing*, 8(2), 33–62.

Burgel, O., Murray, G.C., Fier, A., Licht, G. and Nerlinger, E. (1998). The internationalization of British and German start-up companies in high-technology industries. *Journal of International Marketing*, 8, 33–62.

Butler, J., Doktor, R. and Lins, F. (2010). Linking international entrepreneurship to uncertainty, opportunity discovery, and cognition. *Journal of International Entrepreneurship*, 8, 121–134. 10.1007/s10843-010-0054-x

Calof, J.L. and Beamish, P.W. (1995). Adapting to foreign markets: Explaining internationalization. *International Business Review*, Vol. 4, Issue 2, pp. 115–131, ISSN 0969-5931

Canning, S. (2009). Nespresso taps a cultural thirst. *The Australian*, Vol. 26.

Caputo, F., Garcia-Perez, A., Cillo, V. and Giacosa, E. (2019). A knowledge-based view of people and technology: Directions for a value co-creation-based learning organization. *Journal of Knowledge Management*, Vol. 23 No. 7, pp. 1314-1334. https://doi.org/10.1108/JKM-10-2018-

Cavusgil, S. (1980). On the internationalization process of firms. *European Research*, 8, 273–281.

Cavusgil, S.T. and Knight, G. (2009). *Born global firms: A new international enterprise*. New York: Business Expert Press.

Cavusgil, S. and Knight, G. (2015). The born global firm: An entrepreneurial and capabilities perspective on early and rapid internationalization. *J Int Bus Stud*, 46, 3–16. https://doi.org/10.1057/jibs.2014.62

Cedeño, J.M., Papinniemi, J., Hannola, L. and Donoghue, I.D.M. (2018). Developing smart services by internet of things in manufacturing business. *DEStech Transactions on Engineering and Technology Research*, 14. 10.12783/dtetr/icpr2017/17680

Cesinger, B., Fink, M., Madsen, T.K. and Kraus, S. (2012). Rapidly internationalizing ventures: How definitions can bridge the gap across contexts. *Management Decision*, 50(10),1816–1842.

Cesinger, B., Gundolf, K. and Géraudel M. (2015). "Start-ups" key to sales growth: The strength of growth intention and innovation. Post-Print hal-02075939, HAL.

Chandra, Y., Styles, C. and Wilkinson, I. (2009). The recognition of first-time international entrepreneurial opportunities: Evidence from firms in knowledge-based industries. *International Marketing Review*, 26, 30–61. 10.1108/02651330910933195

Chandra, Y., Styles, C. and Wilkinson, I. (2012). An opportunity-based view of rapid internationalization. *Journal of International Marketing*, 20, 74–102. 10.2307/23274418

Chen, L., Shaheer, N., Yi, J. and Li, S. (2018). The international penetration of i-business firms: Network effects, liabilities of outsidership and country clout. *Journal of International Business Studies*, 50. 10.1057/s41267-018-0176-2

Chen, J., Wang, L. and Qu, G. (2021). Explicating the business model from a knowledge-based view: Nature, structure, imitability and competitive advantage erosion. *Journal of Knowledge Management*, Vol. 25, No. 1, pp. 23–47. doi.org/10.1108/JKM-02-2020-0159

Chesbrough, H. (2006). Open business models: How to thrive in the open innovation landscape. Harvard Business School Press: Boston, Massachusetts.

Chesbrough, H. (2014). Open innovation: Striving for innovation success in the 21st century, in reinventing the company in the digital age. *Open mind*, BBVA, 395–410.

Chesbrough, H. and Rosenbloom, R. (2002). The role of the business model in capturing value from innovation: Evidence from Xerox Corporation's technology spin-off companies. *Industrial and Corporate Change*, 11. 10.1093/icc/11.3.529

Chetty, S. and Campbell-Hunt, C. (2004). A strategic approach to internationalization: A traditional versus a born-global approach. *Journal of International Marketing*, 12, 57–81. 10.1509/jimk.12.1.57.25651

Chetty, S. and Holm, D.B. (2000). Internationalization of small to medium-sized manufacturing firms: A network approach. *Int Bus Rev*, 9, 77–93.

Collins, C. and Clark, K. (2003). Strategic human resource practices, top management team social networks, and firm performance: The role of human resource practices in creating organizational competitive advantage. *Academy of Management Journal*, 46, 740–751. 10.2307/30040665

Contractor, F.J. and Kundu, S.K. (2000). An examination of ownership and alliance patterns in a maturing service sector. *Globalization of services*, 2000, pp. 296–319.

Corvin, A. (2016). Netflix: Strategic partnerships make life easier for subscribers. https://www.ibc.org/interviews/bringing-netflix-to-a-global-audience-through-partners/847.article

Coviello, N.E. (2006). The network dynamics of international new ventures. *Journal of International Business Studies,* Vol. 37, No. 5 (Sep, 2006), pp. 713–731.

Coviello, N.E. and Munro, H.J. (1995). Growing the entrepreneurial firm: Networking for international market development. *European Journal of Marketing*, Vol. 27, No. 7, pp. 49–61.

Coviello, N.E. and Munro, H. (1997). Network relationships and the internationalization process of small software firms. *International Business Review*, 6(4), 361–386.

Coviello, N.E. and McAuley, A. (1999). Internationalization and the smaller firm: A review of contemporary empirical research. *Management International Review*, 39, 223–256.

Coviello, N.E. and Cox, M. (2006). The resource dynamics of international new venture networks. *Journal of International Entrepreneurship*, 4, 113–132. 10.1007/s10843-007-0004-4

Covin, J.G. and Miller, D. (2014). International entrepreneurial orientation: Conceptual considerations, research themes, measurement issues, and future research directions. *Entrepreneurship Theory and Practice*, 38(1):11-44. doi.org/10.1111/etap.12027

Creswell, J.W. (2009). *Research design: Qualitative, quantitative, and mixed-methods approaches*. USA, Sage (3rd ed).

Creswell, J.W. (2015). *A concise introduction to mixed methods research*. USA, Sage Publications Inc.

Creswell, J.W. and Plano Clark, V.L. (2011). Designing and conducting mixed methods research (2nd ed.). Los Angeles, CA: Sage.

Crick, D. and Jones, M.V. (2000). Small high-technology firms and international high-technology markets. First published June 1, 2000, *Journal of International Marketing*. https://doi.org/10.1509/jimk.8.2.63.19623

Crick, D. and Spence, M. (2005). The internationalization of "high performing" UK high-tech SMEs: A study of planned and unplanned strategies. *International Business Review*, Vol. 14, Issue 2, pp. 167–185. https://EconPapers.repec.org/RePEc:eee:iburev:v:14:y:2005:i:2:p:167-185

Davenport, T.H., Barth, P. and Bean, R. (2012). How big data is different. MIT *Sloan Management Review*, Vol. 54 ,No. 1, pp. 22–24.

Del Giudice, M. and Maggioni, V. (2014). Managerial practices and operative directions of knowledge management within inter-firm networks: A global view. *Journal of Knowledge Management*, Vol. 18, No. 5, pp. 841–846.

Dezi, L., Pisano, P., Pironti, M. and Papa, A. (2018). Unpacking open innovation neighborhoods: le milieu of the lean smart city. *Management Decision*, 56. 10.1108/MD-04-2017-0407

Dezi, L., Ferraris, A., Papa, A. and Vrontis, D. (2021). The role of external embeddedness and knowledge management as antecedents of ambidexterity and performances in Italian SMEs. In *IEEE Transactions on Engineering Management*, Vol. 68, No. 2, pp. 360–369, April 2021, doi: 10.1109/TEM.2019.2916378

Dodgson, M. (1991). Technology learning, technology strategy and competitive pressures. *British Journal Management*, Vol. 2, Issue 3, September 1991, pp. 133–149.

Dong, M. (2015). Research on design features of intelligent product based on "Big Data", *Proceedings of the 2015 3rd international conference on machinery, materials and IT applications*, 2015.

Douglas, S. and Craig, S. (1989). Evolution of global marketing strategy: Scale, scope and synergy. *Columbia Journal of World Business*, 24(3), 47–58.

Doz, Y. and Hamel, G. (1998). Alliance advantage: The art of creating value through partnering. Boston: *Harvard Business School Press*.

Dyer, J. and Singh, H. (1998). The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *The Academy of Management Review*, Vol. 23, No. 4 (Oct, 1998), pp. 660–679.

Edmonds, W.A. and Kennedy, T.D. (2017). *An applied guide to research designs: Quantitative, qualitative, and mixed methods*. USA: Sage Publication.

Eriksson, K., Johanson, J. and Majkgård, A. (2001). Time and experience in the internationalization process. *Zeitschrift für Betriebswirtschaft*, 71, 21–43.

Ernst, R., Meyer-Stamer, J. and Haar, J. (2008). *Small firms, global markets. Competitive challenges in the new economy*. UK: Palgrave Macmillan.

Eurofound. (2012). Born global: The potential of job creation in new international businesses. Publications Office of the European Union, Luxembourg.

Federico, J., Kantis, H., Criado, A. and Rialp. J. (2009). Does entrepreneurs' human and relational capital affect early internationalization? A cross-regional comparison. *European Journal of International Management* - 3. 10.1504/EJIM.2009.024322

Feldman, M., Francis, J. and Bercovitz, J. (2005). Creating a cluster while building a firm: Entrepreneurs and the formation of industrial clusters. *Regional Studies*, 39, 129–141. 10.1080/0034340052000320888

Fernhaber, S., McDougall-Covin, P. and Shepherd, D. (2009). International entrepreneurship: Leveraging internal and external knowledge sources. *Strategic Entrepreneurship Journal*, 3, 297–320. 10.1002/sej.76

Fernhaber, S. and Li, D. (2013). International exposure through network relationships: Implications for new venture internationalization. *Journal of Business Venturing*, 28, 316–334. 10.1016/j.jbusvent.2012.05.002

Ferraris, A., Mazzoleni, A., Devalle, A. and Couturier, J. (2018). Big data analytics capabilities and knowledge management: Impact on firm performance. *Management Decision*, Vol. 57, No. 8, pp. 1923–1936. doi: 10.1108/MD-07-2018-0825

Filou, E. (2006). Nestle's perfect start-up. *Management Today.* managementtoday.co.uk/nestles-perfect-start-up/article/560603

Frank, A.G., Mendes, G.H.S., Ayala, N.F. and Ghezzi, A. (2019). Servitization and industry 4.0 convergence in the digital transformation of product firms: A business model innovation

perspective. *Technological Forecasting and Social Change*, July 2018:0–1. doi:10.1016/j.techfore.2019.01.014

Freeman, S. and Cavusgil, S.T. (2007). Toward a typology of commitment states among managers of born-global firms: A study of accelerated internationalization. *J Int Mark*, 15(4), 1–40.

Freeman, S., Edwards, R. and Schroder, B. (2006). How smaller born-global firms use networks and alliances to overcome constraints to rapid internationalization. *Journal of International Marketing*, 14, 33–63. 10.1509/jimk.14.3.33

Friedman, T.L. (2005). The world is flat: A brief history of the twenty-first century. Farrar, Straus and Giroux. ISBN 0-374-29288-4.

Gabrielsson, M. and Kirpalani, M. (2004). Born globals: How to reach new business space rapidly. *International Business Review*, Vol. 13, Issue 5, pp. 555–571.

Gabrielsson, M., Kirpalani, M., Dimitratos, P., Solberg, C.A. and Zucchella, A. (2008). Born globals: Propositions to help advance the theory. *International Business Review*, Vol. 17, Issue 4, pp. 385–401. ISSN 0969-5931, doi.org/10.1016/j.ibusrev.2008.02.015

Gabrielsson, M. and Gabrielsson, P. (2011). Internet-based sales channel strategies of born-global firms. *International Business Review*, Vol. 20(1), pp. 88–99, February.

Gabrielsson, P. and Gabrielsson, M. (2013). A dynamic model of growth phases and survival in international business-to-business new ventures: The moderating effect of decision-making logic. Industrial Marketing Managemen, 42, 1357–1373. doi: 10.1016/j.indmarman.2013.07.011

Grant, R.M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17, 109–122.

Gregorio, D., Musteen, M. and Thomas, D. (2008). International new ventures: The cross-border nexus of individuals and opportunities. *Journal of World Business*, 43, 186–196. 10.1016/j.jwb.2007.11.013

Hagen, B., Denicolai, S. and Zucchella, A. (2014). International entrepreneurship at the crossroads between innovation and internationalization. *J Int Entrep*, 12, 111–114. https://doi.org/10.1007/s10843-014-0130-8

Hagen, B. and Zucchella, A. (2014). Born global or born to run? The long-term growth of born global firms. *Management International Review*, 54, 497–525. 10.1007/s11575-014-0214-7

Halinen, A. and Törnroos, J.-Å. (1998). The role of embeddedness in the evolution of business networks. *Scandinavian Journal of Management*, Vol. 14, Issue 3, 1998, pp. 187–205. ISSN 0956-5221, https://doi.org/10.1016/S0956-5221(98)80009-2

Hallowell, R. (2001). "Scalability": The paradox of human resources in e-commerce. *International Journal of Service Industry Management*, 12, 34–43. 10.1108/09564230110694820

Harris, S. and Wheeler, C. (2005). Entrepreneurs' relationships for internationalization: Functions, origins and strategies. *International Business Review*, 14, 187–207. 10.1016/j.ibusrev.2004.04.008

Hedlund, G. (1994). A model of knowledge management and the n-form corporation. *Strategic Management Journal*, 15, 73–90. https://doi.org/10.1002/smj.4250151006

Hess, T., Matt, C., Benlian, A. and Wiesböck, F. (2016). Options for formulating a digital transformation strategy. *MIS Quarterly Executive*, 15, 123–139.

Hite, J.M. (1999). Embedded network ties of emerging entrepreneurial firms: Patterns, processes, and evolutionary paths. Unpublished doctoral dissertation, The University of Utah, USA.

Hite, J. and Hesterly, W. (2001). The evolution of firm networks: From emergence to early growth of the firm. *Strategic Management Journal*, 22, 275–286. 10.1002/smj.156

Hymer, S.H. (1976). *The international operations of national firms: A study of direct foreign investment*. Cambridge: MIT Press.

Iansiti, M. and Levien, R. (2004). Strategy as ecology. *Harvard Business Review* (March), 68–78.

Ibarra, H. (1993). Network centrality, power and innovation involvement: Determinants of technical and administrative roles. *Academy of Management Journal*, 36(3), 471–501.

Ivankova, N., Creswell, J. and Stick, S. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field Methods*, 18, 3–20. 10.1177/1525822X05282260

Jantunen, A., Nummela, N., Puumalainen, K. and Saarenketo, S. (2008). Strategic orientations of born globals – Do they really matter? *Journal of World Business*, 43, 158–170. 10.1016/j.jwb.2007.11.015

Jeschke, S., Brecher, C., Meisen, T., Özdemir, D. and Eschert, T. (2017). Industrial internet of things and cyber manufacturing systems. In Jeschke, S., Brecher, C., Song, H. and Rawat, D. (Eds.), *Industrial internet of things*. Springer Series in Wireless Technology. Springer, Cham.

Jiménez-Jiménez, D., Martínez-Costa, M. and Sanz-Valle, R. (2014). Knowledge management practices for innovation: A multinational corporation's perspective, *Journal of Knowledge Management*, Vol. 18, No. 5, pp. 905–918. doi: 10.1108/JKM-06-2014-0242

Johanson, J. and Mattsson, L. (1992). Network positions and strategic actions – An analytical framework. In B. Axelsson and G. Easton (Eds.), *Industrial networks: A new view of reality.* Routledge: London, pp. 205–217.

Johanson, J. and Vahlne, J.E. (1977). The internationalization process of the firm: A model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies*, 8(1), 23–32.

Johanson, J. and Vahlne, J.E. (1990). The mechanism of internationalization. *International Marketing Review*, 7(4), 11–24.

Johanson, J. and Vahlne, J.E. (2006). Commitment and opportunity development in the internationalization process: A note on the Uppsala internationalization process model. *Management International Review*, 46(2), 1–14.

Johanson, J. and Vahlne, J.E. (2009). The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership. *J Int Bus Stud*, 40, 1411–1431. https://doi.org/10.1057/jibs.2009.24

Jolly, V.K., Alahunta, M. and Jeannet, J.P. (1992). Challenging the incumbents: How high technology start-ups compete globally. *J. Strateg. Chang*., 1(2) (1992), pp. 71–82.

Kane, G., Palmer, D., Phillips, A. and Kiron, D. (2015). Is your business ready for a digital future? *MIT Sloan Management Review*, 56, 37–44.

Karra, A.N., Nelson, J. and Tracey, P. (2008). Building the born global firm: Developing entrepreneurial capabilities for international new venture success. *Long Range Planning*, 41(4), 440–458.

Katila, R. and Ahuja, G. (2002). Something old, something new: A longitudinal study of search behavior and new product introduction. *The Academy of Management Journal*, Vol. 45, No. 6 (Dec, 2002), pp. 1183–1194.

Kelley, D. (2009). Adaptation and organizational connectedness in corporate radical innovation programs. *Product Innovation Program*, Vol. 26, Issue 5, September 2009, pp. 487–501.

Killing, P.J. (2003). Nestle's GLOBE program (A): The early months. *IMD*, 3, 1334.

Kimberly, J.R. (1976). Issues in the design of longitudinal organizational research. *Sociological Methods & Research*, 4(3), 321–348. doi:10.1177/004912417600400303

Kiss, A.N., Danis, W.M. and Cavusgil, S.T. (2012). International entrepreneurship research in emerging economies: A critical review and research agenda. *Journal of Business Venturing*, 27(2), 266–190.

Knight, G. (2000). Entrepreneurship and marketing strategy: The SME under globalization. *Journal of International Marketing*, 8(2), 12–32.

Knight, G. and Cavusgil, S. (1996). The born global firm: A challenge to traditional internationalization theory. *Advances in International Marketing*, 8, 11–26.

Knight, G. and Cavusgil, S. (2004). Innovation, organizational capabilities, and the born-global firm. *J Int Bus Stud*, 35, 124–141. https://doi.org/10.1057/palgrave.jibs.8400071

Knight, G. and Cavusgil, S.T. (2005). A taxonomy of born-global firms. *Management International Review*, 45(3), 15–35.

Knight, G.A., Madsen, T.K. and Servais, P. (2004). An inquiry into born-global firms in Europe and the USA, *Int. Mark. Rev*., 21(6), pp. 645–665.

Kogut, B. and Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science*, 3. 10.1287/orsc.3.3.383

Kontinen, T. and Ojala, A. (2011). International opportunity recognition among small and medium-sized family firms. *Journal of Small Business Management*, 49, 490–514. 10.1111/j.1540-627X.2011.00326.x

Koryak, O., Lockett, A., Hayton, J., Nicolaou, N. and Mole, K. (2018). Disentangling the antecedents of ambidexterity: Exploration and exploitation. *Research Policy*, Vol. 47, Issue 2, pp. 413–427.

Kraus, S., Rigtering, J.C., Hughes, M. and Hosman, V. (2012). Entrepreneurial orientation and the business performance of SMEs: A quantitative study from the Netherlands. *Review of Managerial Science*, 6(2), 161–182.

Kreiser, P.M., Marino, L.D. and Weaver, K.M. (2002). Assessing the psychometric properties of the entrepreneurial orientation scale: A multi-country analysis. *Entrepreneurship Theory and Practice*, 26(4), 71–93.

Kuemmerle, W. (2002). Home base and knowledge management in international ventures. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship. Available at SSRN: https://ssrn.com/abstract=1513066

Kuivalainen, O., Sundqvist, S. and Servais, P. (2007). Firms' degree of born-globalness, international entrepreneurial orientation and export performance. *Journal of World Business*, Vol. 42(3), pp. 253–267, September.

Kuivalainen, O., Sundqvist, S., Saarenketo, S. and McNaughton, R. (2012). Internationalization patterns of small and medium-sized enterprises. *International Marketing Review*, 29, 448–465. doi:10.1108/02651331211260331

Larson, A. and Starr, J.A. (1993). A network model of organization formation. *Entrepreneurship Theory and Practice*, 17(2), 5–15. doi:10.1177/104225879301700201

Laursen, K. and Salter, A. (2005). Open for innovation: The role of openness in explaining innovation performance among U.K. manufacturing firms. *Strategic Management Journal.* Volume 27, Issue 2, pp. 131–150.

Lavie, D. (2005). Capability reconfiguration: An analysis of incumbent responses to technological change. *Academy of Management Review*, 31. 10.5465/AMR.2006.19379629

Lee, S.M. and Peterson, S.J. (2000). Culture, entrepreneurial orientation, and global competitiveness. *Journal of World Business*, 35(4), 401–416.

Leiponen, A. (2002). Why do firms not collaborate? The role of competencies and technological regimes. doi:10.1057/9780230595880_11

Lenz, L., Pomp, A., Meisen, T. and Jeschke, S. (2006). How will the internet of things and big data analytics impact the education of learning-disabled students? A concept paper, 2016, 3rd MEC International Conference on Big Data and Smart City (ICBDSC), Muscat, Oman, pp. 1–7, doi: 10.1109/ICBDSC.2016.7460389

Lepak, D., Smith, K. and Taylor, S. (2007). Value creation and value capture: A multilevel perspective. *The Academy of Management Review*, Vol. 32, No. 1 (Jan, 2007), pp. 180–194.

Liesch, P. and Knight, G. (1999). Information internalization and hurdle rates in small and medium enterprise internationalization. *Journal of International Business Studies*, 30, Issue 2, pp. 383–394.

Loane, S. and Bell, J. (2006). Rapid internationalisation among entrepreneurial firms in Australia, Canada, Ireland and New Zealand: An extension to the network approach, *International Marketing Review*, Vol. 23, No. 5, pp. 467–485. doi.org/10.1108/02651330610703409

London Business School. (2007). Deliveroo: From innovative start-up to global business, https://www.london.edu/news/how-deliveroo-went-from-innovative-startup-to-global-business-1328

Lu, J.W. and Beamish, P.W. (2001). The internationalization and performance of SMEs. *Strategic Management Journal*, 565–586. doi.org/10.1002/smj.184

Lumpkin, G.T. and Dess, G.G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review*, Vol. 21, No. 1, Articles.

Lumpkin, G.T. and Lichtenstein, B.B. (2005). The role of organizational learning in the opportunity-recognition process. *Entrepreneurship Theory and Practice*, 29(4),451–472. doi:10.1111/j.1540-6520.2005.00093.x

Madsen, T.K. and Servais, P. (1997). The internationalization of born globals: An evolutionary process? *International Business Review*, 6, 561–583. http://dx.doi.org/10.1016/S0969-5931(97)00032-2

Mainela, T, Puhakka, V. and Servais, P. (2014). The concept of international opportunity in international entrepreneurship: A review and a research agenda. International *Journal of Management Review*, Vol 16. Issue n. 1, pp. 105-129

Markides, C. and Oyon, D. (2000). Changing the strategy at Nespresso: An interview with former CEO Jean-Paul Gaillard. *European Management Journal*, 18, 296–301.

Mathews, J. and Zander, I. (2007). The international entrepreneurial dynamics of accelerated internationalisation. *J Int Bus Stud*, 38, 387–403. doi.org/10.1057/palgrave.jibs.8400271

McDougall, P. (1989). International versus domestic entrepreneurship: New venture strategic behavior and industry structure. *Journal of Business Venturing*, 4, Issue 6, pp. 387–400. https://EconPapers.repec.org/RePEc:eee:jbvent:v:4:y:1989:i:6:p:387-400

McDougall, P., Shane, S. and Oviatt, B. (1994). Explaining the formation of international new ventures: The limits of theories from international business research. *Journal of Business Venturing*, 9, 469–487.

McDougall, P. and Oviatt, B. (2000). International entrepreneurship: The intersection of two research paths. *The Academy of Management Journal*, Vol. 43, No. 5 (Oct, 2000), pp. 902–906.

McDougall, P., Oviatt, B. and Shrader, R. (2003). A comparison of international and domestic new ventures. *Journal of International Entrepreneurship*, 1, 59–82. doi:10.1023/A:1023246622972

McGrath, R.G. (2001). Exploratory learning, innovative capacity and managerial oversight. *The Academy of Management Journal*, Vol. 44, No. 1 (Feb, 2001), pp. 118–131.

McKinsey. (2016). Industry 4.0 after the initial hype. Where manufacturers are finding value and how they can best capture it. https://www.mckinsey.com/~/media/mckinsey/business%20functions/mckinsey%20digital/our%20insights/getting%20the%20most%20out%20of%20industry%204%200/mckinsey_industry_40_2016.ashx

Mintzberg, H. (1979). *The structuring of organizations*. Englewood Cliffs, NJ: Prentice Hall.

Moen, O. and Servais, P. (2002). Born global or gradual global? Examining the export behavior of small and medium-sized enterprises. *J Int Mark*, 10(3), 49–72.

Mort, O. and Weerawardenea, J. (2006). Networking capability and international entrepreneurship: How networks function in Australian Born Global firms. *International Marketing Review*, 549–572.

Neubert, M. (2017). Lean internationalization: How to globalize early and fast in a small economy. *Technology Innovation Management Review*, 7(5), 16–22. http://timreview.ca/article/1073

Nielsen, C. and Lund, M. (2015). The concept of business model scalability. *SSRN Electronic Journal*, 1. 10.2139/ssrn.2575962

Nielsen, C. and Lund, M. (2018). Building scalable business models. *MIT Sloan Management Review*, 59, 65–69.

Nonaka, I. (1991). The knowledge creating company. *Harvard Business Review*, 69 (Nov–Dec), 96–104.

Nowiński, W. and Rialp, C.A. (2013). Drivers and strategies of international new ventures from a Central European transition economy. *Journal for East European Management Studies*, 18, 191–231. 10.5771/0949-6181-2013-2-191

Nummela, N., Saarenketo, S. and Puumalainen, K. (2009). A global mindset - A prerequisite for successful internationalization? *Canadian Journal of Administrative Sciences / Revue Canadienne des Sciences de l'Administration*, 21, 51–64. 10.1111/j.1936-4490.2004.tb00322

Ojala, A. (2009). Internationalization of knowledge-intensive SMEs: The role of network relationships in the entry to a psychically distant market. *International Business Review*, 18, 50–59. https://doi.org/10.1016/j.ibusrev.2008.10.002

Ojala, A., Evers, N., Rialp, A. and Criado, Alex. (2018). Extending the international new venture phenomenon to digital platform providers: A longitudinal case study. *Journal of World Business.* 10.1016/j.jwb.2018.05.001

Oparaocha, G.O. (2015). SMEs and international entrepreneurship: An institutional network perspective. *International Business Review*, Vol. 24(5), pp. 861–873.

O'Reilly, C.A. and Tushman, M.L. (2013). Organizational ambidexterity: Past, present and future. *Academy of Management Perspectives*, Vol. 27, No. 4 (November 2013), pp. 324–338.

Oviatt, B. and McDougall, P. (1991). Global start-ups: New ventures without geographic limits. *The Entrepreneurship Forum*, Winter, 1–5.

Oviatt, B. and McDougall, P. (1994). Toward a theory of international new ventures. *J Int Bus Stud*, 25, 45–64. https://doi.org/10.1057/palgrave.jibs.8490193

Oviatt, B.M. and McDougall, P.P. (1995). Global start-ups: Entrepreneurs on a worldwide stage. *The Academy of Management Executive*, 9, 30–44.

Oviatt, B.M. and McDougall, P.P. (2005). Defining international entrepreneurship and modeling the speed of internationalization. *Entrepreneurship and Theory and Practice*, 29(5), 537–553.

Parente, R., Geleilate, J.M. and Rong, K. (2018). The sharing economy globalization phenomenon: A research agenda. *Journal of International Management*, 24, Issue 1, pp. 52–64. https://EconPapers.repec.org/RePEc:eee:intman:v:24:y:2018:i:1:p:52-64

Parker, G.G., Van Alstyne, M.W. and Choudary, S.P. (2016). *Platform revolution: How networked markets are transforming the economy and how to make them work for you*. New York: W.W. Norton & Company.

Penrose, E.T. (1959). *The theory of the growth of the firm*. New York: John Wiley.

Pittaway, L., Robertson, M., Munir, K., Denyer, D. and Neely, A. (2004). Networking and innovation: A systematic review of the evidence. *International Journal of Management Review*, 5, 137–168. 10.1111/j.1460-8545.2004.00101.x

Polanyi, M. (1962). *Personal knowledge: Towards a post-critical philosophy*. Chicago, IL: University of Chicago.

Porter, M.E. (1985). *Competitive advantage. Creating and sustaining superior performance*. New York: Free Press, p. 557.

Porter, M.E. (1989). From competitive advantage to corporate strategy. In D. Asch and C. Bowman (Eds.), *Readings in Strategic Management.* London: Palgrave. https://doi.org/10.1007/978-1-349-20317-8_17.

Porter, M.E. and Heppelmann, J.E. (2014). How smart, connected products are transforming companies. *Harvard Business Review*, November 2014.

Powell, W. (1990). Neither market nor hierarchy: Network forms of organization. *Research in Organizational Behaviour*, 12, 295–336.

Prashantham, S. and Dhanaraj, C. (2010). The dynamic influence of social capital on the international growth of new ventures. *Journal of Management Studies*, Volume 47, Issue 6, September, pp. 967–994. doi.org/10.1111/j.1467-6486.2009.00904.x

Prashantham, S. and Young, S. (2011). Post-entry speed of international new ventures. *Entrepreneurship: Theory & Practice*, 35. 10.1111/j.1540-6520.2009.00360.x

Pucic, T. (2006). The secret of Deliveroo. *Arabian Business*. https://www.arabianbusiness.com/the-secret-of-deliveroo-s-rapid-growth-627011.html

Pudwell, S. (2017). Food delivery firm relies heavily on data and machine learning to increase efficiency. *Silicon.* https://www.silicon.co.uk/data-storage/bigdata/deliveroo-big-data-deliveries-216163

Putnam, R.D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy* 6(1), 65–78.

Ramsey, E., Ibbotson, P., Bell, J. and Mccole, P. (2005). Internet-based business among knowledge-intensive business services: Some Irish regional evidence. *The Service Industries Journal*, 25(4), 525–545, doi: 10.1080/02642060500092337

Rasmussen, E., Madsen, T. and Evangelista, F. (2001). The founding of the Born Global company in Denmark and Australia: Sensemaking and networking. *Asia Pacific Journal of Marketing and Logistics*, 13, 75–107. 10.1108/13555850110764793

Reese, P.R. and Aldrich, H.E. (1995). Entrepreneurial networks and business performance: A panel study of small and medium-sized firms in the research triangle. In S. Birley and I.C. MacMillan (Eds.), *International Entrepreneurship*. London: Routledge, pp. 124–144.

Reid, S. (1983). Firm internationalization, transaction costs and strategic choice. *International Marketing Review*, Vol. 1, No. 2, pp. 44–56. https://doi.org/10.1108/eb008251

Rennie, M.W. (1993). Global competitiveness: Born global. *The McKinsey Quarterly*, 4, 45–52.

Reuber, A. and Fischer, E. (2011). International entrepreneurship in internet-enabled markets. *Journal of Business Venturing*, 26, 660–679. 10.1016/j.jbusvent.2011.05.002

Rialp, A., Rialp, J. and Eusebio, R. (2003). Conceptual frameworks in foreign entry modes: A review and comparison of the contemporary literature. *Marketing Science*, 2003 - AMS; 1999.

Rialp, A., Rialp, J. and Knight, G. (2005a). The phenomenon of early internationalizing firms: What do we know after a decade (1993–2003) of scientific inquiry? *Int Bus Rev*, 14(2),147–166.

Rialp, A., Rialp, J., Urbano, D. and Vaillant, X. (2005b). The born-global phenomenon: A comparative case study research. *Journal of International Entrepreneurship*, Vol. 3(2), pp. 133–171, June.

Rialp, A., Rialp, J. and Knight, G.A. (2014). International entrepreneurship: A review and future directions. In S.A. Fernhaber and S. Prashantham (Eds.), *The Routledge Companion to International Entrepreneurship*. London, UK: Routledge, pp. 7–28. ISBN 9780415829199

Ripollés, M. and Blesa, A. (2012). International new ventures as "small multinationals": The importance of marketing capabilities. *Journal of World Business*, 47, 277–287. https://doi.org/10.1016/j.jwb.2011.04.015

Ritter, T., Wilkinson, I.F. and Johnston, W.J. (2002). Measuring network competence: Some international evidence. *J Bus Ind Mark*, 17(2/3),119–138.

Ritter, T., Wilkinson, I. and Johnston, W. (2003). Managing in complex business networks. *Industrial Marketing Management*, 33, 175–183. 10.1016/j.indmarman.2003.10.016

Sapienza, H., Autio, E., George, G. and Zahara, S. (2006). A capabilities perspective on the effects of early internationalization on firm survival and growth. *Academy of Management Review*, 31(4), 914–933. Research Collection, Lee Kong Chian School of Business.

Sasi, V. and Arenius, P. (2008). International new ventures and social networks: Advantage or liability? *European Management Journal*, 26, 400–411. 10.1016/j.emj.2008.09.008

Scuotto, V., Del Giudice, M., Bresciani, S. and Meissner, D. (2017). Knowledge-driven preferences in informal inbound open innovation modes. An explorative view on small to medium enterprises. *Journal of Knowledge Management*, Vol. 21, No. 3, pp. 640–655. doi: 10.1108/JKM-10-2016-0465

Sedziniauskiene, R, Sekliuckiene, J. and Zucchella, A.. (2019). Networks' impact on the entrepreneurial internationalization: A literature review and research agenda. *Management International Review*, 59. 10.1007/s11575-019-00395-6

Serrat, O. (2017). Notions of knowledge management. In *Knowledge Solutions*. Singapore: Springer. https://doi.org/10.1007/978-981-10-0983-9_30

Servais, P., Zucchella, A. and Palamara, G. (2006). International entrepreneurship and sourcing: International value chain of small firms. *Journal of Euromarketing*, 16, 105–117. 10.1300/J037v16n01_08

Shane, S. (2000). Prior knowledge and the discovery of entrepreneurial opportunities. *Organization Science*, 11(4), 448–469.

Sharma, D. and Blomstermo, A. (2003). The internationalization process of born globals: A network view. *International Business Review*, 12, 739–753. 10.1016/j.ibusrev.2003.05.002

Shepherd, D. and DeTienne, D. (2005). Prior knowledge, potential financial reward, and opportunity identification. *Entrepreneurship Theory and Practice*, Vol. 29, Issue 1, 2005.

Shrader, R., Oviatt, B. and McDougall, P. (2000). How new ventures exploit trade-offs among international risk factors: Lessons for the accelerated antiunionization of the 21st century. *Academy of Management Journal*, 43, 1227–1247. 10.5465/1556347

Siggelkow, N. and Levinthal, D. (2003). Temporarily divide to conquer: Centralized, decentralized, and reintegrated organizational approaches to exploration and adaptation. *Organization Science*, 14(6), 650–669.

Siggelkow, N. and Terwiesch, C. (2019a). Book highlight: The efficiency frontier. *GBOE*, 38, 61– 69. https://doi.org/10.1002/joe.21968

Siggelkow, N. and Terwiesch, C. (2019b). The age of continuous connection. *Harvard Business Review*, May–June issue, pp. 64–73.

Singh, R.P., Hills, G.E., Hybels, R.P. and Lumpkin, G.T. (1999). Opportunity recognition through social network characteristics of entrepreneurs. *Frontiers of Entrepreneurship Research*. Babson College, Wellesley, MA (1999).

Singh, S.K. and Del Giudice, M. (2019). Big data analytics, dynamic capabilities and firm performance. *Management Decision*, Vol. 57, No. 8, pp. 1729–1733. https://doi.org/10.1108/MD-08-2019-020

Soto-Acosta, P., Del Giudice, M. and Scuotto, V. (2018). Emerging issues on business innovation ecosystems: The role of information and communication technologies (ICTs) for knowledge management (KM) and innovation within and among enterprises. *Baltic Journal of Management*, Vol. 13, No. 3, pp. 298–302.

Stampfl, G., Prügl, R. and Osterloh, V. (2013). An explorative model of business model scalability. *International Journal of Product Development*, 18, 226–248. 10.1504/IJPD.2013.055014

Strandskov, J. (1993). Towards a new approach for studying the internationalization process of firms. In P.J. Buckley and P. Ghauri (Eds.), *The internationalization of the firm: A reader*. London: Academic Press Ltd, pp. 201–16.

Taylor, M. and Jack, R. (2013). Understanding the pace, scale and pattern of firm internationalization: An extension of the "born global" concept. *International Small Business Journal*, 31, 701–721. 10.1177/0266242611431992

Teece, D. (2007). Explicating dynamic capabilities: The nature and micro foundations of (sustainable) enterprise performance. *Strategic Management Journal*, Vol. 28, No. 13 (Dec, 2007), pp. 1319–1350.

Teece, D. (2010). Business models, business strategy and innovation. *Long Range Planning*, Vol. 43, Issues 2–3, pp. 172–194. ISSN 0024-6301

Turnbull, P.W. (1987). Interaction and international marketing: An investment process. *International Marketing Review*, Vol. 4, No. 4, pp. 7–19. https://doi.org/10.1108/eb008338

Tushman, M. and O'Reilly, C.A. (1996). Ambidextrous organizations: Managing evolutionary and revolutionary change. *California Management Review*, 38, 28–80.

Tushman, M.L. and O'Reilly, C.A. (2013). Organizational ambidexterity: Past, present and future. *Academy of Management Perspectives*, Vol. 27, No. 4 (Nov. 2013), pp. 324–338.

Un, C., Birkinshaw, J. and Hagström, P. (2001). The flexible firm: Capability management in network organizations. *Administrative Science Quarterly*, 46, 787. 10.2307/3094837

Uzzi, B. (1996). The sources and consequences of embeddedness for the economic performance of organizations: The network effect. *American Sociological Review*, 61(4), 674–698. doi:10.2307/2096399

Vahlne, J.J. and Johanson, J.E. (2003). Business relationship learning and commitment in the internationalization process. *Journal of International Entrepreneurship*, 1, 83–101. 10.1023/A:1023219207042

Vanhaverbeke, W. and Chesbrough, H. (2014). A classification of open innovation and open business models. In H. Chesbrough, W. Vanhaverbeke and J. West (Eds.), *New frontiers in open innovation*. Oxford: Oxford University Press, pp. 50–68.

Vasilchenko, E. and Morrish, S. (2011). The role of entrepreneurial networks in the exploration and exploitation of internationalization opportunities by information and communication technology firms. *Journal of International Marketing*, 19(4), 88–105. https://doi.org/10.1509/jim.10.0134

Veglio, V. and Zucchella, A. (2015). Entrepreneurial firms in traditional industries. Does innovation matter for international growth? *Journal of International Entrepreneurship*, 13(2), 138–152.

Venkataraman, S. (1997). The distinctive domain of entrepreneurship research. *Advances in Entrepreneurship, Firm Emergence and Growth*, 3.

Vlas, R. and Vlas, C. (2016). The role of internal and network constraints on alliance ambidexterity decisions in technology intensive industries. *Asia Pacific Journal of Information Systems*, 26(2), 299–321. https://doi.org/10.14329/apjis.2016.26.2.299

Von Hippel, E. (1986). Lead users: A source of novel product concepts. *Management Science*, 32, Issue 7, pp. 791–805. https://EconPapers.repec.org/RePEc:inm:ormnsc:v:32:y:1986:i:7:p:791-805

Voss, G. and Voss, Z. (2013). Strategic ambidexterity in small and medium-sized enterprises: Implementing exploration and exploitation in product and market domains. *Organization Science*, 24, 1459–1477. 10.1287/orsc.1120.0790

Vrontis, D., Thrassou, A. and Santoro, G. (2017). Ambidexterity, external knowledge and performance in knowledge-intensive firms. *J Technol Transf*, 42, 374–388.

Weerawardena, J., Sullivan, M., Gillian, L.P. and Knight, G. (2007). Conceptualizing accelerated internationalization in the born global firm: A dynamic capabilities perspective. *Journal of World Business*, 42, 294–306. 10.1016/j.jwb.2007.04.004

Welch, L. and Luostarinen, R. (1988). Internationalization: Evolution of a concept. Journal of General Management, 14. 155-171. 10.1177/030630708801400203.

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, Vol. 5, No. 2. (Apr–Jun, 1984), pp. 171–180.

Wright, R.W. and Ricks, D.A. (1994). Trends in international business research: Twenty-five years later. *Journal of International Business Studies*, 25, 687–701. https://doi.org/10.1057/palgrave.jibs.8490219

Yadong, L. (1999). International strategy and subsidiary performance in China. *Thunderbird International Review*, Vol. 41, Issue 2, March/April 1999, pp. 153–178.

Yang, S., Keller, F. and Zheng, L. (2017). *Social network analysis*. Sage Publications Inc.https://www.doi.org/10.4135/9781071802847

Yeoh, P.-L. (2000). Information acquisition activities: A study of global start-up exporting companies. *Journal of International Marketing*, 8, 36–60.

Yin, R.K. (1994). *Case study research design and methods: Applied social research and methods series* (2nd edition). Thousand Oaks, CA: Sage Publications Inc.

Yin, R.K. (1998). The abridged version of case study research: Design and method. In L. Bickman and D.J. Rog (Eds.), *Handbook of applied social research methods*. SAGE Publications Inc., pp. 229–259.

Yin, R.K. (2003). *Case study research: Design and methods*. Thousand Oaks, California: Sage.

Yin, R.K. (2018). *Case study research and applications* (6th edition). Los Angeles: Sage.

Yip, G., Biscarri, J.G. and Monti J. (2000). The role of the internationalization process in the performance of newly internationalizing firms. *Journal of International Marketing*. https://doi.org/10.1509/jimk.8.3.10.19635

Yoon, J., Kim, K.K. and Dedahanov, A.T. (2018). The role of international entrepreneurial orientation in successful internationalization from the network capability perspective. *Sustainability*, 10, 6, 1709. https://doi.org/10.3390/su10061709

Yoon, J., Sung, S. and Ryu, D. (2020). The role of networks in improving international performance and competitiveness: Perspective view of open innovation. *Sustainability*, MDPI, open access journal, Vol. 12(3), pp. 1–16, February.

Yu, J., Gilbert, B. and Oviatt, B. (2011). Effects of alliances, time, and network cohesion on the initiation of foreign sales by new ventures. *Strategic Management Journal*, 32, 424–446. 10.1002/smj.884

Yu, T., Lu, L. and Liu, T. (2010). Exploring factors that influence knowledge sharing behavior via weblogs. *Computers in Human Behavior*, Vol. 26, 32–41. 10.1016/j.chb.2009.08.002

Zacharakis, A. (1997). Entrepreneurial entry into foreign markets: A transaction cost perspective. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship. Available at SSRN: https://ssrn.com/abstract=1506373

Zahara, S., Ireland, R. and Hitt, M. (2000). International expansion by new venture firms: International diversity, mode of market entry, technological learning, and performance. *Academy of Management Journal*, 43, 925–950. 10.2307/1556420.

Zahara, S.A, Korri, J. and Yu, J. (2005). Cognition and international entrepreneurship: Implications for research on international opportunity recognition and exploitation. *Int Bus Rev*, 14(2),129–146. doi:10.1016/j.ibusrev.2004.04.005

Zaheer, S. (1995). Overcoming the liability of foreignness. *Academy of Management Journal*, 38, 341–363.

Zain, M. and Ng, S. (2006). The impacts of network relationships on SMEs' internationalization process. *Thunderbird International Business Review*, 48, 183–206.

Zhang, M. and Tansuhaj, P.S. (2007). Organizational culture, information technology capability, and performance: The case of born global firms. *Multinational Business Review*, Vol. 15, No. 3, pp. 43–78. https://doi.org/10.1108/1525383X200700012

Zhang, H., Wu, F. and Cui, A.S. (2015). Balancing market exploration and market exploitation in product innovation: A contingency perspective. *Int. Journal of Research in Marketing*, 32, pp. 297–308.

Zhou, L. (2007). The effects of entrepreneurial proclivity and foreign market knowledge on early internationalization. *J World Bus*, 42(3), 281–293.

Zhou, L, Wu, W. and Luo, X. (2007). Internationalization and the performance of born-global SMEs: The mediating role of social networks. *Journal of International Business Studies*, 38, Issue 4, pp. 673–690. https://EconPapers.repec.org/RePEc:pal:jintbs:v:38:y:2007:i:4:p:673-690

Zott, C. and Amit, R. (2010). Business model design: An activity system perspective. *Long Range Planning*, 43, 216–226. 10.1016/j.lrp.2009.07.004

Zott, C. and Amit, R. (2013). The business model: A theoretically anchored robust construct for strategic analysis. Strategic Organization, 11(4), 403–411. doi:10.1177/1476127013510466

Zucchella, A., Palamara, G. and Denicolai, S. (2007). The drivers of the early internationalization of the firm. *Journal of World Business*, 42, Issue 3, pp. 268–280. https://EconPapers.repec.org/RePEc:eee:worbus:v:42:y:2007:i:3:p:268-280

Zysman, J. (2016). The rise of the platform economy, National Academies of Sciences, Engineering, and Medicine at the University of Texas at Dallas Arizona State University, Spring 2016.

Zysman, J. and Kenney, M. (2014). Choosing a future in the platform economy: The implications and consequences of digital platforms. Kauffman Foundation New Entrepreneurial Growth Conference, discussion paper.