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Learn How to Experiment: The Development of a Corporate Accelerator

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By

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The candidate confirms that the work submitted is his own and that appropriate credit has been given where reference has been made to the work of others.

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Abstract

Incumbent high technology organizations' responses when facing digital disruption present an important area for research in the field of strategy and innovation management. In times of increasing environmental dynamism and uncertainty, these firms, which previously have relied on strong capabilities in research and development, supported by experiential learning, find themselves unable to learn about new markets and technologies in a satisfactory pace. This study argues that these firms must learn to experiment in order to facilitate development of new businesses, thus enabling organizational renewal and adaptation to the changing environment. As little is known about how incumbents may achieve this undertaking, this thesis sets out to answer the following question:

How do large established firms learn how to experiment in order to develop new businesses?

Through an in-depth case study of a large multinational telecommunications company, I follow the establishment of a corporate accelerator aimed to support systematic experimentation-driven venturing in new strategic business areas. The study draws on multiple sources of data, including field observations, interviews and archival data. The findings, which amount to a grounded model depicting the process of learning how to experiment, are discussed in the light of corporate entrepreneurship theory, the emerging literature on accelerators as enablers of experimentational learning, and organizational learning literature.

I identify six distinct learning mechanisms that transpire partly in parallel, partly sequentially over three distinct phases. These learning mechanisms are referred to as (1) schematic arms-length vicarious learning; (2) coactive vicarious learning; (3) unlearning of conflicting corporate practices; (4) replication across the organization; (5) deliberate learning; and (6) adaptive replication of corporate practices.

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Abbreviations

Abbreviation	Key term
AD	Archival Document
AI	Artificial Intelligence
BTEB	Business Unit Technology and Emerging Business
BU	Business Unit
CE	Corporate Entrepreneurship
CEO	Chief Executive Officer
CSP	Connectivity Service Provider
CTO	Chief Technology Officer
CV	Corporate Venturing
CVC	Corporate Venture Capital
DNEW	Development Unit Networks
EO	Entrepreneurial Orientation
FO	Field Observation
GF	Group Function
ICV	Internal Corporate Venturing
IN	Interview
IoT	Internet of Things
IvD	Invention Disclosure
MA	Market Area
NVD	New Venture Division
OTT	Over the Top
RA	Research Area

Chapter 1: Introduction

This thesis investigates a large incumbent firm's development of business experimentation capabilities as a response to the emerging uncertainty and dynamism caused by a technological discontinuity. The effort was manifested through the establishment of a corporate accelerator focused on supporting corporate entrepreneurship, utilizing the lean startup method.

In the area of technology and innovation management, the call for examination of incumbent strategy during times of digital disruption has become increasingly prominent. Incumbent firms' strategic behavior in response to technological discontinuity, such as the upsurge of digital technology, is an important area of investigation as these discontinuities alters the environmental uncertainty and dynamics, structural barriers to entry and mobility between previously distinct industries, scale and scope benefits, and customer preferences (Lavie, 2006; Khanagha *et al.*, 2018). Studying this transitional period is interesting as extant research has demonstrated that it poses substantial challenges to incumbents, yet have so far only provided limited empirical examination of the factors driving variation in their ability to innovate in the new domain (Cohen and Tripsas, 2018). Digitization fundamentally changes the nature of innovation and thus the required innovation capabilities (Yoo *et al.*, 2012). Hence, understanding how incumbents renew their innovation capabilities to respond to such technological shifts is of vital importance. To narrow down this question we must first articulate what exactly it is that incumbent firms need to change about their current ways of driving innovation.

As organizations historically have strived for competitive advantage through technology leadership built on vast experience, large established firms have institutionalized efficient structures and processes to drive research and development (R&D) within the firms (Argyres and Silverman, 2004). The rate of learning and the advantages in innovation derived from such activities are greater when the object of learning relates to current organizational

knowledge (Cohen and Levinthal, 1990). Experiential learning facilitates innovation when production of new products that are similar to existing ones is prioritized (Egelman *et al.*, 2017), and when learning can be transferred between related problem domains (Schilling *et al.*, 2003).

The reliance on experiential learning has however been recognized as problematic amidst dynamic environments. James March and colleagues (Levitt and March, 1988; Levinthal and March, 1993) have repeatedly asserted the difficulty of learning from experience, which arises amidst several conditions, including paucity of experience (e.g. existing firm in new market or new firm in existing market), ambiguity of experience (e.g. existing firm in existing market with environmental turbulence) or a combination of the two. Experiential learning tend to lead to specialization (Levitt and March, 1988), as improvements of frequently used practices increase the performance of these practices, which in turn leads to increased proclivity to use these practices over others. Such reinforcing learning loops risk leading to competency traps (Levitt and March, 1988).

In dynamic environments, a key challenge that incumbents face is that the context in which prior experience has been gained does not always match the context in which it will be applied, which increasingly invalidates learning from past experience (Rockart and Wilson, 2019). When learning environments are distant from the firm's existing value offerings, learning becomes increasingly difficult (Ross, Fisch and Varga, 2018). The environmental dynamism also increase the difficulty of interpreting experience and the risk of bias as the frames within which organizations comprehend events is based on past experiences that may be irrelevant in the new context (Daft and Weick, 1984; Levitt and March, 1988). Learning within such frames can be classified as single-loop learning (Argyris, 1976). When the environmental turbulence renders extant cognitive frames and thus also single-loop learning invalid, organizations instead need to switch to double-loop learning in which such cognitive frames are replaced (Argyris and Schön, 1978).

As a remedy, experimentational learning, managed in a more open and iterative manner have been posited as a more suitable approach during environmental dynamism. As navigating complex environments under times of high uncertainty demand a high degree of strategic flexibility, an experimental approach based on staggered investments and flexible adaptation to environmental changes and emergent insights have been viewed as superior to reliance on experiential learning, tight predictions of the future and ex-ante commitment of resources (Camuffo *et al.*, 2020). Furthermore, in contrast to learning that rely heavily on prior experience and knowledge, experimental learning typically promotes more radical change (Kreiser, 2011).

Such approach has especially been prominent in the field of entrepreneurship where the idea of running experiments followed by strategic pivots in order to effectively launch new ventures has become a central concept (Hampel, Perkmann and Phillips, 2020). This approach enables the venture team to learn in an iterative fashion by engaging in the market environment rather than following a traditional approach of market research and careful planning from the outset (Gans, Stern and Wu, 2019).

Hence, the interest for corporate entrepreneurship (Guth and Ginsberg, 1990) and approaches to enhance the capabilities to support and leverage such processes has risen as an important complement to traditional R&D that offer a way to continuously renew the firms competitive advantage and achieve radical innovation (Corbett *et al.*, 2013).

Increasingly, corporations have adopted alternative organizational forms to support corporate entrepreneurship such as corporate venture capital units (Basu, Phelps and Kotha, 2016), incubators (Becker and Gassmann, 2006; Ford, Garnsey and Probert, 2010), accelerators (Shankar and Shepherd, 2019) and internal corporate venture units (Hill and Birkinshaw, 2008, 2014), models that to some extent take inspiration or are straight off adopted from the entrepreneurial sphere into the corporate context.

While incubators have received increasing attention among scholars in the recent decade (e.g. Ebbers, 2014; Dutt *et al.*, 2016; Tracey, Dalpiaz and Phillips, 2018) and accelerators, which

has been described as a “new generation incubation model” (Pauwels *et al.*, 2016, p. 13) also have gained much attention during the last five years (e.g. Cohen, Bingham and Hallen, 2018; Hallen, Cohen and Bingham, 2020), their corporate counterparts have been neglected apart from a limited number of studies (e.g. Ford, Garnsey and Probert, 2010; Richter, Jackson and Schildhauer, 2018; Shankar and Shepherd, 2019).

The lean startup method (Blank, 2013; Ries and Euchner, 2013; Ries, 2017), which embodies the experimentational approach described above has become an increasingly used organizing framework among accelerator programs (Mansoori, Karlsson and Lundqvist, 2019; cf. Cohen, Bingham and Hallen, 2018). Also, other complementary learning mechanisms are supported by accelerators, which raison d’être is often understood as the facilitation of accelerated venture team learning and mitigation of bounded rationality (Cohen, Bingham and Hallen, 2018).

This hints at the rationale behind the adoption of acceleration practices by corporations. In this study, I view the infusion of such new innovation practices from the entrepreneurial realm that supports experimental learning, as a reconfiguration of capabilities in response to digital disruption. This enables firms to switch from relying on experiential learning, which is effective during times of stability (Levinthal and March, 1993) to experimental learning that is more suitable in a rapidly changing and uncertain environment (Andries, Debackere and Van Looy, 2013).

How then might organizations reconfigure their innovation capabilities, when switching from reliance on experiential learning to experimental learning? Based on prior literature, the learning processes that enable a firm to reconfigure its innovation capabilities in response to a technological discontinuity would be expected to follow a substitutional, evolutional or transformational pattern, which entail distinct learning mechanisms (Lavie, 2006).

Following the Schumpeterian tradition of envisioning technological development as a process of discontinuous change afforded by innovation, technological discontinuities have been

conceptualized as competence-enhancing or competence-destroying (Tushman and Anderson, 1986). While technological discontinuities, such as digital disruption, may be competence destroying (Tushman and Anderson, 1986), turning core competencies into core rigidities (Leonard-Barton, 1992), incumbents may maintain an advantageous market position by possessing complementary assets that partly make up for the effects of competence destruction (Tripsas, 1997). At the same time the incumbent may need to substitute capabilities by developing new ones and discarding old ones (Tushman and Anderson, 1986). Hence, a substitutional view of capability reconfiguration offers acquisition, retention and disposal of capabilities as the viable options (Lavie, 2006).

By viewing capabilities as malleable, the dynamic capability literature (Teece, Pisano and Shuen, 1997; Teece, 2007) offers an alternative path towards renewal, through which capabilities are evolved in an iterative manner through experience accumulation, knowledge articulation and codification, rather than simply retained, acquired, or discarded (Zollo and Winter, 2002). This leads to a path dependent process where the pre-change configuration of capabilities is the strongest determinant of post-change configuration (Helfat and Peteraf, 2003; Lavie, 2006). This evolutionary perspective can be considered more incremental in nature, whereas the substitutional perspective offers a more radical way of changing.

An intermediary response mechanism in which organizations engage in objective-driven capability transformation by acquiring and discarding as well as modifying existing routines and practices has also been suggested as an alternative (Lavie, 2006). In contrast to the evolutionary path towards renewal, this transformational mechanism also entails step-function learning rather than incremental learning (Helfat and Raubitschek, 2000).

However, in the context of renewing innovation capabilities by switching learning mode in response to highly dynamic and uncertain environmental changes caused by digitization, none of these approaches appear to be effective. This is due to the combination of environmental characteristics and inherent nature of innovation capabilities. A highly uncertain environment makes a substitutional approach problematic as it is difficult to predict the optimal capability

configuration a priori (Lavie, 2006). On the other hand, an evolutionary and more probing approach, which is more suitable during high uncertainty may be too slow and also risk inhibiting more radical change that are necessary. Considering the complexity, causal ambiguity, interdependent and embedded nature of innovation capabilities in large high technology firms, the difficulty to decide on a suitable way of reconfiguring capabilities becomes even more evident.

The complex interdependency between various practices and routines that make up current and envisioned capabilities make an evolutionary approach difficult as changes of one element may have chain effects on other elements, thus requiring continuous alterations of a wide array of practices and routines in unpredictable ways. While a substitutional approach solves this by changing an entire set of coherent routines and practices to another equally coherent set, the embeddedness of innovation capabilities and interdependencies with other capabilities make such radical changes difficult (Dupouët and Barlatier, 2019). Such approach may erode the value of interdependent complementary capabilities. This conundrum begs the following question, which is also the research question addressed in this study:

How do large established firms learn how to experiment in order to develop new businesses?

The objectives of this study are to highlight the actions taken by managers across the company in order to enable systematic experimentation, and the underlying rationale behind these actions. Attention is directed to managers with different roles in relation to the efforts of learning how to experiment. Anticipating the progressive nature of learning how to experiment, this study also set out to uncover the sequence and interplay between different learning mechanisms that are involved throughout this learning process and explore the inherent challenges that are encountered throughout this process. The learning mechanisms are distinguished based on the nature of how experiences are generated, the locus of knowledge, and relation between new and extant knowledge.

In an effort to answer the main research question, I study how a Swedish multinational telecommunications company, Telco (pseudonym), developed a corporate accelerator in order to support experimentation-driven exploration and new business development. Telco is a renowned provider of telecommunication infrastructure with a long history of technology leadership. In recent years however it has experienced disruptive threats to its core business, driven by the convergence of telecommunication and information technology (IT). At the same time, new opportunities have been emerging, driven by the rise of the Internet of Things (IoT), which is expected to lead to a vast increase in connected devices. These opportunities are however linked to various industries that are relatively unfamiliar to Telco. The nascent markets that are developing at the intersection between these industries, the telecommunication industry and the IT industry are associated with immense dynamism and uncertainty. The long-established R&D practices that have supported innovation at Telco in the past have been found to be inadequate in this new environment. To enable exploration in this field Telco has in the last years developed practices for experimentation with new businesses through the establishment of a corporate accelerator that supports autonomous corporate venture initiatives.

This in-depth case study uncovers the learning processes involved in this endeavor by drawing on archival data, interviews and field observations covering a period of almost seven years (2013-2020). I take a broad perspective on organizational learning, considering a wide array of learning mechanisms that may be in the repertoire used by organizations as they reconfigure their capabilities to enable experimentation in new business areas. This theoretical lens enables an agnostic view on the organizational learning processes in action as an incumbent firm acquire and develop new practices for experimentation. Thus, I draw on the broad literature on organizational learning as well as the literature on corporate entrepreneurship and entrepreneurial incubators and accelerators and related experimentation practices.

Next, I present the three main streams of literature (Chapter 2) guiding the theoretical framing of this research. I then account for the in-depth case study design that have been used (Chapter 3) followed by a description of the research setting (Chapter 4). The findings are presented (Chapter 5) by chronologically accounting for observed learning mechanisms underlying the acquisition and development of practices for experimental learning. This is supported by a data structure that visualizes the analytical steps and rigorous grounding of the introduced theoretical concepts. Thereafter, I discuss these findings (Chapter 6) by outlining a grounded process model and considering its theoretical underpinnings, novelty and transferability. I also discuss theoretical implications for the three main streams of literature, as well as the implications for practitioners. Finally, I conclude (Chapter 7) by summarizing the overall contribution of this thesis, discussing its limitations and suggesting avenues for further research.

Chapter 2: Literature Review

In this chapter I review different literatures that together have informed this study. The objective of this literature review is to bring together the relevant current academic knowledge about 1) corporate entrepreneurship and in particular the role the corporate venture process play for strategic renewal; 2) entrepreneurial incubators and accelerators and corporate adaptation of such organizational forms and practices, and the role they play in promoting effective learning on the venture- and organizational level; and 3) organizational learning, and the characteristics of different distinct learning mechanisms.

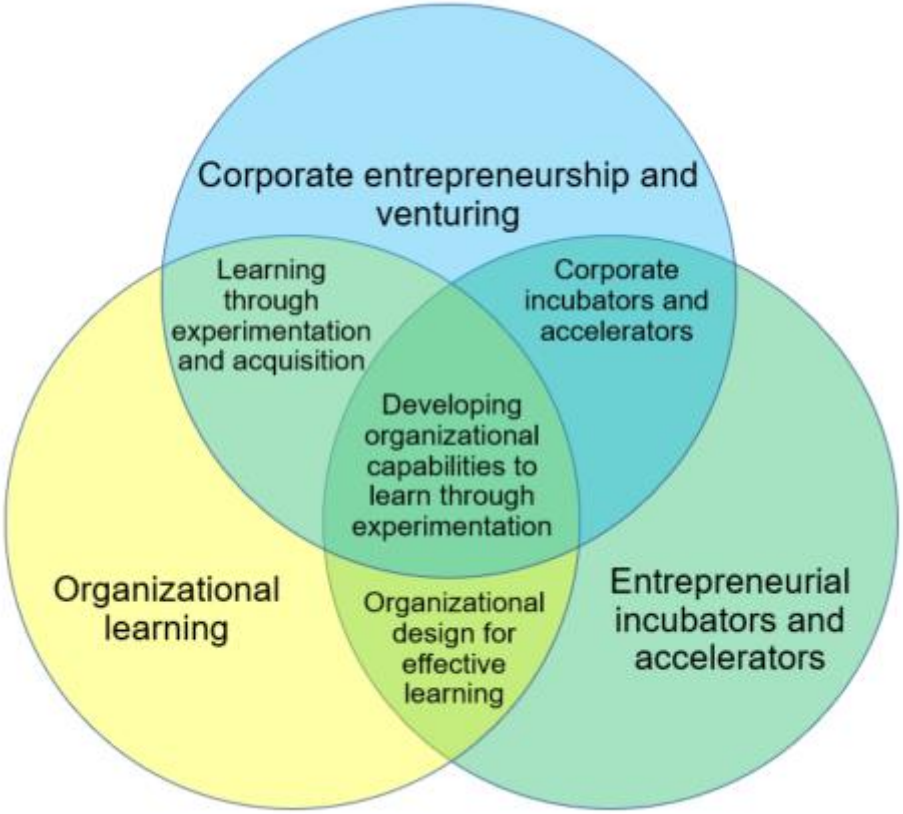


Figure 1. Overview of the reviewed literature

The literature review begins by introducing the corporate entrepreneurship (CE) literature, which is a stream within the broader field of entrepreneurship. While the field of entrepreneurship has been defined as "the scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and

exploited" (Shane and Venkataraman, 2000, p.218), the literature on CE constitutes a subset of these studies which focus on "the process whereby an individual or a group of individuals, in association with an existing organization, create a new organization or instigate renewal or innovation within that organization" (Sharma and Chrisman, 1999, p.18). CE has been described as a continuous, iterative process driven by autonomous, entrepreneurial behavior by operational level personnel and middle managers (Burgelman, 1983b, 1983c) – often referred to as intrapreneurs (Pinchot, 1985) and champions (Burgelman, 1983b) – and retroactive revisions of the entrepreneurial strategic vision by top-level managers, which together amounts to repeated strategic repositioning of the organization (Burgelman, 1983b, 1983c; Ireland, Covin and Kuratko, 2009). As will be discussed, CE activities depend on a range of factors such as external environmental conditions, individual entrepreneurial cognitions, entrepreneurial strategic vision of the executive leadership and pro-entrepreneurial organizational design (Ireland, Covin and Kuratko, 2009). Given the topic of this research, the first section, begin by discussing the role CE play in strategic renewal in response to changing environments, it stresses the link between CE and organizational learning, and conclude by homing in on the relationship between CE and organizational design.

The literature review then segues into the recent organizational responses to dynamic environments through the adoption of entrepreneurial practices (Weiblen and Chesbrough, 2015; Shankar and Shepherd, 2019). By broadly reviewing the literature on incubators and accelerators as well as related entrepreneurial practices often used in these contexts such as the lean startup methodology (Ries, 2011; Blank, 2013), the section provides a deepened understanding of why such experimentation-based approaches are enticing to corporates navigating highly uncertain environments (Felin *et al.*, 2020; Hampel, Perkmann and Phillips, 2020). It also offers insights into how such practices may facilitate enhanced rates of venture-level learning, through experimentation but also through other learning mechanisms (Cohen, Bingham and Hallen, 2018; Cohen *et al.*, 2019). The section highlights different organizational design features of incubators and accelerators and how they may affect learning.

The literature review then goes on to examine the extant knowledge about organizational learning and its links to strategic renewal and corporate venturing. The ability to strategically reposition is vital in dynamic business environments, which is why CE is important in such contexts. Strategic repositioning in turn hinges on the ability to learn, since organizational learning allows the firm to develop capabilities that are valuable in the new business environment and non-trivial for competitors to imitate, thus contributing to the firm's competitive advantage (Crossan and Berdrow, 2003).

Organizational learning, both acquisitive and experimental, has been described as a central element of CE (Phan *et al.*, 2009). However, the link between organizational learning and CE is multifold. For example, Wiklund and Shepherd (2003) find evidence that knowledge-based resources are positively related to firm performance and that an entrepreneurial strategic orientation of the firm enhances this relationship, suggesting that entrepreneurial behaviors, such as innovativeness, proactiveness and risk-taking (Wiklund, 1999), may enable firms to make better use of acquired knowledge, in order to achieve enhanced performance. Zahra, Nielsen and Bogner (1999), on the other hand, emphasize a different relationship, suggesting that CE activities are important means of creating new knowledge that are utilized to build new competencies and revitalizing existing ones. In contrast, a recent study by Covin, Garrett, Gupta et al. (2018) promote the reversed relationship, proposing internal corporate venture learning proficiency as an important enabler of venture performance, in particular when ambiguity of the initial value proposition is substantial. Furthermore, many studies model corporate entrepreneurship as a learning process in itself, in which firms "engage in exploration followed by exploitation of resulting discoveries" (Phan *et al.*, 2009, p. 198).

I delve deeper into the relationship between organizational learning and CE, as well as some of the criticism towards our current knowledge about organizational learning. Notably, I highlight the need for a multifaceted understanding of learning and draw attention to several learning processes, such as experiential-, and vicarious learning, grafting and searching (Huber, 1991).

I also provide a more nuanced understanding of learning by distinguishing between different types of experiential learning, such as trial-and-error (Bingham and Eisenhardt, 2011), experimentation (Murray and Tripsas, 2004) and learning by doing (Levitt and March, 1988); and different types of vicarious learning, such as imitation (Denrell, 2003), replication (Winter and Szulanski, 2001), and translation and adoption (Bresman, 2013).

While these processes often have been studied in isolation, I argue, based on recent studies, that a repertoire of learning processes may be in play when an organization develops certain capabilities (Keil, 2004; McDonald and Eisenhardt, 2019), which necessitates a holistic understanding of the interplay between different learning mechanisms.

Finally, to sum up the literature review I bring together these extant arguments to motivate the research question, referring to the Venn diagram above (Figure 1. Overview of the reviewed literature). I also account for the extant knowledge about incumbents' response to technological change to emphasize how addressing the proposed research question in the light of the reviewed streams of literature may further our knowledge about this important topic.

2.1. Corporate entrepreneurship as a process of venturing and strategic renewal

The sub stream within the field of entrepreneurship that focus on CE emerged due to the widely accepted view amongst theorists and practitioners alike, that traits generally associated with entrepreneurship, such as growth (Lin and Lee, 2009), innovation (Covin and Miles, 1999; Ahuja and Lampert, 2001) and flexibility (Murray, 1984; Barringer and Bluedorn, 1999) are essential, even for large corporations (Stevenson and Jarillo, 1990). As a dynamic understanding of competitive advantage arose in the field of strategic management the notions of innovation and renewal surpassed the previous premise of sustainable competitive advantage, giving rise to the interest in CE as a potential way of achieving and maintaining competitive superiority (Corbett *et al.*, 2013). Since then, CE has received an important role in the strategic management literature with studies linking it to aspects such as the competitive-, technological-, social- and political environment of the firm (e.g. Holmes *et al.*,

2016); characteristics-, values-, beliefs- and behavior of strategic leaders and other organizational members (e.g. De Clercq, Dimov and Belausteguigoitia, 2016; Tang, Tang and Cowden, 2017; Boone *et al.*, 2019); organizational characteristics such as strategy, structure, culture, resources, processes and reward systems (e.g. Brazeal, 1993; Morris, Avila and Allen, 1993; De Clercq, Castañer and Belausteguigoitia, 2011; Hunt *et al.*, 2019); and various measurements of organizational performance (e.g. Zahra, 1991; Zahra and Covin, 1995; see Guth and Ginsberg, 1990; Ireland, Covin and Kuratko, 2009).

CE has been used as a label in studies of different but intertwined phenomena, such as the pursuit of new businesses by established organizations, individual championing of fundamentally new product concepts within a corporate context, and entrepreneurial characteristics and philosophy that permeates an entire organization (Covin and Miles, 1999).

Guth and Ginsberg (1990) made the distinction between corporate venturing and innovation on the one hand, and strategic renewal on the other hand, which has been echoed in subsequent papers (e.g. Sharma and Chrisman, 1999). Innovation and corporate venturing activities (Guth and Ginsberg, 1990; Phan *et al.*, 2009), refer to processes intended to creating new businesses and integrating them into a firm's portfolio (Narayanan, Yang and Zahra, 2009).

Corporate venturing can be divided into internal and external corporate venturing (Sharma and Chrisman, 1999). While external corporate venturing refers to activities such as corporate venture capital (CVC) investments, licensing, acquisitions, joint venturing (Phan *et al.*, 2009) and spin-offs (Sharma and Chrisman, 1999; cf. Phan *et al.*, 2009), internal corporate venturing (ICV) refers to the creation of new businesses residing within the corporate structure. Internal corporate ventures (ICVs) has been recognized as important exploratory vehicles (Covin *et al.*, 2018), as they offer a way of experimenting with new businesses (Garvin, 2004). It is in particular a common phenomenon in large established organizations, where the likelihood of individuals to pursue entrepreneurial opportunities within the confines of the corporate

structure as ‘intrapreneurs’ (see Pinchot, 1985) is greater compared to individuals in smaller, younger firms, who rather become independent entrepreneurs (Kacperczyk, 2012).

The other side of the coin, strategic renewal, has been defined as “the corporate entrepreneurship phenomenon whereby the organization seeks to redefine its relationship with its markets or industry competitors by fundamentally altering how it competes” (Covin and Miles, 1999, p. 52). During this incremental process, organizations continuously explore new opportunities to generate change and progressive adaptation of resources and outputs in response to the changing environment (Albert, Kreutzer and Lechner, 2015; Pettit and Crossan, 2019). The strategy process literature provides a framework portraying a reciprocal relationship between corporate venturing activities and corporate level strategic renewal, which I account for below.

2.1.1. The interplay between corporate venturing and strategic renewal

In the field of strategy, a wide community of researchers have attended to the social processes in which strategies are formed, evaluated and enacted within firms (Mintzberg, 1978; Chakravarthy and Doz, 1992). Breaking away from the previous notion of strategy formulation as a task performed solely by top management, and strategy implementation as a detached task performed by other organizational members, scholars have argued that bottom-up (Burgelman, 1983b) or emergent (Mintzberg and Waters, 1985) strategies is an equally important element of the strategy making process. Contributing to this view Mintzberg (1978), for instance, refer to the dyadic event of deliberate and emergent strategy, and in a similar vein Burgelman (1983a) refers to induced vis-à-vis autonomous strategic activities. Deliberate or induced strategic activities signify explicit, planned and calculated strategic endeavors in line with the firm’s current concept of corporate strategy (Mintzberg, 1978; Burgelman, 1983a). By contrast, emergent or autonomous strategic activities signify activities that are not intended by top management but emerge at lower levels of the hierarchy and fall outside the scope of the current concept of strategy. Contributing to this view Regnér (2003) finds a clear distinction between strategy activities at the center (higher levels in the hierarchy) and in the periphery

(lower levels in the hierarchy) of organizations. He finds that strategic activities at the center rely on a deductive approach, focused on exploitation of prevailing resources and industry, whereas strategic activities at the periphery rely on an inductive approach, focused on exploration of new resources and industries through trial-and-error probing and experimentation. In this way, ideas conceived in the periphery or at lower levels in the organizational hierarchy may help adapt strategies to ambiguous, changing environments (Burgelman, 1983b; Noda and Bower, 1996; Mantere and Vaara, 2008).

An influential and longstanding model of strategy making in large, complex firms, with clear ties to the CE literature is the Bower-Burgelman (B-B) process model (Noda and Bower, 1996), first proposed by Bower (1970) and then further developed by Burgelman (1983b). By depicting a set of parallel, intertwined, and sequential managerial activities at the operational, middle and top management levels, the B-B process model visualizes the organizational strategy-making process as comprising of four sub processes: “two interlocking bottom-up processes of ‘definition’ and ‘impetus’ and two overlaying corporate processes of ‘structural context determination’ and strategic context determination’” (Noda and Bower, 1996 p. 160). In essence, by drawing on the Darwinian variation-selection-retention framework from evolutionary theory (Floyd and Lane, 2000), it is proposed that organizations can maintain fitness despite environmental changes through an experimentation- and selection process, in which autonomous initiatives compete for scares resources that are allocated outside of the tightly defined organizational rule structure (Burgelman, 1991; Pratap and Saha, 2018). A few successful initiatives among these are retrospectively legitimized through adaptation of the corporate strategy and modification of the product-market scope (Pratap and Saha, 2018).

In his seminal paper (1983a), contributing to the B-B process model, Burgelman investigates the process of transforming “R&D activities at the frontier of corporate technology into new businesses through internal corporate venturing (ICV)” (p. 223). He finds this process to be dependent on autonomous entrepreneurial activities by organizational members at the operational level, conceptualization of the strategic implications of such activities by middle-

level managers, and the capacity of top-level managers to allow viable entrepreneurial ventures to serve as the foundation for corporate strategic change. Burgelman (1983b) further argues that, in order to maintain viability, firms need to balance diversity and order in their strategic activities. This is done by both enabling autonomous strategic initiatives at the operational level, such as the formation of a diverse range of new ventures, and creating plans, systems and rules by imposing a concept of strategy on the organization. By supporting emerging ventures, combining and leveraging various organizational capabilities and conceptualizing strategies for new business areas, middle managers contribute to a redefined strategic context in which top-level managers retroactively reformulate the strategic vision to accommodate the new ventures (Burgelman, 1983b). This largely goes in line with Ireland, Covin and Kuratko's (2009) conceptualization of a corporate entrepreneurship strategy process. They argue that top-managers develop and communicate a strategic vision and create an organizational architecture that facilitates entrepreneurial initiatives. Opportunity recognition and exploitation by organizational members is thus affected by the top management's strategic vision via the pro-entrepreneurial organizational architecture that is put in place (Ireland, Covin and Kuratko, 2009), as well as directly, since a well-communicated strategic vision may encourage, guide and provide justification for entrepreneurial actions (Ireland and Hitt, 1999; Ireland, Covin and Kuratko, 2009). This increases the chances that entrepreneurial opportunities are identified and pursued (Kuratko, Ireland and Hornsby, 2001).

Reversely, as ventures are formed across the organization to pursue certain opportunities, this may in turn reinforce top-level managers' commitment to the entrepreneurial strategic vision (Ireland, Covin and Kuratko, 2009). By contrast, opportunities being pursued outside of the scope of the strategic vision may struggle initially but can, if they persevere and get market traction, convince top-management to revise the strategic vision and market scope to include the promising ventures (Abetti, 1997).

Floyd and Lane (2000) put this process in the light of organizational learning theory, viewing autonomous corporate ventures as "early warning signals" (p. 155) and simultaneously the

foundation of the organization's response. They stress that renewal involve not only strategic repositioning but also changes in core competencies. The following section (2.1.2. Strategic learning through corporate venturing) will go deeper into the link between organizational learning and corporate entrepreneurship.

Finally, Burgelman (1983c) also argue that "managerial approaches and innovative administrative arrangements are required to facilitate the collaboration between entrepreneurial participants and the organizations in which they are active" (p. 1349). Ireland, Covin and Kuratko (2009) refer to such administrative arrangements as 'pro-entrepreneurial organizational architecture', putting it as a central concept in their model of corporate entrepreneurial strategy. They visualize a trichotomous relationship between entrepreneurial strategic vision of the top-level management, pro-entrepreneurial organizational architecture and entrepreneurial processes and behaviors of organizational members. In the last subsection (2.1.3. Organizational design for corporate entrepreneurship) of this theory chapter I will expand on the aspect of organizational design and its role in CE.

2.1.2. Strategic learning through corporate venturing

The conceptualization of corporate venturing as a fundamental aspect of organizational learning and vice versa add an important perspective to the phenomenon of strategic renewal and CE overall. Building on the concepts of organizational learning (March, 1991), CE in general, is often modelled as a learning process in its own right, in which firms engage in exploration followed by exploitation of the resulting knowledge assets (Phan *et al.*, 2009). In this view, ICVs are seen as vehicles of exploration, replacing uncertainty with context-specific learning through the act of experimentation (Covin *et al.*, 2018). Zahra, Nielsen and Bogner (1999) highlight the fact that entrepreneurial learning comes from both experimentation and acquisitive learning and model these forms of learning as the outcome of formal and informal CE activities, and as the basis for new knowledge that can be used during the development of new competencies for the firm. They do however hold experimental learning as the most

important source of potential competitive advantage as it leads to highly idiosyncratic knowledge.

Advancing this view, Dess *et al.* (2003) offer a model focused on the causal interrelationships between different forms of CE (i.e. sustained regeneration, organizational rejuvenation, strategic renewal and domain redefinition) and acquisitive and experimental organizational learning. Similarly as Zahra, Nielsen and Bogner (1999), they position organizational learning as a mediator between CE and new organizational knowledge components, which they distinguish as technical-, integrative- and exploitative knowledge. Technical knowledge concerns insights about the properties of specific activities, which are specialized in nature, and which help firms to refine and extend current product lines. They are therefore vital for sustained regeneration (i.e. incremental innovation) (Dess *et al.*, 2003). Integrative knowledge pertains to the creative and unique combinations of resources and capabilities, which firms have learned to generate in order to create value. Exploitative knowledge is accumulated as firms learn how to creatively exploit technical and integrative knowledge by finding new ways of commercializing goods and services that are generated through the two previously mentioned types of knowledge (Kreiser, 2011).

The distinct emphasis on experimental and acquisitive learning as outcomes of CE activities can be compared with the explicit distinction Holcomb *et al.* (2009) make between experiential and vicarious learning as they highlight these as the cornerstones of entrepreneurial learning. Interestingly, however, in contrast to the models of Zahra, Nielsen and Bogner (1999) and Dess *et al.* (2003) they do not model these two forms of learning as the outcome of entrepreneurial activities but as antecedents of entrepreneurial action, mediated by decisions made based on the acquired knowledge. While all these studies model the learning process as a closed loop involving CE activities, learning and new knowledge, the conceptual ordering differs slightly (Zahra, Nielsen and Bogner, 1999; Dess *et al.*, 2003; Holcomb *et al.*, 2009). The use of learning concepts such as experiential and vicarious learning (Holcomb *et al.*,

2009), instead of experimental and acquisitive (Zahra, Nielsen and Bogner, 1999; Dess *et al.*, 2003) is also a notable difference.

Leaving aside the semantic differences (i.e. the use of the words experiential and vicarious contra experimental and acquisitive) of these conceptualizations for now[1], it is worth to point out that learning is endogenous to the entrepreneurial process, which may explain why CE is usually modelled as a learning process (Phan *et al.*, 2009). Hence, it is not straight forward to model the relationships between entrepreneurial activities or actions and various forms of learning. For instance, engaging in entrepreneurial activity has the potential of leading to organizational learning (Zahra, Nielsen and Bogner, 1999; Dess *et al.*, 2003), which in turn can be used to develop new competencies (Zahra, Nielsen and Bogner, 1999). At the same time learning is also a fundamental prerequisite for identifying and pursuing an opportunity in the first place, as opportunities are only available for those who possess certain knowledge required to act, as reflected in the words by McMullen and Shepherd (2006):

> [E]ntrepreneurial action is seen as something all would engage in if they knew what to do, but, owing to epistemological differences, only some people (the entrepreneurs) “know” what to do. Accordingly, entrepreneurs are thought to have taken action because they somehow escaped the ignorance and paralysis produced by uncertainty, whereas those who have not acted entrepreneurially are believed either to have fallen victim to doubt or to have been blinded to the need for forming a belief at all (p. 137).

Nonetheless, learning does not happen without action and the ex-ante actions that set up an environment for learning, such as planning and hypothesis formulation etc., play a crucial role in venture performance (Hopp and Greene, 2018).

In a recent paper on ICV, Covin *et al.* (2018) attempt to break away from the depiction of planning and learning as separate activities, framing them instead as interdependent drivers

[1] This will be further discussed in section 2.3. Organizational learning.

of venture success. The premise of this position is that “business planning sets the stage for ICVs to benefit from learning” (Covin *et al.*, 2018, p. 538).

Although, academic knowledge about organizational learning in independent entrepreneurship is mostly applicable to CE as well, there are important differences between the two contexts that ought to be considered. This become apparent when comparing Zahra, Nielsen and Bogner's (1999) model of organizational learning from CE and the model of entrepreneurial learning presented by Holcomb *et al.* (2009). While both models display learning as dependent on the environmental context, Zahra, Nielsen and Bogner (1999), who are applying the narrower scope focused on CE, also include internal organizational variables as a factor affecting organizational learning, mediated through the formal and informal CE activities performed. Also, in both of their respective models organizational learning leads to new knowledge, but whereas Holcomb *et al.* (2009) sees this knowledge as the basis of decision making, leading to actions that in turn produce certain outcomes, Zahra, Nielsen and Bogner (1999) model the new knowledge as the basis of competencies that in order to bring about organizational performance outcomes require knowledge integration as new knowledge is often fragmented, vague and widely dispersed throughout the established organization.

What essentially distinguishes corporate entrepreneurship from independent entrepreneurship is the immense impact that the mother organization has on the learning capacity of a corporate venture and the role of a corporate venture as merely one of several endeavors by a corporation to learn about certain opportunity landscapes.

Addressing the first aspect, a stream of studies has explored the relationship between the entrepreneurial orientation of firms and their capacity to learn (Wang, 2008; Anderson, Covin and Slevin, 2009; Kreiser, 2011). Entrepreneurial orientation (EO), is a construct based on a set of characteristics that can be applied to organizations regardless of maturity. Most conceptualizations of EO include the three dimensions: innovativeness, risk taking and proactiveness (Miller, 1983; Rauch *et al.*, 2009); although some studies also include the

additional two dimensions: autonomy and competitive aggressiveness (Lumpkin and Dess, 1996).

For instance, Wiklund and Shepherd (2003) find that an EO positively moderates the relation between knowledge-based resources and firm performance. This implies that the willingness of a firm to be innovative, proactive and take risks increases the value of its accumulated knowledge as it becomes better at turning it into financial performance outcomes. A potential explanation for this relationship that is in line with previously mentioned theories in this chapter is that the willingness to act innovatively and proactively, while also taking risks may be inherently tied to integrative and exploitative knowledge as conceptualized by Dess *et al.* (2003). In other words, by accumulating integrative and exploitative knowledge, firms may become increasingly innovative, proactive and risk willing, thus better at making use of its technical knowledge.

2.1.3. Organizational design for corporate entrepreneurship

Several studies have pointed out the important role of managerial approaches, administrative arrangement and organizational design for facilitating CE, the premise being that it requires fundamentally different organizing principles than the main business operations (Burgelman, 1983c; Ireland, Covin and Kuratko, 2009; Foss and Lyngsie, 2014; Burgers and Covin, 2016). In their conceptualization of a corporate entrepreneurship strategy, Ireland, Covin and Kuratko (2009) point to the importance of creating organizational structures, cultural norms and environment, resources, procedures and reward systems that foster and support entrepreneurial behavior, claiming that without such elements in place systematic recognition and exploitation of entrepreneurial opportunities will not take place, regardless of how innovative organizational members might be. Instead the organization risk losing innovation-minded employees who may become embittered by the bureaucracy and seek entrepreneurial opportunities elsewhere (Kuratko, Montagno and Hornsby, 1990). Agarwal *et al.* (2004) emphasize the importance of supporting not only exploration activities but also exploitation activities, as firms otherwise risk creating pockets of underexploited knowledge, which can

lead to knowledge spillovers through spinouts. This does not only mean that the firm fail to take full advantage of its R&D investments but can also create unwanted competition and competency loss as innovative employees leave the firm and start competing businesses. By proactively investing in both technological and market pioneering knowhow incumbent firms may retain their employees and their valuable knowledge (Agarwal *et al.*, 2004).

Considering organizational structure, Covin and Slevin (1988) find that an entrepreneurial top management style only have a positive effect on organizational performance if the firm possess an organic structure (i.e. a proclivity towards loose, informal control systems, adaptable management principles, and high degree of autonomy), whereas a negative relationship was found when the organizational structure was mechanistic (i.e. a proclivity towards tight formal control, strict adherence to proven managerial principles and high degree of centralization and uniformity). However, in mature firms stability and efficiency is, in general, the main goal, which is mostly associated with a bureaucratic and mechanistic structure (Miller and Friesen, 1984).

A widely recognized way of facilitating CE in mature firms is therefore to set up structures that provide autonomy to CE initiatives (Burgers and Covin, 2016). By providing the ICVs the discretion to determine their own strategic direction, their ability to make timely decisions without constantly seeking approval from firm-level management is increased (Garrett and Covin, 2015). In this way it gives the venture team a sense of freedom necessary for creativity to thrive (Amabile *et al.*, 1996), and for building an ability to adapt to identified demands (Burgers *et al.*, 2009), and to learn through experimentation (Garrett and Covin, 2015).

However, due to the lack of credentials of the venture teams and lack of familiarity with the new ICVs, corporate management may feel the necessity to monitor such initiatives (Garrett and Covin, 2015). Furthermore, when ICVs are completely independent of its mother firm, it is difficult for the mother firm to learn from the ventures and vice versa (Garrett and Covin, 2015).

As structural separation creates autonomy but also knowledge flow impediments, the trade-off between differentiation and integration is complicated. This may explain why Garrett and Covin (2015) does not find a positive relationship between operations independence and ICV performance, while Foss, Lyngsie and Zahra (2015) do find that decentralized structures are associated with greater rates of opportunity discovery and realization, ascribing this to the increased level of autonomy.

Applying more detailed research questions may provide a more granular understanding of these issues and thus helping to fill some of the current knowledge gaps. For instance, it has been argued that in combination with informal integration mechanisms, such as a shared vision and common values and goals, structural differentiation may lead to increased ambidexterity (O'Reilly III and Tushman, 2011), and corporate venturing activities (Burgers *et al.*, 2009). On the other hand, despite its benefits in terms of increased knowledge sharing, formal integration mechanisms may have a detrimental effect on differentiated corporate ventures as it results in conflicting formal architectures (Burgers *et al.*, 2009).

Also, in the research agenda proposed by Foss and Lyngsie (2014), the authors stress the importance of studying other organizational design considerations on a granular level, acknowledging that different organizational instruments may have different implications on discovery, evaluation and exploitation of opportunities. For instance, referring to several studies, Kuratko, Montagno and Hornsby (1990) find a consistent perception that an adequate reward system for CE considers goals, feedback, individual responsibility and result-based rewards. However, following Foss and Lyngsie's (2014) argumentation, performance-contingent monetary rewards may be usefully deployed to achieve opportunity exploitation but not suitable for stimulating explorative behaviors that lead to opportunity recognition.

Similarly, the availability of slack resources, including time for innovation activities beyond the ordinary work tasks is considered a vital enabler for entrepreneurship (von Hippel, 1977; Kanter, 1985; Sykes, 1986; Stopford and Baden-Fuller, 1994; Hornsby, Kuratko and Zahra, 2002). Thus, slack resources may enable exploration into new domains. However, as soon as

a venture team goes into execution mode to exploit an identified opportunity the amount of slack is likely reduced significantly, which may limit the chances of identifying new opportunities that are created in the pursuit of the opportunity in focus.

Cultural aspects such as the support and promotion of entrepreneurial activity by managers, including championing innovative ideas, granting resources and expertise is of course also important to stimulate corporate entrepreneurs (Stevenson and Jarillo, 1990; Damanpour, 1991; Kuratko *et al.*, 1993; Pearce, Kramer and Robbins, 1997; Hornsby, Kuratko and Zahra, 2002). This is often related to a culture in which middle managers are willing to take risks and where there is a tolerance for failure (Kuratko, Montagno and Hornsby, 1990; Stopford and Baden-Fuller, 1994; Hornsby, Kuratko and Zahra, 2002). At the same time, the risk/reward-ratio is something that should be minimized. Hence, risk management practices may be crucial.

Overall, the issue of organizational design for CE is a complicated area in which our current knowledge is scarce, and the empirical findings are inconclusive. Further research is necessary in order to gain understanding of how to effectively structure and manage corporations' collective venturing efforts and how a parent corporation can best contribute value to its portfolio of ICVs through mechanisms such as resource provision and managerial oversight (Garrett and Covin, 2015).

2.2. Adopting entrepreneurial approaches to create a pro-entrepreneurial organizational architecture

As acknowledged in the previous section, established firms may seek to manage corporate venturing through separate units within the corporate structure. Such organizational units have been referred to as corporate venture (CV) units (Hill and Birkinshaw, 2008, 2014; Hill *et al.*, 2009). CV units can be divided into two distinct types: 1) externally directed CV units are mostly referred to as corporate venture capital (CVC), and focus on investments in independent startups and early-stage companies founded outside of the corporate boundaries

(Hill *et al.*, 2009); 2) internally directed CV units have been referred to as New (Business) Venture Divisions (Adams, 1969; Burgelman, 1985), New Venture Departments (Fast, 1979), Innovation Labs (Hampel, Perkmann and Phillips, 2020) or Internal Corporate Venture (ICV) Programs (Burgelman and Välikangas, 2005), and focus on new opportunities identified within the organization, for which the established new product development (NPD) processes and structures are inadequate (Hill *et al.*, 2009). Between the 1960s and 1980s internal corporate venturing was mostly in fashion (Burgelman, 1985; Hill *et al.*, 2009), whereas the popularity of external venturing began in the mid-1990 and is still high on the agenda (Hill *et al.*, 2009).

Hill and Birkinshaw (2008) goes further and classifies four types of CV units by distinguishing between them not only based on the locus of opportunity (i.e. internal vs. external) but also their strategic logic (i.e. focus on exploration in order to develop new capabilities for its parent firm vs. exploitation of existing unexploited capabilities).

Close examinations in the past have shown an even greater variety among CV units, demonstrating that there is an abundance of considerations that may distinguish CV units from each other and that influence their chances of success (Fast, 1979). For NVDs for instance, Fast (1979) highlight the level and nature of top management support, organizational positioning, staff, selection criteria, integration mechanisms, functions and responsibilities, expectation management, and spin-off timing as considerations that lead to differences among NVDs and that may differ through time within the same NVD as its managers alter such features to proactively manage the evolution of the unit to ensure survival. Arguably, many of these considerations apply for CVC as well. Considering CV units in general, Hill *et al.* (2009) also emphasize financial incentives, governance structure, investment syndication, investment staging and degree of specialization in a certain area of related competence as adjustable elements that may have important implications on performance and survival.

As established firms endeavor to act entrepreneurially, they have increasingly started to gaze at the entrepreneurial realm for advice about best practices. For instance, during the rise of CVC, corporations begun emulating practices from the venture capital industry, which was

widely regarded to be highly successful (Hill *et al.*, 2009). VC practices have not only been adopted by externally directed CV units (i.e. CVC) but by internally directed ones as well (Hill *et al.*, 2009). Many proponents of the VC model were advocating its use by corporations (Brody and Ehrlich, 1998; Hamel, 1999; Chesbrough, 2000). However, research indicate that the adoption of different elements could be beneficial for different purposes. For instance Hill *et al.* (2009) find that high-powered financial incentives, vertical autonomy and VC syndicate size are VC-model attributes that are positively related to a CV unit's financial performance, whereas horizontal autonomy, investment staging, and investing in areas of related competence are positively related to a CV unit's strategic performance. Hence, professionals have been recommended to understand the inner workings of VC model elements and tailor the model to fit the corporate circumstances without losing sight of these essentials (Brody and Ehrlich, 1998; Hill *et al.*, 2009).

Today, corporations are looking at other promising managerial approaches and forms of organizing, such as incubators and accelerators, that have received prominence in the entrepreneurial ecosystem (Shankar and Shepherd, 2019; Hallen, Cohen and Bingham, 2020). Notably, incubation and acceleration practices offer support that complements the investment-centered VC-model as they focus on the provision of a different set of services, such as training and consultation, and target the early stages of innovation (Dutt *et al.*, 2016; Hallen, Cohen and Bingham, 2020). Hence, they offer other mechanisms tied to learning, to increase venture performance as well as corporate innovation in general.

Similar to the case of adopting VC practices, it is likely that corporations will adopt incubator- and accelerator practices to create a tailored model to suit the circumstances of their CV unit, rather than precisely replicating a known incubator or accelerator model. Thus far there has not been much research on corporate incubation and acceleration, particularly not regarding the process of adopting such practices. The limited studies that do exist however indicate a difference between the discourse around corporate incubators (Becker and Gassmann, 2006; Ford, Garnsey and Probert, 2010; Hirte, 2018) and corporate accelerators (Kohler, 2016;

Kupp, Marval and Borchers, 2017; Shankar and Shepherd, 2019). As the general literature on incubators involve a great variety of incubator types (e.g. private, public, university-based, and corporate) that have evolved throughout the last decades, the definition of corporate incubators has become quite wide, recognizing a variety of objectives that can be pursued through such type of organization. For instance, corporate incubators have been identified as a facilitator of exploitation of non-commercialized in-house technology through existing business units or spin-offs, as well as sourcing of technological knowledge through engagement with external startups (Becker and Gassmann, 2006).

The accelerator model on the other hand, which have been described as a new generation of incubators (Pauwels *et al.*, 2016), is more precisely defined as its roots can be traced back to the foundation of Y-Combinator, as the first accelerator, in 2005. As the model is yet highly associated with independent startups, corporate accelerators have thus far mostly been recognized as a means of bringing about outside-in open innovation by working closely with external startups (Weiblen and Chesbrough, 2015; Kohler, 2016; Shankar and Shepherd, 2019).

As the current study is interested in the adoption of practices from incubators and accelerators rather than strict replication of such models the following section intend to dissect these models to identify distinguishable features rather than only accounting for their definitions.

2.2.1. Incubator and accelerator practices

An incubator has been described as "a facility that provides affordable space, shared office services, and business development assistance in an environment conducive to new venture creation, survival, and early-stage growth" (Allen and Mccluskey, 1991, p. 61). While the first known incubator facility in the US dates back as far as to 1959, it was not until the second half of the 1980s that they started becoming increasingly common followed by a period of increased professionalization in the early 1990s and a significant increase of new incubators during the dot com boom in the end of the millennium (Leblebici and Shah, 2004).

Various types of incubators have formed over the years. These can be distinguished based on their objectives, management models, including what services are provided, and their source of sponsorship (Pauwels *et al.*, 2016). Typical sponsors are governmental agencies, non-governmental organizations, universities and research institutes, private investors, and corporations (Dutt *et al.*, 2016). Each sponsor typically has different main objectives (Rudy, 2004). Governmental agencies generally aim to support national or regional development (Giudici, Reinmoeller and Ravasi, 2018); universities use incubators to offer a path to disseminating and commercializing novel technologies and inventions through spinouts (Clarysse *et al.*, 2005; Pauwels *et al.*, 2016); private investors focus on gaining financial profit; and corporations typically aim to achieve strategic benefits through increased knowledge creation (Becker and Gassmann, 2006).

There is a vast diversity of incubator models, which corresponds to the heterogeneity of objectives held but also the differences in sponsors' experience, expertise and mental models as well as the environmental conditions the incubator is situated in (Dutt *et al.*, 2016; Cohen *et al.*, 2019). A major distinguishing factor is whether the incubator is for-profit or non-profit (Rudy, 2004; Dutt *et al.*, 2016; Pauwels *et al.*, 2016), but the difference in incubator design is more nuanced and involve elements such as the business model, selection practices, program duration, mediation strategies, and the services provided, including facilities, financial support, administration, mentorship, business support, consultation and training (Bergek and Norrman, 2008; Hallen, Cohen and Bingham, 2020).

Throughout the years incubators have shifted focus from the initial provision of facilities and administrative services at reduced rates to the provision of intangible, knowledge-based services (Grimaldi and Grandi, 2005). The accelerator is at the most progressive end of this spectrum as it often does not provide facilities and administrative services but solely focus on aiding business development.

Accelerators have been described as a new generation incubation model that differ from previous incubation mechanisms (Pauwels *et al.*, 2016). An important difference is the

increased focus on learning as the main value added to participating ventures (Hallen, Cohen and Bingham, 2020). This shifted focus is reflected in the accelerator design. They differ from previous generations of incubators by taking in cohorts of ventures rather than continuously onboarding individual ventures. They then provide them with mentoring, education and support during fixed-length programs that last for a few months rather than years, which is the common duration of previous incubators (Cohen, 2013; Cohen *et al.*, 2019; Hallen, Cohen and Bingham, 2020). The emergence of accelerators started in 2005 with the founding of Y Combinator, which immediately became a success and has since served as a blueprint for subsequent accelerators, driving the proliferation of the accelerator model around the world (Hallen, Cohen and Bingham, 2020).

Incubators in general have been observed using different selection strategies. One distinction is whether evaluation of the idea itself or the entrepreneur or entrepreneurial team is emphasized (Bergek and Norrman, 2008). Incubators can potentially go for a selection strategy similar to that of VCs and Angel investors. As these early stage investors look for high risk - high reward ventures they typically put much emphasis on the entrepreneurs' and their team's abilities (Huang and Pearce, 2015), and look for motivational cues such as enthusiasm, preparedness and commitment during pitches (Cardon, Mitteness and Sudek, 2017). This has proven to be an effective approach (Huang and Pearce, 2015). The rationale behind this is that due to the high uncertainty the idea may change as the team pivots, which shift the importance from the quality of the initial idea to the managerial and executional capabilities of the team. Angel investors' decisions rely on a combination of formal analysis and intuition based on their expertise, where intuition trumps formal analysis, in contrast to decision making in many other investment contexts (Huang and Pearce, 2015). For example, this drastically differ from the investment decision procedure at corporate R&D labs where high uncertainty and novelty are often avoided (Criscuolo *et al.*, 2017), and the idea plays an important role since team members and managers can be exchanged.

Accelerators accept ventures in batches once or a few times per year (Cohen, 2013), and the top programs get between 1,000 and 2,000 applications per batch (Hallen, Cohen and Bingham, 2020). The high quantity of applications put substantial limitations on the due diligence given to teams prior to admission compared to that of VCs and angel investors who are more selective as they also make a bigger commitment towards fewer ventures (Hallen, Cohen and Bingham, 2020). However, the cohort orientation of accelerator programs seem to unlock scale benefits by enabling provision of basic services across the cohort and letting resource providers engage with large numbers of ventures in an efficient manner (Cohen *et al.*, 2019).

The selectiveness also varies depending on the incubation approach. For instance, it has been found that incubators supported by research institutes choose from three different spinout strategies: 1) a low-selective approach, which mission is to maximize the number of entrepreneurial ventures; 2) a supportive approach, which requires greater commitment in form of financing and support and thus increase the selectiveness; 3) and an incubator model which is used for commercializing cutting edge technology which requires significant investments often acquired through venture capital and rigorous testing and development, which may go on for up to three years (Clarysse *et al.*, 2005).

Corporate accelerators searching to onboard external start-ups have been observed utilizing different selection strategies depending on whether they emphasize strategic fit with the mother firm or remain industry agnostic and focus on product-market fit (Shankar and Shepherd, 2019).

Incubators and accelerators are often framed as intermediary organizations that link parties to facilitate specific activities and transfer of knowledge and resources (Dutt *et al.*, 2016; Clayton, Feldman and Lowe, 2018; Cohen *et al.*, 2019; van Rijnsoever, 2020). Intermediaries such as incubators and accelerators has been found to address institutional voids in the business environment on behalf of their stakeholders (Dutt *et al.*, 2016). Early incubators focused on the provision of tangible services, which were difficult to obtain by small, new started firms,

such as financial capital and physical facilities. These are still a high priority in less developed entrepreneurial environments but has given place to intangible services such as training and consultation in more advanced environments (Dutt *et al.*, 2016).

As the entrepreneurial environment become more developed, incubators and accelerators no longer need to provide tangible services such as administration, financing and facilities as these resources are provided by other actors. Hence, they can shift to higher value services such as business development support (Dutt *et al.*, 2016). Accelerators, in particular, have been argued to focus on learning related services such as consultation, mentoring and training (Hallen, Cohen and Bingham, 2020), but it has also been shown that intermediaries such as accelerators can increase learning by enhancing participants sensing capabilities through intermediation (Giudici, Reinmoeller and Ravasi, 2018). Intermediation also create value for the ventures in other ways than through learning, such as by providing access to resources held by other actors.

Accelerators are in particular known to support new ventures by increasing their learning rates and complementing the venture teams expertise (Hallen, Cohen and Bingham, 2020). By exposing the venture teams to large amounts of feedback and mentorship early on accelerators have been found to mitigate bounded rationality by encouraging them to prolong broad search efforts and avoiding prematurely satisficing with suboptimal business model elements (Cohen, Bingham and Hallen, 2018). Experienced entrepreneurs, early stage investors and other experts are introduced to the ventures and provide feedback on their business models (Shankar and Shepherd, 2019). In addition to the formal training the cohort design also lets venture teams interact and learn from each other's experiences and challenges (Cohen *et al.*, 2019). By fostering transparency accelerators have been found to enable venture teams to learn from their peers, and increase their search efforts by reigniting search related to business model dimensions deemed good enough, encourage broader search and more effective search by improving entrepreneurs' mental maps of potential alternatives (Cohen, Bingham and Hallen, 2018).

Incubators and accelerators are programs that serve as intermediaries between new ventures and a plethora of critical resources which can be difficult to identify and obtain for a newly started company or venture team (Cohen *et al.*, 2019). By working as intermediaries between individual ventures and the entrepreneurial ecosystem, incubators and accelerators can improve the institutional environment and the entrepreneurial ecosystems in addition to supporting individual ventures (Dutt *et al.*, 2016; Goswami, Mitchell and Bhagavatula, 2018). Accelerators often expose ventures to investors and corporate accelerator also facilitate contacts with clients and corporate business units (Shankar and Shepherd, 2019).

In addition to the formal intermediation activities incubators have been found to promote networking behavior among entrepreneurs within the incubator, leading to exchanges of services between them (Ebbers, 2014).

Few studies have addressed how incubators and accelerators are created and developed in new institutional contexts. A notable exception is a recent study by Tracey, Dalpiaz and Phillips (2018), which investigates how a private incubator is established in a misaligned institutional context. They find that the incubator managers must engage in dual optimal distinctiveness work and authentication work on the local level and on the category level as they translate the misaligned organizational form to the new context. They further find that these types of work unfold over three discrete translation phases: 1) an improvisation phase where the organizational form (in this case the incubator model) is located in a misaligned institutional context, adjusted and explained to the local audience to gain local authenticity; 2) a converging phase in which the emerging organization is explained to category-level stakeholders and where the organization conforms to their expectations to gain category-level authentication; and 3) an optimization phase in which the local- and category-level legitimization pressures evolve as the organizational form has gained acceptance and the organization now need to differentiate from local rivals.

Bøllingtoft and Ulhøi (2005) provide evidence of a less common type of incubator they term “networked business incubator” which is developed through a bottom-up approach by the new

ventures themselves who manage the incubator to gain territorial synergy, relational symbiosis, and economies of scope. Another highly relevant study by Shankar and Shepherd (2019) address how corporations design accelerators, highlighting the diversity of approaches that can be adopted. However, although these studies provide a dynamic understanding of how these intermediary organizations function, they do not address their establishment and development over time.

It can safely be argued that the development of incubators and accelerators is dependent on organizational learning. Several of the practices and their effectiveness may be linked to continuous learning from the ongoing operations. In the adjacent field of CVC programs it has been found that valuation and selection capabilities may be enhanced by investing in divers industries (Yang, Narayanan and Zahra, 2009), and that acquisitive and experiential learning play a role in building capabilities for external corporate venturing (Keil, 2004).

Shankar and Shepherd (2019) study corporate accelerators that focus on nurturing external startups as an approach to outside-in open innovation. They find that corporate accelerators focus on venture emergence or strategic fit, and that the focus determines the organizational design choices. An important element that differs from other types of incubators, VCs and angel investors is that corporate accelerators first and foremost represent the interest of the sponsoring corporation, which means that organization-level learning is just as important as venture-level learning. This may require mechanisms that are not present in the independent accelerator model.

2.2.2. The lean startup approach

The lean startup approach is among the most popular frameworks in the practitioner-oriented entrepreneurship literature (Shepherd and Gruber, 2020). Its focus on iterative exploration and development through experiments and subsequent ‘pivots’, is commonly taught to aspiring entrepreneurs in business schools and incubators, as a highly effective way of launching successful ventures (Hampel, Perkmann and Phillips, 2020). Lately, it has even made its way

into the corporate world (Ries and Euchner, 2013; Ghezzi, 2019), with the promise of benefitting the corporate venturing process by accelerating its pace, reducing unnecessary costs, and increasing the success rate (Hampel, Perkmann and Phillips, 2020). The lean startup approach have also been attributed as an important source of inspiration behind a plethora of currently popular ways in which corporations explore new opportunities, such as through jams, hackathons, innovation labs and accelerators (Hampel, Perkmann and Phillips, 2020).

The lean startup approach is designed according to real options reasoning to avoid committing significant time, effort and resources to developing a business before the value proposition has been thoroughly validated (Shepherd and Gruber, 2020). The real options logic limits the potential losses by staging investments in a way that each investment lead to new information, which then serve as the basis for the next investment decision (McGrath, 1999). That is, by committing a limited amount of resources to an experiment, the entrepreneur can test a set of assumptions that if they hold true increases the chances that the venture indeed may be valuable. Should the experiment provide a positive indication, further investments can be made, which is referred to as exercising the option (McGrath, 1999). Thus, experimentation is valuable if it can reveal important information regarding assumptions that are critical to the overall potential of the venture idea in a cost effective manner (Kerr, Nanda and Rhodes-Kropf, 2014).

By astutely recognizing the assumptions that the business hinge upon, translating these assumptions into hypotheses, and engaging the early customers in order to test these hypotheses, entrepreneurs may in this manner reduce uncertainty before committing to a business idea (Ries, 2011; Blank, 2013). Artefacts such as a business model canvas and a minimum viable product (MVP), which only include the fundamental elements needed to test the business idea, are developed to enable both conceptual feedback and realistic experiments that are based on customers' natural behavior (Ghezzi and Cavallo, 2020). The

customer engagement also makes it possible to gather knowledge that enable pivoting to a better business idea.

This can be contrasted to the traditional focus on elaborate planning and extensive development, often under stealth mode, which proponents of the lean startup method claims has become obsolete due to the importance of customer feedback (Blank, 2013). Critics do however highlight some of the potential drawbacks of the method.

Felin *et al.* (2020) problematize the eagerness to quickly start experiment and to do so cheaply, which they claim may constrict entrepreneurs to the point where they are only able to produce incremental innovations. They argue that more attention needs to be given to how entrepreneurs formulate a novel hypothesis and then craft experiments, which they claim often will be costly and require significant commitment. For example, studies suggest that non-digital (König *et al.*, 2019) and business-to-business (Ghezzi, 2019) offerings may not be as adapt to simple and costless experimentation as digital business-to-consumer ventures.

Given the presumption that the most valuable experiments to conduct (i.e. the experiments that give the most vital information) may be costly, the act of experimenting may require irreversible commitments that limit future options (Pillai, Goldfarb and Kirsch, 2019). Hence, while costless and commitment free learning may be a vital first step (Bennett and Chatterji, 2019), the entrepreneur, due to the inherent uncertainty of entrepreneurial opportunities, eventually has to make decisions between equally viable alternatives (Gans, Stern and Wu, 2019).

While this reasoning dismiss the idea of completely eliminating uncertainty and thus also finding an optimal decision, it gives reasons to expect there may be a tradeoff between, on the one hand, remaining flexible and postponing commitment and, on the other hand, taking a leap of faith and focusing time, effort and resources to explore one potential path forward.

Research remain inconclusive regarding how to manage such potential tradeoff. While McDonald and Eisenhardt (2019) find successful ventures to first test assumptions and then

commit to a broad business model template as they further explore the opportunity, Eesley and Wu (2020) find that minimizing adaptability and adhering to a strong vision has initial benefits but a more amendable approach is better in the long-term. In a similar vein, Andries, Debackere and Van Looy (2013) find that focused commitment to a value proposition positively affects initial growth but jeopardizes long-term survival, whereas simultaneous experimentation leads to lower initial growth but facilitates long-term survival. Shepherd and Gruber (2020) also argue that the real options reasoning perspective would suggest that entrepreneurs need to explore multiple opportunities and that it is important to consider the portfolio of opportunities rather than the pursuit of a single opportunity. This could potentially be an even more prominent factor for corporations, as they possess the resources to handle relatively wide-ranging portfolios.

The real options reasoning of the lean startup approach provides opportunities to reassess the business venture continuously, and the learning from each experiment may provide insights that facilitates pivoting to a more promising avenue. The difficulty of pivoting should however not be underestimated (McDonald and Gao, 2019; Hampel, Tracey and Weber, 2020). While deemed important, recent studies have highlighted the potential hazards of radically changing a business venture that a certain audience of stakeholders have grown to accept and potentially identify with (McDonald and Gao, 2019; Hampel, Tracey and Weber, 2020).

Ventures may pivot quite easily at an early stage but once they have pursued a particular approach for some time it may require careful management of its relations to various stakeholders (Hampel, Tracey and Weber, 2020). By anticipating future strategic reorientation the original concept may be framed abstractly enough to create room for maneuvering, while appearing to be consistent with previous aims (McDonald and Gao, 2019; Shepherd and Gruber, 2020). Still there may be some tensions as the pivot is carried out, which require careful justification of each strategy transition towards different audiences to avoid penalties in the form of withdrawn support (McDonald and Gao, 2019). By foreshadowing the change

while also signaling continuity the stakeholders can be made to feel as a part of the transition and therefore continue to offer their support (McDonald and Gao, 2019). Also, by seeking sympathy to the venture's challenges and frame its efforts as genuine, the venture can even rebuild relationships with stakeholders who initially feel estranged or even hostile because of feelings of betrayal caused by the pivot (Hampel, Tracey and Weber, 2020). Mismanagement of these challenges pose an existential threat as the venture may lose support from essential stakeholders such as investors, user community or employees. Hence, the ability to experiment may be of limited value without the ability to manage audiences during a pivot. Furthermore, corporations, which have a considerable legacy, may encounter additional difficulties as they manage new and old stakeholders and could potentially endanger more than their new business ventures if they mistreat such relationships.

Besides these challenges which are inherent to the experimental approach to entrepreneurship, problems arise when methods are misused due to carelessness or poor understanding of their underlying principles. Many founders cherry pick a few of the lean startup principles, while omitting some of the crucial ones, which may decrease the value of the method substantially (Ghezzi, 2019). The understanding of the principles of lean startup, which rely on the scientific method of experimentation, may vary. One reason for this is the varying quality of lean startup training that founders may acquire (Ghezzi, 2019).

In a recent controlled experiment by Camuffo *et al.* (2020), the treatment group and control group, consisting of a total of 116 startups, received a similar training program in the lean startup approach that spanned over ten sessions. The results of the study demonstrate that the treatment group, for which the scientific method of experimenting was emphasized for each part of the training, pivoted more often and performed better in terms of increased revenue. This suggest that a deeper theoretical understanding of the scientific principles of experimentation that the lean startup approach builds upon could benefit its users.

In summary, the lean startup approach may provide several benefits for corporate venturing, such as enabling keeping a portfolio of real options, in the form of ventures that explore certain

opportunity landscapes in a cost-effective manner. However, in the corporate context one must consider the impact of the firm's legacy and understand the company-wide implications of using the lean startup approach.

2.3. Organizational learning

In previous sections I have mostly discussed learning on the venture level and referred to the role of learning through experimentation and acquisition. The literature on organizational learning is intricate and entail different definitions that are at odds, as the same term are at times used to indicate different phenomena. This calls for a thorough review of the different conceptualizations of organizational learning.

Organizational learning relates to the processes by which an organization acquire knowledge, distribute, interpret and sustain it, and then puts it into use (Huber, 1991). Thus, the theory contributes to a wider tradition of literature emphasizing the importance of knowledge development and maintenance, including the knowledge-based theory of the firm, and the theory on organizational memory, group learning and shared cognition (Madsen and Desai, 2010).

In the management and innovation literature, learning is seen as "a purposive quest to retain and improve competitiveness, productivity, and innovativeness in uncertain technological and market circumstances" (Dodgson 1993, p. 378). The importance of learning increases with the level of uncertainty of the environment in which the organization is situated.

While some conceptualizations of organizational knowledge have emphasized its distinctiveness from individual knowledge, and its imperviousness against individuals leaving the organization (Levitt and March, 1988; De Holan and Phillips, 2004), others have stressed the important role of individual cognition, implying that knowledge reside in a combination of individual and collective memory systems (Anand, Manz and Glick, 1998; Huckman and Pisano, 2006; Felin and Hesterly, 2007; Groysberg, Lee and Nanda, 2008).

This suggest that organizational knowledge encompass procedural knowledge which is manifested through explicit goals, routines, standard procedures and rules, and tacit knowledge contained through shared mental schema and culture, as well as individual cognition and memory (March and Olsen, 1975; Conner, 1991; Weick and Roberts, 1993; Grant, 1996; Simon, 1999; Madsen and Desai, 2010; Argote and Miron-Spektor, 2011).

Hence, organizational learning may be modelled as a multilevel concept in terms of where learning takes place – at the individual level, the group level- or the organizational level (Crossan, Lane and White, 1999). This is an important distinction, with the implication that knowledge is heterogeneously distributed within the organization and therefore may or may not be available at decision points where it would be relevant (Simon, 1999).

A hierarchy of cognitive processes have also been proposed by distinguishing between single- and double-loop-learning (Argyris and Schön, 1978). While single-loop-learning represents a reactive modification of strategies within a constant normative framework, double-loop-learning represents a reflective process by which goals, norms, strategies and knowledge structures (e.g. fundamental assumptions) are modified proactively or as a reaction to environmental change (Shrivastava, 1983; Keil, 2004). Furthermore, it is important to distinguish between different learning mechanisms that vary in terms of locus of where knowledge is derived (Zahra, Nielsen and Bogner, 1999), degree of consciousness in the learning process (Dutton and Thomas, 1984; Adler and Clark, 1991; Zollo and Winter, 2002; Nembhard and Tucker, 2011; Heimeriks, Schijven and Gates, 2012), and relatedness between new and to already possessed knowledge (Miner and Mezias, 1996; Schildt, Maula and Keil, 2005).

The following sections discuss how the nature of learning may differ along these dimensions and defines a broad set of learning concepts.

2.3.1. The varying nature of organizational learning mechanisms

Zahra, Nielsen and Bogner (1999) stress the importance of organizational learning within CE and classify it into two broad categories based on the locus of where knowledge is derived (See also Dess *et al.*, 2003). They define acquisitive learning as "when a firm acquires and internalizes knowledge that pre-exists externally to its boundaries" (p. 173). Referring to Huber (1991), they assort learning activities such as vicarious learning, grafting and search into this category. The other category, 'experimentation', is presented as a generative process that largely takes place internally, driven by individuals who enjoy the discretion to experiment. Experimentation thus generate new knowledge and translates individual experiences into organizational knowledge (Zahra, Nielsen and Bogner, 1999).

What is evident from this reading is that deliberation and cognizance are very prominent in this concept of organizational learning. This is, in contrast to other conceptualizations of organizational learning, that often highlights the autonomous or semiautomatic nature of learning. For instance, experiential learning, that is learning based on experiences and interpretations of action- and outcome relationships, is closely associated with the concept of routines (Levitt and March, 1988). In this light, organizational learning takes place by adapting routines incrementally in response to feedback about outcomes in a trial-and-error fashion (Van de Ven *et al.*, 2019). When a routine is associated with a positive outcome it is more likely to be used and if it is associated with a negative outcome more likely to be discarded (March and Olsen, 1975; Levitt and March, 1988). Such learning is often not a result of deliberate experimentation (i.e. explicit hypothesis formulation ex ante and systematic testing) but could follow from after-event reviews (Ellis and Davidi, 2005), or counterfactual thinking, by which past event as reconstructed and alternative events that might have occurred are considered (Argote and Miron-Spektor, 2011), or through less cognizant processes. Experiential learning thus involves several learning mechanisms, such as experimentation, learning-by-doing through trial-and-error, and deliberate learning from success and failure or near failure, which differ in terms of deliberation and cognitive processing.

Organizational learning both leads to discrimination among routines and refinement of routines, which may lead to competency traps as refined routines may be preferred over routines that are more adequate but which require additional learning to be implemented (Levitt and March, 1988). This imply a path dependent nature of organizational learning, which is captured in the theory of absorptive capacity (Cohen and Levinthal, 1990). While being discernibly focused on R&D related learning, Cohen and Levinthal (1990) argue in their seminal paper that some portion of prior knowledge should be closely related to new knowledge to facilitate its assimilation. Hence, decisions about investments into particular area of knowledge allow for subsequent learning in related areas, whereas it forecloses learning within areas for which investment were lacking. As resources and attention are limited, learning involves a degree of commitment to a certain learning trajectory.

To maintain room to maneuver and broaden the knowledgebase, organizations should avoid only focusing on learning that relates to their current knowledge. Instead they need to balance between local search or exploitative learning and distant search or explorative learning (March, 1991; Afuah and Tucci, 2012).

March (1991) argue that adaptive processes may be effective in the short run as they refine exploitative learning processes but may be detrimental in the long run as they are less effective for developing exploration capabilities. As preferences for certain activities develop simultaneously as competencies within them, the propensity to reevaluate the purposefulness of engaging in certain activities are diminished as competencies at them are gained (Levinthal and March, 1993). Instead there is a risk that organizations gradually adopts current routines but the routines themselves are considered fixed properties (Levitt and March, 1988). This has been referred to as the competency trap (Levitt and March, 1988).

In order to introduce new routines, current routines may need to be forgotten (De Holan and Phillips, 2004). Given the link between the preferences and knowledge, inability to forget competencies may exaggerate the competency trap (Martin De Holan, Phillips and Lawrence, 2004). The ability to forget purposefully is called unlearning and is also important in order to

get rid of bad habits that have been learned in the past (Martin De Holan, Phillips and Lawrence, 2004). Divestiture of businesses and discontinuation of routines and practices are some of the possible actions that can promote unlearning and thus enable learning of new competencies.

2.3.2. Learning mechanisms based on first-hand experiences

Previously in this review Zahra, Nielsen and Bogner's (1999) distinction between acquisitive and experimental learning was referenced. Next, I account for different forms of acquisitive and experiential learning.

Learning-by-doing is a form of experiential learning, which is most prominent in the traditional perspective on organizational learning (Levitt and March, 1988), and has been referred to as semiautomatic (Heimeriks, Schijven and Gates, 2012), autonomous (Dutton and Thomas, 1984) and first-order learning (Adler and Clark, 1991). These epithets are based on the notion that this form of learning is a natural effect of repeating a routine, which explains the regularity of cost reductions through accumulated experience, which is captured in the concept of the 'learning curve' (Adler and Clark, 1991). Hence, learning-by-doing may occur naturally, through a process of trial-and error (Levitt and March, 1988; Van de Ven *et al.*, 2019), without the need for an explicit effort to learn systematically. Individuals simply changes their behavior iteratively and incrementally to avoid negative outcomes and increase positive outcomes.

To further enhance the learning, deliberate investments in knowledge articulation and codification activities (i.e. second-order learning (Adler and Clark, 1991)) are needed (Zollo and Winter, 2002). Through articulation and codification, tacit knowledge that individuals acquire through experience, can be mobilized by creating explicit concepts that can be internalized by other organizational members, enabling them in turn to develop new tacit knowledge (Nonaka, 1994). While codification may lead to rigidity, it can be counteracted by inducing reflection, self-conscious inquiry and conscious action (Heimeriks, Schijven and Gates, 2012). For example, deliberate learning activities such as after-event reviews intended

to analyze and draw conclusions about successes and failures have been shown to accelerate the learning process (Ellis and Davidi, 2005). Dahlin, Chuang and Roulet (2018) refers to it as analytical learning and distinguish it from learning-by-doing. Whereas the latter is mostly automatic and tacit, analytical learning entails active decision-making and uses the existing information gained from previous experiences to revise and adapt future routines. This type of active learning is for example transpiring as organizations attempt to learn from failures (Dahlin, Chuang and Roulet, 2018).

These forms of learning assume there are experiences to draw from that occur naturally. Furthermore, they rely on the prospect of achieving sufficient improvements through incremental adaptations. However, as organizational routines, norms and values are adapted and perfected within the current environment they may also become increasingly streamlined and rigid, offering limited opportunity for learning (Leonard-Barton, 1992). As past experiences influences the way in which organizations frame challenges and choose which problems to solve, it may act as a lens that narrow the search scope (West and Iansiti, 2003). While this may be beneficial in a stable environment, it becomes dangerous when long periods of incremental innovation, which motivates increasingly narrow frames, are punctuated by unpredictable events, induced by changes in technology or market (Anderson and Tushman, 1990). During such circumstances, relying on naturally occurring learning-by-doing may limit the organizations maneuverability.

An alternative form of learning that may enable organization to not only draw on existing experiences but to broaden the scope of search and thus break conceptual inertia, is purposeful experimentation (West and Iansiti, 2003; Murray and Tripsas, 2004). This form of learning refers to a deliberate act of creating an environment that is conducive to learning. This should be contrasted to the semiautomatic form of trial-and-error referenced above, that traditional organizational learning studies mostly refer to and which is sometimes also labeled ‘experimentation’ (Levitt and March, 1988).

Purposeful (Murray and Tripsas, 2004), systematic (McDonald and Eisenhardt, 2019; Hampel, Perkmann and Phillips, 2020), or scientific (Camuffo *et al.*, 2020) experimentation involves hypothesis formulation and rigorous testing in a manner that enables the firm to postpone major commitment until certain key assumptions have been verified.

Table 1: Characteristics of learning mechanisms

Experiential learning (learning from own experiences)			
Learning mechanism	Experimental learning	Learning-by-doing	
Sub-category	N/A	Deliberate learning-by-doing	Semi-automatic learning-by-doing
Nature of experience generation	Deliberate generation of experiences to enable wanted knowledge creation.	Semi-automatic generation of experiences through the act of pursuing a certain objective.	Semi-automatic generation of experiences through the act of pursuing a certain objective.
Nature of knowledge acquisition	Systematic assessment of the purposefully generated experiences and conscious learning.	Systematic assessment of experiences and conscious learning.	Semi-automatic assessment of experiences and reactive learning.
Locus of knowledge prior to learning	Knowledge must be generated.	Knowledge must be generated.	Knowledge must be generated.
Relation to current core competencies and knowledge	Can be unrelated to the expertise of the learner.	Deep understanding of cause and effect.	Not necessarily deep understanding of cause and effect.

Beyond experimentation on the venture level, established organizations that can afford several simultaneous experiments can also apply an experimental approach to its portfolio of projects. This approach has been explored in the entrepreneurial finance literature where investors have been observed to engage in parallel “experiments of manageable financial sizes” (p. 33) to reduce uncertainty before making big investments on a few selected ventures with high potential (Kerr, Nanda and Rhodes-Kropf, 2014). This approach of parallel probing has also been found to be favorable for corporations investing in various entrepreneurial initiatives (Brown and Eisenhardt, 1997). Studies considering experimentation from a portfolio perspective mostly concerns the flexibility associated with a real options approach, which allow the investor to evaluate businesses in domains characterized by great uncertainty.

Venture level learning through experimentation does however offer an additional source of flexibility. The knowledge acquired from each experiment may enable insights that can be used to 'pivot' in a new direction (see section 2.2.2. The lean startup approach). Such insights build on knowledge accumulation, which is another important aspect of experiential learning as it improves the ability to focus search efforts (West and Iansiti, 2003).

2.3.3 Learning mechanisms based on second-hand experiences

Table 2: Characteristics of learning mechanisms (continued)

Acquisitive learning (learning from others' experiences)			
Learning mechanism	Vicarious learning		Grafting
Sub-category	Precise replication	Adaptive replication	N/A
Nature of experience generation	Experiences generated by others.	Experiences generated by others.	Experiences generated by others.
Nature of knowledge acquisition	Practices are replicated precisely to account for the lack of understanding of causal mechanisms between various elements and outcomes.	Adaptation of practices to fit in the current context. Could be done with the help of the group that practices are replicated from who understand the causal mechanisms between various elements and outcomes.	Individuals or organizations possessing certain desired knowledge are hired or acquired respectively.
Locus of knowledge prior to learning	Knowledge is stored in other organizations (in the case of imitation) or groups within the same organization.	Knowledge is stored in other organizations (in the case of imitation) or groups within the same organization. Additional knowledge is generated experientially in the process of adaptation.	Knowledge is stored in the minds of individuals that are hired or organizations that are acquired.
Relation to current core competencies and knowledge	Unrelated to the expertise of the learner.	Unrelated to the expertise of the learner.	Unrelated to the expertise of the learner.

Besides learning from one's own experiences, pre-existing knowledge can be acquired in different ways (Zahra, Nielsen and Bogner, 1999). Huber (1991) offers two mechanisms to

acquire pre-existing knowledge from outside of the organization: knowledge grafting and vicarious learning.

Knowledge grafting refers to acquiring new knowledge and competencies by introducing new organizational members with distinct expertise (Huber, 1991; Nag, Corley and Gioia, 2007; De Clercq *et al.*, 2012). This can be done in large scale through acquisition of a firm or in smaller scale by hiring certain experts. A benefit of this approach is that it is a faster way of acquiring knowledge than through experience and can potentially offer more complete set of knowledge than imitation (Huber, 1991). However, as demonstrated by Nag, Corley and Gioia (2007) it is not always an easy process. Studying an attempt to graft on business knowledge to an engineering-oriented firm in order to switch from technology-push to a market-pull innovation focus, they find that new organizational knowledge may be rejected by the organization due to knowledge inertia that arise from the organizational identity. Hence, organizational learning of certain pre-existing knowledge sources may require adaptations of the organizational identity.

Vicarious learning signifies learning that occurs through observing and making meaning from another's experience (Myers, 2018). Early empirical work portray it as an act of finding and copying practices (Haunschild and Miner, 1997; Baum, Li and Usher, 2000). Levitt and March (1988) refers to this "diffusion" of experience and routines as a process of transferring "encoded experience in the form of technologies, codes, procedures, or similar routines" (p. 329). This can be done for various reasons. Organizations may copy practices that are seen as highly legitimate because they have been adapted by many other organizations or they have been adapted by organizations that are perceived as highly successful, or because the practice itself is associated with a desirable performance outcome (Haunschild and Miner, 1997). It has been noted that organizations may decide to imitate practices based on highly biased grounds as organizations that can be observed at any given time are the survivors of a greater sample of organizations that may have utilized the practices of interest (Denrell, 2003).

Apart from imitating other organizations, vicarious learning can also be used to replicate successful routines and practices within an organization. Winter and Szulanski (2001) suggest replication as a strategy, highlighting successful examples such as the McDonald's franchise model and Intel's approach of exactly copying their semi-conductor plants.

Subsequent studies have found vicarious learning to entail more than just identifying and copying practices (Bresman, 2013; Myers, 2018), highlighting the role of adaptation as an alternative to precise replication (Williams, 2007). Bresman (2013) claim that it is rare for a group to find a routine developed by another group that can be copied exactly, as they most likely already have routines that work satisfactory and which would be expensive to replace completely, and as the context of the two groups probably differ, making it unrealistic to copy routines in their entirety. Instead, he finds that a group engaging in vicarious learning first identify a group with prior experience that is related to what they are trying to achieve and then uncovers relevant routines. They then translate the knowledge gained from studying the role model's routines to suit within their own context and changes current routines in a way that embeds the knowledge they have gained through vicarious learning. This process may take the form of a one-way observation of a non-participant model through observation or via documents and recordings that simply enables superficial examination of artefacts resulting from a prior actor's performance, which require the learner to understand the intention behind the model's actions in order to emulate the vital elements and filter out the noise (Myers, 2018).

Winter *et al.* (2012) however, express a note of warning, as their study of replication efforts finds that adapting a working formula to fit local circumstances may risk losing vital but poorly understood features of the original design. This is why copying a template precisely may be beneficial in situations of causal ambiguity where it is difficult to discern the consequences and interdependencies of various elements of a routine or a practice (Williams, 2007). On the other hand, adaptation may be crucial in order to integrate the new practice or routine with the local context (Williams, 2007).

An alternative remedy might be if the “model”, the individual or group that is being emulated, takes a more active role in the learning process (Myers, 2018). Myers (2018) conceptualize a “coactive” vicarious learning process as an alternative to “independent vicarious learning” (i.e. arm’s length observation and replication) (p. 614). In coactive vicarious learning the model engages as a cocreator in the learning process by reflecting on experiences and developing mutual understandings together with the learner. Therefore the relational context, such as the familiarity, quality of the relationship and history of prior interactions play an important role in the learning process (Myers, 2018). The strong focus on joint experiences and interpretations in this form of transactional learning blurs the boundaries between learning from first-hand and second-hand experiences.

2.4. Learning how to learn through experimentation

Many organizations today are facing increasing uncertainty that renders their current learning processes insufficient. In this context the current study aims to answer the following research question: *How do large established firms learn how to experiment in order to develop new businesses?*

The following section recap some of the reviewed literatures on learning in the context of corporate entrepreneurship to motivate the importance of this question. It also discusses the current knowledge about incumbents’ approaches to learning as a response to discontinuous technological change.

The reviewed literature alludes to the central role of organizational learning in all forms of entrepreneurial activity. From the highly concrete interlinkage between learning, knowledge, decision making and execution under high levels of uncertainty, which affects venture performance (Holcomb *et al.*, 2009), to the more abstract notion of firm-level capability development through entrepreneurial learning, which affects organizational survival during times of rapid change (Zahra, Nielsen and Bogner, 1999). In recent years, practitioners have adopted a highly deliberate and systematic, outward looking approach to entrepreneurial

learning, which is evident by the popularity of the lean startup approach and the proliferation of accelerators. Corporations are trying to emulate these approaches to become increasingly adept and agile as their industries are presented with challenges tied to increasing levels of uncertainty due to convergence of technologies and erosion of industry boundaries (Shankar and Shepherd, 2019; Hampel, Perkmann and Phillips, 2020).

Disruptive technologies, in particular emerging digital technologies, pose a major learning challenge to incumbent firms for several reasons. Firstly, feedback from their current customers may not lead them to invest in these technologies in a timely fashion, but rather ignore them until it is too late (Bower and Christensen, 1995). This is because they offer features and assets that are not yet valued by the mainstream market and do not, at least initially, compete with existing technologies on the features that are currently valued (Adner, 2002). Digital disruptive innovations can also alter the business ecosystem of systemic industries in unpredictable ways, thus requiring firms to reassess established ways of doing business and interact with other market actors (Kumaraswamy, Garud and Ansari, 2018). Furthermore, these new technologies may be competence-destroying, thus erasing the value of current competencies of the incumbent firm (Tushman and Anderson, 1986).

Addressing this issue, several empirical studies on incumbents responses to digital disruption have emphasized the importance of experimentation as a way to seize emerging opportunities enabled by new technology (Cozzolino, Verona and Rothaermel, 2018) and assess diverging interpretations of ambiguous market signals (Khanagha *et al.*, 2018). Even when the importance of disruptive technologies is being recognized incumbents have been found to struggle with ambiguity regarding how the new technologies will impact the market and in what pace the new technologies may be adopted (Khanagha *et al.*, 2018). This is an organizational dilemma as it requires a combination of flexibility and experimentation that stands in contrast to the efficient and rigid learning mechanisms, focused on incremental innovation, that dominate established firms' R&D activities.

Yet, established firms can, despite their legacy of experiences, escape the ‘competency trap’ (Levitt and March, 1988), which threatens to lead them down paths of exclusive local search, and instead create path-breaking innovation (Perra, Sidhu and Volberda, 2017). A rising number of studies have attempted to shed light on how this can be achieved and do provide indications of the drivers, benefits and challenges of experimentation by incumbents.

For instance, in their study on responses to technological disruption in heterogeneous market environments, Khanagha et al. (2018) find that incumbents are required to adapt a complex innovation process, which accommodate different approaches to experimentation. They argue that this is required in order to enable flexible innovation strategy, encompassing both focused experimentation with key customers and more diverse experimentation; experimentation with radical offerings and with offerings closer to the current portfolio; as well as exploration of paths towards new ecosystems and paths that support current ecosystems. In summary, they emphasize the importance of balance between exploration and careful maintenance of technologies, resources, business models and ecosystem configurations. In a similar vein, a number of studies suggest that experimentation with hybrid offerings that incorporate new and existing technologies let firms simultaneously fine-tune and evolve existing technologies, acquire and develop new ones and integrate these into new offerings (Bergek *et al.*, 2013). Investments in experimentation with these offerings can be seen as real-options (McGrath, 1999), as they provide an entry to go after opportunities created by the new technologies, when and if the market takes off, and still maintains the competitive advantage in current technologies, thus allowing for assessment of different competing avenues and the correct timing of transformation efforts (Cohen and Tripsas, 2018).

It remains unclear whether the approach towards experimentation and the organizational setting that accommodate such endeavors vary over time. While some findings indicate that experimentation play a greater role in the early stages of a new technology’s establishment to later make way for an emphasis on acquisitions and alliances (Cozzolino, Verona and

Rothaermel, 2018), other studies have argued that it plays a greater role in the later stages when components and architectures are conceivable (Furr and Snow, 2015), whereas some advocate the need for constant balance between contradictory approaches which involve a combination of collaborations and experiments of various kinds (Khanagha *et al.*, 2018). Furthermore, it is unclear how the approach to facilitate experimentation, such as the organization architecture within which such endeavors are pursued, is shaped by organizational learning as experiences of experimentation is accumulated.

The literature on corporate entrepreneurship stress the importance of organizational design as a fundamental element to unleash entrepreneurship and coordinate efforts in a way that fully take advantage of entrepreneurial activity to enable strategic renewal, growth and performance benefits for the firm as a whole (Marvel *et al.*, 2007; Burgers *et al.*, 2009; Ireland, Covin and Kuratko, 2009; Monsen, Patzelt and Saxton, 2010; Burgers and Covin, 2016). Yet, established organizations are often designed with a propensity towards efficiency (Eisenhardt, Furr and Bingham, 2010). As even their innovation activities (i.e. R&D) are managed in a way that efficiently serve their current customer base and industry by producing incremental improvements through the exploitation of existing capabilities, they do not provide a sufficient basis for new learning and adaptation to a rapidly changing environment (O'reilly and Binns, 2019). As a response, corporations often develop CV units to enable a new form of innovation processes that help the firm learn and develop new capabilities that allows them to transform and adapt to the changing environment (Hill and Birkinshaw, 2014). These are ideally sufficiently autonomous to adopt other practices more suitable for entrepreneurship.

However, such CV units are in general short lived due to several potential factors, such as shift of strategic priorities, which makes the CV unit obsolete (Fast, 1979), (e.g. shift of focus in favor of efficiency and low risk), erosion of the political position of the CV unit (Fast, 1979), exploration focus being too unrelated to corporate strengths for the firm to take advantage of the outcome or too close to the current core capabilities to create a new source of value (Hill and Birkinshaw, 2014). While most VC funds require seven or eight years before showing any

yield on their investments, the corporate cycle of change is shorter (Hill and Birkinshaw, 2014), which is another factor that may explain the high rate of premature closure of CV units (Fast, 1979; Burgelman and Välikangas, 2005; Hill and Birkinshaw, 2014).

Yet, CV units tend to appear anew in a cyclical fashion often without being informed by potentially important learning from its predecessor (Chesbrough, 2000; Burgelman and Välikangas, 2005). Hence, potentially valuable experience-based knowledge is lost, and the organization need to rely on other sources as they develop the CV unit.

Furthermore, while corporations often adopt practices from other contexts, in particular the entrepreneurial context (e.g. VC-practices, incubator practices, accelerator-practices, etc.) there are no clear blueprints of how to design a CV unit, which instead tend to vary significantly between companies as they are designed to fit in their respective corporate context (Fast, 1979).

Interestingly, this results in a situation where CV units to a considerable extent exist in a state of development that is highly dependent on organizational learning. Indeed, studies have noted that there is a high level of experimentation associated with choosing objectives and organizational profiles, and that corporations tend to adopt entrepreneurial practices (e.g. VC-practices) in somewhat inappropriate ways (Hill and Birkinshaw, 2008). This indicate that the development process may also be associated with organizational learning challenges.

Yet, while some studies have adopted a dynamic perspective to understand the inner workings of CV units, depicting their operations over an extended period of time (Burgelman, 1985; Masucci, Brusoni and Cennamo, 2020), the processes by which the capabilities to manage such operations are developed remain obscure. In studies adopting a dynamic perspective, focus has revolved around the ventures, whereas the CV unit itself has been seen as a stable entity (e.g. Burgelman, 1985). Empirical studies that have set the scope on the CV unit have instead adopted a static perspective, considering various features of the model, but at a fixed point in time (e.g. Sykes, 1986; Hill and Birkinshaw, 2008, 2014; Hill *et al.*, 2009). In order to

gain insight about how the organization can learn new practices and routines to enable systematic learning through venturing a dynamic perspective with focus on the unit level is required.

The literature on independent incubators and accelerators is informative in the sense that it highlights how such organizational forms can support venture level learning (Cohen, 2013; Cohen, Bingham and Hallen, 2018; Cohen *et al.*, 2019; Hallen, Cohen and Bingham, 2020). This stream of literature has however also either applied a dynamic perspective, focusing on the venturing process (e.g. Dutt *et al.*, 2016; Cohen, Bingham and Hallen, 2018), or a static perspective considering the variations in the organizational design elements (e.g. Bergek and Norrman, 2008; Cohen *et al.*, 2019). The in-depth study of H-farm (Tracey, Dalpiaz and Phillips, 2018), which I have discussed above, is a notable exception. Its focus on the legitimization process associated with translating the incubator model to another misaligned institutional context would indeed be a warranted angle from which to study the adoption of such practices in a corporate context.

Yet, this study adopts organizational learning as the theoretical lens. The reason for this is that it seems as though the challenges associated with the translation of entrepreneurial practices originated in a different context to the corporate context goes beyond institutional barriers or lack of legitimacy. The anecdotal evidence of misuse of the lean startup approach by digital startups (Ghezzi, 2019) and inappropriate use of VC-practices by CV units (Hill and Birkinshaw, 2008) suggest that there are challenges related to learning how to properly use these approaches even though they are seen as highly legitimate. Given that strict replication of a proven model is not an alternative due to the context-dependent nature of various innovation systems (Williams, 2007), the process of adopting practices from incubators and accelerators for supporting experimental entrepreneurial learning most likely depend on the use of a repertoire of learning mechanisms including vicarious and experiential forms of learning. This makes the adoption of entrepreneurial practices by CV units a highly conducive context to study the organizational learning mechanisms that enable changes of corporate

innovation practices as a way to respond to digital disruptions. While previous empirical studies on organizational learning mostly have focused on a single type of learning mechanism, a broader perspective that enable the study of interrelations between various forms of learning can provide a more complete depiction of the actions and challenges associated with the adoption of a fundamentally new way of driving innovation.

To be able to provide substantial recommendations to practitioners we need to better understand the process and mechanisms by which firms adopt and develop new practices to support learning through experimentation and make this an integral part of the organization's capabilities.

The learning needed to fully take advantage of an experimentation-driven approach to corporate venturing goes beyond individual level learning. It also involves development of structures, processes and relationships that enable the diffusion of venture-level learning across the corporation and that increase the potential of leveraging corporate capabilities in the venturing process (Hill and Birkinshaw, 2008). While some capabilities might be acquired through vicarious learning, adaptations to the corporate context most likely hinge on experiential learning as well (Myers, 2018).

Referring back to the Venn diagram (Figure 1. Overview of the reviewed literature), this chapter links some crucial literature streams in order to support and motivate the research question. The link between organizational learning and CE concerns venture level learning, which, as have been demonstrated, is a prerequisite for successful corporate venturing and a fundamental enabler for navigating in a highly dynamic environment characterized by high levels of uncertainty. Furthermore, CE is manifested in this chapter as a process by which autonomous activities may enable experimental learning that can be utilized for informed strategic repositioning of the firm.

The link between organizational learning and entrepreneurial incubators and accelerators concerns organizational practices conducive of experimental learning, which has originated in

an entrepreneurial context. The link between CE and entrepreneurial incubators and accelerators concerns the phenomenon of corporations emulating these practices, a phenomenon, which is clearly motivated given the established link between experimental learning and CE. Finally, the intersection between all of these three literatures concern the central point of this thesis, which is the underlying learning mechanisms that enable an organization to develop capabilities to learn through experimentation. Hence, these literatures are relevant to the research question and the findings may contribute to each of these literature streams.

Chapter 3. Methodology

The field of strategy and management operates under a great variety of paradigms (Wilson, Tranfield and Starkey, 1998). Therefore, this chapter begins by justifying the methodological choices based on the ontological and epistemological stance that have been adopted before accounting for the data collection and analysis.

3.1. Ontological and epistemological underpinnings of the research design

Field-based research have been used in prior studies to illuminate key mechanisms of corporate entrepreneurship (e.g. Burgelman, 1983b), intermediary organizations (e.g. Giudici, Reinmoeller and Ravasi, 2018) and organizational learning (e.g. Bresman, 2013). The current study uses a qualitative in-depth single case design with a processual focus. Qualitative research has been characterized as an interpretive and naturalistic multimethod approach that often study phenomena in the environment in which they naturally occur (Gephart, 2004). In this vein, the in-depth case study focus on a particular occurrence of the phenomenon of interest and offers a holistic way to study how and why it comes about in its natural context (Dubois and Gadde, 2002; Yin, 2003).

By adopting a processual focus, this study is concerned with how things evolve over time and why they evolve in this way (Van de Ven and Huber, 1990). More concretely, the aim is set on developing insights about *how* an organization learn a new way to acquire knowledge, reduce uncertainty and make strategic decisions revolving innovation – namely by learning through experimentation. This infers that the objective also is to provide a rationale for *why* they learn it in such a way, since only accounting for the steps would not be sufficient for developing a meaningful theory.

This focus differs from many studies concerned with organizational change that fixate on antecedents and consequences related to events of change. Mohr (1982) differentiate these two approaches as being driven by ‘variance theory’ or ‘process theory’. Essentially, variance theory require evidence of correlation, temporal precedence and absence of spurious

relationships between independent and dependent variables to establish causality (Mohr, 1982; Van de Ven and Huber, 1990; Langley, 1999). Process theory, on the other hand, offers ways of explaining an observed sequence of events by considering unobservable underlying generative mechanisms (Tsoukas, 1989; Van de Ven and Huber, 1990; Pentland, 1999; Gehman *et al.*, 2018). In contrast to variance theorizing that utilizes deduction to make conclusions, this line of process theorizing requires an abductive approach. By connecting empirical observations and surprising occurrences to extant theoretical ideas, novel conceptual insights are generated that, due to the deep contextual understanding, may be applied to other settings (Langley *et al.*, 2013). Hence, this approach uses rich details of particular stories in its aims for contingently transferable insights about underlying mechanisms rather than generalizable knowledge of cause and effect relationships (Lincoln and Guba, 1985). Since the aim of this study was to answer an underexplored and complex question this abductive line of inquiry was deemed suitable. Therefore, an important objective was to secure rich naturalistic empirical accounts of the process of interest.

The single case study is an effective tool to generate such rich and contextual descriptions, which can give rise to insights about deep social dynamic structures (Dyer and Wikins, 1991). In this way the in-depth single case study design rely on a different justification than the multiple case study design, advocated by Eisenhardt (Eisenhardt, 1989, 1991; Eisenhardt and Graebner, 2007), which often sets out to control variation in order to find generalizable insights and testable propositions (Welch *et al.*, 2011). While variance theorizing usually operates under the paradigm of positivism, the search for unobservable underlying mechanisms relates to the stratified ontology of the critical realist paradigm, heavily influenced by the English philosopher Roy Bhaskar (Collier, 1994; Bhaskar, 2009, 2010, 2013, 2014).

When studying organizational processes, another fundamental ontological issue regards whether organizations are seen as entities or processes (Van De Ven and Poole, 2005). This distinction, that dates back to ancient Greece philosophies of Democritus (substantive ontology) and Heraclitus (processual ontology), is referred to as substantive ontology and

processual ontology (Rescher, 1996; Van De Ven and Poole, 2005; Thompson, 2011; Langley *et al.*, 2013). This study is guided by a processual ontology which infer that even seemingly stable states are viewed as processes. As illustrated by the words of Heraclitus: “The river is not an object but an ever-changing flow; the sun is not a thing, but a flaming fire” (Rescher, 1996, p. 10; in Langley *et al.*, 2013, p. 5). As I study the change from a traditional R&D based innovation strategy to an experimentation-based innovation strategy, these innovation processes are not seen as stable entities that are being internalized and discarded but as reoccurring processes supported by organizational routines. Hence the analysis focus on processes on two distinct levels: 1) The reoccurring innovation and learning processes intended to develop new knowledge that can be exploited for financial gains; and 2) the processes that aim at changing or maintaining the former processes. This latter form of meta processes can be compared with the concept of meta routines (Lewin, Massini and Peeters, 2011), although the concept of process is a wider definition that does not necessitate regular reoccurrence.

3.2. Justification of research setting

While the research setting is portrayed in greater detail in the next chapter (Chapter 4: Research setting), it is worthwhile to first briefly motivate the appropriateness of the selected case company. The study investigates Telco, a large multinational corporation in the Information and Communication Technology (ICT) industry, which has a heritage of developing innovative high technology products for more than 140 years. The industry as such is seeing an unprecedented pace of digitization and while the market has seen a period of slow decline during the last few years, moderate or massive digital disruption is anticipated in the near future (Caylar and Ménard, 2016). This highly dynamic and uncertain environment put tremendous demand on the capacity for rapid learning. The investigated company was highly regarded in terms of its technological leadership but had recently realized that technology innovation was not enough and that the ability and means to experiment was needed in order to turn the lurking digital disruption of the industry from a threat to an

opportunity. The company had already set in motion an initiative to experiment with new technology and business, which due to its open approach to innovation was publicly known. The explicit ambition to create an environment for experimentation and radical innovation and the initial progress that had been made prior to the study, which indicated commitment to this intent, made it a particularly interesting case. Furthermore, due to the arrangements between University of Leeds and Telco, there was a unique opportunity to collect rich data from within the company during an 18-month secondment.

3.3. Data collection

In April and May of 2016, I was able to familiarize myself with the company and the challenges it was facing due to the digital transformation of the industry as I was conducting research for my MSc thesis. I spent over three months at the company headquarters and conducted several interviews which, while being focused on an adjacent topic, offered very useful data regarding the struggles related to innovation management in the organization more broadly. These insights served as a basis for understanding the drivers and wider context of the phenomenon under investigation and was what woke my interest for it in the first place. In September of 2017, I was seconded to the company's headquarters for 18 months and initiated more focused data collection. For the first three months I searched for information about various innovation initiatives and was eventually able to immerse myself within Telco Garage by the middle of December. This opportunity led me to decide to narrow my scope and anchor my research in Telco Garage, allowing me to sharpen the research question. During the following six months I was able to observe the daily activities of Telco Garage from within, have informal conversations as well as interviews with various members of the organization, and collect internal documents. In May 2018 an unexpected reorganization occurred and Telco ONE was created shortly thereafter by combining parts of Telco Garage with various other innovation initiatives. My studies took an unexpected but interesting turn and I kept collecting data through additional interviews, observations and collection of new documentation that was being produced continuously as Telco ONE was being developed.

This data was complemented with archival data (e.g. meeting protocols and documentation of strategy, operational procedures, etc.) covering a period that stretched back until 2013, when the launch of Telco Garage was first contemplated. People involved during these early years were traced through 'snowball sampling' (Lincoln and Guba, 1985), and interviewed as well. After a five-month period of staying in the UK, between end of March and end of August of 2019, I returned to spend another seven months at the company, ending in March 2020.

My level of access within the company was comparable to a regular employee, which gave me ample opportunity to collect rich data. This study therefore benefits from a wide variety of data such as interviews, observations and secondary data, including classified internal documents. Below follows a table of the data and its use in the analysis. A more detailed description of the interviews can be found in *Appendix A: List of interviews.*

3.3.1. Interviews

Interviews were conducted continuously. A strength of interviews is that they can provide depth and subtlety and give meaning to events and actions (Pettigrew, 1990). The interviewees provided their personal reflections on the current situation, future prospects and the past events leading up to the present. Given the processual focus of this study, questions revolved around events and actions, sequences and interrelationships of such, and the rationale behind them.

The interviewees can roughly be divided into four groups, although there was some overlap. The first category consists of people that were not directly involved in the initiatives of interest (i.e. Telco Garage or Telco ONE) but who had insights about various aspects of the company in general, its ways of working and the implications of recent changes in the business environment. These informants helped creating contextual awareness and a deeper understanding of possible antecedents to the studied phenomenon.

The second category include people who were centrally involved in the undertakings under investigation and had close experiences of these initiatives' evolution over time.

Table 3: Summary of data sources and their use in the analysis.

Data sources	Type of data	Use in analysis
Interviews (122 interviews, 4847 minutes of recordings and 1227 pages of transcriptions)	**Unrelated to Garage/ONE** 33 interviews with Telco employees working with core business and with the new businesses around IoT	Afforded an initial background understanding of the challenges and new requirements on innovation process in general due to digital transformation as well as the uncertainty the company was facing.
	Central in Garage/ONE 28 interviews with informants central to the development and operations of Telco Garage and Telco ONE	Provided subjective narratives from multiple perspectives about the origins, evolution, and outcomes of Telco Garage and Telco ONE. These interviews gave meaning to the events and highlighted challenges and considerations underlying critical decisions.
	Extended network of Garage/ONE 41 interviews with local garage leaders and drivers of related local innovation initiatives targeting early phases of the innovation process.	Provided understanding of the width of dispersed innovation initiatives across the company, the interrelationship between Garages, and how the innovation process was organized and managed. This included, for instance, concerns such as ideation and idea selection processes, coaching and support, tracking of KPIs, and associated challenges.
	Venture team members 20 interviews with project-level informants, including the CEOs of three incubated startups, and key members of five internal early ventures.	Deepened the understanding of the innovation process and getting underneath the “ideal” conceptualization of it. This included a deeper understanding of the strategic concerns, business model innovation process, organizational interdependencies, external collaborations and interactions, as well as experiences of the support provided.
Observations (25 months of on-site observations)	**Telco Garage** 6 months of observations from within Telco Garage (15 Dec 2017 – 20 Jun 2018); 8 months of observation of the planning, development and execution of a startup accelerator program (1 Feb 2018-23 Oct 2018)	Offered highly detailed insights about the day to day activities of central Telco Garage, their initiatives to expand their operations to engage more closely with the startup community and efforts to systematize and create greater oversight and accountability within the organization.
	Telco ONE: Early development and follow-up 9 months observations of the development of Telco ONE (20 Jun 2018 – 25 Mar 2019); 5 months follow-up observation of the new established organization (1 Sep 2019 – 8 Mar 2020)	Provided a first-hand account of the turbulent transition from Telco Garage to Telco ONE and real time observations of the successive development of the new unit and its interactions with the rest of the organization.
	Visits to affiliated Garages and Hubs	Gave a greater understanding of the peripheral innovation activities.
Archives	**Internal documentation** Including, strategy documentation from 2013 to 2020, Monthly reports from Telco Garage, repositories for shared	Granted insights about strategies, intentions and past events and the successive development of the studied initiatives.
	External documentation Including, magazine articles and Telco yearly reports	Enabled triangulation of recollections of past events in order to pinpoint events temporally and reducing the impact of afterthoughts.

These informants could provide their accounts and sense making of events that had occurred and reflect upon the current situation. These testimonies complemented and enriched accounts of archival data and my own observations of the same events.

The third category were people who had not driven the development of the central initiatives but were highly active contributors in the periphery of the organization, with loose ties to the central organization. This included *affiliated Telco Garage leaders*, *Telco ONE Ambassadors* and other innovation managers that were involved in these networks, contributing in various ways to enable dispersed experimentation across the company. Since, I had limited possibility to be present and do observations at these dispersed locations, I relied on these informants in order to gain insights of the activities taking place at their locations. Oftentimes, I received not only verbal accounts but also different instances of "hard data" (Eisenhardt, 1989), such as various forms of documentation.

Finally, the fourth category consisted of venture team members who were affected by the organizational structures and processes put in place. Based on their input, I was able to contrast concrete experiences of experimentation within the emerging organizational framework intended to support such endeavors with the abstracted "ideal" view of how venturing within this framework was thought to transpire. The broad sampling of interviewees with different backgrounds, perspectives and ties to the processes of interest helped avoid a naïve reliance on data as a mirror of reality (Alvesson, 2003).

Interviews were generally tape recorded, unless the informant felt uncomfortable being recorded, and transcribed verbatim. Transcriptions were anonymized and stored in the qualitative analysis software tool, NVivo, which was also used for coding. A downside with interviews is that the factual detail and accuracy tend to be low (Pettigrew, 1990). Hence, the participant observation and secondary data was immensely important.

3.3.2. Observations

In process studies the value of real-time observation as a way to capture ongoing processes, cannot be overstated. Participant observation as a research tool in organizational studies is typically used to capture patterns relating to how people together get things done through observable and repeated actions and interactions (Maanen, 1979). It allows for identification of the discrepancy between what people say they do and what they actually do (Pettigrew, 1990). Observations were recorded through memo writing, in which reports of what had been observed was combined with reflections upon those events. These diary-like notes were kept in NVivo for further analysis.

The first period of observation can be characterized as a phase of stability and concerned the daily activities of Telco Garage. From December of 2017 until May 2018, I was sitting in the Garage facilities at the headquarter together with the Telco Garage core team. I participated in their weekly Monday meetings, where the plans for the week and reports of relevant matters were shared with the team. I also took active part in two important tasks during this period. Firstly, starting in December I was involved in the work to map existing activities in the network of affiliated Garages, including activities to spur ideation and engagement in corporate entrepreneurship activities, ongoing experimental projects, and routines for managing and tracking progress. The objective was to increase the transparency of ongoing activities, develop KPIs and enable ways of learning and sharing best practices across the Garages.

Secondly, I was involved in the planning of an acceleration program targeting external startups. This work included planning and execution of the intake processes aimed at selecting a cohort of startups by leveraging a dispersed panel of internal judges who also volunteered to support the selected startups, and the articulation of the program itself.

The second period of observation, from June of 2018 to March of 2019, can be characterized as a discontinuous phase, in which the central Telco Garage team was dissolved and Telco ONE was created. During this phase I was able to observe activities aimed at leveraging the

momentum created by Telco Garage, introducing new practices and tools and creating a new organization.

While, close contact was maintained during my stay in the UK, on-site observations were resumed in August of 2019 until March of 2020. During this last phase, Telco ONE had been established, allowing for observations of their ongoing activities.

3.3.3. Secondary data

In addition to real-time observation, time stamped archival data is a powerful component for developing an accurate depiction of how events unfold over time (Gehman *et al.*, 2018). The archival data in this study include publicly accessible documents, such as yearly reports, news articles and LinkedIn profiles, but more importantly internal documents. The access to the corporate intranet and the status as an employee made it possible to collect a wide variety of archival documents from different repositories. This data included unit-level monthly and quarterly reports; strategy descriptions and recorded presentations; organizational announcements, various information about organizations and programs, including codified processes, practices and routines; artifacts, templates and tools designed to facilitate various elements of the innovation process; and other internal and external communication. Also, project-level data was accessed, such as projects descriptions and presentations, and working documents covering the business model and pricing, marketing and communication material, contractual documents, and market research. The document formats ranged from Word-documents, PDFs, PowerPoints, and Excel spreadsheets, to pictures, videos, organizational charts, and internal websites. Internal documents are typically time stamped which enabled creating a detailed timeline of events. In this regard, the monthly reports played a significant role in covering the development of Telco Garage prior to the commencing of the study. Strategy documentation and various artefacts also helped verify retrospective accounts of intentions and rationale behind various actions, that were acquired through interviews and informal conversations.

3.4. Data analysis

An abductive analytical approach was adopted inspired by previous processual work and guidance (e.g. Langley, 1999; Pentland, 1999; Langley *et al.*, 2013; Giudici, Reinmoeller and Ravasi, 2018). However, as in the case of previous studies the analytical process started out inductively before switching to abductive reasoning in order to first process the data with an open mind and reduce preconceptions (Gioia, Corley and Hamilton, 2013). This was done by enforcing a semi-ignorance of the literature, by not studying it carefully from the outset (Gioia, Corley and Hamilton, 2013).

Data analysis was done through a combination of techniques suitable for process research, including a grounded theorizing (Glaser and Strauss, 1967; Gioia, Corley and Hamilton, 2013), narrative strategy (Pettigrew, 1990; Pentland, 1999), visual mapping and temporal bracketing (Langley, 1999). This purposeful use of a diversity of analytical strategies reduce the risk of blind spots of any singe strategy (Langley, 1999; Gehman *et al.*, 2018). Furthermore, the analysis process focused on temporal relations among events in order to develop a process theory.

The secondment to the studied company allowed for great flexibility in terms of the ability to gather more data to make up for knowledge gaps identified during the analysis as theoretical concepts emerged. While data analysis was done iteratively in accordance with abductive reasoning the steps of the analysis are presented below in a sequential manner that captures the logic of the process.

3.4.1. Step 1: Event analysis and open coding

To make sense of the rich and multifaceted data a narrative strategy (Langley, 1999) was first used to create a general understanding of the history of events and their relations. Narratives is a helpful tool when creating theoretical constructs in the domain of process theory as it contains the required indicators in the same way a survey contains indicators for the underlying constructs of a variance theory (Pentland, 1999; Corbin and Strauss, 2008). By

drawing jointly on observations, interviews and archival data a comprehensive storyline was crafted (see Figure 2: Timeline of events). This enabled reflections about the sequence, flow and interlinkages of observed events (Langley, 1999). The variety of data sources enabled triangulation, by using various data points as cross checks (Pettigrew, 1990). Also, open coding was used in order to create a basis for subsequent construct development. These first-order codes were all tied to certain events or actions and were expressed through verbs and nouns, which is characteristic for processual studies (Thompson, 2011). The qualitative data analysis software tool, NVivo, was used for this purpose as well as for simply keeping data in a manageable repository.

During this step prior theoretical concepts were suspended, and focus were instead on developing an accurate account of the observed events as experienced by the researcher and the informants. This form of "willing suspension of belief" reduces the risk of confirmation bias (Gioia, Corley and Hamilton, 2013). Given the iterative process of data collection, analysis and theorizing, an increasing level of 'theory-ladenness' (Kuhn, 2012) is inevitable. However, a balance between knowing and not knowing have been suggested conducive of insightful discovery (Gioia, Corley and Hamilton, 2013).

While written narrative lead to thick contextual descriptions, visual techniques offer a way to more easily show precedence of parallel processes and represent multiple dimensions (Langley, 1999). Hence, a timeline of key events was drawn up (see Figure 2: Timeline of events). This was combined with a temporal bracketing strategy, in order to distinguish between crucial phases of continuity separated by discontinuous events (Langley, 1999). The temporal bracketing strategy was also used to structure the written narrative in distinct comprehensible chapter.

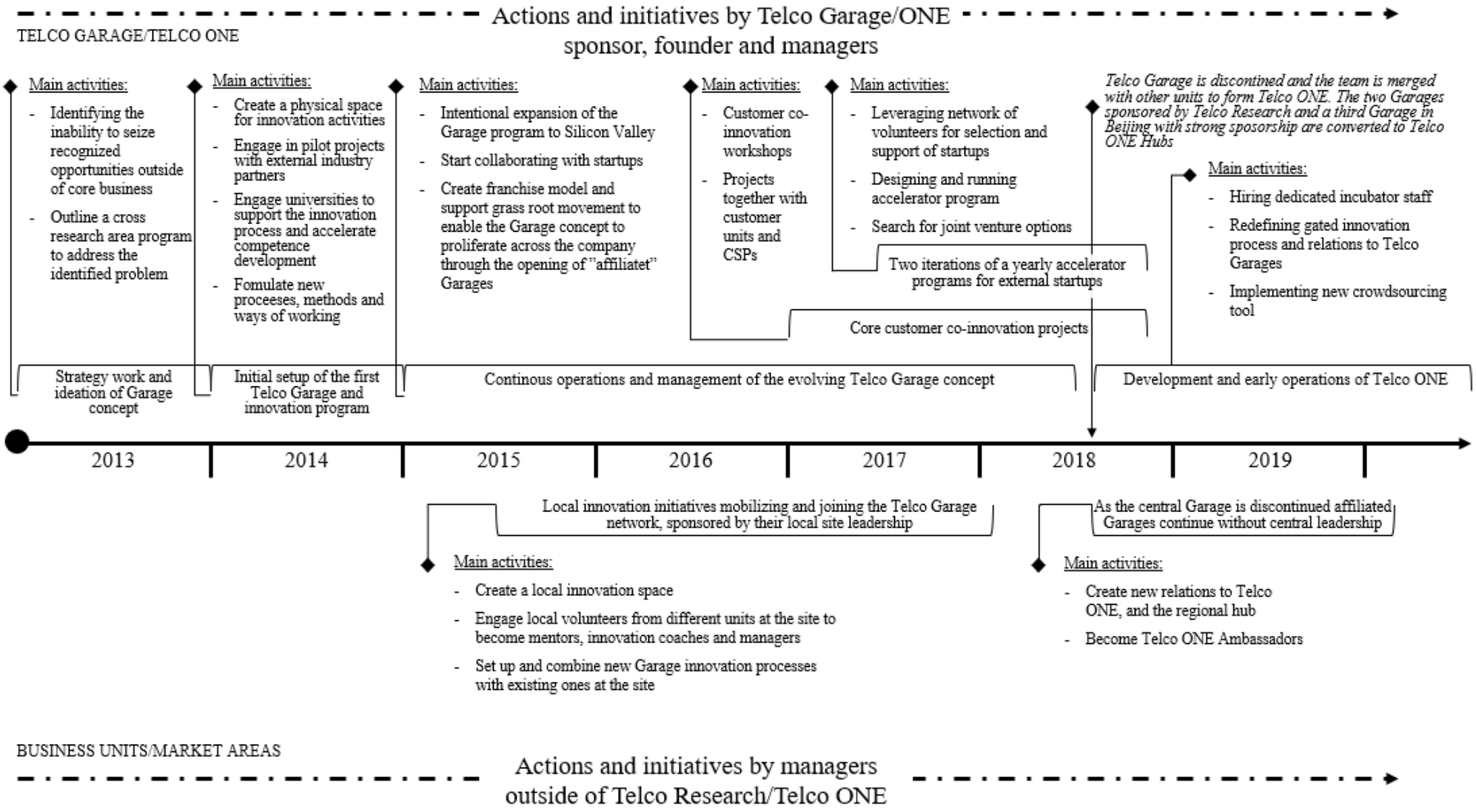


Figure 2: Timeline of events

3.4.2. Step 2: Axial coding and data structure

The second step was more influenced by prior research. First-order codes were combined to form second-order themes, that in turn were combined to form aggregate dimensions (Gioia, Corley and Hamilton, 2013), thus successively progressing towards a theory-driven explanation of the phenomenon (Glaser and Strauss, 1967). At this stage I had to distance myself from the data. Extant theoretical concepts from learning theory offered a creative framework and a lens to facilitate more abstract interpretations of the observed events, thus switching from purely inductive reasoning to abductive reasoning (Alvesson and Kärreman, 2007; Gioia, Corley and Hamilton, 2013).

Figure 3: Data structure

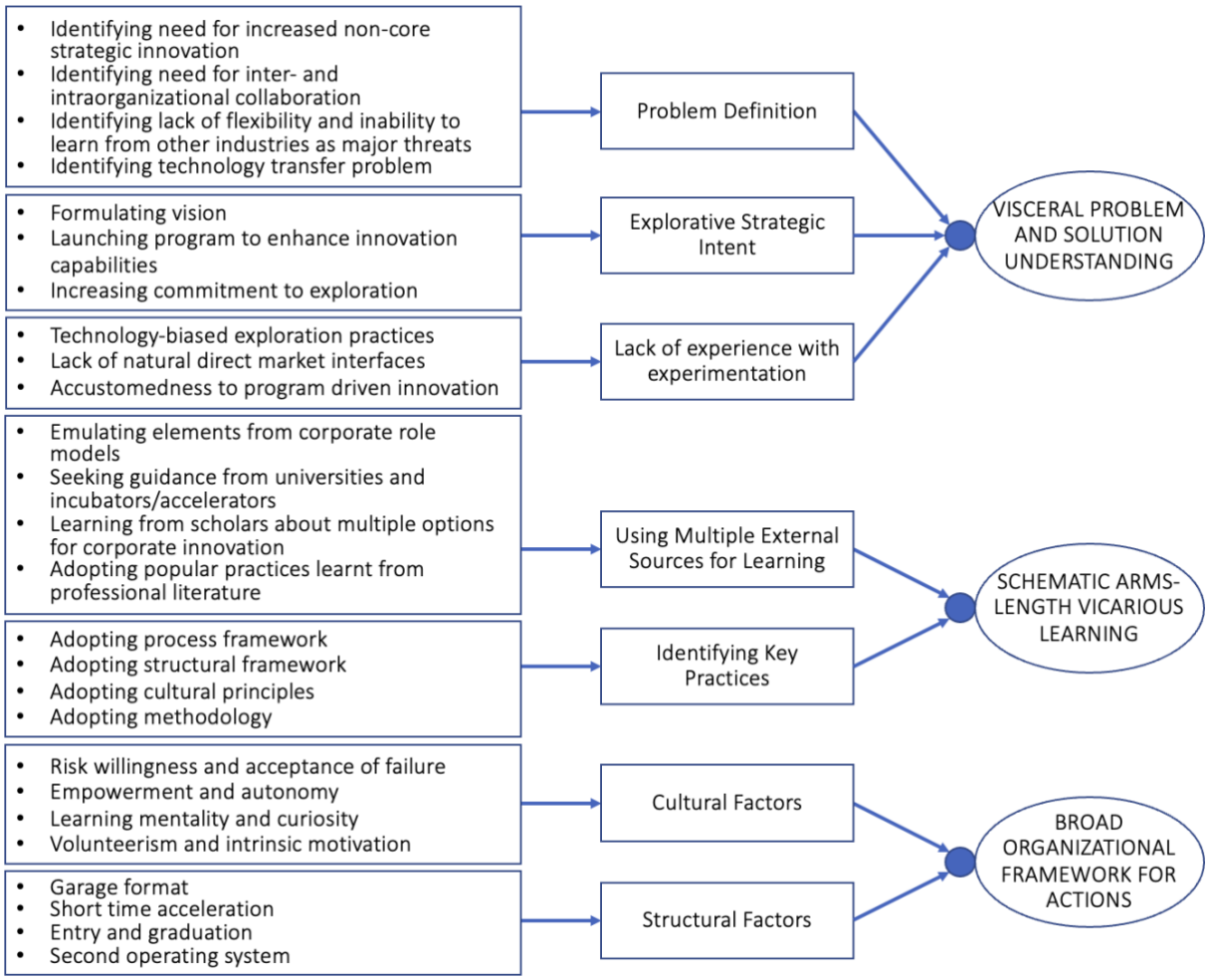


Figure 4: Data structure (continued)

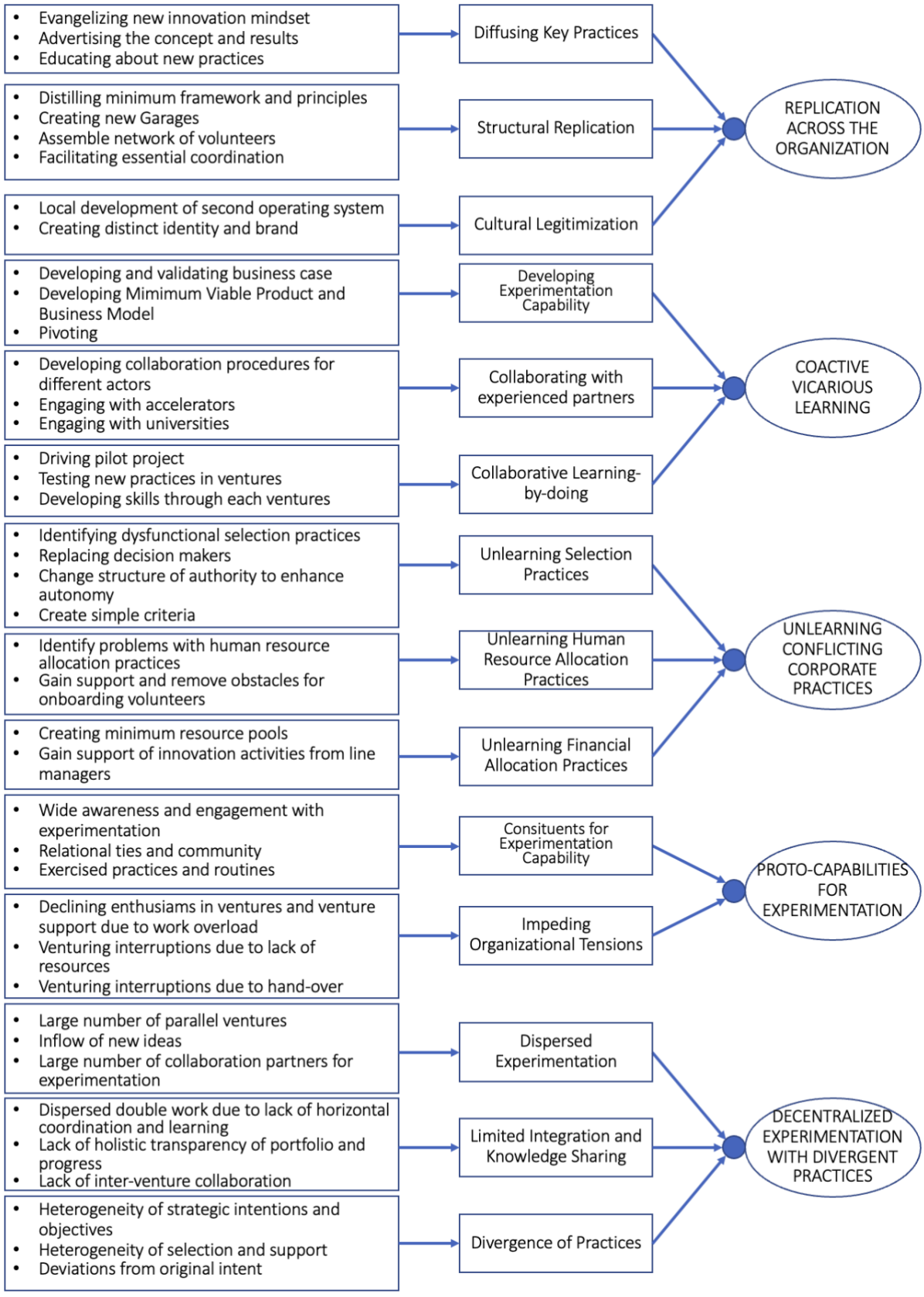
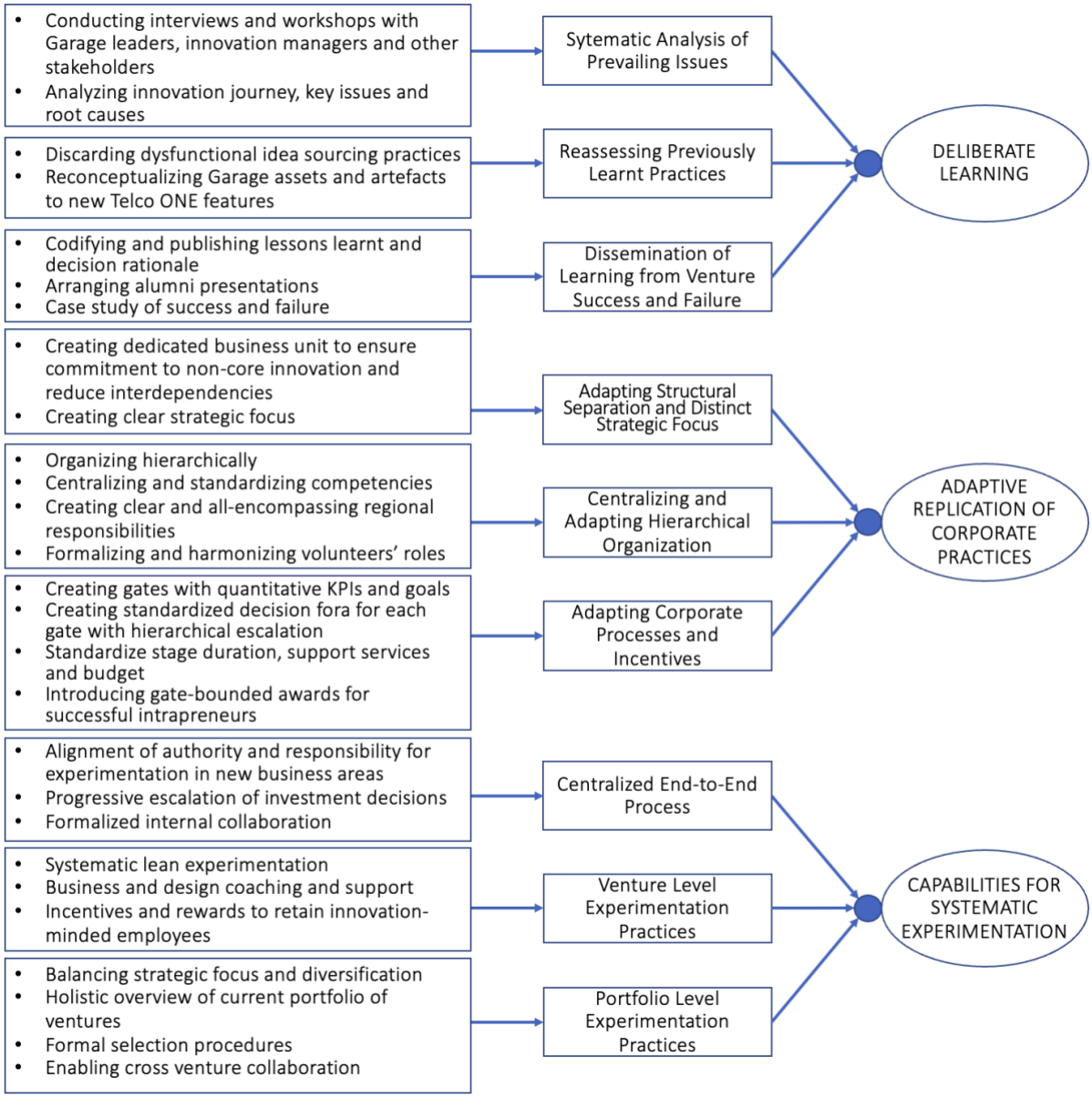


Figure 5: Data structure (continued)



The narrative and timeline were crucial enablers of this step as they allowed for a holistic and processual view that helped draw links between lower-level codes, thus structuring them into higher-level constructs. The coding process utilized a typical data structure framework to systematically assess consistency and empirical support of the emerging categories (Gioia, Corley and Hamilton, 2013). The resulting aggregate themes corresponded to essential learning mechanisms observed in the study. The data structure is shown above in Figure 3, Figure 4 and Figure 5.

3.4.3. Step 3: Sequencing of emerging dimensions and development of a temporal model

While a data structure provides a visual representation of the analytic steps and rigorous grounding of introduced theoretical concepts (Gioia, Corley and Hamilton, 2013), it does not promote an intuitive understanding of the sequences, flow, and interrelations between those concepts. To reconcile this issue, I again turned to a visual mapping strategy combined with temporal bracketing, this time informed by the emerging theoretical processual macro-level concepts and not merely observed events (Langley, 1999). At this stage theorizing was guided not only by extant concepts but also expectations and assumptions based on prior research in order to identify surprising observations (Welch *et al.*, 2011; Piekkari and Welch, 2018). When being deeply emerged in the data, observations typically make sense or are taken for granted but by consulting the literature it is easier to identify discrepancies between what would be expected based on current theory and unexplicit assumptions. This step arrived at a process model explaining how an established firm may learn how to experiment in order to develop new businesses. This contextualized explanation enabled the identification and articulation of causal links between different learning mechanisms and organizational outcomes and learning outcomes as well as the interaction between different parallel and sequential learning mechanisms. The final model is presented in the discussion chapter.

3.5. Ethical considerations

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 675866 and was part of the COINS project (Complex and Open Innovation for Networked Society). Ethical considerations, including the approval for using the data collected at the case company for this thesis and further publications, were addressed in the research consortium agreement. In addition, an ethical review (reference LTLUBS-194) was approved by the representative of the ESSL (Education, Social Science and Law), Environment and LUBS (AREA) for research from Leeds University Research Ethics Committee.

Despite being granted the same access to the company as a regular employee, no financial compensation was paid by the company. Hence, there is no conflict of interest.

Interviewees were informed about the purpose of the study, were asked for their consent to participate in the study and informed about their right to withdraw their participation at any time. All interviews and other collected data were treated with appropriate confidentiality and stored on encrypted hard drives.

Chapter 4: Research setting

4.1. Research setting for studying the adoption of new practices for corporate entrepreneurship and experimentation

The research context of this study is the ICT industry and more precisely the mobile telecommunication industry. The case company, Telco (pseudonym), offers a suitable setting for this research endeavor as it is coping with a nascent technology, the Internet of Things (IoT), which can be characterized theoretically as being in an era of ferment (Anderson and Tushman, 1990). While the IoT appear to offer immeasurable opportunities, it also brings considerable disruptive forces, and is characterized by extreme market heterogeneity and uncertainty regarding technology and business prospects, as pointed out by an IoT marketing manager.

> *"I think we can all envision how life would become much more convenient and how industries would become much more effective with IoT. But at the end, the monetization and commercialization of it is not very clear. Who is going to pay for it? And how? And where can operators and industries make money?" (Interview 13)*

As can be seen in one of Telco's own estimates (Figure 6, p. 83) various unrelated industries are predicted to be affected by this technology, and this heterogeneity of users and use cases creates a highly fractioned market, which stand in stark contrast to how the telecommunication industry have been characterized historically. Telco has traditionally been one of a few infrastructure providers on the market and have enabled CSPs in 180 countries worldwide to provide services to consumers and enterprises. For decades, technological development has been incremental, and highly influenced by Telco and other infrastructure providers who jointly have developed new standards such as GSM, 3G, 4G and 5G. The technological development has been characterized by increases in bandwidth and speed, which have enabled mobile internet and made cellular media services possible. IoT entail more than communication. Also, data storage, processing and analytics (e.g. through AI), in the cloud or edge of the network are integral parts. Many actors from different industries compete as they attempt to develop

radically new offerings with high financial potential that leverage these technologies. There is no commonly agreed path towards standardization, instead different redundant technologies co-exist and compete.

The immense uncertainty and ambiguity this entail necessitate an experimental learning approach that offer rapid learning and flexibility when pursuing new opportunities rather than the linear approach described by a respondent from Telco Research's leadership team, as the more common way to deal with the type of predictable innovation within Telco's core business that have dominated their innovation efforts in the past.

"Once specifications are done, you go and develop the product and then you do some testing and then you roll it out." (Interview 30)

Innovation and product development typically flow sequentially through the organization. Telco Research, which belongs to the technology group function headed by the CTO, engage in technology exploration in strategic areas with a time horizon of two to five years, and through cooperation with external research institutes and universities they probe new areas that may be relevant ten years down the line. They also drive standardization and contribute to open

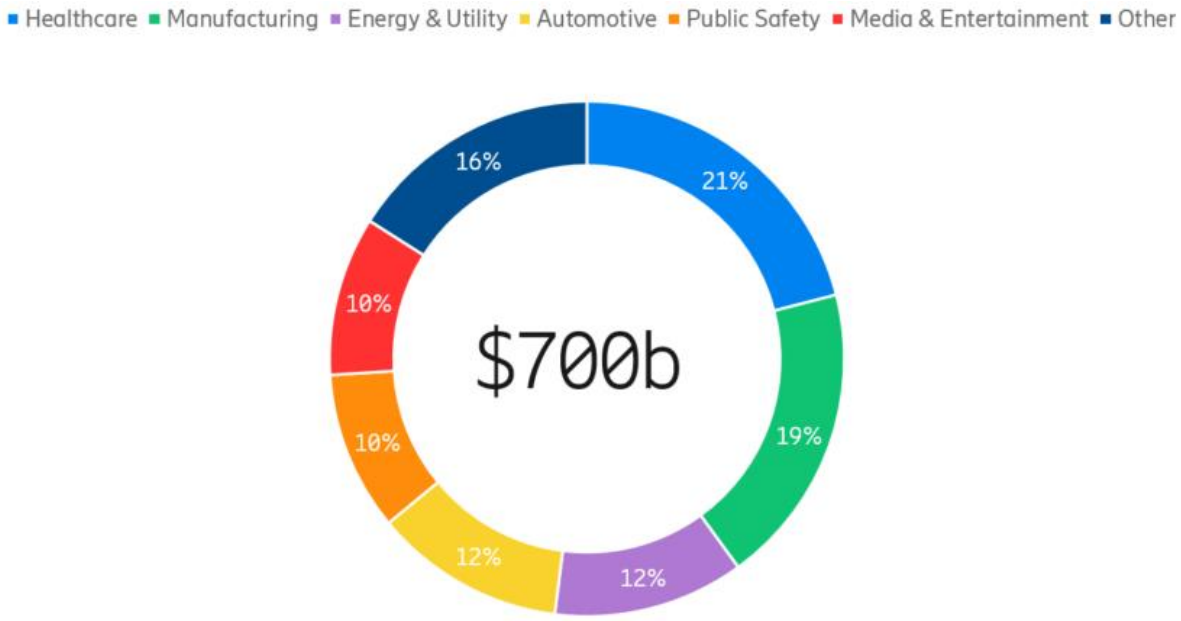


Figure 6: Business opportunities driven by IoT – a prediction of 2030 (AD)

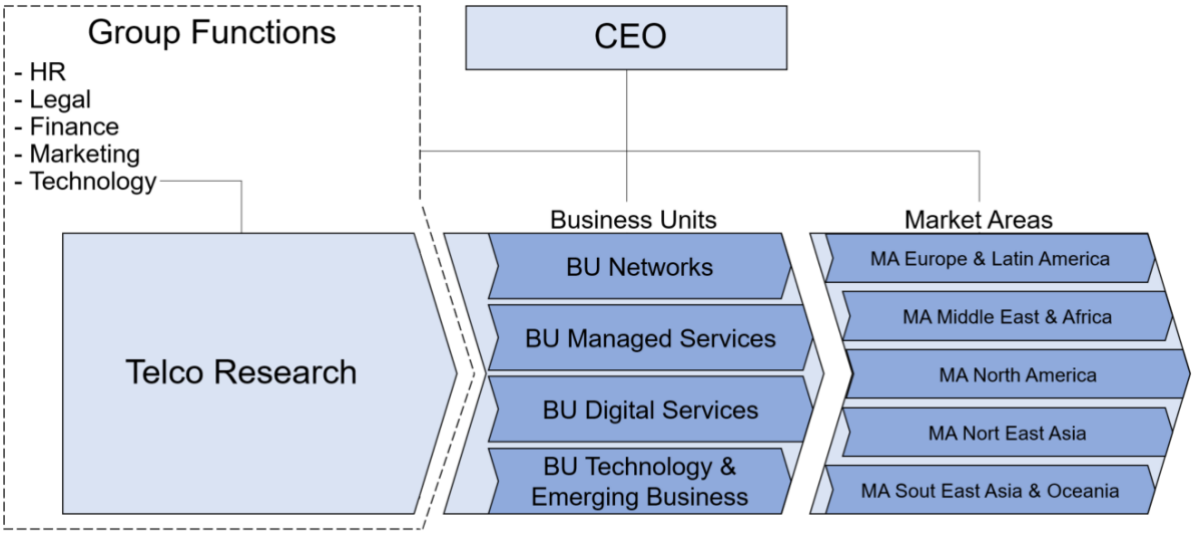


Figure 7: Telco's organizational structure

source. Outcomes from this technology research in the form of concepts, intellectual property, and reports are leveraged by the business units, in which development units work on improvements and additions to the current portfolio of offerings with a time to market horizon of up to two years. Market areas have responsibility for sales and customer relations in certain regions. Customer units that are situated within these market areas, tailor offerings to their respective customers by combining hardware, software and services from the different business units and third-party providers. The arrows in Figure 7 indicates how Telco Research provides the input to the business units, which output in turn is used by the market areas.

Telco Research consist of a number of different sub-units, called research areas (sometimes referred to as RAs), which focus on distinct technologies. Each of the research areas are headed by a research director who together with the head of Telco Research and a few select experts constitutes Telco Research's leadership team. On a yearly basis they launch a number of strategic cross research area programs. Typically, these programs recur several years in succession but are renewed each year. Such program was launched in 2014, called Telco Research Innovation Program, which was the starting point of Telco Garage.

4.2. Telco Garage

Telco Research Innovation Program quickly come to be renamed Telco Garage, although it was run as a program for three years. From 2017 it was instead run as a separate unit within Telco Research. The concept quickly gained traction across the company, sparking an interest among employees to develop a similar setup at their local site. At its peak in 2018 the Garage concept had proliferated, and new affiliated Garages had opened at several sites. Telco Research only provided resources and had formal ownership of two Garages, the global or central Telco Garage, situated at the headquarters in Stockholm and Garage Silicon Valley, situated at one of their other major research sites in California. The, so called, affiliated Garages at other locations were formally independent but adhered to a set of basic principles, reported their work each month and took part in recurring meetings hosted by the central Garage team.

Telco Garage personnel engaged with aspiring intrapreneurs and venturing teams that approached the Garage to gain support. The type of ventures that qualified to the Garage

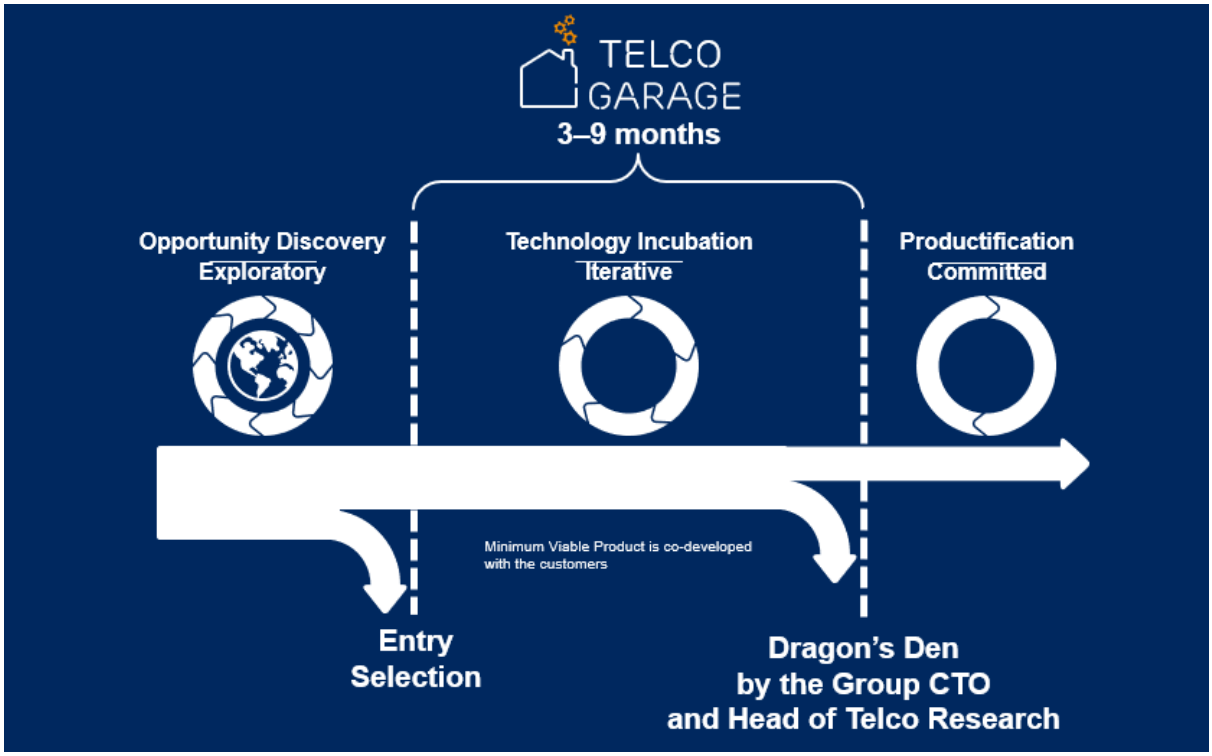


Figure 8: Telco Garage incubation process (AD)

were pushing innovations that were disruptive or laid adjacent to current project road maps. The Garage provided support by connecting both internal coaches and external resources to the projects. Firstly, they provided support in developing a business case. The business case was then pitched to an entry selection panel headed by the head of Telco Research. Successful ventures were admitted to the Garage for incubation during three to nine months. Once a minimum viable product had been developed, this was showcased in a dragon's den format, where potential stakeholders from business units together with the CTO and head of Telco Research took decisions about how to potentially take the venture further by incorporating it in one of the business units depending on the interest to make more substantial investments to commercialize the venture. The process is outlined above in Figure 8.

4.2. Affiliated Telco Garages

In 2018 a total of eleven affiliated Garages had opened, in addition to the two Garages sponsored by Telco Research (see Figure 9: Research sponsored and affiliated Garages, in which the location and approximate opening date is indicated). These two types of Garages differed as the Telco Research sponsored Garages were officially a part of the research

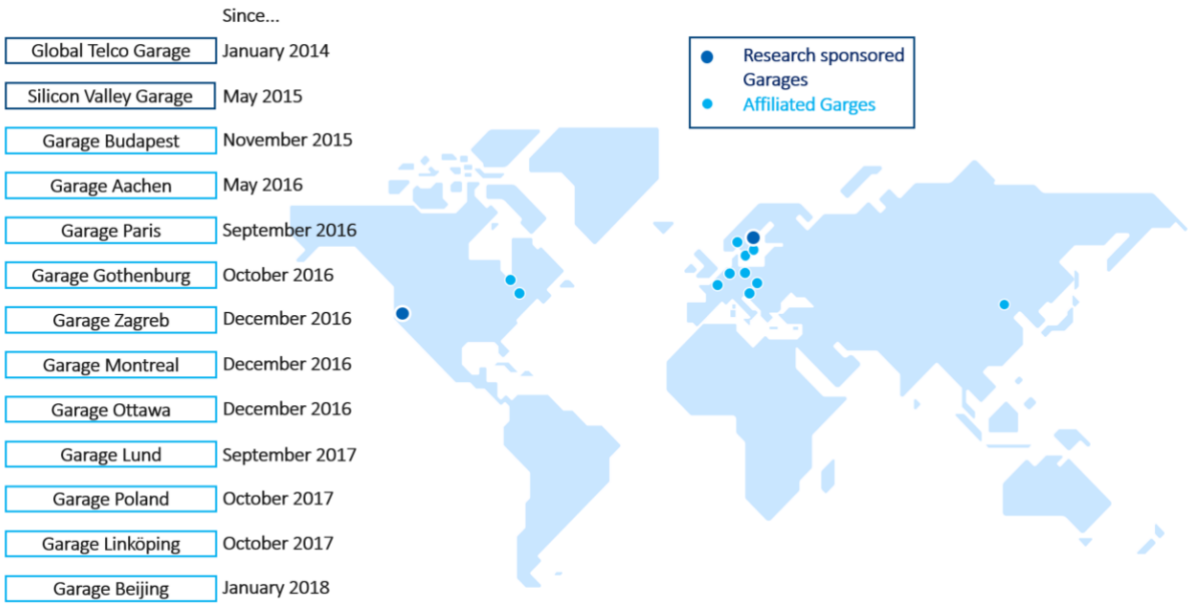


Figure 9: Research sponsored and affiliated Garages

organization, whereas affiliated Garages belonged to their respective sites and only had informal connections to each other.

Typically, the affiliated Garages were run by teams of, on average, seven volunteers with a deep passion for innovation, who beside their formal responsibilities spent time to operate the Garages. On average, a total of 35 manhours were spend per affiliated Garage by these volunteers. By hosting ideation workshops and hackathons, they promoted local innovation initiatives. If deemed promising enough such initiatives could become ventures that were incubated within the Garage. To enable some autonomy the affiliated Garages did not necessarily have to bring ventures through Telco Research's formal entry selection to start a project. They were allowed to start projects locally. But to gain C-level attention, increased support and to qualify to the dragon's den, they first had to go through the central entry selection procedure. Hence, projects could have two different levels of status. Either they were considered 'local' projects or 'global' projects. In 2018 a total of six global projects and 44 local projects were running simultaneously.

In 2018, the research sponsored Garages were moved out of the Telco Research organization and into a new business unit called, Technology and Emerging Business. Soon after, these formed a new corporate accelerator, named Telco ONE. Apart from Garage Beijing, which also became part of the new organization, the affiliated Garages continued their activities as before but had to find new ways to fit into the organization without a central Garage as the orchestrator of the Garage network. Instead the affiliated Garages became partners to Telco ONE.

4.3. Telco ONE

In April of 2018, a business unit dedicated to growth in new strategic business areas was created. Business Unit Technology and Emerging Business stood out from the other business units as it was not expected to be profitable but rather to focus solely on growth through

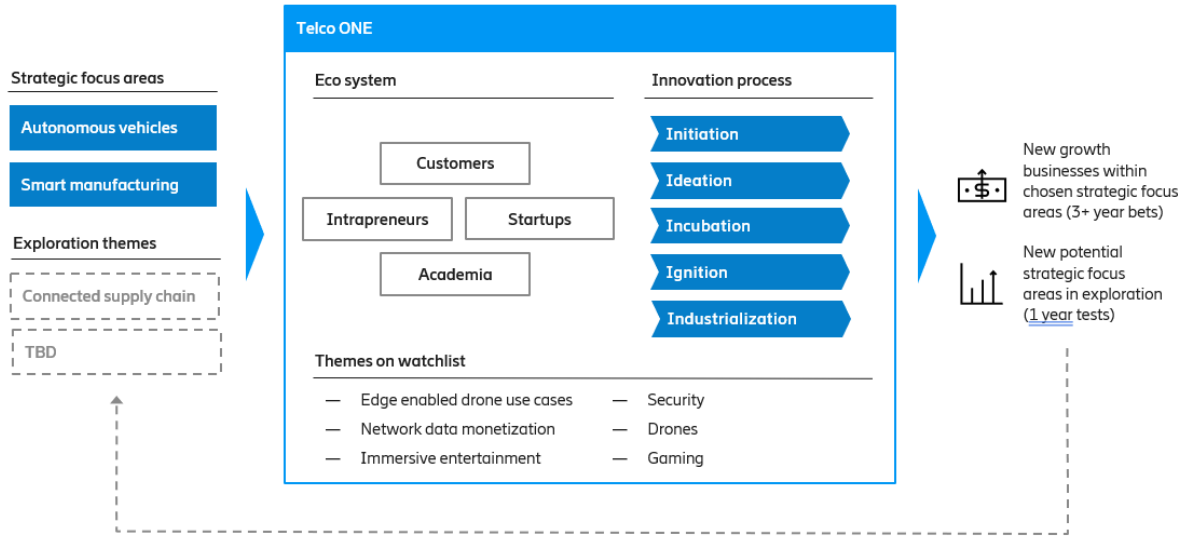
Figure 10: Telco ONE organization (AD)

innovation in areas such as autonomous vehicles, smart manufacturing and connected logistics solutions, all fast growing areas in the IoT landscape. The new corporate accelerator, Telco ONE, was created in June 2018 by combining the Research sponsored Garages at the headquarters and in Silicon Valley, and the affiliated Garage in Beijing, which was the only affiliated Garage with a dedicated manager and substantial resources. These Garages were converted into Telco ONE Hubs, gaining increasing resources and authority. An innovation team that had worked together with Garage Silicon Valley joined the Silicon Valley hub, while new personnel was hired internally and externally to support the hubs in Stockholm and Beijing. The hubs were all governed by a new manager supported by a small team. Also, a strategic design team from Telco Research that had been closely involved with Telco Garage ever since the start joined as a general asset to support all the three hubs. The organization and the regions in which the hubs were responsible to support intrapreneurship is visualized in Figure 10. Apart from Garage Beijing, which also became part of the new organization, the affiliated Garages continued their activities as before but had to find new ways to fit into the organization without a central Garage as the orchestrator of the Garage network. Instead the affiliated Garages became partners to Telco ONE.

Telco ONE served the role as a greenhouse within Business Unit Technology and Emerging Business, responsible to generate new ventures that could become future business units.

Each of the hubs sourced entrepreneurial ideas from across the whole organization and supported intrapreneurs to promote a systematic process for corporate venturing. As visualized below in Figure 11, Telco ONE balanced activities within the strategic focus areas of the business unit with exploration themes that could develop into future strategic focus areas. A stepwise process referred to as the 5i-process (initiation, ideation, incubation, ignition and industrialization) was adopted by the business unit and Telco ONE had the responsibility for the first three phases, which inferred generation of innovative ideas, strategic insights and opportunity identification (initiation), business case development and creation of hypotheses about the market (ideation), and testing and development of early ventures, validating their viability as future businesses and preparing them to function as independent operating units, ready to commercialize their offering. In addition to the formal Telco ONE organization, a network of “ambassadors” that supported the early venture activities locally was created. Several of the former affiliated Garage teams were among the ones who took the training to become an ambassador for Telco ONE.

Figure 11: Telco ONE description (AD)



Chapter 5: Findings

The necessity for a systematic approach to enable experimentation in new business areas in addition to pure technology development within the area of expertise dawned on the leadership of Telco's research organization in 2013, as the business environment appeared increasingly uncertain. A clear strategic intent to develop capabilities to drive business experimentation to pursue emerging opportunities was announced in 2014. By 2020, Telco had established a holistic and systematic approach for bottom-up initiated corporate venturing in new areas to drive business development and growth, all supported by a corporate accelerator. This was based on an experimentation-driven approach that had been gradually developed over several years, and which enabled the company to probe a wide range of opportunities discovered in the periphery of the organization, reduce uncertainties cost-effectively and successively increase commitment to certain explorative paths as their strategic viability became increasingly evident. While the corporate accelerator, Telco ONE, which was central to this strategy, was established first in 2018, it would not have been possible without the prior discontinued efforts that had been put into its predecessor, Telco Garage. By covering below how Telco engaged in different efforts to learn how to experiment, the outcomes from these activities and how those outcomes fed into subsequent activities, I outline a comprehensive depiction of the learning processes that led to the experimentation capability finally achieved.

This study suggest that Telco learned how to experiment through a combination of six partly parallel and partly sequential learning mechanisms that interacted over time, through three discrete phases: 1) Learning without prior experience; 2) generating experience; 3) building capabilities for experimentation. This chapter presents a narrative covering this process of learning and offers a grounded explanation of the theoretical model developed through this study by linking empirical evidence with the concepts underlying the model. The chapter is divided into three subsections, representing each of the phases. These subsections in turn comprise of detailed description of the second-order categories of the learning mechanisms

and the aggregate dimensions constituting the drivers and learning outcomes. Furthermore, the written narrative is complemented with tables of selected evidence for each of the aggregate dimension, which constitute the learning mechanisms and outcomes that make up the key components of the process model presented in the discussion chapter (See Figure 21: A grounded model of the process of learning how to experiment, page 140). For the sake of readability these tables are simplified and succinct, including more of the researcher's notes rather than raw data. Since much of the analyzed data involve visual material and observations that are difficult to present and make intelligible within a reasonable space in a written format, my own recitations of this material are used in the tables as well as quotations from interviewees. More comprehensive tables, which include more of the raw visual archival data can be found in *Appendix C: Extended data tables.*

5.1. Learning without prior experience: Launching the Telco Research Innovation Program (2013-2014)

In the yearly strategy work at Telco Research in 2013, a visceral or intuitive understanding emerged, that extant practices for exploration were insufficient as the company entered a new technological landscape, the Internet of Things (IoT). IoT was seen as highly disruptive as it entailed a convergence of various industries, and the complexity, uncertainty and ambiguity that characterized this new area extended well beyond questions regarding technology. It put requirements on the firm's ability to navigate strategically within this environment by experimenting with new businesses. This is how Telco Research's most senior IoT expert expressed what Telco needed to navigate in this new environment:

"You know the answer is fail fast, of course. You need to work on things in parallel, try out multiple parallel tracks and you need to get out into reality. Not just work in the labs or in the development units and internally but get out in the marketplace and try it out with concrete activities in the marketplace. That is absolutely a must." (Interview 30)

However, it became apparent that the organization faced problems when exploring areas outside of Telco's core business. Throughout the year, as the strategic analysis and planning for 2014 and forward progressed, this problem became increasingly articulated. The organization decided to increase their commitment to exploration of new business areas and also increase their capabilities to do so by launching a cross organizational innovation program with the objective to infuse new ways to manage exploration experimentally and build a culture conducive of radical innovation and experimentation. As the organization lacked prior experience with experimentation, a search for new ways to organize and manage such activities was triggered. By engaging in schematic arms-length vicarious learning, in which they learned by drawing on multiple external sources to identify basic key practices, they were able to develop a broad organizational framework for actions. This framework of new structural and cultural elements was considered a first step to enable initial experimentation, thus also enabling the organization to start learning from their own experiences how to experiment effectively.

5.1.1. Visceral problem and solution understanding

Systematic analysis have been described as a rational way of learning via intensive gathering of information from within and outside of an organization, in order to discover key problems and opportunities (Miller, 1996). Telco Research leadership team engaged in this type of activity by gathering insights, developing alternative scenarios, identifying key issues and conducting SWOT-analysis to identify strengths, weaknesses, opportunities and threats (Hill and Westbrook, 1997). This systematic analysis was part of a yearly strategy planning procedure, which was described as particularly substantial in 2013, as Telco Research recently had been appointed a new head of the organization.

While this analysis gave a positive impression of Telco Research's ability to develop technology that incrementally strengthen the company's portfolio within its core business areas, documentation of the strategy work shows that the organization's abilities to learn from other industries, stay flexible and drive strategic innovation beyond core business were

deemed weak. These shortcomings constituted a perceived threat to the organization according to the documents that were produced based on this analysis. Several informants of this study provide statements in line with these archival documents arguing that although the researchers in the organization identified interesting opportunities in adjacent domains, these seldom became more than sidelined concepts, reports, demos or invention disclosures (IVDs). Rarely did such ideas get momentum enough to get absorbed by the business unit and, rarer still, lead to commercial outcomes. The head of Telco Research also acknowledged this in a speech, as she recalled the motivation to start Telco Garage:

"When we started our strategy work in [Telco] Research in 2013, we realized that innovation was one of the areas we needed to focus more on. And specifically, we realized that when we work on innovation in areas where [Telco] is strong it was pretty easy to get traction on those ideas but when we work in new areas where we don't have strong business units or product units it was very difficult to go forward with those ideas." (Video recorded speech at the inauguration of Garage Gothenburg, October 2016)

The diagnosis by Telco Research leadership team, which resounded around the organization, linked these weaknesses with the high level of narrow specialization, rigorous separation between units and rigid ways of cooperation within the organization as well as with external parties. When describing the organization, respondents used metaphors such as, 'moles digging different tunnels', referring to the deep search in highly specific domains by groups within the organization without much transparency or oversight of neighboring groups' activities; 'the whispering game', referring to the long way information had to travel from the frontline workers with direct customer contact to the developers; and 'factory', framing research as a repetitive task driven by efficiency goals.

From Telco Research's standpoint closer collaboration across the various separated research areas, between the research department and the business units and between the research department and external industry players were highlighted as key areas of improvement, which called for loosening of some deeply entrenched structures.

These findings merely affirm current theory that homed core capabilities can inhibit innovation (Leonard-Barton, 1992). While the current organizational framework was efficiently supporting the core business, it limited the agility necessary for innovation in new domains to flourish.

As the issue of insufficient non-core strategic innovation and linked organizational barriers were recognized an immediate response was planned by formulating an explorative strategic intent. While a majority of research activities during 2013 had been devoted to supporting ongoing businesses (60%, according to Telco Research strategy documentation), the plan was to dedicate increased effort to create new businesses the coming years. Strategy documentations indicate that 60% of Telco Research's work would focus on exploring new businesses from 2014. In particular, next generation technology, which in this case mostly referred to 5G and breakthrough innovation, in particular in the field of IoT, was receiving significantly increased priority.

In order to succeed in their commitments to explore these new business opportunities, the development of capabilities to do so was recognized as key. By launching an innovation program that cut across the various research areas, Telco Research took a highly cognizant and proactive approach towards the development of such capabilities. Hence, launching the innovation program was not only intended to increase exploration activities directly but also to enhance learning and capability development, thus increasing the conversion rate between exploration activities and successful business launches. Implementation and execution based on analytical learning is often done through detailed plans and programs as in the observed case. However, lower level employees are not always made aware of the underlying rationale and their experiences are not always taken into account (Miller, 1996). This study finds that Telco Research leadership did present the strategic work that had preceded the decision to launch said program, during meetings open for all employees at the research organization both in September of 2013 and January of 2014.

The innovation program focused on enabling adjacent and disruptive innovation activities. A strategic vision was formulated in order to explain how this should be done. A more open

approach was envisioned in which Telco Research engaged directly with industries to learn about their needs through systematic experimentation and where the different research areas worked closely together taking a holistic perspective that included not only technology innovation but also innovation of services and businesses. They were also to work more closely with the business units, group functions and market areas to iteratively transfer ideas, knowledge and more tangible exploration outcomes. An excerpt from their mission statement presented the month before the launch of the new Telco Research strategy for 2014 reads:

"To win we understand and interact to explore user needs and industry value of our concepts and solutions […] We engage with users, industry & academia, we formulate relevant research questions, and we are curious by exploration and experimentation" (presentation by Head of Telco Research at Telco Research Day 2013-12-05)

The experience with business experimentation was relatively limited within Telco Research. Exploration was primarily focused on technology and the organization was divided into distinct areas of technology. People were mainly focusing on highly technology-centric development rather than exploring new business opportunities. As there was no natural direct link to the markets, the exploration was driven by clearly defined specifications and exploration revolved around how to meet such demands rather than exploring customer needs to conceive new solutions. The accustomedness to rigid processes made people comfortable in their functional roles where they became experts in clearly defined areas rather than learning more broadly.

5.1.2. Using multiple external sources for learning

In the time interval that exist between when a new organization is envisioned and when it is granted a clear mission and resources by its parent organization, the managers responsible for setting up the organization generally engage in search activities and may employ grafting and vicarious learning to build knowledge despite the lack of experiences to draw upon (Huber, 1991). The backbone of Telco Garage was highly influenced by its sponsor's synthesis of disparate concepts learnt from a broad range of external sources. At this point the innovation

Table 4: Aggregate dimension – Schematic arms-length vicarious learning

Second-Order Codes	**Selected Evidence on First-Order Codes** *(IN# = Interview; FO = Field observation; AD = Archival data; RN = Researcher's note)*
Using Multiple External Sources for Learning	*Emulating elements from corporate role models* "And then one day [...] [The program sponsor] came rumbling with a Harvard Business Review article about Microsoft Garage [...] and was like 'this is what we shall have! This is what we need!'" (Original Telco Garage core team member, IN53) *Seeking guidance from universities and incubators/accelerators* "To learn from other 'innovation programs' we had separate sessions with KTH Innovation, Centek at Luleå University, Innova at DUBI and [Telco] Research in San José. This input together with the outcome from discussions in the Innovation Core Team and other internal Kista-based stakeholders will be reflected in the methodology that we choose to use for the [Telco Research] Innovation Program" (from Telco Research, Monthly Report, February 2014; AD) *Learning from scholars about multiple options for corporate innovation* "UC Berkeley (Center for Entrepreneurship & Technology) developed a first version of a boot camp concept for [Telco Research] All Leaders. This makes it possible to benchmark ourselves with innovative and modern advanced-R&D organizations, make a self-assessment of Telco Research and set out wanted position through a framework of innovation measurements" (from Telco Research Monthly Report, July 2014; AD) *Adopting popular practices learnt from professional literature* "So, my sketch for [Telco] Garage was inspired by John Kotter, Harvard Business Review article, which was about, I think, 'Accelerate!'"…" So, these were the main two inspirations, the John Kotter, Accelerate, and the Steve Blank" (Research director and sponsor of Telco Garage, IN40)
Identification of Key Practices	*Adopting process framework* "A visualization of the adopted process framework (see Figure 29 in Appendix C: Extended data tables page 197) indicate the following process sequence: (1) stage 1: Opportunity Discovery (Exploratory: 'What could be'); (2) Gate to concept within Telco Research; (3) stage 2: Concept Incubation – Rapid prototyping (Iterative: 'What should be'); (4) Gate to product with CTO and head of BUs; (5) stage 3: Productization (Commitment: 'What will be'). Brackets indicate that stage 1 and 2 as well as the gate to stage 3 is within the scope of the Garage program" (from first presentation of the Garage Program to all Telco Research employees, 2014-01-31; RN/AD) *Adopting structural framework* "The most agile innovative companies add a second operating system, built on a fluid, networklike structure, to continually formulate independent strategy […] staffed by volunteers throughout the company" (from presentation of Garage second operating model concept, 'Garage team across hierarchies'; The quote is originally from Kotter (2012); AD) *Adopting cultural principles* "And then we decided that as a part of our innovation program that we started 2014 we wanted to establish something that we called the Telco Garage. And the idea with the Garage was that we would establish something that would be like a small, lean startup culture within the big company" (Video recorded speech by Head of Telco Research, October 2017; AD) *Adopt methodology* "And also, we said that you have to work based on the lean startup methodology, which was again a big inspiration for me, from Steve Blank from a Harvard Business Review article." (Research director and sponsor of Telco Garage, IN40).

program was loosely defined but the sponsor induced some key features. The Garage concept, having a space where employees could go to work on more explorative projects not necessarily related to their ordinary line of work, was emulated from Microsoft who had launched such a concept just a couple of years earlier. Telco did not engage with Microsoft to replicate their model but rather used the Garage concept as one element among others to define what the innovation program was supposed to be about. Popular practices from professional literature were also referred to as sources of inspiration by the Garage sponsor. These sources were often quoted in internal presentations and in interviews with informants from the extended Garage network, aiming to describe the strategy and rationale behind the program.

Collaboration with universities was a common and accepted way of working, since the research organization used to work with universities in various technology research projects. Engaging with business schools was seen as a way to leverage the latest theoretical ideas about how to organize innovation activities and learn about different options for corporate innovation. It was also considered important to get external validation of the methods that were adapted by the organization. Hence, the group driving the implementation of the innovation program engaged in partnerships with various business schools in the proximity of their research sites, mainly in Sweden and the Silicon Valley area in California. They did not only work with professors to develop theoretical knowledge about innovation but also with people from university incubators or accelerators that offered more practical insights and shared specific methods and ways of working.

5.1.3. Identifying key practices

The initial learning focused on creating a few basic principles, which were schematic in the sense that they offered a broad framework but lacked detail, since many of the principles were learned from an arms-length distance without the ambition to copy any particular practice precisely. Process, structure, culture and methodology were key elements that needed to be learned quickly to prompt initial experimentation. Respondents describe the structure and

process framework that were set up as lightweight. The process framework included the order of key activities without describing exactly how to perform these activities. It resembled the typical acceleration process by focusing on intense iterative learning and development during a limited duration enclosed by an entry and an exit procedure. The entry procedure aimed at selecting sufficiently promising opportunities whereas the exit procedure aimed to identify stakeholders to support further development. Also, cultural elements were adopted from the startup context, promoting speed, agility and willingness to fail and learn fast.

To drive the ventures through the acceleration process teams were to be assembled based on the needs of each venture, by recruiting people freely from different units and hierarchical positions. These people did not formally leave their current positions but volunteered to spend time on the innovation projects. The Telco Research leadership team encouraged lower-level managers to let their employees take part in such projects. Informants and observations both indicate the prevalence of lean startup methodology. These principles were engrained in the emerging organization by creating simple rules such as always to partner up with an external actor in Garage projects, always use rapid prototyping and developing an MVP, and to focus on customer pain points and validation thereof before making extensive efforts to develop technology and solutions.

5.1.4. Broad organizational framework for actions

Conceptually, the initial learning activities described resulted in a broad organizational framework for actions consisting of cultural and structural factors. The culture that Telco Garage tried to promote focused on empowering employees, encouraging them to explore and learn autonomously. In this regard, acceptance of failure was deemed important as the main objective was to learn within highly uncertain environments. Also, the drivers of the program, adopted a learning mentality themselves and did not want to claim having the answers.

Table 5: Aggregate dimension – Broad organizational framework for actions

Second-Order Codes	**Selected Evidence on First-Order Codes** *(IN# = Interview; FO = Field observation; AD = Archival data; RN = Researcher's note)*
Cultural Factors	*Acceptance of failure* "Permission that its ok to fail as long as its fail quick and reuse the learning to know what we should not persist with." (from first presentation of the Garage Program to all Telco Research employees, 2014-01-31, AD) *Empowerment and autonomy* "So, we tried to make it that it's empowering, it's distributed and it's also autonomous. I believe that an innovation system in a corporate should be distributed and autonomous, because that's the most adaptive one." (Research director and sponsor of Telco Garage, IN40) *Learning mentality and curiosity* "To win we understand and interact to explore user needs and industry value of our concepts and solutions […] We engage with users, industry & academia, we formulate relevant research questions and we are curious by exploration and experimentation" (from presentation by Head of Telco Research at Telco Research Day 2013-12-05) *Volunteerism and intrinsic motivation* "I had a discussion with a unit at the university. They had a pretty attractive model for how to handle researchers and researchers' ideas to drive them all the way to become a business. More like the startup concept. They had to some extent the view that it's very important that the idea owner needs to feel engaged and intrinsic ambition. Then the idea owner may need support but it's tremendously important to have the idea owner onboard all the way" (Original Telco Garage core team member; IN56)
Structural Factors	*Garage format* "So, it's both a physical space it's also a support system, it's a process, and it's kind of second operating system to our big operating system in Telco" (Video recorded speech by Head of Telco Research, October 2017; AD) *Short time acceleration* "As can be seen for instance in Figure 8, p. 89, in section 4.2. Telco Garage, Telco Garage strived towards an acceleration duration of three to nine months until the conclusion of the project and presentation in the Dragon's Den" (Overall assessment based on several sources; RN) *Entry and graduation* "Very early it came out that pain point, external partner, MVP. Basically, that was the only criteria that was very, very clearly came up. And then how you pitch in […] then [Head of Telco Research] became the first gate keeper to pitch in. […] And then very early, thanks to God, we could define a Dragon's Den, with […] the CTO. So, this was basically the whole set up" (Research director and sponsor of Telco Garage, IN40) *Second operating system* "And from start I was thinking about, and I was also advised, and I realized, that I cannot change the culture of Telco. That would be a very, very stupid goal, that would fail. So, always from the start, I was talking about this as a second operating system. Create something besides what you have and then very transparently you can move back and forth" (Research director and sponsor of Telco Garage, IN40)

These cultural attributes were also mirrored in the structure of the new initiative. By letting employees approach the Garage and initiate projects themselves rather than starting top-down driven projects, the Garage concept encouraged autonomous behavior and relied on volunteerism and intrinsic motivation of the employees. The aim was that the envisioned culture would permeate Telco Research and then diffuse to other organizations through their interaction in Garage projects. This was one of the reasons why no distinct unit was created, thus avoiding structural separation. Only a single manager was dedicated to facilitating Garage activities. To select, drive and support ventures employees from various positions within the company as well as external actors were to self-select and organize to a large extent. Employees were supposed to be able to move back and forth between their formal responsibilities and autonomous Garage engagements. This so called 'second operating system' (Kotter, 2012) was a way to bypass existing structural boundaries and create a more flexible approach to driving innovative projects. Instead of applying structural separation the second operating system was intended as a form of cultural separation where projects in the Garage would be run by the same people driving typical program-based innovation, but different rules would apply.

The simply defined entry selection criteria forced an open approach by demanding external partnership. It also spurred a startup and learning mentality by requiring validation of a customer problem before attending to technical solutions.

Innovativeness and creativity were to a large extent seen as the result of mixing diverse sets of knowledge. Hence team diversity was considered positive and constituted another reason why this amorphous structure of Telco Garage was promoted.

Short-time acceleration and the strong focus on creating an MVP also forced venturing teams to get out of their comfort zone and create tangible outcomes that were good enough rather than spending time on extensive plans. This allowed for quick and early feedback, a key aspect of entrepreneurial lean experimentation (Ries, 2011). The dragon's den inspired graduation procedure was mainly done to create a matchmaking mechanism to facilitate the

transfer of ventures from the Garage to the right business unit for further development and commercialization.

5.2. Generating experiences (2014-2018)

Telco Garage was officially opened in August of 2014. This is conceptualized as the start of the second phase of learning to experiment, which centers around the generation and accumulation of experience of experimentation. By replicating the broad Garage framework across the organization experimentation and capability development efforts spread and became decentralized. As the Garage concept constituted a basic framework for actions rather than a precise template, practices diverged among the Garages. While limited coordination was facilitated that enabled some extent of joint learning, each Garage typically generated experience locally and developed its own organizational capabilities successively.

The learning that took place at each site is conceptualized as a loop in which experiences are generated in close collaboration with partners, which enable vicarious learning from these partners in combination with experiential learning. This form of learning is termed coactive vicarious learning. The experiences led to the identification of certain conflicting corporate practices that needed to be unlearned to reduce tensions and enable successful adoption of new practices.

Through this learning loop a set of proto-capabilities, which can be described as building blocks to experimentation capabilities, were developed. While some impeding organizational tensions remained and limited the potential of these nascent capabilities, their value could be unlocked through organizational changes, which however required profound executive decisions.

5.2.1. Diffusing key practices

The Garage concept was initially only intended to be a part of Telco Research. The first Garage was created in the headquarters and a second Garage was planned to open the year after at Telco's research site in Silicon Valley. An explicit goal of Telco Garage was to convey

Table 6: Aggregate dimension – Replication across the organization

Second-Order Codes	**Selected Evidence on First-Order Codes** *(IN# = Interview; FO = Field observation; AD = Archival data; RN = Researcher's note)*
Diffusing Key Practices	*Evangelizing new innovation mindset* "Be obsessed with the pain point, early technology and market validation; Build fast and pivot faster, lean startup principles (MVP 1.0); Opportunity for high quality investment decision; Build knowledge how to engage with new areas; Second operating system: alternative culture and career path; New type of engagement with current and new customers" (points from presentation to the affiliated Garage leaders, during meet up, 2017-12-13; AD) *Advertising the Garage concept and results* "They did lots of advertisement, so I think everyone knew what the Garage was, that you could go there and develop your ideas" (Telco Garage, Technology Coach, IN57) *Educating about new practices* "There are a number of innovation workshops, then this innovation coach program was introduced. So, here in Ottawa myself and few others took that training. It was a very good training" (Innovation Manager, Garage Ottawa; IN102)
Structural Replication	*Distill minimum framework and principles* "So, then we came up with a franchise model. I mean, how you can franchise it. Basically, what you had is a framework as I described. What is the three criteria, two gates, still you can have [the CTO] as the Dragon's Den, so everything can go though there but how you're solving the inflow. There I was thinking about and I wanted to make sure that it's empowering. So, I didn't want to put lots and lots of control functions." (Research director and Garage sponsor, IN40) *Creating new Garages* "As can be seen for instance in Figure 9, p. 90, in 4.2. Affiliated Telco Garages, Telco Garage expanded to thirteen sites of which only two were governed by Telco Research" (Overall assessment based on several sources; RN) *Assemble network of volunteers* "So, the affiliated Garage aren't necessarily sponsored by way of dedicated staff, so it comes in more as a volunteer and people working together" (Garage Leader, Montreal; IN67) *Facilitating essential coordination* "The other thing we had as a demand was that if you want something that you will call Telco Garage then we require that we will create a form of community between these Garages, so, a higher degree of communication is important" (Telco Garage Program Manager, Telco Research; IN51)
Cultural Legitimization	*Local development of second operating system* "It's called the second operating system, by John Kotter. Yes, we really use it like that. Upon demand we take people from the hierarchical model of the organization" (Garage Leader 1, Aachen; IN68) It's not easy. I mean it's a lot of, we try to motivate and inspire people, organize events, and support in coaching and connect them. So, it requires a lot of activities" (Garage Leader 2, Aachen; IN68) *Creating distinct identity and brand* "The Garage was made distinct by creating their own logotype, website and communicating without adhering to the corporate brand and policies. Informants mentioned that they identified more strongly to the Garage community than their formal organizations." (Overall assessment based on field observations from within Telco Garage; FO)

the impression of Telco Research as a leading-edge organization and innovation partner. Furthermore, the Garage depended on other internal units, such as group functions, business units and customer units that all needed to engage in new ways for the Garage concept to work. The Garage needed to attract interest across the organization to develop cross functional teams and get support in different capacities. Hence, the Garage core team, incubated project teams as well as the Head of Telco Research engaged in internal and external advertisement of the concept and the projects they ran. For instance, half a year after the inauguration of the Garage, a project was demoed at the Mobile World Congress, the biggest yearly commercial event that Telco usually attended to showcase new technology. The CEO also mentioned the program and alluded to the planned expansion. The Garage founder and sponsor was very active in presenting the key principles of Telco Garage and to evangelize the new innovation mindset. Telco also brought in an external company to deliver formal training to people who wanted to become innovation coaches. The training involved aspects that was in line with the Garage practices, such as customer perspective and challenging latent pre-conceptions.

As awareness of the Garage initiative spread across the organization it became apparent that the concept and innovation mindset that was promoted resonated with many groups outside of Telco Research. People from different part of the organization started to approach Telco Garage asking to learn more about the concept and whether this could be extended to other parts of the organization. This grassroot movement was the main driver of the proliferation of the Garage concept.

5.2.2. Structural replication

Replication can be used as a strategy to scale a successful organization and extend an offering to new regions by copying a clearly defined and proven template (e.g. the franchise model) (Winter and Szulanski, 2001). When Telco Research was approached by interested site representatives from different parts of the organization, they saw the opportunity to expand their Garage concept through replication to new sites. However, as Telco Garage was still in

an early phase in its own learning curve there was no tried and tested template, neither were their ways of working clearly defined and codified.

To enable replication a simple framework and a set of core principle were distilled based on the broad framework for actions that had been developed. Telco Research did not have the means to fund more Garages than the one based in the headquarters and the one in Silicon Valley. However, they granted sites permission to create and fund “affiliated Garages” themselves that could be part of the Garage network and have access to their entry selection and dragon’s den as well as the support functions that had been developed. The condition that applied was that the new Garages would adhere to the basic principles of the Garage. Projects should be focused on business opportunities based on verified problems, be driven during a short period of time with the aim of developing an MVP and be driven in concert with an external partner. However, each Garage had the discretion to manage their activities as they saw suitable. Projects could be opened and closed without involving the central Garage.

From 2015 to 2018, eleven affiliated Garages were created. Several other sites also expressed their interest to do the same and there was an extensive waiting list of sites that planned to open Garages. The site management at these different locations provided facilities for the Garages but apart from Garage Beijing none of the Garages had a fulltime employed manager as in the Research-sponsored Garages. Instead, the Garages assembled networks of volunteers who dedicated parts of their time to run Garage activities. Typically, one or two people had a more articulate leader role and took greater responsibility in overseeing the activities. As the Garage network grew, the central team was extended to cater for the increasing workload. In 2016 and 2017 the team went from only two Garage managers and the sponsor to a team of a total of ten people. This expansion coincided with the transformation of Telco Garage from a cross research area program to a formal unit within Telco Research, which was officially announced in January of 2017. The central Garage team facilitated essential coordination by arranging recurring virtual and physical meetings, collecting and distributing monthly reports to create increased transparency and developing an internal

website where ongoing and past projects were showcased. The idea was to avoid that different sites drove similar projects in parallel without any cooperation among the teams. However, the discretion that had been given to the affiliated Garages to start and stop projects at will, reduced the oversight by the central team and the decentralized approach with different project sponsors made it difficult to synchronize the dispersed activities.

5.2.3. Cultural legitimization

As the Garage was highly dependent on other units an important part of the replication of the concept was to gain legitimacy across the company. This enabled employees to gain the acceptance by managers as well as colleagues to engage in Garage projects. The risk was that such actions would be disapproved as it could be perceived as a cause of increased burden on teams to manage their daily operations. It was important that the Garage activities was broadly recognized as serious, important and valuable. The Garages arranged local events to increase the awareness of their objectives and inspire to innovate.

By having a shared identity and brand, new Garages could leverage the goodwill created by more established Garages. The successful outcomes, such as ventures that went commercial or proof of concepts shown at the big commercial events created credibility to the Garage network as a whole. Yet, much of the convincing was made on a local level. By establishing a cultural legitimacy at the local level, contributing to the Garage became normalized. Initially, many Garage teams had to seek out funds to be able to create simple prototypes on an ad hoc basis but in most cases the site sponsors eventually agreed to spare a small budget for such expenses to smoothen the early explorative phases.

The brand also created a distinct recognition of Telco Garage externally, which attracted external partners and customers who were enticed by the concept.

5.2.4. Developing emergent experimentation capability

A goal of the Garage initiative was to learn a new way of driving lean business experiments. The lean startup approach build on practices such as customer development, rapid prototyping

and agile development (Mansoori, Karlsson and Lundqvist, 2019). These methods were practiced at each new venture due to the framework that had been put in place.

Being forced to onboard an external partner before commencement of a Garage project, for instance, usually meant that teams engaged with potential early customers of the value offering being developed. This way venture teams engaged in customer development to verify the problem that a value offering was addressing. Interview responses clearly state that the problem definition and validation was deemed more important initially than the technology itself.

The business model canvas (Osterwalder and Pigneur, 2010) is a common tool used in the lean startup approach (O'reilly and Binns, 2019). While being fairly straight forward, it is not necessarily easy to use for engineers with very limited business training. The Garage promoted a self-made simplified version of the business model canvas (see Figure 12, p. 112) to develop what they called a minimum viable business model to go along with the development of a minimum viable product. This served as a tool to communicate the business model and develop it consciously. Thus, avoiding that the project driver got too caught up in technology details and forgot about the business aspects. By engaging in rapid prototyping and gathering customer feedback the business model and technology was developed in tandem through an iterative process.

When ventures did not get the traction that was envisioned, project termination was not the only option. Many times, projects pivoted and found new paths. Pivots was also observed as the result of new information that came about serendipitously and which revealed unanticipated opportunities as well as when pursued opportunities turned out to be less significant than expected. Garage managers sometimes brought together people with similar interests and project ideas, which also could spark creative discussions which resulted in pivots towards a shared vision.

Table 7: Aggregate dimension – Coactive vicarious learning

Second-Order Codes	**Selected Evidence on First-Order Codes** *(IN# = Interview; FO = Field observation; AD = Archival data; RN = Researcher's note)*
Developing Emergent Experimentation Capability	*Developing and validating market and business case* "I needed to understand like the voice of the customer directly. […] So, I was actually able to talk to somebody who, you know, is an executive of the weather company who would purchase this data. So, very early on I was like able to capture like the voice of the customer" (Project 2 – Business driver, Telco Garage; IN107) *Developing minimum viable product and business model* "As can be seen below in Figure 12, Telco Garage developed their own version of the business model canvas and offered this together with clear instructions for how to use it to intrapreneurs prior to pitching to guide them in the business modelling process" (RN) *Pivoting* "We'd been looking more at like weather companies, like private weather companies, or like sewage applications […] I think claim validation was something we had thought of as a use case but wasn't until […] I talked with the insurers in London that I realized, okay this is really valuable for them" (Project 2 – Business driver, Telco Garage; IN107)
Collaborating with Experienced Partners	*Developing collaboration procedures for different actors* "As can be seen in Figure 13, Figure 14, Figure 15 below, collaboration procedures were developed, standardized and codified for recurring types of venture-based collaboration" (Overall assessment based on multiple data sources, RN) *Engaging with accelerators* "Joined cooperation with biggest startup incubator in Croatia (http://www.tehnopark.hr/) Official partner and mentor for accelerator program" (Telco Research Monthly Report, 2017-11; AD) "As [Telco] Poland, we have established a cooperation with Startup Spark accelerator." (from Telco Research Monthly Report, 2017-12; AD) *Engaging with universities* "In April we continued to build up the network of competence support we want to be able to provide to our innovation teams. Handelshögskolan (SSE) in Stockholm accepted to use our innovation projects as course assignments for Masters and MBA students to do business analysis. Stanford University in California is likely to agree on this too, as the course material and teachers are the same. We also spent time to detail a similar setup with Uppsala University" (from Telco Research Monthly Report, 2014-02; AD)
Collaborative Learning-by-Doing	*Driving pilot project* "I realized it very quickly that slides are not good enough, so to have the idea, and talk about the idea and have nothing tangible is not going to go. So, very, very quickly I pushed to have the first project. So, my strategy was that, instead of having work like six months on the policies and I don't know, the description or the framework or whatever you call it, or finding a place, I really pushed to get a first project" (Research director and Garage sponsor, IN40) *Testing new practices in ventures* "The project is opening the development for anyone within [Telco] to contribute in an open source style of working, crowd development" (from Monthly Report of Project and Portfolio Planning within Telco Research, 2015-04; AD) *Developing skills through each venture* "And we became much better by time at coaching the ones who would come and pitch, about what was important. Especially, things such as having a clearly articulated problem, talk about who else are looking at this problem, and in some way motivating" (Telco Garage program manager; IN55)"

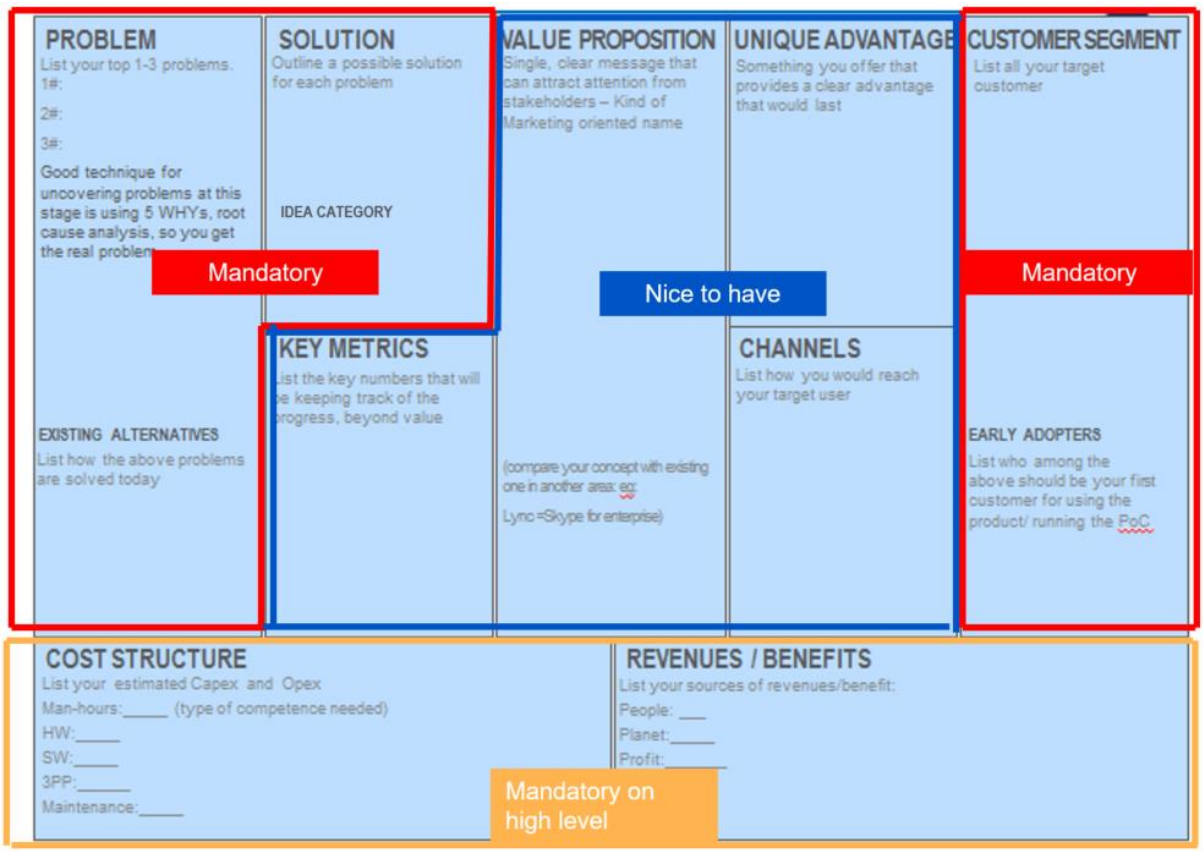


Figure 12: Minimum viable business model template for preparation before first stage gate (AD)

5.2.5. Collaborating with experienced partners

Recent research have argued that vicarious learning in complex environments benefit from sensemaking through interpersonal communication and interactions between learners and those whom they are trying to learn from (Myers, 2018). Telco Garage aimed to learn interactively from a range of actors by involving them directly in the process of experimentation. Through this approach ventures would be able to benefit directly from the knowledge of the external actors while Telco simultaneously learned how to support ventures by observing the provision of support made by these experienced actors. The monthly reports indicate how the Garage developed networks of external competence support by creating formal long-term relationships with universities and accelerators to complement the inhouse technology expertise with business know-how and entrepreneurial project management competency. Telco not only received help but also contributed to other accelerator programs to learn from their practices. By becoming sponsors and offering

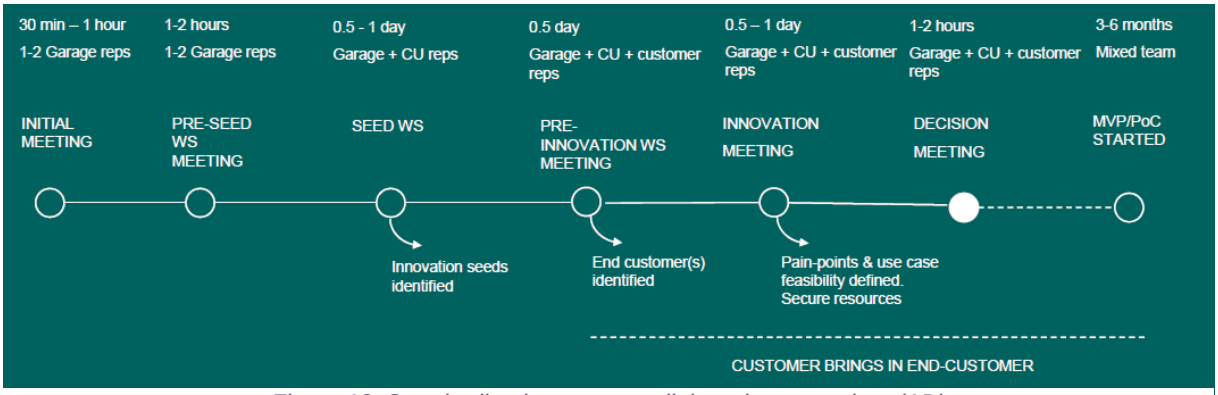


Figure 13: Standardized customer collaboration procedure (AD)

mentorship to startups Telco was able to learn by directly observing other venturing procedures, while also getting access to startups.

To enable efficient collaborations with startups and customers on a project basis, standardized procedures were developed to create a streamlined approach and enable structural learning by improving routines iteratively. For instance, Figure 13 showcase the standardized procedure for engaging in collaborative ventures with core customers (CSPs). Different collaboration procedures were developed for different types of actors to create a more systematic approach. When engaging with core customers, an initial meeting was held with customers and customer unit, in order to describe the Garage strategy and ways of working. The customer unit had to agree on the Garage terms, such as the aim to develop a minimum viable product, the importance of onboarding an external partner in addition to the core

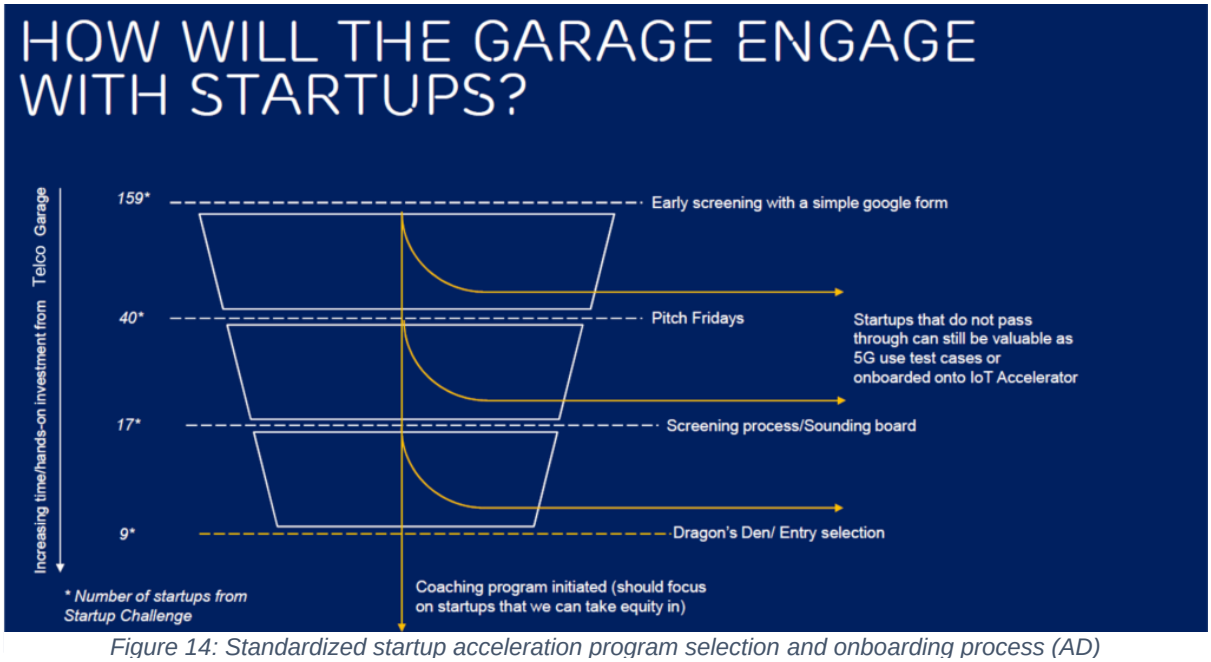


Figure 14: Standardized startup acceleration program selection and onboarding process (AD)

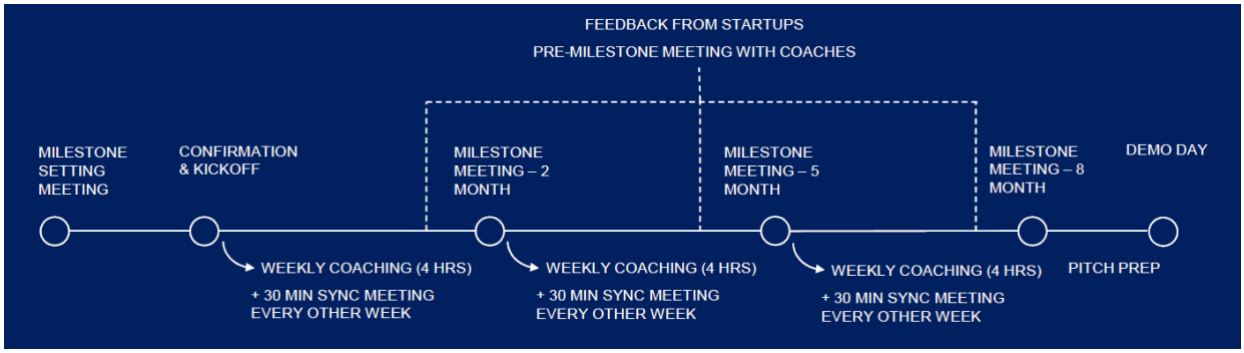


Figure 15: Startup acceleration program process (AD)

customer, such as an industry player that could serve as a first friendly customer. The interactions with startups were arranged in a way that was more similar to entrepreneurial accelerator programs. Figure 14 and Figure 15 showcase the procedure for evaluation, screening and selection of startups, and the startup acceleration process, respectively.

5.2.6. Collaborative learning-by-doing

Prior research has described interactive learning-by-doing as an emergent form of learning where actors interact, bargain and compromise while learning about each other's motives, and modifying their own actions iteratively to advance their agendas (Miller, 1996). This type of learning played a big role as Telco Garage did not have a strong mandate to control the innovation process. Due to the difficulty to foresee how internal venturing of the kind that they attempted to establish would fall out they quickly launched a pilot project to learn through trial-and-error and design the program according to the learnings they obtained.

Through each new project they developed skills and a deeper understanding of how the organization as a whole reacted to different approaches. While the Garage drivers sometimes had a strong belief of how certain elements of their framework ought to work, reality sometimes proved to be different since different actors and stakeholders that the Garage depended on did not share the same mindset or objectives.

In particular, tensions emerged regarding new selection practices and resource allocation practices that were introduced through the Garage. Through continuous learning, Garage members developed insights into how to manage these activities and identified practices used

by other actors that could be incorporated. However, to implement the knowledge by introducing these new practices other conflicting practices had to be unlearned.

5.2.7. Unlearning selection practices

Intentionally unlearning of obsolete or inadequate mental models, assumptions, behaviors or routines has been proposed as a way for learning organizations to prevent rigidity and enable innovation (Klammer, Grisold and Gueldenberg, 2019). As obstacles were encountered while trying to instigate new behavior by the development of Telco Garage, efforts had to be made to unlearn conflicting practices. The selection practices were one important element that required this line of actions.

To create structure and transparency a clear entry gate and an exit gate was created initially. The entry selection panel was led by the head of Telco Research but also comprised of several research directors and other stakeholders. By engaging a large number of people with limited affiliation with the new innovation program and commitment to its objectives in the decision-making process, it ended up being influenced by the mindset attributed to prior innovation logic. As research projects in general have been big and investment heavy, decision makers had a propensity to be restrictive and look for weaknesses in proposals. This mindset had a considerably negative effect on the ability to start experimenting.

After identifying the shortcoming of the initial set up, the Garage team did a number of actions to alleviate the tension between the old and new decision-making practices and ensure that the decision makers unlearned inadequate legacy practices. By redesigning the entry selection panel and making sure the same people attended each time, they enabled faster substitution of old practices. They also changed the structure of authority by allowing the local managers of each Garage make their own decisions about starting and stopping projects. The formal and centralized entry selection gate became an optional step, but which increased the level of support ventures could obtain. Simple criteria were also created and codified in order

Table 8: Aggregate dimension – Unlearning conflicting corporate practices

Second-Order Codes	**Selected Evidence on First-Order Codes** *(IN# = Interview; FO = Field observation; AD = Archival data; RN = Researcher's note)*
Unlearning Selection Practices	*Identifying dysfunctional selection practices* "But what became obvious during the first years, 2015, not to mention 2016, was that the pitch procedure to enter the Garage didn't work […] It was that there was the entire [Telco] Research Leadership Team that didn't understand innovation […] and they ended up in a mode of rather shooting down than giving it a chance" (Telco Garage program manager; IN55) *Replacing decision makers* "But what we did rather quickly […] was that we reshaped the Entry Selection Board. […] And then it became eight people. So, we took two people from Research with the right to vote, and that was [the Garage Sponsor] and [the head of Telco Research] and then there were two people from the IoT side, there was one from [Business Unit Digital Services], two from the radio side and one from the CTO office." (Telco Garage program manager; IN55) *Change structure of authority to enhance autonomy* "There I was thinking about and I wanted to make sure that it's empowering. So, I didn't want to put lots and lots of control functions. So, I said that for the ideation, you have all the freedom. How you're collecting the ideas, it's up to the site. We're not going to tell you. […] And then after that we said that you can have internal, on the garage level, you can have projects yourself. So, I don't want to be, every time, the gatekeeper" (Research director and Garage sponsor; IN40) *Creating simple criteria* "Entry Selection Criteria: • Satisfies a clear need – Verified problem definition; • Minimum Viable Product (prototype) – Clearly defined Minimum Viable Product – Feasibility; • The innovation extends business in new areas; • Understand the competition – Who, what; • What is new and innovative? – Benefit of the approach clearly described; • External partner onboard; • Team secured – Resources and expected time reasonable; • What values are expected to be created?" (criteria in form of bullet points from Powerpoint documentation of criteria, AD)
Unlearning Human Resource Allocation Practices	*Identifying problems with human resource allocation practices* "The following challenges were reported during the interviews by the local Telco Garage leads: Fading engagement due to lack of slack. Telco Garage activities are often on top of an 100% fulltime job. Both garage teams and project teams face this challenge. […] No dedicated time or money: each project and person must negotiate with line managers" (Excerpt from Telco Garage Report to CEO – Site assessment; AD) *Gain support and remove obstacles for onboarding volunteers* "In order to address some of these issues we have recently: • Engaged with DNEW leadership to encourage employees to work on Telco Garage projects and disseminate better information about how to volunteer. • Begun pursuing the use of network numbers with MAs/BAs to get better visibility into time spent and enable minimal budgets. • Established an "Telco Garage Volunteer" option in O365 so employee can volunteer and be matched to projects in need of certain competences" (Excerpt from Telco Garage Report to CEO – Site assessment; AD)
Unlearning Financial Resource Allocation Practices	*Creating minimum resource pools* "The department will take over the time reported, that they spent. I mean we finance a small equipment, let's say if they join a hackathon like raspberry pies, or smaller SD cards or these kinds of things." (Garage Leader, Aachen; IN68) *Gain support of innovation activities from line managers* "There are specific people […] that are really focusing on the garage. I mean we got support from the […] manager […] from the site opportunity council, that they are constantly accompanying and supporting us" (Garage Leader, Aachen; IN68)

to guide decision-makers' evaluation process. To ensure that old selection practices would not become dominant later in the innovation process the Garage introduced bridging routines such as involving potential decision makers early on. Guided by a series of workshops provided by a university partner, the ventures conducted formal internal convincing activities. This contrasted to their typical over the fence approach and served as a way to unlearn this function driven behavior, based on a clear distinction between various units' responsibilities.

5.2.8. Unlearning human resource allocation practices

Human resource allocation practices that were advocated by the Garage contrasted significantly to the existing practices. Although Telco Research was also separated into distinct research areas which limited collaboration across these, the explicit strategic intent from the Research leadership and the flexibility that researchers enjoyed in terms of not having to bill their hours to specific budgets, helped the organization to modify these practices. However, the problems of introducing these new practices became increasingly apparent as people from other organizations were to join projects, either because they had project ideas or because they possessed valuable competencies needed in certain projects. To deal with this problem the Garage needed to engage with the leadership of organizations they depended upon to persuade them to encourage their employees to volunteer to projects. Managers that did engage with Telco Garage substituted more strict human resource management practices with more autonomous self-selection to projects.

The obstacles to allocate employees in a fluid and volunteer-based manner required changes in behavior on multiple levels and systems were put in place to enable a competency based human resource allocation rather than basing human resource allocation on organizational affiliation. The need for increasing slack persisted in many parts of the organization despite these efforts and remained an obstacle for the new human resource allocation practices to be fully implemented.

5.2.9. Unlearning financial resource allocation practices

Financial allocation emerged as another issue. Typically, each manager who holds a budget manage this to serve their own goals. By ignoring such organizational boundaries, Telco Garage projects had no clear sponsor. The limitation of Telco Research's budget precluded that they could sponsor the myriad of ventures that emerged across the company. Doings so would also have risked reducing the feeling of responsibility by other organizations to sponsor these activities. This type of separation and centralization would have gone against the Garage philosophy of empowerment and inclusion.

To handle this issue local Garage representatives, with substantial backup from the central organization, influenced organizations at the sites to collaboratively form essential budgets that different organizational units represented at the sites jointly contributed to, while giving up the mandate for how these resources would be distributed. The local Garage managers had the prerogative to decide which ventures qualified to use the fund. These resources were limited and reflected the warranted low level of commitment to these early ventures. When ventures had reached certain milestones and were ready to exit the Garage, business units typically invested more substantial amounts to perform large scale trials if the venture was deemed promising and strategically interesting.

5.2.10. Proto-capabilities for experimentation

While coactive vicarious learning led to the adoption of new practices, unlearning of conflicting corporate practices paved the way to increase their acceptance. The replication of this new innovation approach across the organization strengthened the cultural acceptance. Arguably, a more isolated approach would not have amounted to cultural acceptance in the wider context but instead created a distinct culture. The replication also afforded a wide awareness and engagement with experimentation. New relational ties and a sense of community around experimental initiatives had been created across the company, which spanned across organizational boundaries that were described as solid. Among this community new routines

Table 9: Aggregate dimension – Proto-capabilities for experimentation

Second-Order Codes	**Selected Evidence on First-Order Codes** *(IN# = Interview; FO = Field observation; AD = Archival data; RN = Researcher's note)*
Constituents for Experimentation Capability	*Wide awareness and engagement with experimentation* "Meta data about all Garage projects and Garage events in 2017-2018 indicate that there was representation from Telco Research, all of the business units, several market areas and group functions in the projects and that 3000 people had attended Telco Garage events" (Researcher's report based on Garage project tracker; RN/AD) *Relational ties and community* "you can't manufacture this grassroots' enthusiasm and commitment […] you can launch as many campaigns as you want to, to recruit for these kinds of people. That's not how it works. But this sort of brought them up, gave them a platform. They found each other, they amplified their own message, which is why it spread so much. And so today, for any future innovation activities we have a very fertile sort of ground to leverage these people again. We activate them, we invite them into this conversation. So that's an enormous positive and I don't know if we could have done it without that." (Head of Telco ONE Hub Sweden and former strategy advisor at Telco Garage; IN46) *Exercised practices and routines* "Looking per site, we find that older [Telco] Garages tend to be more prolific and host more events. Gothenburg and Montreal are two of our most prolific garages" (Excerpt from Telco Garage Report to CEO – Site assessment; AD); "Overall assessment of field observations indicate that the older Garage's more prolific by gaining experience and routinizing key activities, such as hosting ideation events, etc." (Researcher's notes based on field observations; RN/FO)
Impeding Organizational Tensions	*Declining enthusiasm in ventures and venture support due to work overload* "The resource issue is another thing that would be helpful if we could solve somehow. We, who works in the Garage could perhaps be more dedicated to put our time here. Today, it is rather a guilty conscience. Something one willingly does because it is fun, but it is not sustainable from a personal perspective" (Garage Leader, Lund; IN64) *Venturing interruptions due to lack of resources and time* "The project is on hold. No resources are available, neither internal nor external" (Telco Research Monthly Report, 2017-06; AD) "I see that we have less and less slack and buffer for the people, so I see these teams working and taking longer to develop something" (Garage Leader, Aachen; IN76) *Venturing interruptions due to hand-over* "we have always struggled with, what do you do when you have brought something up to, from a startup, to 'now it's time to scale this. Where should this reside?' That hand-over have never been resolved. So, in the early stages we've had 'everything looks good in the pipeline' and then when you are to move this new thing, which still is only going to cost, into an existing business unit, and the first thing that happens in the next financial cycle and budgeting period is that it is killed" (Head of Telco ONE, IN48)

had been created such as regular ideation events, mile-stone follow-ups, coaching and project support activities and other administrative activities.

These assets that were created can be conceptualized as proto-capabilities, which means that while these did not amount to a full-fledged experimentation capability, they constituted building blocks to further develop the corporate experimentation capability. However, remaining organizational tensions prevented the company from exploiting these nascent capabilities to the fullest. The identification of such impeding organizational tensions constituted an important learning outcome.

Declining enthusiasm amongst venture teams and Garage volunteers were observed as a result of work overload. As the organizational slack was relatively restricted, extracurricular activities tended to extend beyond work hours, which put increasing strain on employees. Furthermore, the workload of ordinary responsibilities varied, and in times of increased urgency of such activities, the lower priority of Garage activities became evident.

These issues were worsened as projects frequently were interrupted due to lack of resources, which could for instance be caused by the temporary withdrawal of a key team member. Also, the hand-over phase after ventures were to leave the Garage remained a sensitive period, where projects often halted and sometimes engaged in search for a new host organization rather than developing the venture.

5.2.11. Decentralized experimentation with divergent practices

The wide awareness and engagement with experimentation resulted in large number of parallel ventures. In the spring of 2018, 50 experimental ventures were running in parallel within the Garages while there was a big funnel of unofficial projects in the starting pits, working with Garage representatives to articulate their business ideas, finding external partners and finding a problem-solution fit. In each venture the Garage engaged with external collaboration partners, often new partners in each venture. This resulted in a wide range of

collaboration partners around the world with whom Telco had developed new relationships.

However, the decentralized network of Garages also led to limited integration. Even though the Garage required monthly reports and regular coordination meetings there were quite limited transparency into what was going on in each of the Garages. This led to occasional double work as similar ventures started without learning from previous ones or collaborate with parallel initiatives in the same domain. Such forms of collaborations were difficult due to the geographical distance and different organizational affiliation. Also, the Garage routine activities to support innovation had to be learned in each new Garage and the support from more experienced Garages or from the central Garage was limited. Practices also diverged as the strategic intentions and objectives of different Garages drifted in different directions. The autonomy led to heterogeneity of selection regimes and support differed depending

Table 10: Aggregate dimension – Decentralized experimentation with divergent practices

Second-Order Codes	**Selected Evidence on First-Order Codes** *(IN# = Interview; FO = Field observation; AD = Archival data; RN = Researcher's note)*
Dispersed Experimentation	*Large number of parallel ventures* "Meta data of the project funnel indicate that in April of 2018, at least 44 projects were ongoing on a local Garage level, without having passed the global entry selection panel, and six more projects were ongoing and had passed the global entry selection" (Researcher's notes based on overall assessment of interviews with all Garage leaders, RN) *Inflow of new ideas* "The goal is to empower employees, customers and partners to explore. In light of this, we were happy to find that 85 events were hosted during 2017 with over 3000 participants, resulting in 215 ideas developed. Our idea funnel progresses through two stages: local projects and global projects. Of the 215 ideas 46 were pitched into local garages during the year of 2017. Including ideas that cannot be directly traced to the events a total of 74 ideas were pitched into local garages" (Excerpt from Telco Garage Report to CEO – Site assessment; AD) *Large number of collaboration partners for experimentation* "Meta data of a total of 89 Garage projects from between 2014 and 2018, show the involvement of around 130 unique external partners, of which 10 were universities and 11 were CSPs, while the rest mostly consisted of private firms from various other industries" (Researcher's report based on Garage project tracker, RN)

Table 11: Aggregate dimension – Decentralized experimentation with divergent practices (continued)

Second-Order Codes	**Selected Evidence on First-Order Codes** *(IN# = Interview; FO = Field observation; AD = Archival data; RN = Researcher's note)*
Limited Integration and Knowledge Sharing	*Dispersed double work due to lack of horizontal coordination and learning* "Local staff spending too much time on simple things because of inexperience. More central support and sharing best practices would be helpful." (Excerpt from Telco Garage Report to CEO – Site assessment; AD) *Lack of holistic transparency of portfolio and progress* "We have created an excel based tracker which will be used to monitor ideas going forward" … "Note that project status "unknown" means that we did not get answer on the status of the project, i.e. ongoing, stopped, shelved or exited. We aim to improve historical data by approaching specific project leads, and going forward ensure better population of the needed data" (Excerpt from Telco Garage Report to CEO – Site assessment; AD) "The excerpt above indicate that not until 2018 was systematic tracking attempted in response to a request from the CEO, which corresponds to field observations" (RN) *Lack of inter-venture collaboration* "The Telco Garage program manager, reported issues of creating collaboration between the Garages on similar projects. For instance, disconnected drone projects have been observed in Beijing, Montreal, Poland and Silicon Valley." (Insights based on field observations and aggregated project data from local Garages; FO)
Divergence of Practices	*Heterogeneity of strategic intentions and objectives* "When we exploded into 13 Garages we didn't have a mission […] and if you had asked our founder at that time even after 13 Garages of which 11 were not Research he would still say the mission was to bring experimentation back to [Telco] Research. So, you have a fraction of the Garages speaking on behalf of the majority with a mission that is totally ununited. Because if you go to the other Garages, their mission was 'we want to have interface with our customer' or someone else's mission was 'we want to have engagement with our staff'" (Head of Telco ONE Hub Sweden and former strategy advisor at Telco Garage; IN46) *Heterogeneity of selection and support* "The number of supporting Garage volunteers and staff varied substantially from 10 to 60 manhours per week, which was not proportional to the variation in the number of projects. Manhours divided with number of projects resulted in a ratio between 5 and 13.33 manhours per project. This suggests a diversity in the support gained by Garage projects. Furthermore, the acceptance rate of Garage applications varied between 18% and 100%, which suggest great diversity in selection practices" (Researcher's note based on aggregate Garage-level meta data, RN) *Deviations from original intent* "To call themselves a Garage they had to drive projects. It could not be an empty facility where people go to play but they had to do projects that then were finalized and demonstrated. In the end it was a bit so and so at the different Garages but overall,l it was working well. Several Garages were pretty bad at finalizing it and move further in some form of phase two. Instead, they held on to project for a very long time" (Telco Garage program manager; IN55)

on the local context and which individuals volunteered to support the Garage activities. To some degree Garages deviated from the original intent by for instance not quickly reaching a conclusion of the projects and by disregarding the formal entry selection and dragon's den.

5.3. Building experimentation capability (2018-2020)

In 2018, Telco created a distinct business unit that exclusively catered for the development of fast-growing businesses in new strategic areas. A central element of this new strategy for innovation in emergent business areas was the introduction of Telco ONE. This unit was responsible for creating a great diversity of strategic ventures by stimulating, sourcing and supporting bottom-up initiatives from across the company, and creating and managing an innovation funnel to produce promising ventures.

The development of Telco ONE is conceptualized as a learning phase in which Telco built an experimentation capability by centralizing and systematizing the experimentation process. The identified issues but also the learning outcomes, in terms of new practices from the prior learning phase, informed this phase of learning. It centered around the development of experimentation capabilities through deliberate learning from past experiences and adaptation of corporate practices.

By systematically analyzing prevailing issues experienced in the Garage context, reassessing previously learnt practices as well as disseminating lessons learnt from both successful and failed ventures, Telco ONE was able to map and address capability gaps for venture level and portfolio level experimentation. Through reassessment and modification of previously learnt practices and adaptive replication of corporate practices such as centralized and hierarchical decision-making processes, structural separation and distinct strategic focus, and formalized innovation processes and incentive mechanisms, Telco ONE was able to fill these capability gaps. This amounted to a centralized holistic end-to-end process for corporate venturing supported by systematized venture-level and portfolio-level experimentation practices.

Table 12: Aggregate dimension – Deliberate learning

Second-Order Codes	**Selected Evidence on First-Order Codes** *(IN# = Interview; FO = Field observation; AD = Archival data; RN = Researcher's note)*
Systematic Analysis of Prevailing Issues	*Conducting interviews and workshops with Garage leaders, innovation manager and other stakeholders* "In the months immediately after the discontinuation of Garage and creation of Telco ONE was announced, the prior Garage staff that now became part of Telco ONE and some additional staff that joined, began conducting interviews with Garage leaders and innovation managers to build a wider understanding of issues regarding the early phases of experimentation and venturing" (Field observations, October 2018; FO) "A team from Telco ONE did a tour to different sites to collect data about people's experiences of the innovation journey, using service design methods. I directly observed two of these visits. 637 short descriptions of issues related to different stages were collected from sites in Asia, North America and Europe" (Field observations, February to March 2019; FO) *Analyzing innovation journey, key issues and root causes* "Collected issues from workshops were grouped into categories and placed along a 'customer journey map' of the Telco ONE catered venturing process to identify key obstacles" (Field observations February to March 2019; FO) "Issues observed during interviews were analyzed and linked to root causes in key areas. These were addressed on joint meetings among the newly formed Telco ONE Hubs, to decide on actions to take" (Field observations October to November 2018; FO)
Reassessing Previously Learnt Practices	*Discarding dysfunctional idea sourcing practices* "When I joined, I swallowed these four streams that we were supposed to work with: the intrapreneur track or internal track, the startup incubator, universities […] and customers. And now there is only one left. And that is based on a number of insights and outputs that we have discovered that took some time to render" (Head of Telco ONE, IN48) *Reconceptualizing Garage assets and artefacts to new Telco ONE features* "we call innovation ambassador. Okay? So, what they would do, they will become the first line of filtering and they also become the first line to respond to those ideas through the tool. They, we need those folks be very well versed in regional and local innovation ecosystem. They need to have a lot of experience in dealing with innovation projects and they have high-level knowledge of business case […] we're proposing like a Telco ONE Garage member" (Head of Innovation Enablement, Telco ONE Hub Silicon Valley; IN42) "As Telco ONE started to structure the innovation process into distinct phases, the view of this as a reconceptualization of the previous entry and exit gates was obvious. They often referred to the new gates as corresponding to prior entry and exit procedures to make sense of the new process" (Field observations, June to December; FO)
Dissemination of Learning from Venture Success and Failure	*Codifying and publishing lessons learnt and decision rationale* "As a part of the open idea management tool where anyone signed up can track progress of the entire Telco ONE funnel, as projects are sorted into columns of different categories depending on their current stage. One category including 28 projects that has been entered between 11 March 2019 and 21 April 2020, include descriptions of why the projects were discontinued and what was learnt" (Field observation, FO) *Arranging alumni presentations* "Alumni presentations - Develop a framework for how we could engage alumni who have gone through certain stages to inspire and support newer projects, e.g. inspirational talks, coaching, etc. (Could be a part of Strategic Design teams culture program)" (Telco ONE team meeting protocol 2018-10-24; AD) *Case study of success and failure* "Short and simple case studies were observed including information about progress and status, nature of the initiative, how it came about, what happened with it and why, and rational behind go or no-go decisions" (Observation of Telco ONE shared document repository, FO/AD)

5.3.1. Systematic analysis of prevailing issues

Firms learn deliberately through investment in reviews and analysis of past experiences (Ellis and Davidi, 2005) as well as articulation and codification activities (Zollo and Winter, 2002). An intense period of deliberate learning was observed to take place as Telco ONE was being developed, which involved these types of activities.

To build deep knowledge about current practices and existing issues interviews were conducted with a wide range of stakeholders. One of the informants who had called for such systematic analysis as early as when Telco Garage was set up, described an ambition to bring in as many voices and perspectives as possible. Interviews were conducted over phone with Garage leaders and other innovation managers across the world, known to drive initiatives adjacent to the current core business. These interviews were in particular concerned with the issues regarding the facilitation of a variety of ideas, and steps towards creating an MVP.

In addition to interviews, a team from the central Telco ONE organization made a tour to different sites around the world, combining education in new innovation practices such as design thinking and lean startup and advertisement of Telco ONE, with collection of insights through workshops of a ‘focus group’ character. Through these interactions they were able to collect information about the experiences of various stages of the innovation process.

This data was analyzed both by breaking down issues and searching for the potential root causes, which were framed as particular areas of improvements and by connecting perceived problems to different phases and key events during the innovation journey. Recognized techniques, such as service journey mapping and service blueprint, were used to analyze these issues. The resulting knowledge was intended to provide a well-grounded basis for design decisions during the development of Telco ONE. The development was often framed as the design of a set of services to help intrapreneurs.

5.3.2. Reassessing previously learnt practices

While the launch of Telco ONE was considered an important new start and the necessity to structure corporate venturing in a more systematic manner and discard ineffective practices was underscored, members of the organization also recognized the importance to preserve valuable elements of the Garage model.

The reassessment of previously learnt practices was guided by insights from the systematic analysis of past experiences. Some practices that had become deeply entrenched in the concept of the Garage were initially taken for granted as elements to preserve, such as idea generation and joint projects with core customers and incubation of external startups. However, insight garnered through systematic analysis revealed inherent problems of some practices, including these, which led them to be discarded, eventually.

Other elements such as the wide reach and local presence established at multiple sites by the Garage network was perceived as vital assets since it encouraged corporate entrepreneurship across the firm. This network and sense of community was however compromised as the Garage was discontinued and a more centralized approach was adopted. To leverage what had been developed through Telco Garage and enable further development of these assets, Telco ONE reconceptualized the network aspect of the Garage and created a program where anyone could become a link between Telco ONE and their local site. This new ‘ambassador program’ lowered the thresholds to be a part of the network and to support and coach intrapreneurs. Former affiliated Garage members joined this network to substitute the prior link towards the headquarter through the central Garage.

Also, the entry and exit rituals of Telco Garage, with their characteristic entrepreneurship inspired pitch format, had become important cultural artifacts that helped convey the narrative of the corporate venture process and make sense of its different phases. As Telco ONE took a more holistic responsibility for the process of developing new ventures into independent operating units these rituals were reconceptualized into distinct stage gates ordered as a

ladder of increasing investments. Catchy names such as ‘angel’s room’, ‘dragon’s den’ and ‘pioneer’s nest’ were used for these stage gates.

5.3.3. Dissemination of learning from venture success and failure

Learning from ventures in a more systematic way became a priority for Telco ONE. In order to reduce recurring errors and share knowledge about success factors, learning and knowledge dissemination activities were embedded in the innovation process. By conducting simple case studies of past and ongoing projects knowledge about key issues could be articulated and shared with other employees through the platform-based ideation tool, the open SharePoint-site and through presentations.

Individuals and teams submitting proposals or driving project were also given constructive feedback with short response time. In line with theory, this feedback was considered important in order to sustain the engagement from innovative employees regardless of whether their ideas were passing the requirements or not and to increase the quality and adequacy of subsequent submissions (Piezunka and Dahlander, 2018). An important part of incorporating learning mechanisms into Telco ONE’s operational process was to leverage alumni. Alumni was what the Telco ONE team called intrapreneurs with experience of driving projects through certain gates in Telco ONE’s stage gate process. These experienced intrapreneurs represented valuable sources of knowledge. While there were elaborate plans to utilize these people as mentors for younger projects, this was not observed in action during the time of the study. However, they held alumni presentations to both inspire and share their own learnings with a wider audience and answered questions about their experiences of the entrepreneurial process.

Table 13: Aggregate dimension – Adaptive replication of corporate practices

Second-Order Codes	**Selected Evidence on First-Order Codes** *(IN# = Interview; FO = Field observation; AD = Archival data; RN = Researcher's note)*
Adapting Structural Separation and Distinct Strategic Focus	*Creating dedicated business unit to ensure commitment to non-core innovation and reduce interdependencies* "then when you're about to move this thing, that is still only going to cost money, into an existing business unit, and the first thing that happens in the next funding cycle and the next budget period is that it gets shut down. So, now we have solved that problem with a whole dedicated BA, or Business Area for New Business, so that we can go from start-up mode, which is [Telco] ONE, to scale-up mode á la [Project 1], [Project #] and IoT, which still reside with [Business Unit Technology and Emerging Business] and is all about growth, growth, growth" (Head of Telco ONE; IN48) *Creating clear strategic focus* "As can be seen in Figure 16, p. 130, Telco ONE defined autonomous vehicles, smart manufacturing and connected supply chain as their three strategic focus areas" (Researcher's notes based on overall assessment, RN)
Centralizing and Adapting Hierarchical Organization	*Organizing hierarchically* "In the first half a year Telco ONE developed an organization with a central head and some functional roles catering for the three hubs, each with a head and six positions appointed by each of these heads. The hub setups were similar" (Assessment of organization structure; FO) *Centralizing and standardizing competencies* "Each hub had the same set of key competencies, i.e. business coaches, ecosystem managers, market initiation support and marketing. Also, a central team of designers supported the three hubs and their ventures" (Field observations, 2019-2020; FO) *Creating clear and all-encompassing regional responsibilities* "Telco ONE Beijing catered for ideas from and maintained a network of ambassadors in South East Asia, Telco ONE Silicon Valley did the same for the Americas and Australia and India, and Telco ONE Stockholm did the same for Europe, Africa and the Middle East" (Joint assessment of assignment of coaches to ideas on digital idea management tool, archival data, and observation of ambassador lists; FO) *Formalizing and harmonizing volunteers' roles* "Support and training – Basic training, content: •Introduction to ONE; •IdeaDrop; •Evaluation criteria; •Primer to user centered innovation; – Recurring coaching and guidance with Hub: •Monthly retrospective insights and guidance call; • Coach coaching; Inspirational & educational seminars (Excerpt from document presenting Telco ONE ambassadorship; AD)
Adapting Corporate Processes and Incentives	*Creating gates with quantitative KPIs and goals* "2019 Key deliverables: •50/10/2-3/1 Ideation/MVP/Industrialization/Ignition projects" (Presentation of ONE's objectives, AD) "The quote describes how many projects ONE was expected to have in each phase during 2019" (Researcher's notes, RN) *Creating standardized decision for a for each gate with hierarchical escalation* "For each of the gates a there was a chair with the ultimate decision-making power, a driver of the event, standing panel members and a set of optional panel member depending on the nature of the venture. The decision makers were for each gate: (1) Angel's Room: Head of ONE Hub; (2) Dragon's Den: Head of ONE; (3) Pioneer's Nest: Head of Business Unit Technology & Emerging Business; (4) Acceleration Board: CEO" (Overall assessment of process models of the staged decision points, AD/RN) *Standardize stage duration, support services and budget* "As can be seen in Figure 18, p. 132, a precise step by step, stage gate process was designed with clearly defined durations, budgets and scope. Support services were designed around this process" (Researcher's notes; RN) *Introducing gate-bounded awards for successful intrapreneurs* "After many questions to Telco ONE about 'what's in it for the intrapreneur' an award of up to 100% of an employee's yearly income was introduced for intrapreneurs responsible for bringing a venture through all Telco ONE's gates and create a new independent operating unit" (Field observation, September 2018 October 2019;)

5.3.4. Adapting structural separation and distinct strategic focus

The experienced problems of ambiguity about venture ownership and difficult handover processes, reluctance or inability of business units to drive non-core innovation projects, and misalignment between business unit strategy and emerging experimental ventures prompted the adaptation of structural separation and distinct strategic focus. Hence, Telco adapted similar organizational structure for managing emergent ventures as for the new product development within the core business.

By creating a new business unit dedicated to creating growth in emergent business areas, the commitment to non-core innovation was anchored at a higher level in the organizational hierarchy. Yet, the initiation of new innovation projects differed to the traditional approach. It was not only driven by members of the same business unit. Instead, the establishment of Telco ONE, as a central part of the innovation strategy, offered an integration mechanism towards the other business units to source ideas from the entire company.

In line with other established business units, the new business unit developed a clear strategic focus. To achieve scope benefits, three strategic focus areas (autonomous vehicles, smart manufacturing and connected logistics) were determined, targeting currently fast-growing verticals in the IoT space. Telco ONE adopted these strategic focus areas to guide their search for new opportunities. However, to stay open and still enable diversity, concepts referred to as “scouting and insights”, “on our radar” and “hot topics” were introduced. These sets of activities enabled structured explorations outside of the strategic focus areas. While new innovation initiatives within the strategic focus areas were encouraged through calls for ideas and challenges posted through the digital idea management tool, emerging themes were investigated by gathering insights, ideas and new perspectives through continuous interactions with external partners, as well as “active engagement in Telco’s innovation ecosystem to identify potential cross connections and opportunities” (See Figure 16, p. 130).

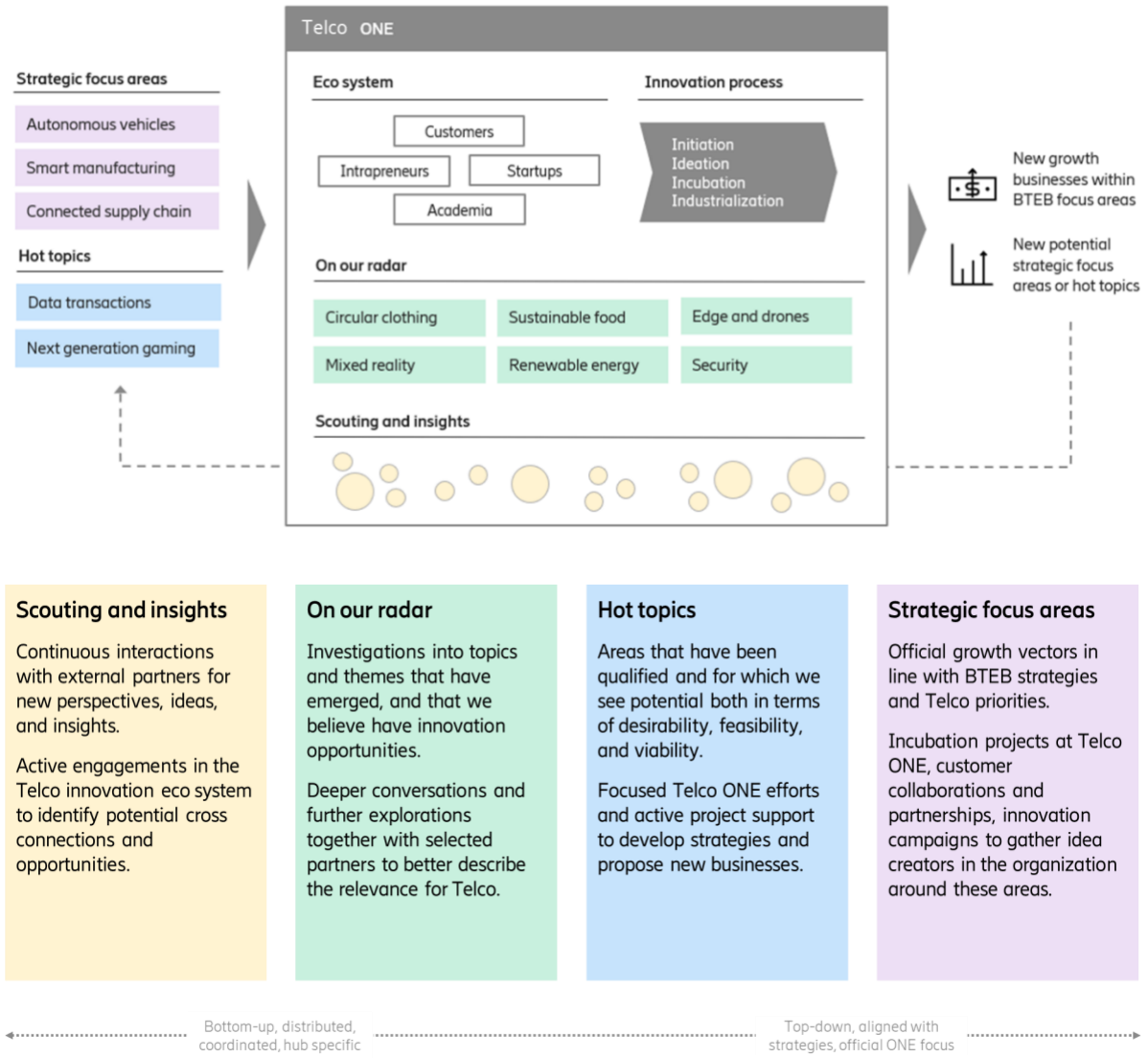


Figure 16: Telco ONE strategic focus areas (AD)

5.3.5. Centralizing and adapting hierarchical organization

In response to the perceived problems of the decentralized approach of Telco Garage, Telco ONE adopted a more traditional centralized and hierarchical organizational design (see Figure 17, p. 131). At the top, a central team was established with functional roles catering for all of the three hubs. In addition to the typical roles of executive manager, assistant, business controller, HR and marketing, a team of strategic designers were transferred from Telco Research and positioned as a support function for all the hubs and as drivers of continuous organizational improvements. Each hub had a similar setup with a standardized set of

competencies which had been recognized as important complements to support the often technology savvy intrapreneurs.

To avoid the same divergence of practices encountered in the Garage network in the new ambassador network, the roles and responsibilities of volunteers became more formalized too. Procedures for onboarding new ambassadors were thoroughly codified by both explicating the type of persons that they sought and how to introduce and train them. Also, the ambassadors' responsibilities were clearly articulated, similarly as for the formal roles of the dedicated personnel. The geographical areas of responsibility were clearly divided among the three hubs. Each hub created its own ambassador network to reach the different sites within its region.

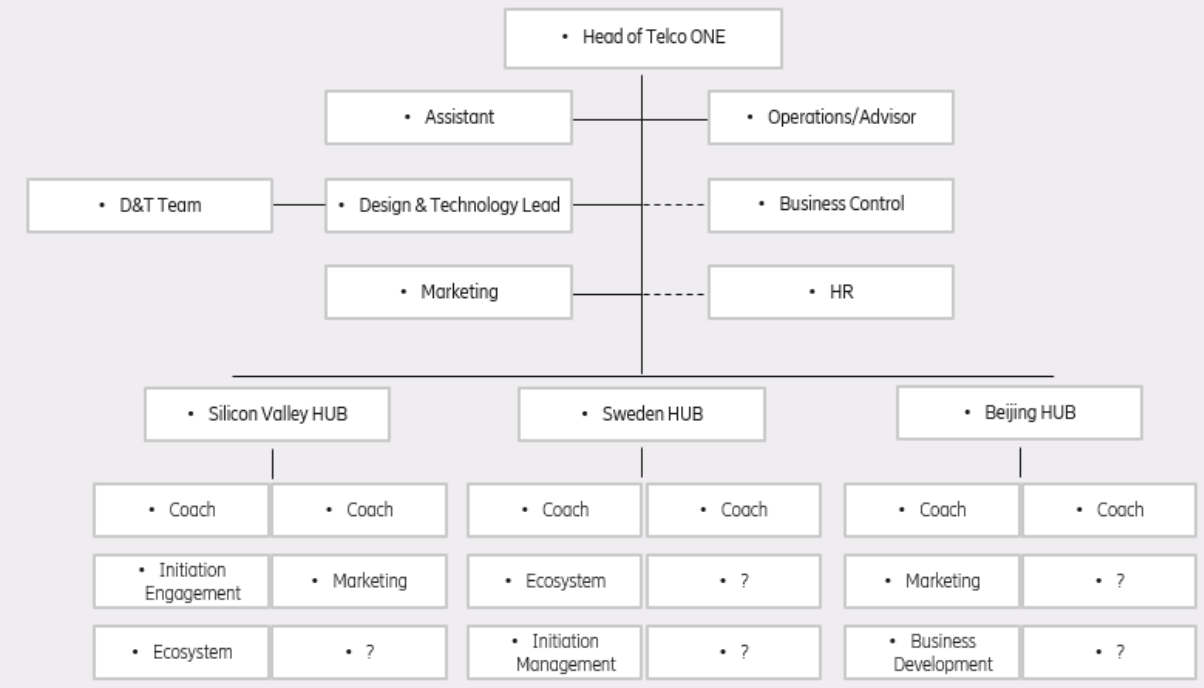


Figure 17: Organization structure - Telco ONE (AD)

5.3.6. Adapting corporate processes and incentives

In resemblance to the new product development process that Telco typically employed for its core business, the structured corporate venture process within Telco ONE followed a stage gate process (See Figure 18, p. 132). Quantitative goals were set by top management, expecting the generation of submitted ideas in the ballpark of a thousand per year and that

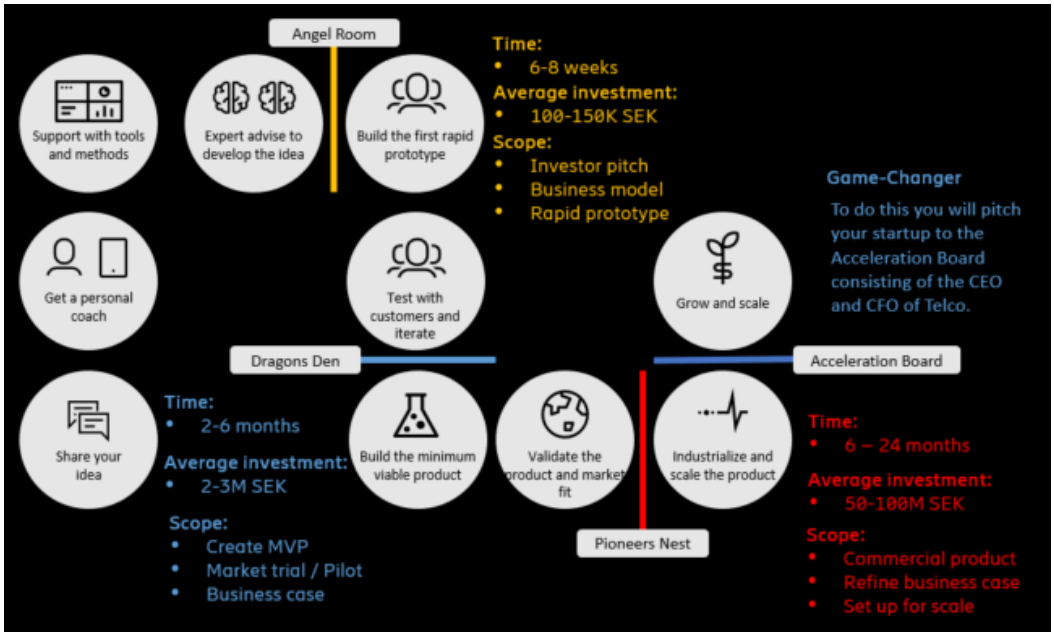


Figure 18: Telco ONE - Standardized steps, gates, support, duration and budgets

around a hundred of these would be developed through rapid prototyping and business model development into articulated business cases that could be pitched in order to receive a more substantial investment. Around ten to fifteen of these were to be incubated for up to half a year, creating an MVP and conduct market trials to verify the business case and then if deemed promising receive further investment to create a commercial product, refine the business case and set up the venture organization to be able to scale. This approach can be seen as an innovation funnel with a relatively loose scope (Wang, 2017). The end goal of Telco ONE was to produce independent operating units that could become the seed of a new business unit, be incorporated as a vital part on an existing business unit or be spun out.

The process was highly structured, with standard durations and investments as well as a set of predefined core activities per phase. To evaluate and select among ventures at each stage gate, regularly reoccurring and standardized decision fora were established. In these, representatives from various organizations were present to make up a more diverse group of evaluators. The decision escalated higher in the organization for each gate. At the first gate the regional head of the Telco hub had the authority to make the final decision. At the second gate it was, the corporate head of Telco ONE who made the decision, in the third gate it was

the head of business unit technology and emerging business and for the final exit from Telco ONE the CEO made the decision.

In contrast to Garage where pure intrinsic motivation by the intrapreneur were deemed enough to enable corporate entrepreneurship, Telco ONE introduced a result based financial reward as an incentive mechanism based on prior learning that employees were disincentivized to engage in innovation activities by the current organizational pressures.

5.3.7. Capabilities for systematic experimentation

In contrast to the dispersed Garage model where the process of advancing a venture was highly ambiguous and beyond the control of the Garage, the development of a dedicated business unit and an embedded corporate accelerator with reserved human and financial resources enabled a centralized end-to-end innovation process. In this set up, the responsibility, authority and means to drive experimentation in new business areas were aligned and concentrated under the same roof. This created a more transparent and predictable path for new ventures. The progressive increase of investment size and escalation of investment decision ensured the appropriate level of executive support and reduced the risk of discarding uncertain ventures in situations when small investments can be enough to reduce uncertainty and determine the value of an opportunity (Hackett and Dilts, 2004). The collaboration between hubs was more formalized to ensure sharing of best practices and creation of greater synergy. The resulting experimentation capabilities were constituted by a set of venture-level and portfolio-level experimentation practices.

Corporate incentive systems typically disfavor radical innovation initiatives that are outside of the boundaries of the core business and corporations therefore struggle to retain entrepreneurship-minded people (Leifer, O'Connor and Rice, 2001). By introducing a result-based award Telco ONE addressed this issue. Retaining innovative individuals was a high priority as this is a fundamental precondition to enable corporate venturing.

The imbalance of technology and business knowhow resulting from the reliance of technology savvy intrapreneurs was addressed by creating a dedicated line of support in important complementary areas such as business and design.

To make up for the lack of knowledge among individuals about lean experimentation, the entire process, methods and supportive resources were designed to systematize experimentation and make it a natural way of working for new innovators in Telco ONE's incubation process. This included routines for early problem verification, MVP development, iterative rapid prototyping and user trials, and validation of product-market fit.

In terms of portfolio-level practices, the adoption of both induced strategic focus areas and emergent areas of exploration enabled conscious balancing between strategic order and diversity (Burgelman, 1983c). This type of practice may enable a balanced portfolio in terms of diversifying to reduce risks and focusing efforts to enable economies of scope.

The centralized approach in combination with an open digital idea tracking tool, enabled a holistic view of the portfolio of ventures and their progress through the funnel. The holistic oversight but also the transparency afforded by the open approach enabled combination and cross venture collaboration.

Table 14: Aggregate dimension – Capabilities for systematic experimentation

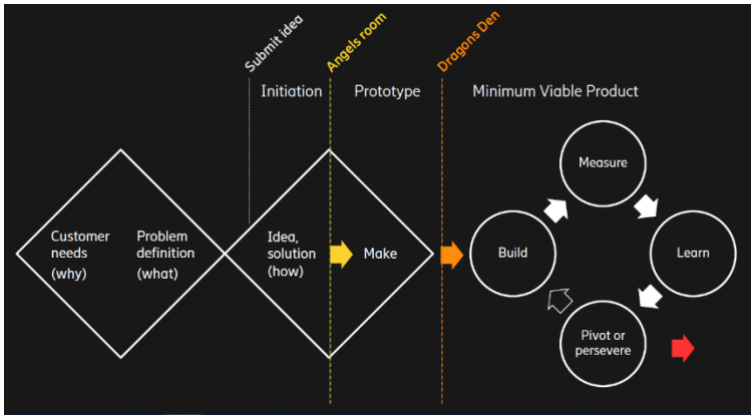
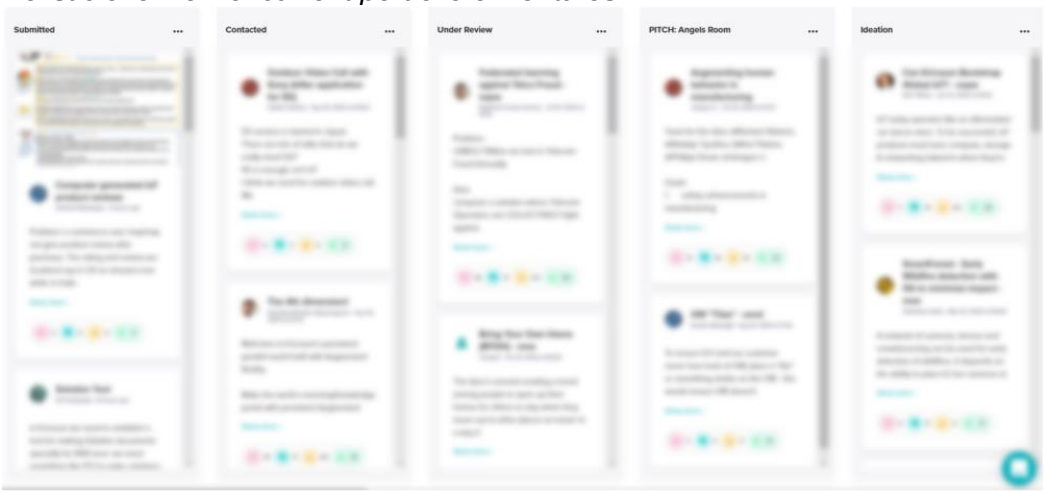
Second-Order Codes	**Selected Evidence on First-Order Codes** *(IN# = Interview; FO = Field observation; AD = Archival data; RN = Researcher's note)*
Centralized End-to-End Process	*Alignment of authority and responsibility for experimentation in new business areas* "With the creation of a dedicated business unit for new businesses and placing Telco Research right under the head of the Business unit, the same group that was in charge for driving more experimentation in new areas also had the authority to influence the rest of the organization to better cater for such activities" (Field observation, June 2018 to March 2020, FO) *Progressive escalation of investment decisions* "First decision point is Angel's room, the head of the hub makes the decision, the investment size is around $15K and the fund is used to verify the problem over an average of 4-8 weeks; Second decision point is Dragon's Den, the head of Telco ONE makes the decision, the investment size is around $300K and the fund is used to build an MVP and test feasibility over an average of 4-6 months; Third decision point is Pioneer's Nest, the head of the business unit makes the decision, the investment size is up to $10M and the fund is used to industrialize the venture and test its ability to scale. Final decision point is IOU Board, the CEO makes the decision" (Synthesis of information from process description of Telco's 5i process; RN) *Formalized internal collaboration* "From the start collaboration between hubs was formalized due to the fact they belonged to the same organization. They worked closely to align their ways of supporting new ventures and spurring innovation across the organization. For instance, they launched coordinated Telco ONE days around the world. Also, day to day activities were coordinated and physical visits were paid to the sister hubs." (Field observation June 2018 to March 2020)
Venture Level Experimentation Capabilities	*Systematic lean experimentation*  *Figure 19: Use of design thinking and lean startup in the venture process (AD)* "The figure show how lean startup (build, measure, learn and pivot or persevere) was a central part of the innovation process (Researcher's notes; RN) *Business and design coaching and support* "Why build your project with ONE? Validate your idea with experienced business coaches and industry experts; Access to early adopter customers and broader ecosystem; Build the dream team to grow idea into successful venture" (from presentation of Telco ONE; AD) *Incentives and rewards to retain innovation-minded employees* "Recognition Level (% of Annual Base Salary): Dependent on role and level of involvement in [Independent Operating Unit] creation. Founder: • If active in full incubation: 100% • If active in only one incubation phase: 50% Core Leadership Team: • Active LT in full incubation: 50% • Active LT in 1 incubation phase only: 25% Other Members: • Only Ideation: 10% • Only Incubation MVP phase: 20% • Any two phases: 40%..." (AD)" (Excerpt from Pioneer Award overview document; AD)

Table 15: Aggregate dimension – Capabilities for systematic experimentation (continued)

Second-Order Codes	**Selected Evidence on First-Order Codes** *(IN# = Interview; FO = Field observation; AD = Archival data; RN = Researcher's note)*
Portfolio Level Experimentation Capabilities	*Balancing strategic focus and diversification* "As can be seen in Figure 16, page 130, Telco ONE complemented strategic focus areas with 'Hot topics', 'On our radar, and 'scouting' to enable bottom up driven continuous reassessment of the strategic direction" (Researcher's notes based on observations and archival documents; RN) *Holistic overview of current portfolio of ventures*  *Figure 20: Web-based idea tracking tool (AD)* "This figure above is a snapshot of the idea management tool. All ventures could be followed along its innovation journey and receive comments by users of the tool. Each column represents a certain stage in the process and a list of all the projects within that stage are listed. (Researcher's notes regarding web-based idea management tool, RN) *Formal selection procedures* "The evaluation and selection procedure use weighted scorecards developed based on design thinking theory. The score card include a set of questions that help determine a score for desirability, feasibility and viability. A calculator is used to weight the scores based on the phase. Desirability is prioritized at first and the weight of feasibility and viability increases successively" (Field observations of development of scorecard; FO) *Enabling cross venture collaboration* "Information Sharing and Learnings •Teams Site for all MVP Projects: to be set up shortly to enhance collaboration and sharing of best practices etc." (from internal Telco ONE presentation, 2020-03-31; AD)

Chapter 6: Discussion

This study proposes that to enable learning in an increasingly uncertain and fast changing environment, incumbent firms, which previously have relied on experiential learning in their innovation processes, must learn to experiment. How firms effectively incorporate experimentation in the corporate innovation process has been framed as the main puzzle to be addressed. I have argued that the complex, interdependent, embedded and causally ambiguous nature of innovation capabilities, in combination with increasing environmental uncertainty and pace of change due to digital disruption poses a wicked dilemma for managers in large high technology firms, who endeavor to incorporate experimentation into the organization's innovation system in order to facilitate corporate entrepreneurship. This dilemma, which current theory appear unable to resolve, has been the driver of this research.

To address this knowledge gap, I have adopted an organizational learning lens. In line with some seminal and recent studies (e.g. Zollo and Winter, 2002; McDonald and Eisenhardt, 2019) I have taken a broad perspective on learning, jointly considering how several different modes of learning, which mostly have been studied in isolation previously, interact to adopt and develop experimentation practices for innovation. I have used a field-based study of the development of a corporate accelerator within a large incumbent firm stretching over more than six years to start unpacking these different learning mechanisms.

I start this chapter by articulating the theoretical underpinnings of the observations and present a conceptual model of *the process of learning how to experiment* (see Figure 21, p. 140). I explain the underlying rationale of these learning mechanisms and the relationships between them. I highlight the novelty of these findings in the light of current theory by discussing the theoretical implication in respect to corporate entrepreneurship, corporate accelerators and organizational learning. I further provide some suggestions for future research, discuss the practical implications for managers and conclude by summarizing and discussing the limitation of this study.

6.1. The process of learning how to experiment

Organizational learning theory plays an important role in the field of corporate entrepreneurship. Indeed, corporate entrepreneurship is often described as a learning process in its own right (Phan *et al.*, 2009). Experimentation, in particular, is regarded as a vital part of the innovation processes of entrepreneurial ventures (Kerr, Nanda and Rhodes-Kropf, 2014). Although the role of experimentation in startup firms is well researched, the same cannot be said about how experimentation becomes ingrained within corporations, despite the increasing interest it has sparked among managers in corporations (Hampel, Perkmann and Phillips, 2020) and despite the long tradition of corporate entrepreneurship research. In particular, our current understanding of how incumbent firms learn to experiment is underdeveloped. Uncovering this phenomenon is crucial in order to further our understanding of corporate responses to discontinuous technological change. My findings suggest that learning to experiment as a large incumbent firm is a complex and extended process and that the establishment of a corporate accelerator in this case is a manifestation of this learning process.

In the previous chapter, I accounted for six learning mechanisms that occurred partly sequentially, partly in parallel over three discrete phases to achieve this end. These mechanisms were labeled schematic arms-length vicarious learning, replication across the organization, coactive vicarious learning, unlearning of conflicting corporate practices, deliberate learning and adaptive replication of corporate practices. I demonstrated how Telco, through the interaction between these disparate learning mechanisms, was able to build and incorporate a capability to learn through experimentation.

In short, the process can be outlined as follows. The first phases were primarily driven by middle-level managers and, to some extent, other operational members. To start learning without any prior experience, the organization had to acquire knowledge from external sources. By searching broadly and synthesizing a few relevant practices a schematic blueprint with low levels of detail was developed. This knowledge can be described as an ambiguous

conceptual model of how to experiment. This provided the necessary framework for further actions. To flesh out the details that were still missing the organization needed to learn-by-doing. However, given their lack of experience they engaged more knowledgeable partners in this learning process to gain advice, affirmation, and draw on readily available practices and tools to solve emerging issues. This coactive vicarious learning process led to the development of proto-capabilities, i.e. routines, processes and practices yet to unreliable to qualify as capabilities (Helfat and Peteraf, 2003). When implementing these new ways of working unanticipated inadequacies of corporate practices were revealed, which is why the new capabilities could not be fully developed. To alleviate the tensions between newly adopted entrepreneurial practices and corporate practices the organization endeavored to unlearn conflicting corporate practices. Tensions did however persist as the middle managers trying to enforce the new practices lacked the means and authority to dissolve these completely. In parallel, the initiative was replicated with the result that the learning loop of coactive vicarious learning and unlearning of conflicting corporate practices occurred at dispersed locations with limited coordination. This in turn led to decentralized experimentation with divergent practices across the organization. This triggered a response from top-management to systematize and centralize these efforts. Thus, a dedicated business unit for development of new businesses was created and within it a centralized innovation unit assigned to revamp existing experimentation activities and facilitating a more structured and controlled approach. As vast experience of experimentation had been accumulated during the last several years, the new organization engaged in deliberate learning by systematically analyzing prevailing issues, reassessing previously learnt practices and streamlining and codifying experimentation activities. Interestingly, in this phase corporate practices were adaptively replicated to resolve prevailing tensions and create capabilities for systematic experimentation. The resulting capabilities entailed an end-to-end approach for systematic experimentation and practices to support such activities on the venture-level as well as the portfolio-level.

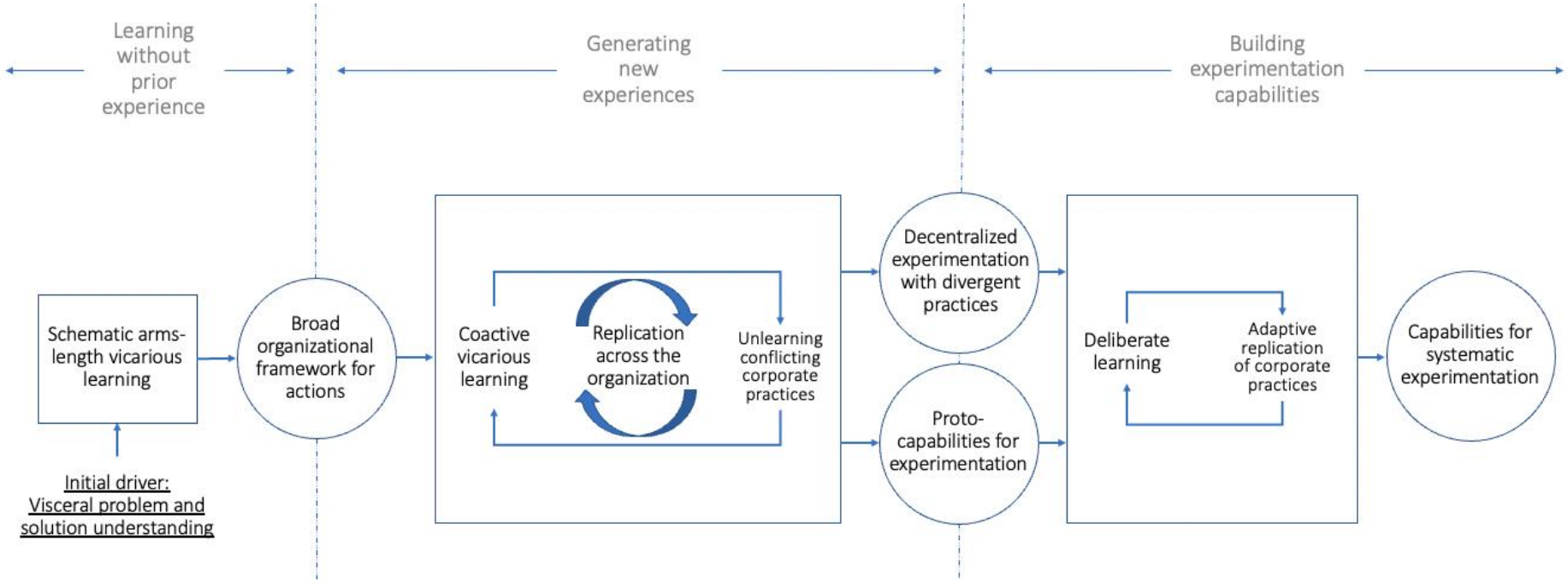


Figure 21: A grounded model of the process of learning how to experiment

Next, I explain theoretically, the rationale behind the actuation of these learning mechanisms and how they contributed to the development of an experimentation capability. I emphasize the novelty of these findings and how they contribute to theory. The conceptualization of the interlinkages between these learning mechanisms and temporal ordering are visualized in *Figure 21: A grounded model of the process of learning how to experiment*.

6.1.1. Schematic arms-length vicarious learning

Organizations commonly learn vicariously about strategies, organizational practices and technologies from other organizations (Huber, 1991). This is an important part of the substitutional approach to capability reconfiguration as it enables acquisition of capabilities from external domains (Lavie, 2006). Usually conceptualized as replication of an existing set of practices or routines, vicarious learning have been described as a viable option to obtain guidance under times of uncertainty (Srinivasan, Haunschild and Grewal, 2007). Vicarious learning tend to be more dominant relative to experiential learning in the early phase of establishing an organizational unit compared to when it has become more mature (Aranda, Arellano and Davila, 2017). Hence, it is unsurprising that Telco Research attempted to learn from external sources when establishing what would become Telco Garage, as they lacked substantial first-hand experience of experimentation-driven venturing to draw from. The observed choice of learning sources is more interesting from a theoretical standpoint.

Vicarious learning has been observed to be driven by the commonality of a practice (frequency-based), its association with a desired outcome (outcome-based) or the utilization of the practice in a similar organization (trait-based) (Srinivasan, Haunschild and Grewal, 2007). Outcome-based vicarious learning can be seen as a rational action, whereas frequency-based vicarious learning can be seen as a result of isomorphic pressures (Compagni, Mele and Ravasi, 2015). Both of these drivers are unlikely to be present when a practice is new since its value is difficult to determine at this stage and the adoption is yet low (Compagni, Mele and Ravasi, 2015). Hence, the adoption of the “Garage model” previously observed in Microsoft appear to have been trait-based, primarily. Furthermore, Microsoft is a

renowned innovative company and can thus be seen as a role model. The adoption of practices such as lean startup methodology was also seen in other prominent corporations such as General Electric, Qualcomm and Intuit (Blank, 2013). The awareness that such well-known organization utilize a certain practice may provide enough legitimacy to motivate its adoption, even though the practice is not learned directly from these actors.

Vicarious learning have been problematized by demonstrating the bias resulting from the fact that the available sample of organizations that can be observed are the survivors of a selection-retention process (Denrell, 2003). This is further exacerbated by an overrepresentation of successful firms in books and popular press (Denrell, 2003). Hence, it is plausible that organizations, as in the observed case, also tend to imitate practices from role models with high legitimacy as innovators, regardless of whether the practice that is emulated can be tied to their superior performance or not (Huber, 1991). This may be even more common in context of environmental dynamisms and rapid change, in which organizations may determine that they do not have time to wait for the evidence that a practice rising in popularity is indeed effective.

In general, learning from second-hand experiences is associated with causal ambiguity due to variations between the context in which experience has been accumulated and where knowledge is implemented (Zollo and Winter, 2002; Nguyen and Cai, 2016; Bao, Wei and Di Benedetto, 2020). The similarity between the model organization and the learner in the case of the Garage model can be expected to have had a positive effect on Telco's absorptive capacity (Cohen and Levinthal, 1990). As the context in which the lean startup approach was developed (i.e. the software-based startup scene) differs substantially from the corporate context of Telco, the absorptive capacity can be expected to have been low. This was also supported by the observation that Telco encountered several learning barriers, when trying to adopt lean startup methodology, whereas the Garage concept diffused in the organization spontaneously. Yet, a set of simple principles were derived from the lean startup approach and other modern organizing practices to serve as a basic framework for subsequent

experiential learning. This broad schematic framework for action allowed for flexibility in how to modify acquired practices, while at the same time forcing the organization to deviate significantly from path-dependent learning based on prior experiences and modification of individual routines and practices, which threatened to lead to competency traps (Levitt and March, 1988).

Apart from aligning the context of where knowledge is acquired and where it is implemented to mitigate the issue of causal ambiguity, extant theory provides two approaches that enable learning from more dissimilar organizational contexts. The first approach is to copy a capability precisely (Winter *et al.*, 2012), which reduces the need to understand causal mechanisms. This is in line with the substitutional approach (Lavie, 2006). The second approach is to engage the model from which a group attempt to learn as a cocreator in the learning process, leveraging the knowledge of the model in an iterative manner as new first-hand experiences are created and modifications are made by the learner (Myers, 2018). This is in line with the transformative approach (Lavie, 2006). Notably, in the initial phase of learning, when developing the broad framework for further actions, none of these approaches were utilized. Instead, a broad range of external sources were consulted, and the input was synthesized to a bundle of practices. This can be explained by the self-awareness of their lack of absorptive capacity, which meant that they were aware that they would not be able to instantaneously identify the optimal approach for experimentation, i.e. the value-maximizing capability configuration (Lavie, 2006). The use of multiple external sources and adoption of various loosely defined practices can be understood as a form of broad search, which has been recognized as an important measure to identify new ideas (March, 1991; Leiponen and Helfat, 2011; Dahlander, O'Mahony and Gann, 2014).

In summary, schematic arms-length vicarious learning may enable firms to search broadly and synthetize various practices in order to develop a holistic but loosely defined and flexible framework for action that enable subsequent experiential learning (Miller, 1996). This process can help overcome the inertia associated with evolutionary change (Levitt and March, 1988;

Tripsas and Gavetti, 2000), without fundamentally substituting any capabilities. Hence, it can be contrasted to the evolutionary approach where adjustments happen at the micro-level by iteratively modifying routines, processes and practices. It can also be contrasted to the substitutional and transformative approach as substitution of an entire set of processes, practices and routines does not take place. This form of learning is rather in line with Miller's (1996) notion of synthetic learning as a source of relatively radical new ideas. I argue that the ambiguously defined framework that this learning process resulted in is more prone to replication compared to precisely defined practices or fully developed capabilities. Next, I therefore discuss the drivers, mechanisms and result of the subsequent replication.

6.1.2. Replication across the organization

Replication within a corporation has been viewed as a viable approach to exploit an effective formula (Winter and Szulanski, 2001). However, the replication process should typically be preceded by an exploration effort and thorough assessment of said formula (Winter and Szulanski, 2001), which can be done through an extended period of trial-and-error learning at a smaller scale (Sosna, Trevinyo-Rodríguez and Velamuri, 2010). While some experiential learning had occurred before the Garage concept started spreading, Telco had by no means tested and verified that the new organizational framework for experimental early venturing was effective. Making such conclusions would necessitate long periods of observation as innovation in general take time. Replication was instead driven primarily by a grassroot movement in the periphery of the organization and was not induced by central actors. This can be explained by the ambiguous definition of the Garage framework. Prior research have found that ambiguously defined practices lend themselves better to adaptation and are therefore more likely to be adopted (Giroux, 2006). Adaptability enables a practice to be used in different contexts, thus enabling it to be replicated across an organization (Ansari, Reinecke and Spaan, 2014). However, adaptation within an organization poses a dilemma. Organizations may encourage adaptation that increases a practice’s effectiveness in the local context, but seek to avoid undesired adaptations that damage the integrity of the practice

(Ansari, Reinecke and Spaan, 2014). If an ambiguously defined practice strikes the right chord in the minds of managers, they may adapt the practice to serve their own strategic goals, which may partly be misaligned with the original intent (Giroux, 2006). This explains the observation that the replication across the organization led to decentralized experimentation with divergent practices.

Hence, I find that the ambiguity surrounding the new set of practices for experimentation was initially a natural result of the lack of experience and intention to subsequently learn and adapt the practices iteratively through trial-and-error. This, however, had the side effect that the practice became adaptable also for others and therefore more prone to diffusion. When the possibility of diffusion did occur, the managers who facilitated the replication across the organization took a proactive role as they further simplified and codified a minimum framework and set of principles. Such purposeful codification is known to enable replication (Zollo and Winter, 2002). What these observations also show is that the codification of a set of key principles and a framework preserved some integrity of the practices while also maintaining adaptability, which enabled diffusion. In this way, the paradox that ambiguity lead to diffusion but also risk degrading a practice's integrity was partially mitigated (Giroux, 2006). Other actions, such as facilitating essential coordination, also contributed to this end. By coordinating activities while at the same time allowing for some local self-governance, practices may co-evolve, thus delimitating the degree to which practices drift apart. However, as diffusion progresses the coordination activities become more burdensome and time consuming. At the same time, incentives to coordinate such activities are likely not as great for middle-level managers as to diffuse their practices and create a critical mass of cultural acceptance across the organization. This was in particular important due to the open and collaborative approach that was advocated, which hinged on the cooperation by several other units. Hence, diffusion may lead to divergence, unless coordination efforts are significantly increased, which middle-level managers have little incentive to facilitate.

Since replication took place before a standardized model for how to organize and conduct experimentation had been developed the adopters all had to learn by themselves to a large degree. This entailed a process of coactive vicarious learning in collaboration with the local ecosystem as well as unlearning of conflicting corporate practices. These learning mechanisms are discussed next.

6.1.3. Coactive vicarious learning

Schematic arms-length vicarious learning only facilitates high-level learning. Abstract frameworks that are learnt does however not provide a clear understanding of how the envisioned new practices may work in reality on a detailed level. Learning these details require direct experiential learning, which can only ensue from the act of doing. Hence, learning-by-doing is a possible next step. However, to go about learning-by-doing without taking advantage of preexisting knowledge is an inefficient approach.

Prior research affirm that when learning vicariously the engagement of others from whom learnings are acquired plays an important role (Myers, 2018). Furthermore, the importance of external involvement has been recognized in the process of creating new organizational practices, structures, processes and techniques (Mol and Birkinshaw, 2014). Yet, not knowing what external knowledge is applicable make external search efforts difficult. Hence, engaging more experienced and knowledgeable actors in the process of learning-by-doing offers a way to simultaneously leverage vicarious learning. The teaching actor take an active role as they are in a position to identify situations in which their knowledge can be applied to help the learning actor.

In the previous chapter, I showed that Telco involved external experienced actors in the learning process as Telco Garage was being developed, thus combining learning-by-doing with directed collaborative vicarious learning (as opposed to the prior schematic arms-length vicarious learning) to solve issues as they emerged. Specifically, I find that collaboration with external parties both helped filling capability gaps by leveraging external accessible

capabilities rather than developing them inhouse or acquiring them, and enabled imitation and validation of certain practices which were then incorporated in the new ways of organizing experimentation. This infers that experienced and knowledgeable partners may act as repositories of readily available knowledge assets that can be drawn upon when necessary to solve emergent issues and that by involving them closely in the innovation process, they themselves can identify when knowledge they possess is applicable. Likewise, they may act as mentors providing guidance. Also, contributing to others' innovation processes, for example by participating as coaches and mentors in other incubator and accelerator programs, provide a way to observe an established program in operation from within and transfer learnings into the focal organization's own program.

Actively engaging and collaborating with external actors was also a natural consequence of the open and collaborative way of working that was envisioned. Hence, learning in collaboration with others may not just be a way to access external knowledge but to cocreate knowledge about how to collaborate in an effective manner. This form of interactive learning enable new knowledge to emerge spontaneously as different actors engage in social and political activity (Miller, 1996). By developing standardized ways of collaborating with new partners in innovation projects, iterative learning from each project is facilitated while also enabling engagement with many different collaboration partners with less effort. Through the repeated projects, where new methods, tools and practices are being tested experience is accumulated and a process of trial-and-error leads to a set of routinized practices (Zollo and Winter, 2002).

While new practices may be incorporated in this way, corporate practices got in the way and impeded the learning process. Thus, an iterative process of learning and unlearning occurred. Next, I discuss the importance of unlearning found in this study.

6.1.4. Unlearning conflicting corporate practices

It has been noted that unlearning is necessary in order to discard obsolete practices when an organization must adapt to a new situation (Klammer, Grisold and Gueldenberg, 2019). Some researchers mean that it is a precondition for organizational learning (Bettis and Prahalad, 1995; De Holan and Phillips, 2004; Tsang and Zahra, 2008), and that an unwillingness to unlearn therefore can have detrimental consequences to the ability to learn (Inkpen and Crossan, 1995). It has specifically been argued that unlearning protects beliefs and routines against rigidity, thus potentially enabling firms to identify and evaluate new markets and technologies without being inhibited by rigid product development procedures (Akgün, Lynn and Byrne, 2006). The notion of discarding knowledge by forgetting or disregarding it in order to open the way for new learning (Huber, 1991) is compatible both with the evolutionary and the substitutional approaches to capability reconfiguration but may manifest in different ways ranging from incremental to radical unlearning efforts (Lavie, 2006).

As observed in the current study, the Garage initiative was an attempt to create an alternative safe space to work differently and fail fast. This type of separation as well as an error-forgiving culture have support in the literature as a way to facilitate unlearning (Klammer, Grisold and Gueldenberg, 2019). However, the initiative still relied on other organizational units. I attribute this to the complexity, interdependency and embeddedness of innovation systems. These characteristics complicates the reconfiguration process, requiring changes to multiple organizational practices in order to develop a new experimentation capability (Lavie, 2006). The findings suggest that problems may occur due to the dependency upon organizational actors with limited commitment to the new initiative, making unlearning increasingly difficult. To fully separate the initiative from the rest of the organization to alleviate these problems, as suggested in previous research, (Klammer, Grisold and Gueldenberg, 2019) is not possible as long as dependency remains. Other more drastic means of unlearning such as discharging employees, in particular managers, who are unable or unwilling to embrace the behaviors is

not viable neither (Huber, 1991). To be able to leverage complementary capabilities that remain valuable other approaches are necessary (Tripsas, 1997).

What this study suggest is that unlearning may be performed cautiously by enabling self-selection. For example, to unlearn inadequate practices, provision of education by externals to widen the understanding of innovation and to question current ways of working was offered in an attempt to substitute knowledge of individuals in important positions. This represents one way of purposeful unlearning (Klein, 1989). The external infusion of ideas as well as training in critical thinking about current behaviors is also a way of reducing group-thinking, which can be an impediment to unlearning (Akgün, Lynn and Byrne, 2006) Another method that extant theory offers is to discharge or replace people who behave inappropriately (Klein, 1989). This may however be beyond the authority of middle-level managers trying to implement new practices as the problematic individuals may outrank them. Also, these individuals who may have important roles in the maintenance of other capabilities may not necessarily need to be excluded from the organization but can be circumvented in other ways, in respect to the focal initiative. For example, consider the unlearning of selection practices by Telco Garage. By reshaping the selection board, once education efforts turned out to be insufficient, individuals more prone to discard old behaviors were selected. Furthermore, by engaging with a select few individuals while avoiding others, a greater commitment to the cause can be ensured by these individuals, which enables intensifying their learning and unlearning processes. The same can be seen in terms of unlearning resources allocation practices. While some managers took interest and interacted with the Garage and were also more willing to allow their employees to leave their current roles to engage in experimentation, others did not engage and held on tight to their employees. Nevertheless, it can be enough to win over a portion of the organization instead of wasting energy and political capital on those unwilling or unable to change. Learning which individuals to work with and which to avoid represents a distinct form of interactive learning (Miller, 1996), which seem to have a moderating effect on

the effectiveness of unlearning efforts. By directing learning efforts towards those more adept to learn, conflict can be avoided, and the efficiency of these efforts increase.

6.1.5. Deliberate learning

To sum up the previous sections, *replication across the organization, coactive vicarious learning and unlearning of conflicting corporate practices* led to decentralized experimentation with divergent practices and a set of *proto-capabilities*. Prior research has called for studies to capture evidence of nascent capabilities which may not "work in a reliable manner" (Helfat and Peteraf, 2003, p. 999), but which provide the basis for subsequently developed reliable capabilities (Keil, McGrath and Tukiainen, 2009). The findings of this study indicate that these, so called proto-capabilities, served as an important basis when learning deliberately as managers started reassessing previously learnt practices.

The distinction between the two learning phases labeled *generating new experiences* and *building experimentation capabilities* may superficially appear like a discontinuation of one organization and establishment of another. Prior work have warned about the cyclical nature of initiatives to organize radical innovation such as corporate venture units, and the apparent lack of learning transfers between such efforts (Burgelman and Välikangas, 2005). However, what this distinction represents conceptually in the proposed model is a switch of theory-in-use in a continuous learning process (Argyris, 1976). While the first phase is driven by middle-level managers and a growing grass root movement across the organization, the second phase is initiated from the top in an attempt to create order in the resulting dispersed activities and to use the authority of the executive leadership to resolve some of the evident impeding organizational tensions. Hence, this can be understood as double-loop learning on the organizational level (Argyris, 1976). In the first phase the current line of action is hardly called into question, which delimits self-reflection. As the initiative grows and triggers the involvement of top-management the need for more systematic assessment of current ways of working and deliberate learning becomes emphasized and supersede the previous learning activities. Replication is forced to stop, many of the collaborative activities seizes due to ineffectiveness

and rather than unlearning corporate practices, the firm start adaptively replicate corporate practices as the new organization is established.

Systematic analysis and reassessment of previously learnt practices can only be done after experiences have been gathered about these practices, which explain why deliberate learning is instigated in the last phase of the model. In addition to systematically analyzing issues and reassessing practices deliberate learning involves codification (Zollo and Winter, 2002). The previous phase was characterized by ambiguity of definitions of the practices and a relatively unstructured way of working. This is not necessarily negative as it enable modification, whereas codification entail rigidity (Heimeriks, Schijven and Gates, 2012). Yet, the deliberate efforts to codify knowledge based on past experiences into manuals and checklists, which are observed at this later stage, has been advocated as an important way of learning (Zollo and Winter, 2002; Heimeriks, Schijven and Gates, 2012). It lets firms identify the causal mechanisms that govern the performance outcomes. Hence, deliberate learning, as observed in this study, enable firms to distinguish between effective and ineffective practices, and discard the ineffective, while solidifying the effective ones through codification.

Furthermore, by building in mechanisms to continually learn deliberately such as through case studies of successes and failures, and codification and dissemination of lessons learnt, as well as connecting experienced people (e.g. alumni intrapreneurs) with unexperienced people (e.g. first-time intrapreneurs), knowledge can systematically accumulate and spread in the organization. Thus, this phase of learning is much more focused on reducing the repetition of common errors.

When creating this more structured and centralized approach, experiences of being a corporation appear to be more useful than in the stage of learning new practices, which I discuss next.

6.1.6. Adaptive replication of corporate practices

Corporations are in general more used to improve existing processes, practices and routines than learning something completely new. While this corporate characteristic seems inhibiting during the prior learning phase it appears to become an advantage in this final phase. The experience of organizing innovation into distinct business units with clear strategic focus, in a hierarchical fashion and support the innovation process with clear stage gates, standardized decision fora, routines and incentive mechanisms is less problematic.

Yet, this phase entails different challenges. These corporate processes must be adopted to fit the new experimental approach, so as not to reintroduce the impediments that triggered this organizational change effort in the first place. Hence, while stage gates are created, criteria and decision fora must be different to cater for the experimental ventures. While incentives and KPIs are introduced, these must be of a different character to support corporate entrepreneurship (Monsen, Patzelt and Saxton, 2010). And while strategic focus areas are articulated, these must be up for continuous discussion and not be a constraint for exploration. This balancing act is made possible through the experiences gathered in the preceding phases of learning.

The renewed reliance on corporate practices stand in stark contrast to the previous efforts to unlearn corporate practices. However, unlearning of corporate practices can be seen as a reactive endeavor that follows from the attempt to gain experiences and test new approaches. The adaptive replication of corporate practices on the other hand is highly proactive. Through the generation of new experiences, the usefulness of some corporate experiences may become evident. However, to switch from unlearning corporate practices to adaptively replicate corporate practices require double-loop learning (Argyris, 1976). When top-management becomes involved and ultimately prompt the creation of Telco ONE, this represent double-loop learning since the fundamental goal that drives decisions is changed. Whereas the prior phase is fundamentally concerned with exploration (i.e. learning new practices from externals and broaden the repertoire of competencies), the subsequent phase

is all about exploitation (i.e. homing the current capabilities, improving and reducing errors). This switch does not happen on an individual level primarily but on an organizational level. The commando over the transpiring events is taken over by top-management, who pursue different goals and have different governing values (Argyris, 1976). Yet, it is the middle management level which is mostly responsible for the creative adaptation of corporate practices. Guided by previous learning they find ways to selectively combine well-established corporate practices and newly learnt practices to design a coherent and focused approach to manage experimentational ventures as well as the overall portfolio of ventures.

6.2. Theoretical implications

In this section I provide a discussion around the contributions of this study to the different streams of literature that have guided the theoretical framing. The section is divided into three subsections addressing corporate entrepreneurship, accelerators and organizational learning.

6.2.1. Implications for research on corporate entrepreneurship

Literature on corporate entrepreneurship view experimental learning and entrepreneurial behavior as closely intertwined phenomena (Zahra, Nielsen and Bogner, 1999). It has also highlighted the role of a pro-entrepreneurship organizational architecture in increasing entrepreneurial behavior (Ireland, Covin and Kuratko, 2009), and retaining innovation-minded individuals (Brazeal, 1993). The internal conditions of a firm has been argued to play a significant role for how corporate entrepreneurship is perceived and for the willingness to support such explorative activities (Hornsby, Kuratko and Zahra, 2002). Factors such as reward systems, top management support, resource availability, supportive organizational structure, culture of risk taking and acceptance of failure, all matter (Brazeal, 1993; Hornsby, Kuratko and Zahra, 2002). Historically, this structural context has been viewed as the result of top-level management's vision and strategic decisions (Ireland, Covin and Kuratko, 2009). For example, Burgelman (1984) states, "Structural context refers to the various administrative mechanisms which top management can manipulate to influence the perceived interest of

strategic actors at the operational and middle levels in the organization" (p. 155). The current study did indeed observe that top-level management's involvement was crucial in order to create a holistic approach to support corporate entrepreneurship and experimentation across the organization and alleviate some of the persisting obstacles to create reliable venture- and portfolio level capabilities for experimentation. However, this study also reveal that such top-management actions may be preceded by significant efforts by organizational members at lower levels in the hierarchy, especially middle-level managers, to proactively alter the structural context. These autonomous efforts enable crucial learning processes that allow the organization to acquire external practices and unlearn corporate behavior broadly across the organization, leading to decentralized experimentation with divergent practices and proto-capabilities for experimentation. This becomes a fertile ground for a more systematic top-down-driven change effort. The learning processes and their resulting accumulation of experience and knowledge-based assets influences subsequent decisions of top-level management, which in turn triggers new deliberate learning processes to systematize practices and advance proto-capabilities to a threshold where they become reliable through the adaptive replication of corporate practices (Helfat and Peteraf, 2003).

While autonomous strategic behavior at the lower levels of hierarchy is recognized in prior literature, it is in general not linked to the structural context but to the strategic context (Burgelman, 1983a, 1983c, 1983b, 1984). The activities that such autonomous strategic behavior entail is for instance identification of new business opportunities, engagement in project championing efforts to mobilize resources for particular ventures, and strategic forcing efforts to create momentum for new businesses (Burgelman, 1984). The role of middle managers has mostly been described as creators and advocates of new strategies based on synthesis of emerging bottom-up initiatives. Their actions have been described as attempts to circumvent selective effects of the current structural context (Burgelman, 1983b, 1984). For instance, operating under the radar, by-passing chain of commands and breaking rules are commonly highlighted behaviors (Wedell-wedellsborg, 2013).

This study outlines an alternative approach in which middle-level managers and operational level members engage in proactive manipulation of the structural context, focusing primarily on managerial innovation rather than product innovation. Instead of escaping existing rules, reshaping them for the benefit of experimental projects, broadly. This finding can be seen in contrast to the Bower-Burgelman model (Bower, 1970; Burgelman, 1983b) which depicts questioning of the structural context by operational-level members, and negotiation of changes by middle-level managers as “reactive rather than primary” (Burgelman, 1983b, p. 231). Instead, the observed approach is not focused on the strategic content (i.e. which new businesses to promote) as much as how strategy is created (i.e. organizing for experimentation). By creating new ways for emergent strategic initiatives to prosper, these efforts are aimed at changing the balance between induced and emergent strategy. Hence, this study broadens the perspective of the scope of middle-level managers’ activities in CE and strategy processes in general. It does however still acknowledge that top-level management ultimately play a crucial role in shaping the structural context and that middle-managers efforts are not sufficient.

Another clear attribute of the extant literature on CE and strategy more broadly, is that middle-level managers, understandably so, are conceptualized as a link between the higher and lower echelons of the organization (e.g. Burgelman, 1983b; Floyd and Wooldridge, 1992). An implicit assumption is that they primarily support subordinates and influence superiors through vertically directed efforts such as championing, award provision, resource allocation etc., within their respective branches of the organizational hierarchy. Hence, upward and downward directed activities tend to be in focus (Floyd and Wooldridge, 1992). This is in line with the ideal model of how hierarchical organizations work: information travels vertically. This study, however, finds horizontal activities by middle-level managers to play an important part in the development of a structural context conducive to experimentation. By engaging in replication across the organization and creating an informal network, what starts out as an initiative in one branch of the organization may diffuse to other parts of the company, without the

deliberate strategic intent of top-management. This may eventually trigger a response from the top-management in order to formalize and create order in the dispersed activities. Horizontally directed efforts appear to have some limitations as middle managers cannot implement typical organizational changes in favor of CE that require formal authority and resources. While, research on organizational change have recognized the positive effects of change that is initiated by middle management and implemented by either top- or middle management (Heyden *et al.*, 2017), this component of horizontally directed activities, that replication across the organization entail, have not received due attention.

The type of horizontal activity depicted in this study is likely rarer compared to vertical activities in highly hierarchical organizations. However, as organizations strive towards more fluid organizational structure, horizontal activities may play an increasingly important role (Schreyögg and Sydow, 2010). Hence, this could provide avenues for future studies.

6.2.2 Implications for research on accelerators

The accelerator literature is yet in an early stage as the organizational form itself is a relatively new phenomenon. Studies on corporate accelerators that have been published in mainstream academic journals are few so far, which makes it difficult to define what constitutes a corporate accelerator. Some notable exceptions however are the studies by Shankar and Shepherd (2019), Kohler, (2016), Richter, Jackson and Schildhauer (2018), and Moschner *et al.* (2019). These studies all have in common that they frame corporate accelerators as a vehicle for tapping the external startup ecosystem through engagement in open innovation. For instance, Shankar and Shepherd (2019) adhere to Kohler's (2016) definition of corporate accelerators as “company supported programs of limited duration that supports cohorts of startups during the new venture process via mentoring, education and company-specific resources” (p. 348). Moschner *et al.* (2019) however, examine a large number of corporate accelerators, classifying them into four different types. Although they only sampled corporate accelerators that search for external startups, they found that some of them (i.e. hybrid accelerators) also support intrapreneur-driven ventures in a similar manner. This intrapreneurship focused use

of the accelerator model is likely to be underreported in the academic literature due to the difficulty to identify such organizations, relative to those that openly advertise to attract external startups, as they reside within corporations. Yet, the potential similarities motivate these types of organizations to be compared with startup-centric corporate accelerators and entrepreneurial accelerators in general.

This study examines a form of corporate accelerator that may be classified as a “hybrid accelerator” (Moschner *et al.*, 2019) and find that the focus on external and internal ventures may vary over time due to organizational learning as the corporate accelerator is modified to fit within the corporations overall innovation processes . While external startup engagement was a part of the strategy which was pursued intensely for a period of time, the main focus was on accelerating internal ventures and this eventually became the sole focus.

I have framed the studied organization as a form of CV unit, drawing on the broad definition put forward by Hill and Birkinshaw (2008), who uses it as an umbrella term for ICV units and CVC. I argue that research on corporate accelerators may benefit from building on the literature within this field. This enables studying the adoption of entrepreneurial practices more broadly, regardless of whether they are used as a way to facilitate outside-in open innovation, standalone experimentation or a combination.

By tracking the development of a corporate accelerator over time, I identify the learning mechanisms that underly the establishment of such an organization. In doing so, I also find that, as a manifestation of this learning process, the corporate accelerator is in flux for a significant period of time. During this time the accelerator experiment with different modes of collaboration, strategies for corporate entrepreneurship and various entrepreneurial practices. Hence, defining what entails a corporate accelerator too narrowly may inhibit a dynamic perspective of these organizations and how their innovation strategies and ways of organizing may change over time. Future studies may contribute by further investigating strategic and organizational considerations underlying the design of a corporate accelerator and how these may change over time. This dynamic perspective may be particularly important in the

corporate context as prior research have noted the volatile nature of CV units (Fast, 1979; Burgelman and Välikangas, 2005; Hill and Birkinshaw, 2014). Our understanding of how corporate accelerators operate and how they are developed would also benefit from a granular perspective on entrepreneurial practices. Hence, future studies focused on specific entrepreneurial practices and their adoption by established firms could help progress this field of research. This study did for instance highlight the modification of selection and resource allocation practices and the adoption of lean startup as a guiding framework for venture development. Future studies could opt for a narrower focus on any of these elements or on other ones such as reward systems, financing, product development, or ecosystem orchestration. Also, by considering the use of entrepreneurial practices that are used regardless of whether the innovation activities are primarily closed or open, as well as those that are specific for closed or open innovation, future research could begin to uncover the appropriateness and transferability of different practices across these different contexts, thus providing guidance for managers to achieve their intended objectives.

Another interesting avenue for future research is to consider the combination of different entrepreneurial practices that are adopted. Since this study identifies the initial importance of schematic arms-length vicarious learning, in which established organizations draw on several external sources of knowledge, and since also prior research have found that CV units may draw on practices from for example VC units (Hill *et al.*, 2009), future studies may for instance delve deeper into how corporations may synthesize practices from the entrepreneurial context such as angel and VC investors, incubators and accelerators to serve different purposes.

Another important contribution of this study is the role of coactive vicarious learning and unlearning, which point to the need for adaptation of the accelerator model to fit in the corporate context. Also, the observation of adaptive replication of corporate practices indicates the distinct nature of corporate accelerators and that corporate experience can be valuable and not only a source of rigidity once the organization has learned which practices to discard and which to maintain. With a more granular understanding of the main practices adopted

from the corporate and entrepreneurial context, future studies may investigate different adaptation strategies and their associated tensions.

Finally, as I also found that corporate accelerators may learn from established entrepreneurial accelerators through the process of coactive vicarious learning, future studies could advance our knowledge in this direction by unpacking in greater detail different ways in which these organizations may interact, contribute to the learning process and in other ways provide value to each other.

6.2.3. Implications for research on organizational learning

Organizational learning has been the main theoretical lens in this study, which contributes to research on the adaptation process of incumbent firms to technological change (Eggers and Francis Park, 2018). I have argued that central theories of adaptation and capability reconfiguration do not offer clear answers as to how established organizations learn to experiment in order to develop new businesses during times of increasing environmental dynamism and uncertainty. My findings suggest that organizations may learn in different ways than the patterns that the evolutionary, substitutional and transformative perspectives offer (Lavie, 2006). The grounded model that is presented demonstrates that firms may initially learn on an abstract level by synthesizing knowledge from a broad range of external sources, which allows for a radical departure from existing practices without substituting any of them initially (Miller, 1996). This holistic form of learning can also be contrasted to the semiautomatic learning that leads to incremental changes in existing practices (Levitt and March, 1988; Adler and Clark, 1991; Heimeriks, Schijven and Gates, 2012). While signifying a deliberate form of learning it also refrains from codification, which is otherwise typically associated with deliberate learning (Zollo and Winter, 2002). This is mainly because the knowledge is on such a high level of abstraction and because a degree of ambiguity enable later adaptation based on learning-by-doing (Ansari, Reinecke and Spaan, 2014).

The finding that both the innovation approach and the approach to learning how to organize experimentation were open initially and entailed many forms of collaborative experimentation with startups, research institutes and universities, customers and other industry players, contradicts prior indications that incumbents may first do stand-alone experimentation when a new disruptive technology emerges and shift to reliance on alliances and acquisitions once the technology has matured and new disruptive business models are appearing (Cozzolino, Verona and Rothaermel, 2018). My findings reveal that due to the limited knowledge about new markets in which experimentation is to be pursued and about the act of experimentation itself the incumbent may opt for an open approach where experimentation is done collaboratively. This offers an opportunity to learn from others and potentially detect if the corporation's innovation efforts are aligned with other important ecosystem players. Another contributing factor to the choice of this open approach in the observed case could be the nature of Telco's core technology. As their main offerings can be seen as an enabling technology that may come to play a great role in the digitalization of several different industries the necessity of an open approach that facilitate learning about these industries may be more prevalent than for companies that are expected to serve similar customers and end users after a digital disruption as before.

Although prior research have argued for the importance of a mixture of experimentation with core customers and other new ecosystem players, with incremental and radical innovation and with focused and broad trials (Khanagha *et al.*, 2018), this study go further by showing that a broader and more open approach to experimentation driven by peripheral actors within the organization may precede a more focused approach driven by top management. This is explained, not only as a way to allow for broad experimentation with technologies and markets before subsequently narrowing the search but as a way to learn how to experiment. Accumulating experience of a vast range of organizational practices intended to support experimentation served as a basis when top management driven efforts to developing capabilities for experimentation were undertaken later on.

Another reason why incumbents may try different ways to collaborate within its experimentation efforts is to learn to manage the multitude of challenges that are associated with the adaptation to discontinuous technological change. Eggers and Francis Park (2018) argue that incumbents' responses to discontinuous technological change depend both on their ability to acquire, assimilate and reconfigure relevant new knowledge, technologies and complementary assets but also their ability to reconfigure such resources that they already possess. Experimentation may enable, not just learning from the external environment and acquire new knowledge but also to find ways to redeploy existing knowledge in new ways. Whether experimentation is aimed at learning about a new technology or finding new use cases for existing technology different modes of collaboration may be required. Further research is needed to verify this thesis and advance our understanding of the drivers behind various practices for collaborative experimentation.

The study also contributes to the literature on replication by identifying its potential role as an intermediary stage in an extended learning process. Whereas previous studies have viewed replication as an effective and efficient approach to diffuse processes and practices after they have been developed and successively improved in a smaller scale (Winter and Szulanski, 2001; Sosna, Trevinyo-Rodríguez and Velamuri, 2010), I find replication to be used to quickly provoke dispersed learning-by-doing. Instead of facilitating a homogeneous approach that exploits certain knowledge, this form of replication facilitates heterogeneous and decentralized explorative learning that leads to variety of experiences, but which may subsequently necessitate centralization and formalization to enable exploiting the knowledge that is generated.

Finally, while the dual process of learning and unlearning has been recognized in which old knowledge is forgotten and new knowledge is generated (Bettis and Prahalad, 1995; De Holan and Phillips, 2004; Tsang and Zahra, 2008) the findings of this study suggest that a corporation may switch back to a learning mode in which the corporate knowledge is leveraged and newly learnt practices are retained, modified or discarded based on insights from deliberate

analytical learning. Future studies may investigate the occurrence of a pattern of oscillation between these learning modes since companies potentially may depart radically in order to break away from path-dependent learning but then need to adopt a more moderate approach. Eventually, they may again become too rigid in their routines, thus inhibiting sufficiently fast learning and change.

6.3. Managerial implications

This study suggests the establishment of a corporate accelerator as a way to enable experimentation and leverage corporate venturing in a more systematic way, in order to gain benefits of rapid learning. It further outlines the learning process needed to accomplish this objective.

The theory and results provided in this study bear important implications for practitioners observing a need to infuse experimentation into their organization in order to strategically navigate an increasingly dynamic and uncertain environment. These insights are valuable for both top- and middle-level managers. I find that initiatives to modify the structural context driven by middle management may provide important organizational learning opportunities that top management can leverage subsequently to implement relatively radical changes to the structural context. This implies that incumbent firms in highly dynamic and uncertain environment may benefit from middle level management autonomy not only in what strategic initiatives to drive but how they do it. In doing so, support among employees and motivation to pursue organization-wide changes can be mobilized and instilled (Heyden *et al.*, 2017). Instead of inducing change in a top-down driven manner, it can start as a grassroot movement, only to be systematized and streamlined through top-management involvement later on. This way radical organizational change is enabled which would be difficult to conceive of in advance. Knowledge of what does work and what does not become available to those in charge of the organizational changes and awareness and acceptance of the new organizational practices that are put in place by key stakeholders is facilitated by the prior engagements.

The study also suggest that organizations may not only focus on unlearning corporate practices and learning new ones. This dual learning mode is important and may enable a radical departure from existing processes, practices and routines. In particular, if abstract and holistic learning based on synthesis of external sources of knowledge precedes and defines the starting point for this learning loop. However, this may need to be complemented by subsequent phase of learning with almost opposite characteristics. Through this mode of learning corporate practices and new practices are reassessed in order to select the most promising new practices, discard those that does not work and adaptively replicate corporate practices to enable increased systemization.

Chapter 7: Conclusions

This study draws on a longitudinal in-depth case study to provide novel insights about how large established firms learn to experiment. This is conceptualized as a response to digital disruptive forces that render experiential learning and R&D insufficient to adapt to the changing environment (Rockart and Wilson, 2019). The model explains the set of learning mechanisms and their interactions over time, which enable an established firm to learn to experiment through the creation of a corporate accelerator. Thus, it contributes to the emerging accelerator literature. More precisely the model shows that in lack of experience of experimentation, incumbent organizations can draw on schematic arm-length vicarious learning to synthesize a set of externally acquired key principles, creating an abstract framework for further actions. This enable the firm to depart from current practices, process and routines, thus avoiding competency traps (Levitt and March, 1988).

This framework for actions enables the firm to start engaging in coactive vicarious learning, by which experienced external partners' knowledge is leveraged in the process of leaning-by-doing. This is accompanied by unlearning of conflicting corporate practices to enable new practices to be adopted. These efforts may also be replicated across the firm, due to the adaptability of the initially developed framework for actions. Through these mechanisms, experiences are generated, new practices become established, and decentralized experimentation with divergent practices occur.

However, to centralize these activities, create order and advance nascent capabilities to reliable capabilities for systematic experimentation the company engage in deliberate learning and adaptive replication of corporate practices (Helfat and Peteraf, 2003). This results in a streamlined, holistic and systematic way of managing experimental venturing activities.

Notably, the model offers a way to comprehend this learning process which cannot simply be explained through an evolutionary, substitutional or transformational perspective alone (Lavie, 2006). While, each of the approaches that these perspectives offer has drawbacks due to the

environmental conditions and inherent attributes of innovation capabilities accounted for in this thesis, the discovered model offer a nuanced understanding of different learning mechanisms at play that enable overcoming these seemingly paradoxical obstacles.

The study thus contribute to existing research on incumbent adaptation to technological changes (Eggers and Francis Park, 2018), in particular, digital disruption. Building on the vast literature on organizational learning, this study takes a broad perspective by considering the interrelations between several learning mechanisms that mostly have been studied in isolation. Hence, the study also contributes to organizational learning theory.

It contributes to corporate entrepreneurship and strategy literature as well by suggesting, in contrast to seminal work (e.g. Burgelman, 1983b), that middle-level managers, in particular innovation managers, may proactively initiate changes to the structural context in order to facilitate corporate venturing and experimentation. Top-management involvement is also found to be crucial in order to change the structural context, which correspond to prior research (Burgelman, 1983b; Ireland, Covin and Kuratko, 2009). This novel finding does however open avenues for research about the interrelation between middle-manager and top-manager influence on the structural context of established firms.

As innovation capabilities such as the capability to create and develop ventures or engage in systematic experimentation is sometimes conceptualized as dynamic capabilities (Keil, 2004), it should be cautioned that the conceptualization of dynamic capabilities as higher-order capabilities may lead to an infinite regress in the explanation of sustainable competitive advantage (Collis, 1994). Dynamic capabilities, such as innovation capabilities may offer a competitive advantage for a significant period of time as they are difficult to imitate (Eisenhardt and Martin, 2000). Yet, as this study indicate, innovation capabilities are context dependent and as the environment changes due to technological discontinuities even dynamic capabilities do not offer “the ultimate source of sustainable competitive advantage” (Collis, 1994). As this study consider the process of learning new routinized innovation activities based on an experimental approach as an episodical event rather than a continuous process based

on higher-order routines, it does not claim to unveil such ultimate source nor follow a path of infinite regress. I do however claim that the study contributes to our understanding of organizational learning as a key aspect of organizational renewal in times of technological discontinuities.

As a single-case study design was used for this research the context specific nature of findings is an inevitable consequence (Gephart, 2004). The processual focus enabled accounts of the evolution of events and abductive reasoning about the rationale behind these. While this does not allow for generalizability the underlying mechanisms that drove this sequence of events should be expected to be found in other settings in which corporations endeavor to learn to experiment. Replication studies in different corporate contexts would not be easy to conduct but could potentially shed light on the contingencies that affect the proposed model.

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Appendices

Appendix A: List of interviews

Table 16: List of interviews

#	Date	Organizational Role/Position	Interview Method (*=no recording)	Time (min)
		Unrelated to Garage/ONE		
1	2016/3/29	Master Researcher, *Telco Research*	In person*	30
2	2016/3/29	Principal Researcher, *Telco Research*	In person*	30
3	2016/3/29	Experienced Researcher, *Telco Research*	In person	30
4	2016/3/29	Senior Researcher, *Telco Research*	In person*	30
5	2016/3/31	Research Manager, *Telco Research*	In person*	31
6	2016/4/5	Strategic Product Manager, *BU Networks*	In person	42
7	2016/4/5	Strategic Product Manager, *BU Digital Services*	In person	38
8	2016/4/6	1) Senior Program Manager, *BU Networks;* 2) External Consultant	In person	52
9	2016/4/8	Innovation and Strategy Execution Manager, *BU Managed Services*	In person	51
10	2016/4/8	Expert – IoT Ecosystem and Technology, *BU Digital Services*	In person	48
11	2016/4/11	Project Manager, *GF Business Excellence*	In person	42
12	2016/4/11	1) Radio Base Station Site Solution Manager 1, *BU Networks;* 2) Radio Base Station Site Solution Manager 2, *BU Networks;*	In person	24
13	2016/4/11	Head of IoT Marketing, *MA South East Asia and Oceania*	Call	47
14	2016/4/11	Senior Consultant, *BU Digital Services*	Call	33
15	2016/4/12	Portfolio Manager, *BU Networks*	In person	37
16	2016/4/12	Product Development Leader, Business Unit Digital Services	In person	29
17	2016/4/13	Price Manager, *BU Networks*	In person	22
18	2016/4/15	Senior Researcher, *Telco Research*	In person*	60
19	2016/4/18	Senior Business Analyst, *BU Media*	Call	53
20	2016/4/18	Product Quality Leader, *BU Networks*	Call	35
21	2016/4/18	Senior Consultant, *GF Business Excellence*	In person	37
22	2016/4/20	Innovation and Competence Manager, *BU Digital Services*	In person	36
23	2016/4/20	Senior Specialist, *BU Digital Services*	In person	43
24	2016/4/25	Price Manager, *BU Networks*	In person	50
25	2016/5/18	VP and Head of PLCM Operations, *GF Technology*	In person	41
26	2016/5/18	Strategy Development, *Telco Research*	In person	50
27	2016/5/19	Business Process Improvements, *BU Managed Services*	In person	83
28	2016/5/19	Director, Government and Industry Relations, *GF Marketing & Corporate Relations*	Call	52

29	2016/5/19	Director, Government and Industry Relations, *GF Marketing & Corporate Relations*	In person	40
30	2016/5/24	Fellow Researcher, *Telco Research*	In person	52
31	2016/5/26	Business Analyst, *Telia (Customer, CSP)*	Call*	30
32	2016/5/31	Director, Government and Industry Relations, *Group Function Marketing & Corporate Relations*	In person	51
33	2017/10/31	Leader of 5G Innovators' Initiative, *GF Technology*	In person	51
Central in Garage/ ONE				
34	2017/10/3	Business Model Expert, *Telco Garage*	In person	50
35	2017/12/4	Business Model Expert, *Telco Garage* (second interview)	In person	43
36	2017/12/15	Program Manager 2, *Telco Garage*	In person*	30
37	2018/2/9	Business Model Expert, *Telco Garage* (third interview)	In person	60
38	2018/4/20	Garage Founder and Sponsor (Research Director, *Telco Research*)	In person	15
39	2018/5/16	Ecosystems Manager, *Telco Garage*	In person	34
40	2018/9/24	Garage Founder and Sponsor (Research Director, *Telco Research*) – (second interview)	In person	60
41	2018/10/15	Head of Telco ONE Beijing (former Garage Beijing)	Call	35
42	2018/10/15	1) Head of *Telco ONE Silicon Valley*; 2) Head of Innovation Enablement *Telco ONE Silicon Valley*	Call	25
43	2019/2/18	Strategic Design Director, *Telco ONE*	In person	48
44	2019/2/18	Head of Operations, *Telco ONE*	In person*	60
45	2019/2/25	Head of *Telco ONE Beijing*	Call	57
46	2019/2/28	Head of *Telco ONE Sweden*	In person	56
47	2019/3/4	Head of *Telco ONE Silicon Valley*	Call	58
48	2019/3/14	Head of *Telco ONE*	In person	45
49	2019/3/27	Head of Innovation Enablement *Telco ONE Silicon Valley* (third interview)	Call	40
50	2019/4/1	Head of Telco ONE Sweden	In person	26
51	2019/4/23	Program Manager 2, *Telco Garage*	In person	48
52	2019/4/26	Design Lead, *Telco ONE*	In person	35
53	2019/4/29	Head of Design and Technology, *Telco ONE*	In person	116
54	2019/5/3	Telco Garage Initial Core Team Member (Experienced Researcher, *Telco Research)*	In person	89
55	2019/5/6	Program Manager 2, *Telco Garage* (second interview)	In person	52
56	2019/6/13	Telco Garage Initial Core Member (Senior Researcher, *Telco Research*)	In person	30
57	2019/6/24	Technology Coach, *Telco Garage*	In person	25
58	2019/7/3	Business Coach, *Telco Garage*	In person	45
59	2019/8/19	Program Manager 1, *Telco Garage*	Call	23
60	2019/8/19	Business Coach, *Telco ONE Silicon Valley*	In person	79
61	2019-08-19	Program Manager 1, *Telco Garage* (second interview)	In person	70
Extended Network of Garage/ONE				
62	2017/10/25	Leader of *Garage Silicon Valley*	In person*	30

63	2017/11/2	Leader of *Garage Silicon Valley* (second interview)	In person	29
64	2018/3/6	Three leaders of *Garage Lund:* 1) Research Leader, *Telco Research*; 2) Partner Manager Ecosystems, *BU Technology & Emerging Business*; 3) System Designer, *BU Networks*	Call	40
65	2018/3/7	Leader of *Garage Poland – Kraków (1) and Lódz (2):* 1) Line Manager, *BU Networks;* 2) Program Manager, *BU Networks*	Call	30
66	2018/3/7	Two leaders of *Garage Gothenburg* 1) Product Development Leader, *BU Digital Services;* 2) Global Engagement Director, *BU Technology & Emerging Business*	Call	30
67	2018/3/7	Two leaders of *Garage Montreal:* 1) ICT Security Analyst, *BU Networks*; 2) Head of Security and Privacy Development, *BU Managed Services*	Call	37
68	2018/3/8	Two leaders of *Garage Aachen:* 1) Project Manager, *BU Networks*; 2) Operational Group Leader, *BU Digital Services*	Call	30
69	2018/3/8	1) Leader of *Garage Budapest* (Research Manager, *Telco Research*); Two garage team members: 2) Solution Manager, *BU Managed Services*; 3) Research Manager, *Telco Research*	Call	24
70	2018/3/9	Leader of *Garage (later ONE) Beijing* (Head of R&D, *MA North East Asia)*	Call	39
71	2018/3/9	Head of *Garage Ottawa* (Line Manager, *BU Network*)	Call	28
72	2018/3/14	Head of *Garage Paris* (Strategy & Innovation Enablement Manager)	Call	40
73	2018/4/19	Head of *Garage Linköping* (Line Manager, *BU Networks*)	Call	30
74	2018/4/23	Head of *Garage Zagreb* (Innovation, Strategy & Business Development Manager, *MA Europe & Latin America*)	Call	62
75	2018/9/12	Two leaders of *Garage Gothenburg* – (second interview)*:* 1) Product Development Leader, *BU Digital Services);* 2) Global Engagement Director, *BU Technology & Emerging Business*	Call	60
76	2018/9/17	Two leaders of *Garage Aachen* – (second interview) 1) Project Manager, *BU Networks*; 2) Operational Group Leader, *BU Digital Services*	Call	52
77	2018/9/17	Head of *Garage Linköping* (Line Manager, Business Unit Networks) – (second interview)	Call	40
78	2018/9/17	Three leaders of *Garage Lund* – (second interview): 1) Research Leader, *Telco Research*;	Call	42

		2) Partner Manager Ecosystems, *BU Technology and Emerging Business*; 3) System Designer, *BU Networks*)		
79	2018/9/17	Head of *Garage Paris* (Strategy & Innovation Enablement Manager) – (second interview)	Call	54
80	2018/9/18	Head of *Garage Zagreb* (Innovation, Strategy & Business Development Manager, *MA Europe & Latin America*) – (second interview)	Call	58
81	2018/9/18	Leader of *Garage (later ONE) Beijing* (Head of R&D, *MA North East Asia*) – (second interview)	Call	53
82	2018/9/18	Leader of *Garage Poland – Kraków (1) and Lódz (2)* – (second interview): 1) Line Manager, *BU Networks;* 2) Program Manager, *BU Networks*	Call	52
83	2018/9/24	Head of *Garage Ottawa* (Line Manager, *BU Network*)	Call	43
84	2018/9/24	Leader of *Garage Silicon Valley* (third interview)	Call	44
85	2018/9/25	1) Leader of *Garage Budapest* (Research Manager, *Telco Research*); Two garage team members: 2) Solution Manager, *BU Managed Services*; 3) Research Manager, *Telco Research*	Call	65
86	2018/9/25	Leaders of *Garage Montreal (new ones):* 1) Head of IoT, *BU Technology and Emerging Business*; 2) Service Exploration Manager, *BU Digital Services*; 3) Developer, *BU Digital Services*; 4) Development Manager, *BU Digital Services*	Call	51
87	2018/10/15	Head of *Garage Zagreb* (Innovation, Strategy & Business Development Manager, *MA Europe & Latin America*) – (second interview)	Call	29
88	2018/10/15	Innovation Leader Brazil, Extended Garage Network (Commercial Director, *MA Europe and Latin America*)	Call	26
89	2018/10/15	Leaders of *Garage Montreal* – (second interview): 1) Head of IoT, *BU Technology and Emerging Business*; 2) Service Exploration Manager, *BU Digital Services*; 3) Developer, *BU Digital Services*; 4) Development Manager, *BU Digital Services*	Call	30
90	2018/10/16	1) Leader of *Garage Budapest* (Research Manager, *Telco Research*); Two garage team members: 2) Solution Manager, *BU Managed Services*; 3) Research Manager, *Telco Research*	Call	29
91	2018/10/16	Two leaders of *Garage Gothenburg* – (third interview)*:* 1) Product Development Leader, *BU Digital Services);* 2) Global Engagement Director, *BU Technology & Emerging Business*	Call	26

92	2018/10/23	Three Innovation Leaders, Extended Garage Network: 1) Innovation Leader Nanjing (Site Lead, *BU Networks*); 2) Innovation Leader Guangzhou (Head of Technology & Innovation, *BU Digital Services*) 3) Innovation Leader Shanghai (Head of Technology Portfolio, *BU Digital Services*); 4) Head of *Telco ONE Beijing*.	Call	35
93	2018/10/31	Innovation Leader, Nanjing (Site Lead*, BU Networks*)	Call	40
94	2018/11/5	Innovation Leader, Guangzhou (Head of Technology & Innovation, *BU Digital Services*)	Call	59
95	2018/11/6	Innovation Leader, Shanghai (Head of Technology Portfolio, *BU Digital Services*)	Call	54
96	2019/3/6	Leader of *Garage Gothenburg* (Performance Manager, *Telco ONE Sweden*) – (fourth interview)	Call	55
97	2019/3/11	Leader of *Garage Gothenburg* (Product Development Leader, *BU Digital Services*)	Call	72
98	2019/3/12	Partner Manager Ecosystem, BU Technology & Emerging Business	In person	66
99	2019/3/25	Leader of *Garage Budapest* (Research Manager)	Call	48
100	2019/3/25	Site Innovation Leader, *Garage Montreal* Sponsor (Line Manager, *BU Networks*)	Call	40
101	2019/4/2	Leader *Garage Linköping* (Line Manager, *BU Networks*)	Call	77
102	2019/4/2	Leader of *Garage Ottawa* (Senior Customer Support Professional, *BU Networks*)	Call	21
Venture Members				
103	2017/11/12	Project 1 - Head of [Project 1], *Business Unit Media*	Call	19
104	2018/3/2	Startup 1 – Founder, CEO	Call	38
105	2018/3/5	Startup 2 – CEO	Call	67
106	2018/3/8	Startup 3 – Founder, CEO	In person	26
107	2018/6/25	Project 2 – Business Driver, *Telco Garage*	In person	38
108	2019/1/11	Project 2 - Head of Network Management Customer Adaptations, *BU Digital Services*	Call	59
109	2019/1/14	Project 2 - Manager, Microwave Systems, *Telco Research*	Call	53
110	2019/1/15	Project 2 – Strategic Sourcing Manager, *BU Networks*	Call	57
111	2019/1/16	Project 2 – Technical Account Manager, *BU Technology & Emerging Business*	Call	59
112	2019/1/21	Project 3 – Senior Product Designer, *BU Technology & Emerging Business*	In person	39
113	2019/1/24	Project 2 – Director Technical Product Management (Business Coach), *Telco ONE Silicon Valley*	Call	50
114	2019/2/4	Project 2 – Radio Wave Expert/Researcher, *SMHI (external partner)*	In person	36
115	2019/2/7	Project 3 – UX Design Consultant	Call	53
116	2019/2/15	Project 3 – Senior Program Director, *BU Technology & Emerging Business*	Call	54

117	2019/2/21	Project 3 – Channel Project Director, *BU Technology & Emerging Business*	Call	53
118	2019/3/5	Project 3 – Leader 1, CTO of [project 2], *BU Technology & Emerging Business*	In person	58
119	2019/7/9	Project 3 – Leader 2, Head of Advanced Industries, *BU Technology & Emerging Business*	Call	23
120	2019/9/12	Project 4 – COE (and founder) of [Project 4], *BU Technology & Emerging Business*	Call	49
121	2019/12/2	Project 3 – Smart Manufacturing Portfolio Manager, *BU Technology & Emerging Business*	In person	49
122	2019/12/9	Project 3 – Market Development Manager, *BU Technology & Emerging Business*	In person	52

Appendix B: Extended table of data sources

Table 17: Extended table of data sources

Data sources/Type of data	Use in analysis
Interviews (122 interviews, 4847 minutes of recordings and 1227 pages of transcriptions)	
Unrelated to Garage/ONE 33 interviews with Telco employees working with core business and with the new businesses around IoT	Afforded an initial background understanding of the challenges and new requirements on innovation process in general due to digital transformation as well as the uncertainty the company was facing.
Central in Garage/ONE 28 interviews with informants central to the development and operations of Telco Garage and Telco ONE, including sponsor, manager and core team of Telco Garage throughout the years, as well as Head of Telco ONE and leaders and staff from the three hubs.	Provided subjective narratives from multiple perspectives about the origins, evolution, and outcomes of Telco Garage and Telco ONE. These interviews gave meaning to the events and highlighted challenges and considerations underlying critical decisions.
Extended network of Garage/ONE 41 interviews with local garage leaders and drivers of related local innovation initiatives targeting early phases of the innovation process.	Provided understanding of the width of dispersed innovation initiatives across the company, the interrelationship between Garages, and how the innovation process was organized and managed. This included, for instance, concerns such as ideation and idea selection processes, coaching and support, tracking of KPIs, and associated challenges.

Venture team members 20 interviews with project-level informants, including the CEOs of three incubated startups, and key members of five internal early ventures.	Deepened the understanding of the innovation process and getting underneath the "ideal" conceptualization of it. This included a deeper understanding of the strategic concerns, business model innovation process, organizational interdependencies, external collaborations and interactions, as well as experiences of the support provided.
Observations (25 months of on-site observations)	
6 months of observations of the daily activities of Telco Garage, including weekly Monday morning meetings, ongoing Garage projects, coordination meetings with affiliated Garages, meetings with aspiring intrapreneurs presenting ideas and external ventures, as well as improvement work in terms of introducing practices for tracking progress, increasing transparency and improve learning rates. (15 Dec 2017 – 20 Jun 2018)	Contributed with general insights about the ways in which Telco Garage was working and in particular their efforts to develop and improve the organization. The on-site observation gave a processual view of Telco Garage as I could witness the activities made to increase the awareness of the unit, the early conversation with employees with ideas, the ongoing work within the Garage and attempts to find ways forward after Telco Garage. By being particularly involved in the improvement work I could witness learning processes on the organizational level, such as attempts to articulate and codify practices, identify areas in need of improvement and addressing these.
5 months participant observation of the screening and selection process of external startups, including planning and preparation, ending with a 'Dragon's den'-like pitch session with the CEO as one of the judges (1 Feb 2018 – 24 April 2018).	Provided insights about the development of screening and selection procedures of external startups through weekly pitch sessions before a selection panel of Telco volunteers, who rated each venture and later on provided their support as mentors.
6 months of observations of the planning and execution of startup onboarding, training and matchmaking during a 6-month acceleration program ending with a demo day (15 May 2018 – 23 Oct 2018)	Gave insight in how they created an accelerator program with tailored coaching and match making to find internal stakeholders within the organization, formal milestone meetings and training seminars in IPR protection, business model innovation, technology insights, execution and VC investments.
9 months of participant observations of the development of Telco ONE, including handover of activities from Telco Garage, coordination meetings, team development, development of new relationships and the Telco ONE Ambassador program, introduction of a new idea sourcing tool, and learning and improvement activities. (20 Jun 2018 – 25 Mar 2019)	Provided a detailed account of the turbulent transformation from Telco Garage to Telco ONE, including attempts to preserve the momentum and valuable resources from the previous set up to the new one, such as various hand over activities, while also creating renewal by learning from past experiences and introducing new practices.

5 months of observations of the continuous work at Telco ONE after having been up and running for over a year (1 Sep 2019 – 8 Mar 2020).	Granted a depiction of the resulting ways of working as Telco ONE was relatively advanced and settled in. This enabled taking note of the rapidly growing number of ideas and new ventures through a transparent tool for tracking and contributing to ventures, posting calls and challenges, and finding team members. I was also able to see the result as some of the issues early on had been solved through various new practices.
Visits to affiliated Garages in Gothenburg (4 Feb 2019) Lund (5 Feb 2019), and two visits to Garage/ONE Hub Silicon Valley (25 Oct 2017 – 3 Nov 2017 and 4 Mar 2019 – 7 Mar 2019)	Granted a more intuitive understanding of how these Garages and hubs worked and fitted in at the different sites. By seeing the sites, meeting active members of the local communities and being told about the ways in which they were working it was easier to understand the grander perspective of the links between peripheral employees, the garages/ hubs and the headquarters.
Archival data	
Telco Research strategy documentation from 2013 to 2020	These documents included early proofs of the strategic recognition that technology research was not enough and that the current organization could not handle ideas that involved business model innovation. They also enabled tracing the strategic development over the years and Telco Garage's role in the overall strategy.
Monthly reports from Telco Garage from February 2014 to March 2018.	These documents gave fine grained and precise depictions of the actions and progress of Telco Garage through its development and served as a basis for triangulation and crosschecking with interviewees' recollection of events.
Briefing documents addressed to the new CEO concerning various aspect of Telco Garage.	Provided a comprehensive and succinct depiction of Telco Garage's strategy to utilize the network of affiliated Garages, engage the startup community, and co-innovate with customers. It also gave a snapshot overview of the current situation in early 2018.
Documentation from Telco Garage network coordination meetings between September of 2017 and May of 2018.	Gave a sense of the coordination meetings in addition to the ones that were attended and observed.
Telco Garage's repository for shared documents	Entailed information about new tools being used in the innovation process, kept
Telco ONE's repository for shared documents (and other circulated documents through email), including 73 documents	Involved codified depiction of Telco ONE's strategy, structure, process and ways of working, and current progress.

28 venture pitch presentations (Garage entry selection pitch decks from 17 internal Garage ventures and Dragon's den presentation decks from 11 internal Garage ventures). And 1670 submitted ideas with brief descriptions for Telco ONE, which were accessed in a digital idea collection and tracking tool.	Offered a way to gaze how pitches were structured at different times and what type of ventures were accepted through different stage gates.
Project 1's and Project 2's repositories for shared documents, including 142 and 197 documents, respectively.	Included working document, including gantt-charts, market research material, business- and pricing model descriptions, contractual documents, marketing and communication material, etc. This gave a good idea of the priorities and actions early on in the venturing process.
4 news magazine articles about Telco Garage.	Useful for triangulation of certain interview data.
Telco Annual Reports from 2008 to 2020	Enabled tracking the reorganizations during the time period of the study and further back and pin down the point in time different events occurred.

Appendix C: Extended data tables

Table 18: Aggregate dimension – Visceral problem and solution understanding [extended]

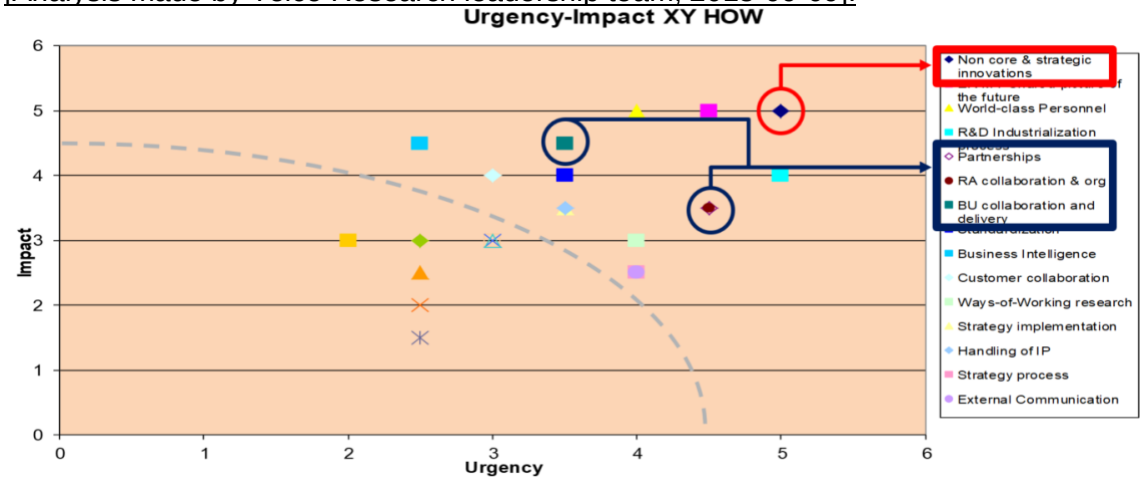
<table>
<tr><th colspan="2">Second-Order Category: Problem Definition (IN# = interview; FO = field observation; AD = archival document; RN = researcher's notes)</th></tr>
<tr><td>First-Order Code: Identifying need for increased non-core strategic innovation</td><td>First-Order Code: Identifying need for inter- and intraorganizational collaboration</td></tr>
<tr><td>[Analysis made by Telco Research leadership team, 2013-09-09]:
 

Figure 22: Urgency-impact XY-plot, 2013-09-09 (AD)

"The figure shows that 'non-core & strategic innovation' was top rated as both an urgent issue and one with potential substantial impact (highlighted in red)" (RN)</td><td>[Researcher's comment on the Urgency-Impact XY-Plot]: "Collaboration within Telco Research across research areas, with the business units and in external partnerships scored high in urgency and impact in the strategic analysis of key issues for the organization (highlighted in blue)." (RN)

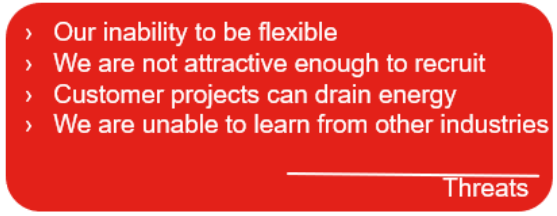
[Original core member of Telco Garage involved in setting up the organization]: "… it was necessary to break up and think differently and find an alternative way to create things at Research, because Research was very silofied, one could say." (IN53)</td></tr>
<tr><td>First-Order Code: Identifying lack of flexibility and inability to learn from other industries as major threats</td><td>First-Order Code: Identifying technology transfer problem</td></tr>
<tr><td>[From SWOT Analysis by Telco Research leadership team, 2013]: "In a SWOT analysis made by Telco Research's leadership team during the strategic planning in 2013, the lack of flexibility and inability to learn from other industries were identifies as key threats." (RN)
 

Figure 23: Threats - excerpt from SWOT-analysis (AD)</td><td>[Video recorded inauguration speech for Garage Gothenburg by Head of Telco Research, October 2017]: "When we started our strategy work in Telco Research in 2013 we realized that innovation was one of the areas we needed to focus more on. And specifically, we realized that […] when we work in new areas where we don't have strong business units or product units it was very difficult to go forward with those ideas." (AD)</td></tr>
</table>

Table 19: Aggregate dimension – Visceral problem and solution understanding (continued) [extended]

<table>
<tr><th colspan="3">Second-Order Category: Explorative Strategic Intent</th></tr>
<tr><td>First-Order Code: Formulating vision</td><td>First-Order Code: Launching program to enhance innovation capabilities</td><td>First-Order Code: Increasing commitment to exploration</td></tr>
<tr><td>[Strategic vision for Telco Research, 2014-02-05]:
 

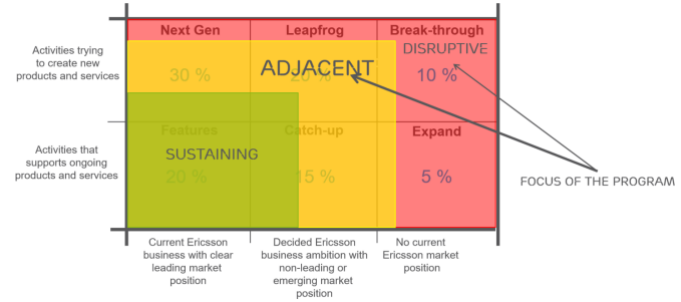
Figure 24: Telco Research - Strategic Vision 2014 (AD)</td><td>[Focus of the Telco Research Innovation program explained: to strengthen capabilities for adjacent and disruptive innovation, 2014-01-31]:
 

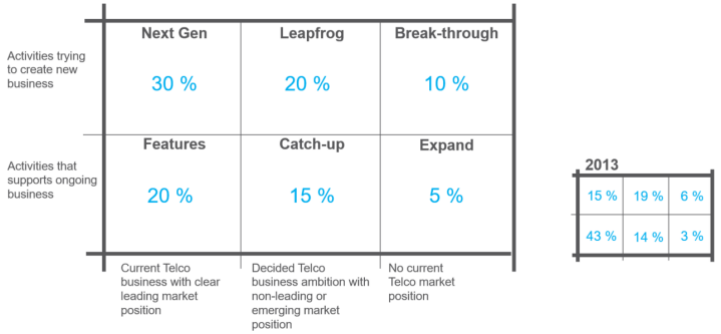
Figure 25: Focus of Telco Research Innovation Program, 2014 (AD)</td><td>[Announcing the shift from 40% to 60% commitment to activities aimed to create new businesses contra supporting ongoing businesses, 2014-02-05]:
 

Figure 26: Telco Research - Activity distribution (AD)</td></tr>
<tr><th colspan="3">Second-Order Category: Lack of Experience with Experimentation</th></tr>
<tr><td>First-Order Code: Technology-biased exploration practices</td><td>First-Order Code: Lack of natural direct market interfaces</td><td>First-Order Code: Accustomedness to a rigid innovation process</td></tr>
<tr><td>[Original core member of Telco Garage involved in setting up the organization]: “The conclusion had been made that [Telco] Research was good at innovation that was incremental within core areas such as radio, and things like that […] Sort of, the innovation that revolves around building more efficient algorithms and things like that, which should lead to the next mobile network.” (IN53)</td><td>[Telco Research Strategy Expert]: “So, sales people talk to product management and product management might talk to someone else, then in the end talks to R&D and you have the whispering game, and you know what happens in the whispering game, the information gets distorted. So, when it comes to R&D the kind of message is so distorted, so R&D doesn’t understand the full context, but they get the spec. So, they deal with the spec, they code according to the spec.” (IN26)</td><td>[Telco Research leadership team member and IoT expert]: “I think one thing that we should get more of is entrepreneurship. We don’t have that inside the company, we are a large industrial player that is using traditional industrial thinking when it comes to solving problems, buildings solutions and building organizations. You need something that is much more agile, something that is much more entrepreneurial oriented. Also, I think that, not boxed up, because now we have an organization that is built around functions. […] They’re all silos.” (IN30)</td></tr>
</table>

Table 20: Aggregate dimension – Schematic arms-length vicarious learning [extended]

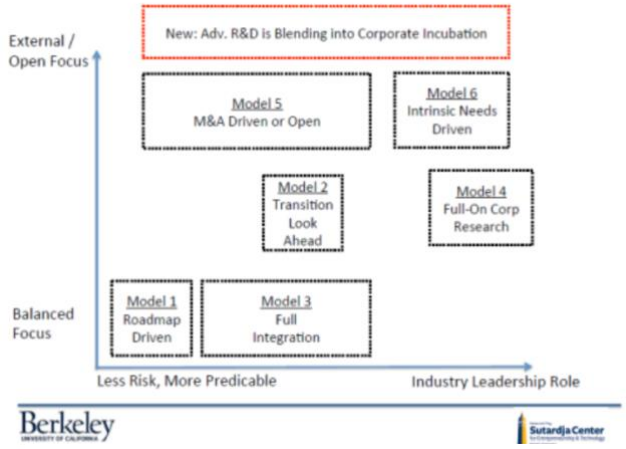
<table>
<tr><th colspan="2">Second-Order Category: Using Multiple External Sources for Learning</th></tr>
<tr><td>First-Order Code: Emulating elements from corporate role models</td><td>First-Order Code: Seeking guidance from universities and incubators/accelerators</td></tr>
<tr><td>[Original Garage program core team member]: “And then one day [...] [The program sponsor] came rumbling with a Harvard Business Review article about Microsoft Garage [...] and was like ‘this is what we shall have! This is what we need!’” (IN53)</td><td>[Telco Research, Monthly Report February 2014]: “To learn from other ‘innovation programs’ we had separate sessions with KTH Innovation, Centek at Luleå University, Innova at DUBI and [Telco] Research in San José. This input together with the outcome from discussions in the Innovation Core Team and other internal Kista-based stakeholders will be reflected in the methodology that we choose to use for the [Telco Research] Innovation Program. (AD)</td></tr>
<tr><td>First-Order Code: Learning from scholars about multiple options for corporate innovation</td><td>First-Order Code: Adopting popular practices learnt from professional literature</td></tr>
<tr><td>[Telco Research, Monthly Report July 2014]: “UC Berkeley (Center for Entrepreneurship & Technology) developed a first version of a boot camp concept for [Telco Research] All Leaders. This makes it possible to benchmark ourselves with innovative and modern advanced-R&D organizations, make a self-assessment of Telco Research and set out wanted position through a framework of innovation measurements.” (AD)
 

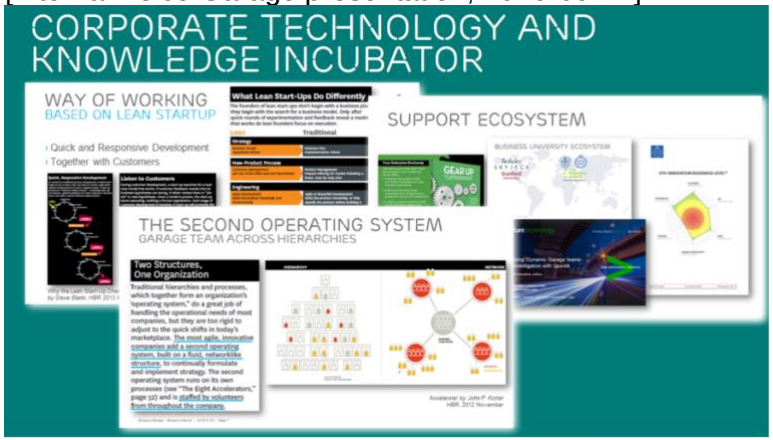
Figure 27: Alternative corporate innovation approaches, Berkeley presentation to Telco Research leadership (AD)</td><td>[Garage Sponsor and Founder]: “So, my sketch for Telco Garage was inspired by John Kotter, Harvard Business Review article, which was about, I think, ‘Accelerate!’”…“And also, we said that you have to work based on the lean startup methodology, which was again a big inspiration for me, from Steve Blank from a Harvard Business Review article. So, these were the main two inspirations, the John Kotter, Accelerate, and the Steve Blank.” (IN)
[Internal Telco Garage presentation, 2016-09-21]:
 

Figure 28: Referenced HBR articles from which key practices have been adopted (AD)</td></tr>
</table>

Table 21: Aggregate dimension – Schematic arms-length vicarious learning (continued) [extended]

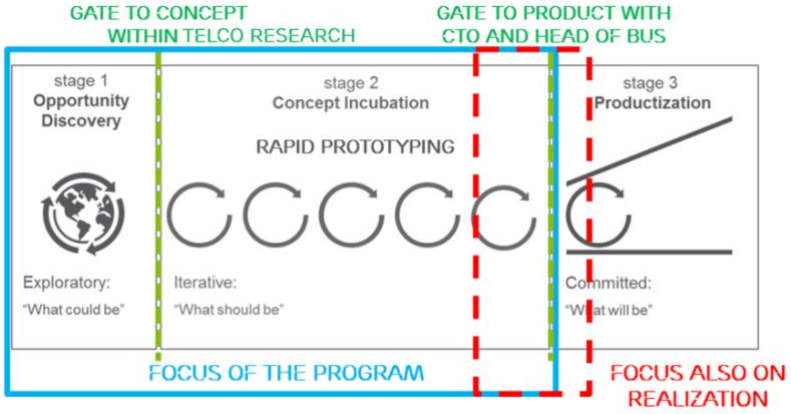
<table>
<tr><th colspan="2">Second-Order Category: Identifying Key Practices</th></tr>
<tr><td>First-Order Code: Adopting process framework</td><td>First-Order Code: Adopting structural framework</td></tr>
<tr><td>[First presentation of Garage Program, 2014-01-31]:
 

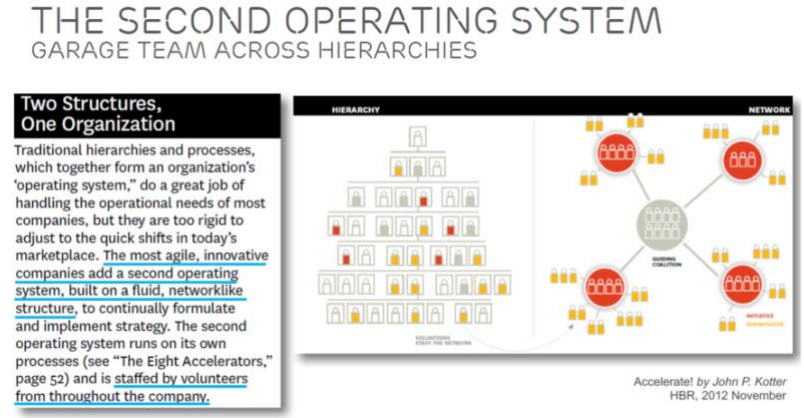
Figure 29: Process model for Telco Research Innovation Program (AD)</td><td>[Internal Telco Garage presentation, 2016-09-21]:
 

Figure 30: Description of the second operating system (AD)</td></tr>
<tr><td>First-Order Code: Adopting cultural principles</td><td>First-Order Code: Adopting methodology</td></tr>
<tr><td>[Video recorded inauguration speech for Garage Gothenburg by Head of Telco Research, October 2017]: “And then we decided that as a part of our innovation program that we started 2014 we wanted to establish something that we called the Telco Garage. And the idea with the Garage was that we would establish something that would be like a small, lean startup culture within the big company. So, it’s both a physical space it’s also a support system, it’s a process, and it’s kind of second operating system to our big operating system in Telco.” (AD)</td><td>[Internal Telco Garage presentation, 2016-09-21]:
 

Figure 31: Description of Telco Garage's way of working based on Lean Startup (AD)</td></tr>
</table>

Table 22: Aggregate dimension – Broad organizational framework for actions [extended]

Second-Order Category: *Cultural Factors*		
First-Order Code: *Acceptance of failure*	First-Order Code: *Empowerment and autonomy*	First-Order Code: *Learning mentality and curiosity*
[Description of culture from first presentation of the Garage program]: "Permission that its ok to fail as long as its fail quick and reuse the learning to know what we should not persist with." (AD) [CEO brief]: "Local garage presence creates an opportunity to run core and adjacent projects in a space and cultural environment that is friendly to exploration, experimentation, and failure." (AD)	[Telco Garage Sponsor and Founder]: "So, we tried to make it that it's empowering, it's distributed and it's also autonomous. I believe that an innovation system in a corporate should be distributed and autonomous, because that's the most adaptive one." (IN40)	[Telco Garage Sponsor and Founder]: "…the first two phases of innovation is [sic] about learning and knowledge. […] they have to learn a lot by themselves. Because the mindset is very important. The behavioral change is very important" (IN) [Head of Telco Research, at Telco Research Day 2015-12-05]: "To win we understand and interact to explore user needs and industry value of our concepts and solutions in the Networked Society. We engage with users, industry & academia, we formulate relevant research questions and we are curious by exploration and experimentation." (AD)
First-Order Code: *Openness and diversity*	First-Order Code: *Volunteerism and intrinsic motivation*	First-Order Code: *Startup mentality*
[Garage Brief to CEO]: "An exciting finding is that half of the local project teams, and 64% of global projects, were cross functional (i.e., coming from different organizations in the sites). We believe that cross-pollination sparks innovation and the Garage can help create fluidity across our local silos." (AD)	[Original Telco Garage core team member]: "We had, I had a discussion with a unit at the university. They had a pretty attractive model for how to handle researchers and researcher's ideas to drive them all the way to become a business. More like the startup concept. They had to some extent the view that it's very important that the idea owner needs to feel engaged and intrinsic ambition. Then the idea owner may need support but it's tremendously important to have the idea owner onboard all the way" (IN56)	[Garage Brief to CEO]: "The main responsibilities of the Telco Garages are […] to drive culture change by introducing experimentation and lean startup methodology into core and adjacent business development." (AD) [Interview with Garage core team member]: So, I think the biggest motivation was to do something else outside of Research. And then to get this agile or be able to show a minimum viable product in six months. Then I though, this is something I want to be part of. To try this start-up mentality" (IN57)

Table 23: Aggregate dimension – Broad organizational framework for actions (continued) [extended]

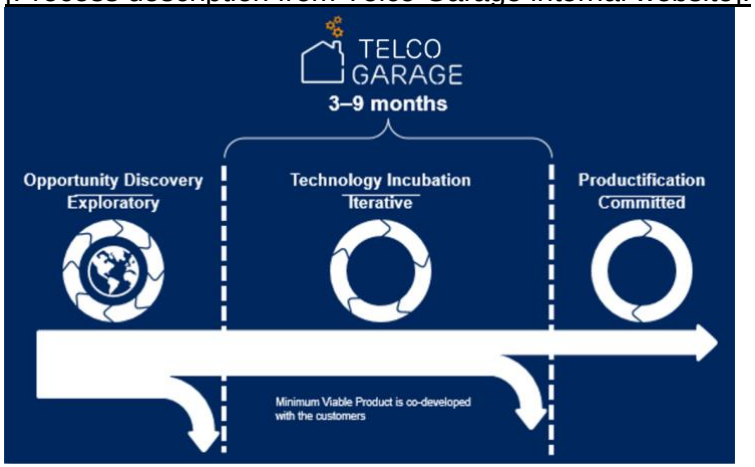
<table>
<tr><td colspan="2">Second-Order Category: Structural Factors</td></tr>
<tr><td>First-Order Code: Garage format</td><td>First-Order Code: Short time acceleration</td></tr>
<tr><td>[Video recorded inauguration speech for Garage Gothenburg by Head of Telco Research, October 2017]: “And then we decided that as a part of our innovation program that we started 2014 we wanted to establish something that we called the Telco Garage. And the idea with the Garage was that we would establish something that would be like a small, lean startup culture within the big company. So, it’s both a physical space it’s also a support system, it’s a process, and it’s kind of second operating system to our big operating system in Telco.” (AD)</td><td>[Process description from Telco Garage internal website]:
 

Figure 32: Telco Garage process description (AD)</td></tr>
<tr><td>First-Order Code: Entry and graduation</td><td>First-Order Code: Second operating system</td></tr>
<tr><td>[Garage sponsor and founder]: “Very early it came out that pain point, external partner, MVP. Basically, that was the only criteria that was very, very clearly came up. And then how you pitch in […] then [Head of Telco Research] became the first gate keeper to pitch in. […] And then very early, thanks to God, we could define a Dragon's Den, with […] the CTO. So, this was basically the whole set up. The whole framework was very lightweight and then the main elements was that if you start, then you come with a pain point, so the idea has to describe the pain point, you have to get an external partner and an MVP. Then we had the first stage, basically how you get in or how you get [a Telco] Garage project, then it was [the Head of Telco Research], then how you exit, that was [the CTO] […] Basically, what you had is a framework as I described. What is the three criteria, two gates, still you can have [the CTO] as the Dragon's Den”. (IN40)</td><td>[Garage sponsor and founder]: “And from start I was thinking about, and I was also advised, and I realized, that I cannot change the culture of Telco. That would be a very, very stupid goal, that would fail. So, always from the start, I was talking about this as a second operating system. Create something besides what you have and then very transparently you can move back and forth.” (IN40)</td></tr>
</table>

Table 24: Aggregate dimension – Replication across the organization [extended]

Second-Order Category: *Diffusing Key Practices*		
First-Order Code: *Evangelizing new innovation mindset*	First-Order Code: *Advertising the Garage concept and results*	First-Order Code: *Educating about new practices*
[Presentation to affiliated Garage leaders during meet up, 2017-12-13]: “  *Figure 33: Telco Garage key principles (AD)*	[Telco Garage Technology Coach]: “They did lots of advertisement, so I think everyone knew what the Garage was, that you could go there and develop your ideas” (IN57)	[Innovation Manager, Garage Ottawa]: “There are a number of innovation workshops, then this innovation coach program was introduced. So, here in Ottawa myself and few others took that training. It was a very good training provided by a company in Telco called Amplify. So, I think it was remote training for about four weeks and then we had a full week of face-to-face. And I think that was very useful. So, a lot of the activities we have here in Ottawa are kind of moderated and supported by this group of innovation coaches.” (IN102)

Table 25: Aggregate dimension – Replication across the organization (continued) [extended]

Second-Order Category: *Structural Replication*			
First-Order Code: *Distill minimum framework and principles*	First-Order Code: *Creating new Garages*	First-Order Code: *Assemble network of volunteers*	First-Order Code: *Facilitating essential coordination*
[Garage sponsor and founder]: "So, the sites came out to us and said 'we would like to understand more, what is this? We would like to have this. Can you broaden it?' So, then we realized, and I realized that, 'aha! So, we can do something for Telco, internally'. So how you can scale that? […] so, then we came up with a franchise model. I mean, how you can franchise it. Basically, what you had is a framework as I described. What is the three criteria, two gates, still you can have [the CTO] as the Dragon's Den, so everything can go though there, but how you're solving the inflow. There I was thinking about and I wanted to make sure that it's empowering. So, I didn't want to put lots and lots of control functions. (IN40)	[Research note based on analysis of Monthly Reports]: "New Garages were created in Silicon Valley (2015-04), Budapest (2015-11), Aachen (2016-05), Paris (2016-09), Gothenburg (2016-10), Zagreb (2016-12), Montreal (2016-12), Ottawa (2016-12), Lund (2017-09), Poland (2017-10), Linköping (2017-10), Beijing (2018-01).' (RN)	[Garage Leader, Montreal]: "Because there are two elements, or I would say two types of Garages. There is Garages that are funded, so by funding I mean they have dedicated resources or what not and then there are Garages that are affiliated. So, the affiliated Garage aren't necessarily sponsored by way of dedicated staff, so it comes in more as a volunteer and people working together" (IN67)	[Second Telco Garage Manager]: "The other thing we had as a demand was that if you want something that you will call Telco Garage then we require that we will create a form of community between these Garages, so, a higher degree of communication is important" (IN51) [Analysis of Monthly Reports]: Starting from June 2016 all affiliated Garages contributed to the Telco Garage monthly reports by providing an update of their activities and progress on incubated projects. (RN)
Second-Order Category: *Cultural Legitimization*			
First-Order Code: *Local development of second operating system*		First-Order Code: *Creating distinct identity and brand*	
[Garage sponsor and founder]: "And these organizations that are distributed in Telco's case there are like 180 different sites, so let's say 10-13 different sites, they have to learn a lot by themselves […] To really locally create a second operating system is very important. So, this was the whole idea." (IN40) [Garage Leader 1, Aachen]: "It's called the second operating system, by John Kotter. Yes, we really use it like that. Upon demand we take people from the hierarchical model of the organization" (IN68) [Garage Leader 2, Aachen]: "It's not easy. I mean it's a lot of, we try to motivate and inspire people, organize events, and support in coaching and connect them. So, it requires a lot of activities" (IN68)		[Researcher observation]: "The Garage was made distinct by creating their own logotype, website and communicating without adhering to the corporate brand and policies. Informants mentioned that they identified more strongly to the Garage community than their formal organizations." (FO)	

Table 26: Aggregate dimension – Coactive vicarious learning [extended]

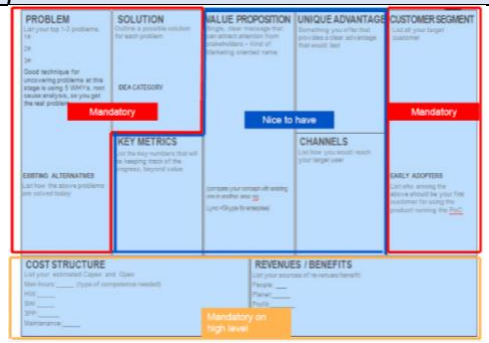
<table>
<tr><td colspan="3">Second-Order Category: Developing Experimentation Capability</td></tr>
<tr><td>First-Order Code: Developing and validating market and business case</td><td>First-Order Code: Developing minimum viable product and business model</td><td>First-Order Code: Pivoting</td></tr>
<tr><td><u>[Project 2 – Business Driver, Telco Garage]:</u> “I needed to understand like the voice of the customer directly. […] So, I was actually able to talk to somebody who, you know, is an executive of the weather company who would purchase this data. So, very early on I was like able to capture like the voice of the customer. […] if I hadn't had that I think it would have been very hard because he even gave me price points and things, […] So, he was sort of able to articulate for me the value to him in monetary dollars. And that was huge, because without that I couldn't really have built a business case because how else could I have gotten price input?” (IN107)</td><td> 

Figure 34: Minimum Viable Business Model Canvas (AD)
”Red fields indicate mandatory business model aspects to figure out before the first gate. Yellow fields were mandatory on a high level and blue just ‘nice to have.’” (RN)</td><td>“An example of pivoting was the change of lead customers by Project 2. The project first attempted to get a first sale of their real-time and high accuracy rain measurement solution to a local municipality where initial tests had been performed. When they were not able to sell at a reasonable price point, they changed direction and started investigating in parallel selling their solution to UN military, and to insurers for whom the data could potentially have bigger value.” (RN)</td></tr>
<tr><td colspan="3">Second-Order Category: Collaborating with Experienced Partners</td></tr>
<tr><td>First-Order Code: Developing collaboration procedures for different actors</td><td>First-Order Code: Engaging with accelerators</td><td>First-Order Code: Engaging with universities</td></tr>
<tr><td><u>[Researcher’s notes]:</u> “As indicated by
- Figure 13: Standardized customer collaboration procedure (AD)
- Figure 14: Standardized startup acceleration program selection and onboarding process (AD)
- Figure 15: Startup acceleration program process (AD)
standardized and codified procedures were developed for common forms of collaborations.” (RN)</td><td><u>[2017-11 Telco Research Monthly Report]:</u> “Joined cooperation with biggest startup incubator in Croatia (http://www.tehnopark.hr/). Official partner and mentor for accelerator program (smart city solutions, healthcare solutions, ...)” (AD
[2017-12 Telco Research Monthly Report]: “As [Telco] Poland, we have established a cooperation with Startup Spark accelerator.” (AD)</td><td><u>[2014-02 Telco Research Monthly Report]:</u> “In April we continued to build up the network of competence support we want to be able to provide to our innovation teams. Handelshögskolan (SSE) in Stockholm accepted to use our innovation projects as course assignments for Masters and MBA students to do business analysis. Stanford University in California is likely to agree on this too, as the course material and teachers are the same. We also spent time to detail a similar setup with Uppsala University“ (AD)</td></tr>
</table>

Table 27: Aggregate dimension – Coactive vicarious learning (continued) [extended]

Second-Order Category: *Unlearning Selection Practices*		
First-Order Code: *Identifying dysfunctional selection practices*	First-Order Code: *Replacing decision makers*	First-Order Code: *Change structure of authority to enhance autonomy*
[Garage Sponsor and Founder]: "And then in the beginning we also included everyone in the [Telco] Research leadership team, which was not good neither. Because then it was lots of discussions, you know. I mean people, even though they are leaders in Research, but they do not have the mindset for innovation." (IN40) [Second Garage manager]: "But what became obvious during the first years, 2015, not to mention 2016, was that the pitch procedure to enter the Garage didn't work […] It was that there was the entire [Telco] Research Leadership Team that didn't understand innovation […] and they ended up in a mode of rather shooting down than giving it a chance." (IN55)	[Second Garage Manager]: " But what we did rather quickly […] was that we reshaped the Entry Selection Board. […] And then it became eight people. So, we took two people from Research with the right to vote, and that was [the Garage Sponsor] and [the head of Telco Research] and then there were two people from the IoT side, there was one from [Business Unit Digital Services], two from the radio side and one from the CTO office." (IN55)	[Garage Sponsor and Founder]: "There I was thinking about and I wanted to make sure that it's empowering. So, I didn't want to put lots and lots of control functions. So, I said that for the ideation, you have all the freedom. How you're collecting the ideas, it's up to the site. We're not going to tell you. […] And then after that we said that you can have internal, on the garage level, you can have projects yourself. So, I don't want to be, every time, the gatekeeper." (IN40)
Second-Order Category: *Collaborative Learning-by-Doing*		
First-Order Code: *Driving pilot project*	First-Order Code: *Testing new practices in ventures*	First-Order Code: *Developing skills through each venture*
[Garage sponsor and founder]: "I realized it very quickly that slides are not good enough, so to have the idea, and talk about the idea and have nothing tangible is not going to go. So, very, very quickly I pushed to have the first project. So, my strategy was that, instead of having work like six months on the policies and I don't know the description or the framework or whatever you call it, or finding a place I really pushed to get a first project." (IN40)	[2015-04 Project and Portfolio Planning, Monthly Report]: "The project is opening the development for anyone within [Telco] to contribute in an open source style of working, crowd development." (AD) [2015-12 Telco Research, Monthly Report]: "…project completed workshop 3 in a series of 9 for internal convincing with the Entrepreneurship Lab at Uppsala University" (AD)	[Second Telco Garage manager]: "And we became much better by time at coaching the ones who would come and pitch, about what was important. Especially, things such as having a clearly articulated problem, talk about who else are looking at this problem, and in some way motivating" (IN55)

Table 28: Aggregate dimension – Unlearning conflicting corporate practices [extended]

Second-Order Category: *Unlearning Selection Practices*	
First-Order Code: *Creating Simple Criteria*	First-Order Code: *Bridging between Research and business units*
[Documentation of Garage criteria]: "ENTRY SELECTION CRITERIA -Satisfies a clear need -Verified Problem definition -Minimum Viable Product (prototype) -Clearly defined Minimum Viable Product -Feasibility -The innovation extends business in new areas -Understand the competition -Who, what -What is new and innovative? Benefit of the approach clearly described -External partner onboard -Team secured -Resources and expected time reasonable -What values are expected to be created?" (AD)	[Researcher's observation]: "By engaging business unit members and researchers in the projects, as well as offering c-level exposure of ventures towards business unit leaders in the dragon's den, Telco Garage offered a new bridge for concepts to be transferred from Research to the business units" (FO)
Second-Order Category: *Unlearning Human Resource Allocation Practices*	
First-Order Code: *Identifying problems with human resource allocation practices*	First-Order Code: *Gain support and remove obstacles for onboarding volunteers*
[Excerpt from Telco Garage CEO FollowUp – Site Assessment]: "The following challenges were reported during the interviews by the local Telco Garage leads: Fading engagement due to lack of slack. Telco Garage activities are often on top of an 100% fulltime job. Both garage teams and project teams face this challenge. […] No dedicated time of money: each project and person must negotiate with line managers. […]" (AD)	[Excerpt from Telco Garage CEO FollowUp – Site Assessment]: "In order to address some of these issues we have recently: -Engaged with DNEW leadership to encourage employees to work on Telco Garage projects and disseminate better information about how to volunteer. -Begun pursuing the use of network numbers with MAs/BAs to get better visibility into time spent and enable minimal budgets. -Established an "Telco Garage Volunteer" option in O365 so employee can volunteer and be matched to projects in need of certain competences" (AD)
Second-Order Category: *Unlearning Financial Resource Allocation Practices*	
First-Order Code: *Creating minimum resource pools*	First-Order Code: Gain support of innovation activities from line managers
[Garage Manager, Aachen]: "The department will take over the time reported, that they spent. I mean we finance a small equipment, let's say if they join a hackathon like raspberry pies, or smaller SD cards or these kinds of things." (IN68)	[Garage Manager, Aachen]: "There are specific people […] that are really focusing on the garage. I mean we got support from the […] manager […] from the site opportunity council, that they are constantly accompanying and supporting us." (IN68)

Table 29: Aggregate dimension – Proto-capabilities for experimentation [extended]

Second-Order Category: *Constituents for Experimentation Capability*			
First-Order Code: *Cultural acceptance of new practices*	First-Order Code: *Wide awareness and engagement with experimentation*	First-Order Code: *Relational ties and community*	First-Order Code: *Exercised practices and routines*
[Garage sponsor and founder]: "So, the sites came out to us and said 'we would like to (IN40)	[Researcher's report based on Garage project tracker]: "Meta data about all Garage projects and Garage events in 2017-2018 indicate that there was representation from Telco Research, all of the business units, several market areas and group functions in the projects and that 3000 people had attended Telco Garage events" (AD)	[Head of Telco ONE Hub Sweden]: "you can't manufacture this grassroots' enthusiasm and commitment […] you can launch as many campaigns as you want to, to recruit for these kinds of people. That's not how it works. But this sort of brought them up, gave them a platform. They found each other, they amplified their own message, which is why it spread so much. And so today, for any future innovation activities we have a very fertile sort of ground to leverage these people again. We activate them, we invite them into this conversation. So that's an enormous positive and I don't know if we could have done it without that." (IN46)	[CEO Brief]: "Looking per site, we find that older [Telco] Garages tend to be more prolific and host more events. Gothenburg and Montreal are two of our most prolific garages" (AD)

Second-Order Category: *Cultural Legitimization*		
First-Order Code: *Declining enthusiasm in ventures and venture support due to work overload*	Venturing interruption due to lack of resources and time	First-Order Code: *Venturing interruptions due to hand-over*
[Garage Manager, Lund]: "The resource issue is another thing that would be helpful if we could solve somehow. We, who works in the Garage could perhaps be more dedicated to put our time here. Today, it is rather a guilty conscience. Something one willingly does because it is fun, but it is not sustainable from a personal perspective. (IN64)	[2017-06 Telco Research Monthly Report]: "The project is on hold. No resources are available, neither internal nor external" (AD) [Garage Manager, Aachen]: "I see that we have less and less slack and buffer for the people, so I see these teams working and taking longer to develop something." (IN76)	[Head of Telco ONE]: "…we have always struggled with, what do you do when you have brought something up to, from a startup, to 'now it's time to scale this. Where should this recide?' That hand-over have never been resolved. So, in the early stages we've had 'everything looks good in the pipeline' and then when you are to move this new thing, which still is only going to cost, into an existing business unit, and the first thing that happens in the next financial cycle and budgeting period is that it is killed" (IN48)

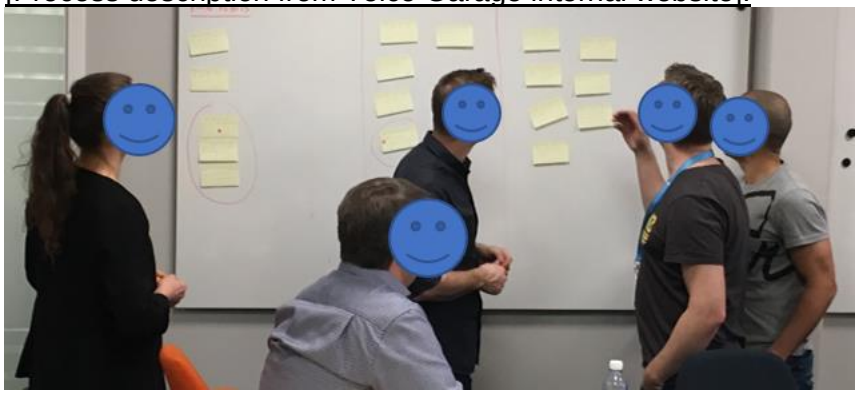
Table 30: Aggregate dimension – Decentralized experimentation with divergent practices [extended]

Second-Order Category: *Dispersed Experimentation*		
First-Order Code: *Large number of parallel ventures*	First-Order Code: *Inflow of new ideas*	First-Order Code: *Large number of collaboration partners for experimentation*
[Researcher's report based on Garage project tracker]: "Meta data show the project funnel indicate that in April of 2018, at least 44 projects were ongoing on a local Garage level, without having passed the global entry selection panel, and six more projects were ongoing and had passed the global entry selection" (RN)	[CEO Brief, 2018]: "The goal is to empower employees, customers and partners to explore. In light of this, we were happy to find that 85 events were hosted during 2017 with over 3000 participants, resulting in 215 ideas developed. Our idea funnel progresses through two stages: local projects and global projects. Of the 215 ideas 46 were pitched into local garages during the year of 2017. Including ideas that cannot be directly traced to the events a total of 74 ideas were pitched into local garages." (AD)	[Researcher's report based on Garage project tracker]: "Meta data of a total of 89 Garage projects from between 2014 and 2018, show the involvement of around 130 unique external partners, of which 10 were universities and 11 were CSPs, while the rest mostly consisted of private firms from various other industries" (RN)
Second-Order Category: *Limited Integration and Knowledge Sharing*		
First-Order Code: *Dispersed double work due to lack of horizontal coordination and learning*	First-Order Code: *Lack of holistic transparency of portfolio and progress*	First-Order Code: *Lack of inter-venture collaboration*
[CEO Brief, 2018]: "Local staff spending too much time on simple things because of inexperience. More central support and sharing best practices would be helpful." (AD)	[CEO Brief, 2018]: "We have created an excel based tracker which will be used to monitor ideas going forward" … "Note that project status "unknown" means that we did not get answer on the status of the project, i.e. ongoing, stopped, shelved or exited. We aim to improve historical data by approaching specific project leads, and going forward ensure better population of the needed data." (AD) [Researcher's notes]: "These quotes indicate that not until 2018 was systematic tracking attempted in response to a request from the CEO, which corresponds to field observations" (RN)	[Field observation]: "The Telco Garage Manager, reported issues of creating collaboration between the Garages on similar projects. Disconnected drone projects have been observed in Beijing, Montreal, Poland and Silicon Valley." (FO)

Table 31: Aggregate dimension – Decentralized experimentation with divergent practices (continued) [extended]

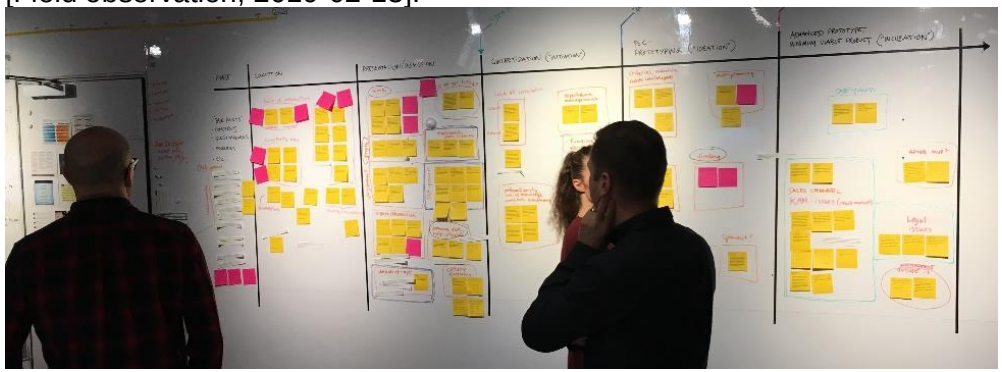
Second-Order Category: *Divergence of Practices*		
First-Order Code: *Heterogeneity of strategic intentions and objectives*	First-Order Code: *Heterogeneity of selection and support*	First-Order Code: *Deviations from original intent*
[Head of Telco ONE Hub Sweden]: "When we exploded into 13 Garages we didn't have a mission […] and if you had asked our founder at that time even after 13 Garages of which 11 were not Research he would still say the mission was to bring experimentation back to [Telco] Research. So, you have a fraction of the Garages speaking on behalf of the majority with a mission that is totally ununited. Because if you go to the other Garages, their mission was 'we want to have interface with our customer' or someone else's mission was 'we want to have engagement with our staff'". (IN46)	[Researcher's note based on aggregate Garage-level meta data]: "The number of supporting Garage volunteers and staff varied substantially from 10 to 60 manhours per week, which was not proportional the variation in the number of projects. Manhours divided with number of projects resulted in a ratio between 5 and 13.33 manhours per project. This suggest a diversity in the support gained by Garage projects. Furthermore the acceptance rate of Garage applications varied between 18% and 100%, which suggest great diversity in selection practices." (RN)	[CEO Brief, 2018]: "Gothenburg and Montreal are two of our most prolific garages; however, we see few global projects coming from them. The reasons need to be further investigated although one explanation provided from Gothenburg was that they had not understood the benefits of receiving global status on projects until recently and still remained uncertain." (AD) [Second Garage Manager]: "To call themselves a Garage they had to drive projects. It could not be an empty facility where people go to play but they had to do projects that then were finalized and demonstrated. In the end it was a bit so and so at the different Garages but overall it was working well. Several Garages were pretty bad at finalizing it and move further in some form of phase two. Instead they held on to project for a very long time." (IN55)

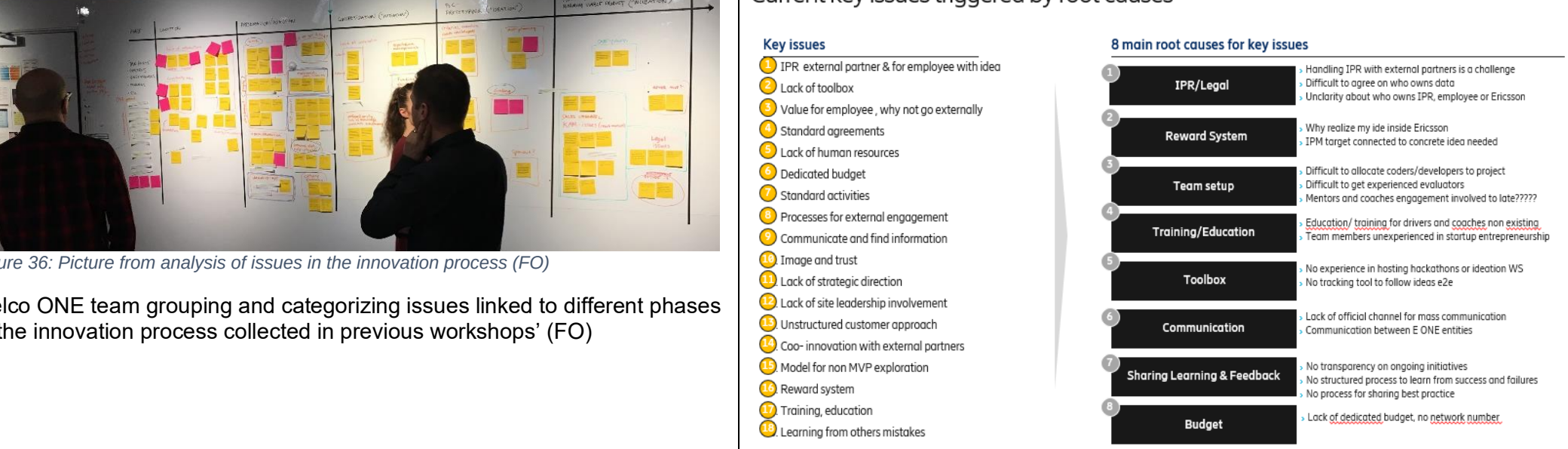
Table 32: Aggregate dimension – Deliberate learning [extended]

<table>
<tr><td colspan="2">Second-Order Category: Systematic Analysis of Prevailing Issues</td></tr>
<tr><td>First-Order Code: Interviewing Garage leaders and innovation managers</td><td>First-Order Code: Hosting workshops with Garage teams and other stakeholders</td></tr>
<tr><td>[Observation of interviews]: “‘Interview about Initiation and Ideation phases, Garage Manager Zagreb, 2018-10-15, 30 minutes
‘Interview about Initiation and Ideation phases, Head of Strategy CU Brazil, 2018-10-15, 30 minutes
Focus Group about Initiation and Ideation phases, Garage Team Montreal, 2018-10-15, 30 minutes
Interview about Initiation and Ideation phases, Telco ONE Hub leader Silicon Valley, 2018-10-15, 30 minutes
Focus Group about Initiation and Ideation phases, Garage Team Budapest, 2018-10-16, 30 minutes
Focus Group about Initiation and Ideation phases, Garage Team Gothenburg, 2018-10-16, 30 minutes
Focus Group about Initiation and Ideation phases, Garage Leader Beijing and regional innovation managers from China, 2018-10-16, 30 minutes (FO)</td><td>[Process description from Telco Garage internal website]:
 
Figure 35: Picture from workshop, Garage Lund (FO)

‘Telco Garage Team Lund Sticking Post-It Notes on the whiteboard with issues relating to different stages of the innovation process’ (Observation, 2019-02-05)
‘Design experts from the Telco ONE Team travelled around the world to different Garages and innovation sites, collecting data about perceived challenges linked to different phases of the innovation journey:
- Telco ONE Open House: Montreal 2019-03-19, 45 issues collected.
- Workshop: Montreal, 2019-03-20, 93 issues collected.
- Telco ONE Open House: Ottawa, 2019-03-21, 15 issues collected.
- Workshop: Ottawa, 2019-03-22, 57 issues collected.
- Workshop: Shanghai 2019-03-11, 79 issues collected.
- Workshop: Yokohama, 2019-03-12, 93 issues collected.
- Workshop: Seoul, 2019-03-14, 123 issues collected.
- Telco ONE Open House: Stockholm, 2019-01-23, 46 issues collected.
- Workshop: Gothenburg, 2019-02-04, 41 issues collected
- Workshop: Lund, 2019-02-05, 45 issues collected
As of end of March 2019. (FO)</td></tr>
</table>

Table 33: Aggregate dimension – Deliberate learning (continued) [extended]

<table>
<tr><th colspan="2">Second-Order Category: Systematic Analysis of Prevailing Issues</th></tr>
<tr><td>First-Order Code: Analyzing innovation journey</td><td>First-Order Code: Analyzing key issues and root causes</td></tr>
<tr><td>[Field observation, 2019-02-13]:
 
Figure 36: Picture from analysis of issues in the innovation process (FO)

‘Telco ONE team grouping and categorizing issues linked to different phases of the innovation process collected in previous workshops’ (FO)</td><td>[Archival document, ‘identification of key issues and root causes’]:
 

‘Analysis of key issues identified through interviews with Garage Leaders and other Innovation Managers concerned with non-core innovation to identify root causes and actions for Telco ONE’ (AD)</td></tr>
</table>

Table 34: Aggregate dimension – Deliberate learning (continued) [extended]

Second-Order Category: *Reassessing Previously Learnt Practices*	
First-Order Code: *Discarding dysfunctional idea sourcing practices*	First-Order Code: *Reconceptualizing Garage network to Ambassador network*
[Head of Telco ONE]: '"When I joined, I swallowed these four streams that we were supposed to work with: the intrapreneur track or internal track, the startup incubator, universities […] and customers. And now there is only one left. And that is based on a number of insights and outputs that we have discovered that took some time to render." (IN48) [Researcher's note]: "Telco ONE initially adopted the four tracks for startups, customers, academia and intrapreneurs (See Figure 11: Telco ONE description (AD), page 93). While collaborations with academia, startups and customers remained an alternative for each project, there were no overarching intent to drive such collaborations as programs" (RN)	[Head of Telco ONE Hub Silicon Valley]: "The second one is, we call innovation ambassador. Okay? So, what they would do, they will become the first line of filtering and they also become the first line to respond to those ideas through the tool. They, we need those folks be very well versed in regional and local innovation ecosystem. They need to have a lot of experience in dealing with innovation projects and they have high-level knowledge of business case, business of Telco knowledge, Telco product portfolio or this kind of stuff. But it's very important, we want those folks to kind of have some kind of local presence in market areas. So right now, we're assuming, we're proposing like a Telco ONE Garage member or some very, very active volunteers from the MANA, from the Latin America Market Areas, they take this kind of role." (IN42)
Second-Order Category: *Reassessing Previously Learnt Practices*	
First-Order Code: *Reconceptualizing entry and exit to stage gates*	First-Order Code: *Codifying and gamifying lean startup approach*
[Field observation of new stage gate]: "As Telco ONE started to structure the innovation process into distinct phases, the view of this as a reconceptualization of the previous entry and exit gates was obvious. They often referred to the new gates as corresponding to prior entry and exit procedures to make sense of the new process" (FO)	[Field observation of gamification and codification of the 5i process]: "Telco ONE has incorporated a point-systems in the ideation tool and rank participants based on their contribution in terms of ideas submitted and comments made on others' ideas. The head of operation have been tasked to make a game-like version of the 5i process by incorporating different work packages and check lists per stage, such as design thinking workshop, business model canvas, tech validation, market

Table 35: Aggregate dimension – Deliberate learning (continued) [extended]

Second-Order Category: *Dissemination of Learning from Venture Success and Failure*		
First-Order Code: *Publishing lessons learned in digital idea management tool*	First-Order Code: *Arranging alumni presentation*	First-Order Code: *Case studies of success and failure*
[Telco ONE team meeting protocol 2018-10-24]: "Communication between decision makers and ideators/project team and ambassadors: - Develop way of evaluating what happened to a project, why, how to learn from it and communicate this to the relevant people like the project team, idea submitter and the evaluators who endorsed these projects." (AD) [Research observation]: "The idea management tool got a repository for project that were categorized as lessons learned." (FO)	[Telco ONE team meeting protocol 2018-10-24]: Alumni presentations - "Develop a framework for how we could engage alumni who have gone through certain stages to inspire and support newer projects, e.g. inspirational talks, coaching, etc. (Could be a part of Strategic Design teams culture program)" (AD)	[Research observation]: Short and simple case studies were observed including information about progress and status, nature of the initiative, how it came about, what happened with it and why, and rational behind go or no-go decisions" (FO); [Telco ONE team meeting protocol 2018-10-24]: "Develop processes from learning from each success and failure in terms of project outcome, e.g. systemic evaluation in each stage gate" (AD)

Table 36: Aggregate dimension – Adaptive replication of corporate practices [extended]

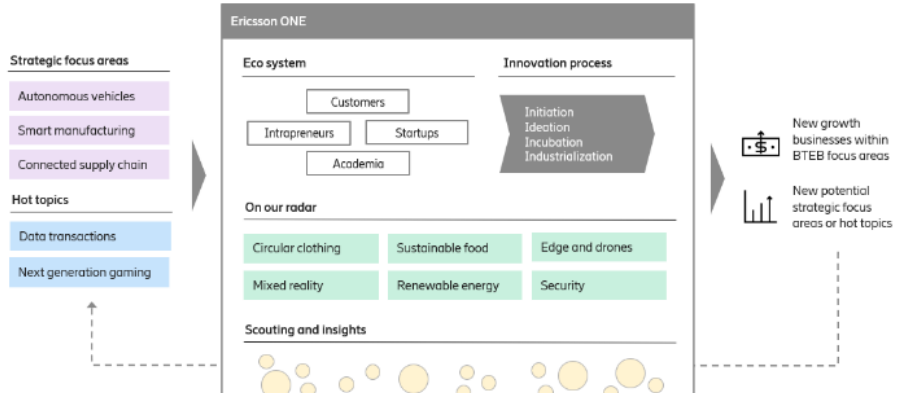
<table>
<tr><th colspan="2">Second-Order Category: Adapting Structural Separation and Distinct Strategic Focus</th></tr>
<tr><td>First-Order Code: Creating dedicated business unit to ensure commitment to non-core innovation and reduce interdependencies</td><td>First-Order Code: Creating clear strategic focus</td></tr>
<tr><td>[Head of Telco ONE]: “In the early stages we’ve had ‘okay, everything looks great in the pipeline!’ and then when you’re about to move this thing, that is still only going to cost money, into an existing business unit, and the first thing that happens in the next funding cycle and the next budget period is that it gets shut down. So, now we have solved that problem by with a whole dedicated BA, or Business Area for New Business, so that we can go from start-up mode, which is [Telco] ONE, to scale-up mode á la [Project 1], [Project #] and IoT, which still reside with [Head of BTEB] and is all about growth, growth, growth.” (IN48)</td><td>[Telco ONE presentation, 2019-01]:
 

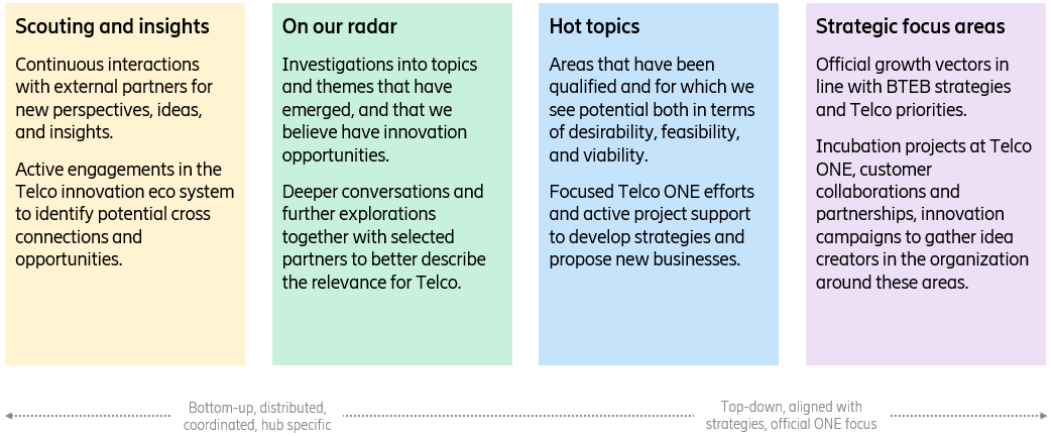
Figure 37: Telco ONE Model (AD)
 

Figure 38: Telco ONE - exploration practices (AD)</td></tr>
</table>

Table 37: Aggregate dimension – Adaptive replication of corporate practices (continued) [extended]

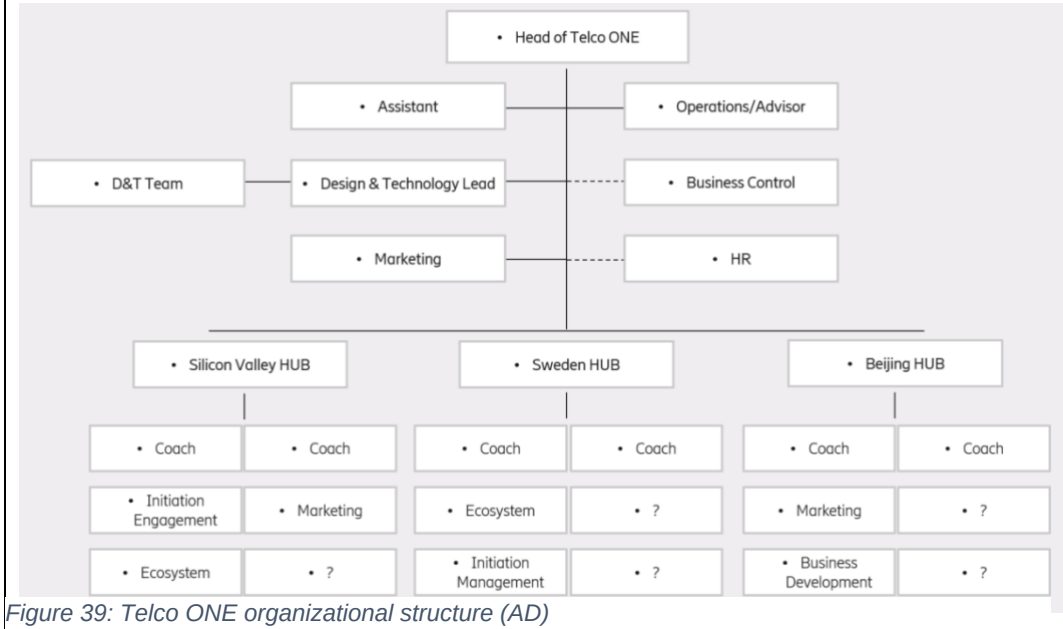
<table>
<tr><th colspan="2">Second-Order Category: Centralizing and Adapting Hierarchical Organization</th></tr>
<tr><td>First-Order Code: Organizing hierarchically</td><td>First-Order Code: Formalizing and harmonizing volunteers' roles</td></tr>
<tr><td><u>[From Telco ONE Strategy Deck 2020]:</u>
 

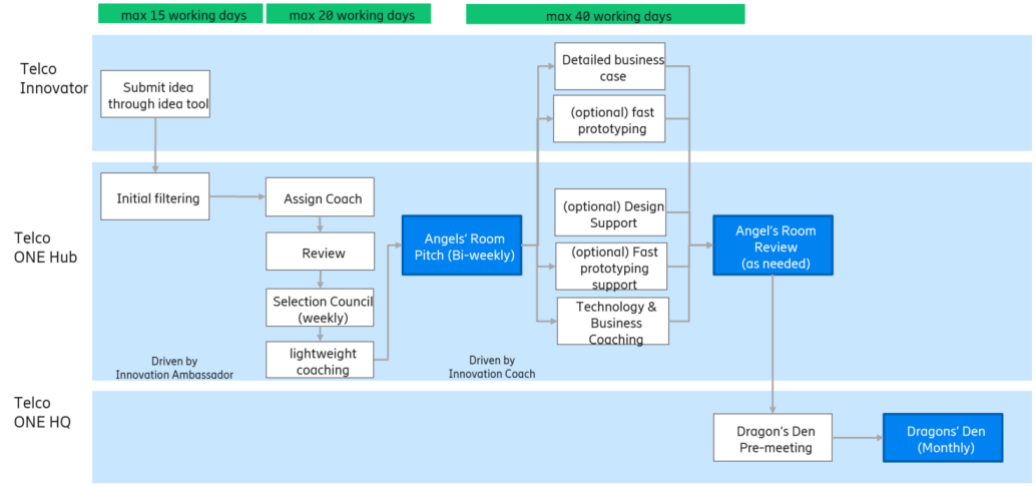
Figure 39: Telco ONE organizational structure (AD)</td><td><u>[From Innovation Ambassador deck]:</u>
 

Figure 40: Service blueprint of the flow from idea submission to Dragon's Den (AD)

[Researcher's note]: "Step 2-6 in this service blueprint of the first phases of Telco ONE's innovation process indicates the formal routines of Telco ONE ambassadors" (RN)</td></tr>
<tr><td>First-Order Code: Creating clear and all-encompassing regional responsibilities</td><td>First-Order Code: Centralizing and standardizing competencies</td></tr>
<tr><td><u>[Researcher's note]:</u>
"Telco ONE created geographical areas of responsibility similar to how the sales organization is organized, which leaves no blind spots as opposed to Telco Garage, where sites without a Garage were excluded. This is illustrated in Figure 10, p. 92.</td><td><u>[Researcher's notes]:</u> "As illustrated in Figure 39: Telco ONE organizational structure (AD)Figure 39: Telco ONE organizational structure (AD), a relatively big dedicated team was created with complementary competencies in business development, design, marketing, ecosystem enablement, HR, business control and management. Each hub also had a very similar setup with a standard set of competencies" (RN)</td></tr>
</table>

Table 38: Aggregate dimension – Adaptive replication of corporate practices (continued) [extended]

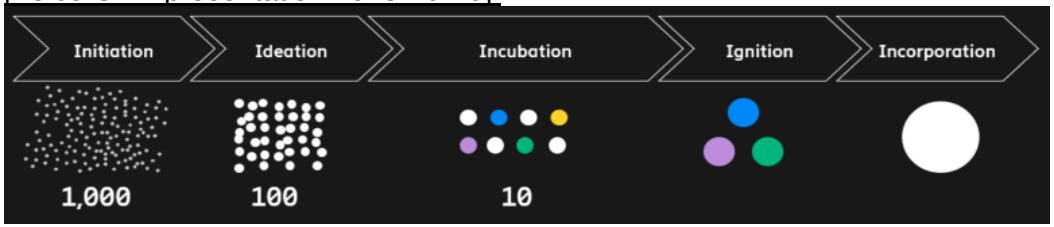
<table>
<tr><td colspan="2">Second-Order Category: Adapting Corporate Processes and Incentives</td></tr>
<tr><td>First-Order Code: Creating gates with quantitative KPIs and goals</td><td>First-Order Code: Creating standardized decision fora for each gate</td></tr>
<tr><td>[Telco ONE presentation 2018-10-10]:
 

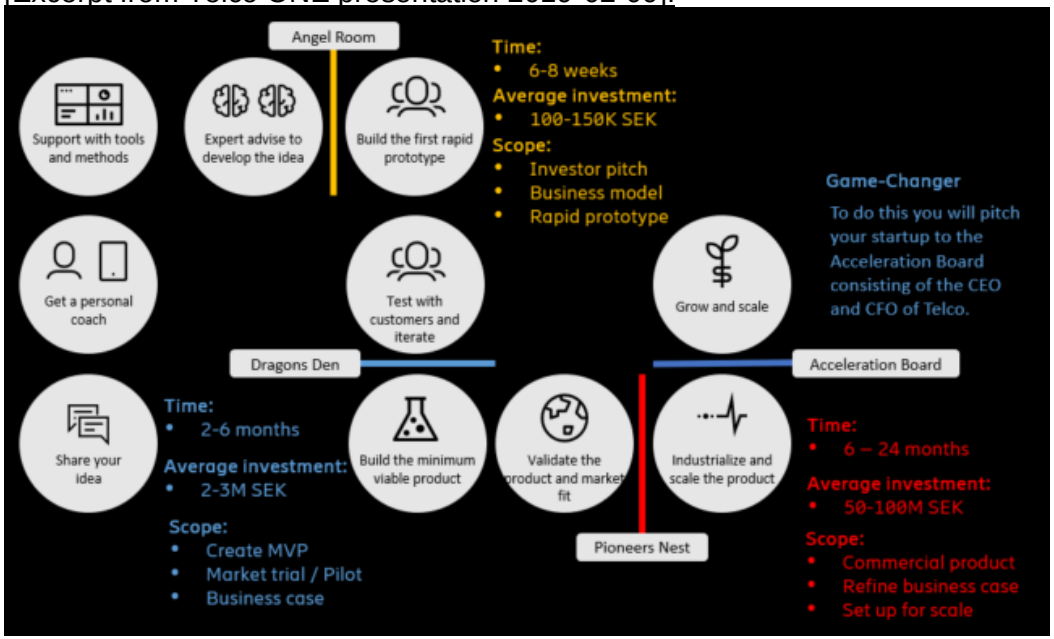
Figure 41: Telco ONE Stage gate process and expected numbers of projects (AD)</td><td>[Researcher’s notes]: “For each of the gates a there was a chair with the ultimate decision-making power, a driver of the event, standing panel members and a set of optional panel member depending on the nature of the venture. The decision makers were for each gate:
1) Angel’s Room: Head of ONE Hub; 2) Dragon’s Den: Head of ONE; 3) Pioneer’s Nest: Head of Business Unit Technology & Emerging Business; 4) Acceleration Board: CEO. (RN)</td></tr>
<tr><td>First-Order Code: Standardize stage gate duration, support services and budget</td><td>First-Order Code: Introducing gate-bounded awards for successful intrapreneurs</td></tr>
<tr><td>[Excerpt from Telco ONE presentation 2019-02-09]:
 

Figure 42: Telco ONE gates, support, duration and budget (AD)</td><td>[Researcher’s notes]: “In the event of creation of an independent operating unit, which meant passing through all gates in Telco ONE, team members were granted the ‘pioneer award’, a financial compensation of up to 100% of their yearly salary depending on role and involvement in the venture’s creation.” (RN)</td></tr>
</table>

Table 39: Aggregate dimension – Capabilities for systematic experimentation [extended]

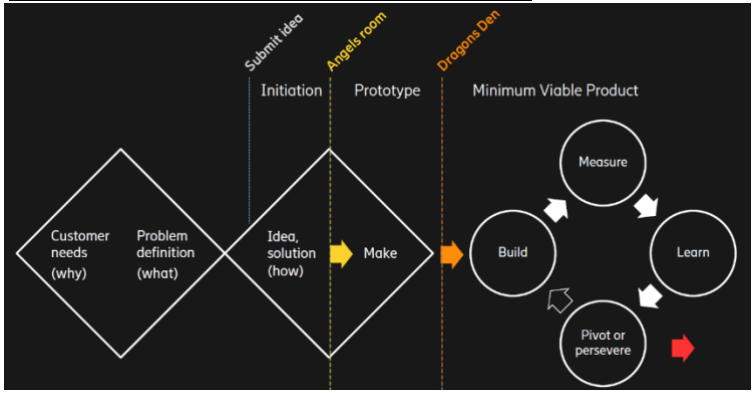
Second-Order Category: *Centralized End-to-End Process*		
First-Order Code: *Alignment of authority and responsibility for experimentation in new business areas*	First-Order Code: *Progressive escalation of investment decisions*	First-Order Code: *Formalized internal collaboration*
[Field observation]: "With the creation of a dedicated business unit for new businesses and placing Telco Research right under the head of the Business unit, the same group that was in charge for driving more experimentation in new areas also had the authority to influence the rest of the organization to better cater for such activities." (FO)	[Researcher's notes based on synthesis of documentation about the stage gate decision process]: "First decision point is Angel's room, the head of the hub makes the decision, the investment size is around $15K and the fund is used to verify the problem over an average of 4-8 weeks; Second decision point is Dragon's Den, the head of Telco ONE makes the decision, the investment size is around $300K and the fund is used to build an MVP and test feasibility over an average of 4-6 months; Third decision point is Pioneer's Nest, the head of the business unit makes the decision, the investment size is up to $10M and the fund is used to industrialize the venture and test its ability to scale. Final decision point is IOU Board, the CEO makes the decision (RN)	[Field Observation]: "From the start collaboration between hubs was formalized due to the fact they belonged to the same organization. They worked closely to align their ways of supporting new ventures and spurring innovation across the organization. For instance, they launched coordinated Telco ONE days around the world. Also, day to day activities were coordinated and physical visits were paid to the sister hubs." (FO)
Second-Order Category: *Venture Level Experimentation Practices*		
First-Order Code: *Business and design coaching and support*	First-Order Code: *Systematic lean experimentation*	First-Order Code: *Incentives and rewards to retain innovation-minded employees*
[Excerpt from ONE Presentation]: "Why build your project with ONE? Validate your idea with experienced business coaches and industry experts; Access to early adopter customers and broader ecosystem; Build the dream team to grow idea into successful venture" (AD)	[ONE User centered innovation primer]: "  *Figure 43: Use of design thinking and lean startup mapped to process (AD)*	[Excerpt from pioneer award overview document]: "RECOGNITION LEVEL (% of Annual Base Salary): Dependent on role and level of involvement in [Independent Operating Unit] creation. Founder: - If active in full incubation: 100% - If active in only one incubation phase: 50% Core Leadership Team: - Active LT in full incubation: 50%. - Active LT in 1 incubation phase only: 25% Other Members: - Only Ideation: 10% - Only Incubation MVP phase: 20% - Any two phases: 40%..." (AD)

Table 40: Aggregate dimension – Capabilities for systematic experimentation (continued) [extended]

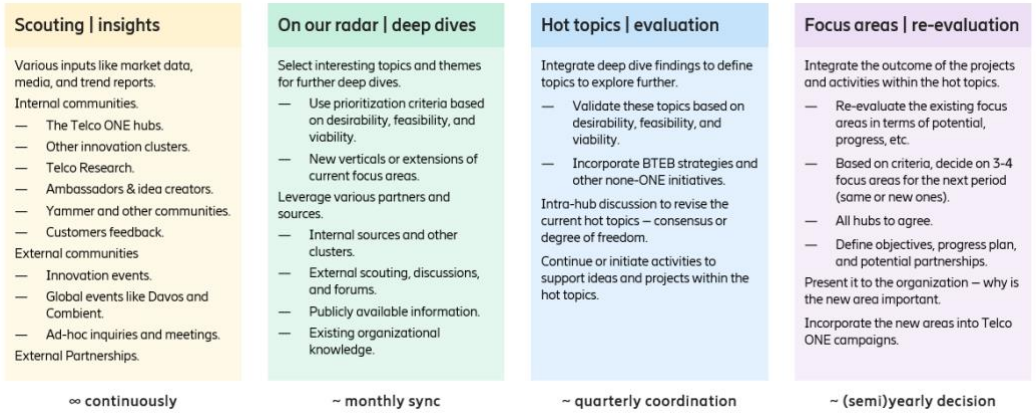
<table>
<tr><td colspan="2">Second-Order Category: Portfolio Level Experimentation Capabilities</td></tr>
<tr><td>First-Order Code: Balancing strategic focus and diversification</td><td>First-Order Code: Holistic overview of current portfolio of ventures</td></tr>
<tr><td>[Exploring focus areas, 2020-01-20]:
 

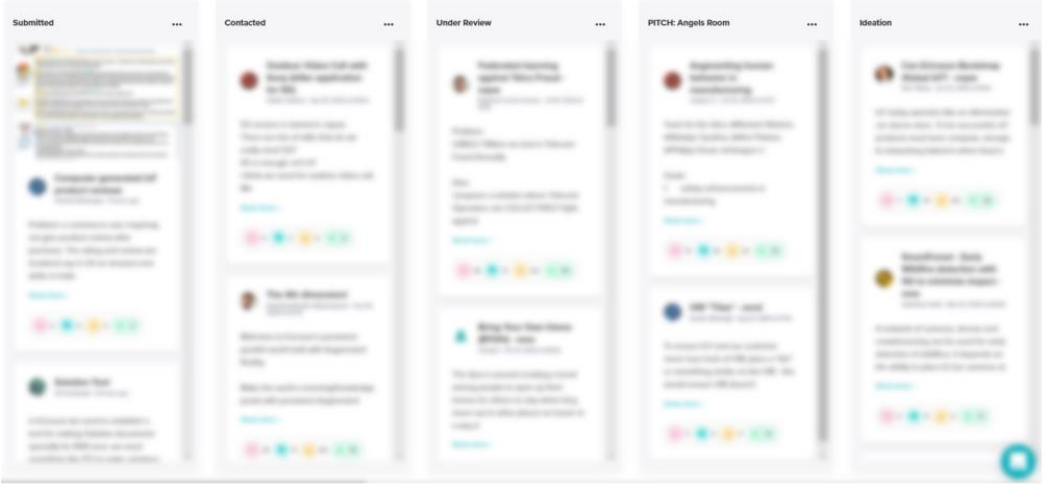
Figure 44: Routine activities to explore outside of current focus areas (AD)</td><td>[Screenshot of funnel tracker in ideation tool]:
 

Figure 45: Web-based idea tracking tool (AD)</td></tr>
<tr><td>First-Order Code: Formal selection procedures</td><td>First-Order Code: Enabling combination and cross venture collaboration</td></tr>
<tr><td>[Researcher's notes based on observations scorecards]: The evaluation and selection procedure use weighted scorecards developed based on design thinking theory. The score card include a set of questions that help determine a score for desirability, feasibility and viability. A calculator is used to weight the scores based on the phase. Desirability is prioritized at first and the weight of feasibility and viability increases successively." (RN)</td><td>[Excerpt from ONE internal presentation 2020-03-31]:
"Information Sharing and Learnings
Teams Site for all MVP Projects: to be set up shortly to enhance collaboration and sharing of best practices etc." (AD)</td></tr>
</table>