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AGILE INNOVATION ACROSS FIRM BOUNDARIES

Mehmet Kerem KIZILTUNÇ  
1138001002

Prof. Dr. Beyza OBA

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FİRMA SINIRLARINDA ÇEVİK İNOVASYON

MEHMET KEREM KIZILTUNÇ

1138001002

Tez Danışmanı : Prof. Dr. Beyza Oba

(İmza) 

 İstanbul Bilgi Üniversitesi


Jüri Üyeleri : Doç. Dr. Mehmet Genç

(İmza) 

 İstanbul Ekonomi Üniversitesi

Doç. Dr. Zeynep Özsoy

(İmza) 

 İstanbul Bilgi Üniversitesi

Doç. Dr. Deniz Tunçalp

(İmza) 

 İstanbul Teknik Üniversitesi

Prof. Dr. Levent Akın

(İmza) 

 Boğaziçi Üniversitesi

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## FOREWORD

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## **ABBREVIATIONS**

BPA	Blanket Purchase Agreements
CD	Compact Disk
CMM	Capability Maturity Model
CSP	Communications Service Provider
FPA	Function Point Analysis
GDP	Global Domestic Product
IP	Intellectual Property
ISO	International Standards Organization
NASA	National Aeronautics and Space Administration
OSRD	Office of Scientific Research and Development
OTT	Over The Top
PBC	Performance Based Contracts
R&D	Research and Development
RPF	Request for Proposal
SEI	Software Engineering Institute
SPICE	Projects In Controlled Environments
TCE	Transaction Cost Economics
XP	Extreme Programming

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## **ABSTRACT**

Agile practices are becoming common in innovative product development due to time pressure while firms are finding advantages in working with outside parties. In this qualitative study, I merge research on inter-firm innovation, dynamic capabilities and firm boundaries with agile practices to arrive at an integrative view on cross-boundary innovation activities, where agility is defined as a dynamic capability on both sides of an inter-firm collaboration dyad, triggered by the need of strategic urgency. My study, revisits research on firm boundaries and dynamic capabilities aiming to provide a complementary view of the firm's ability to innovate in a highly competitive market through co-exploration with outside parties while at the same time reducing uncertainty and costs. As these dynamics cannot materialize in isolation within the firm alone, I focus on the relationships between the firm and its business partners rather than taking a firm-centric perspective. My research context was a major telecommunications service provider and I conducted a qualitative case study by interviewing managers both from the focal firm and its innovation partners. I find that in the value co-creation phase, "compatibility of practices" between the focal firm and its innovation partners was a significant factor in the success of agile innovation. This is further complemented with the firms' capacity in the design and execution of new contractual forms. I contribute to the dynamic capabilities literature by introducing a "dynamic co-capabilities" perspective.

**Keywords:** DYNAMIC CAPABILITIES, AGILE PRACTICES, INTER-FIRM INNOVATION, VALUE CO-CREATION, CONTRACTING FOR INNOVATION

## ÖZET

Çevik süreçler zaman baskısı altında yenilikçi ürün geliştirmede artan bir yaygınlık kazanırken örgütler dış ortaklarla çalışmakta da fayda görmekteler. Bu kalitatif çalışmada, firmalar-arası yenilik, dinamik kabiliyetler ve örgüt sınırları araştırmalarını çevik pratiklerle birleştirerek çevikliğin stratejik aciliyetle tetiklenen ve örgütler arası çift taraflı işbirliğinde dinamik bir yetkinlik olarak tanımlandığı sınırlararası yenilikçi aktivitelerde bütüncül görüşe ulaşmaya çalışıyorum. Çalışmam örgüt sınırları ve dinamik kabiliyetler araştırmalarını gözden geçirip örgütün yüksek rekabetli pazarlarda dış ortaklarla bir yandan belirsizlikleri ve maliyetleri düşürürken bir yandan da ortak araştırma yapabilme yeteneklerine bütüncül bir resimden bakmayı amaçlıyor. Bu dinamikler örgütün içerisinde tek başına gerçekleştiremeyeceğinden, araştırmada örgüt-merkezli bir bakış yerine örgüt ve onun iş ortakları arasındaki ilişkilere odaklanıyorum. Çalışmam büyük bir iletişim sağlayıcısı firmada gerçekleştirildi ve odak firma ve iş ortaklarının yöneticileriyle yaptığım mülakatlara dayanan kalitatif bir vaka çalışması oldu. Bulgularım birlikte değer yaratma aşamasında örgüt ve onun yenilik ortakları arasındaki “pratiklerin uyumunun” çevik yenilik için önemli bir eksen olduğunu gösteriyor. Örgütün yeni sözleşmeler tasarlama ve uygulama kapasitesi de bunu tamamlıyor. Dinamik kabiliyetler literatürüne “dinamik eş-kabiliyetler” perspektifi ile katkıda bulunuyorum.

**Anahtar Kelimeler:** DİNAMİK KABİLİYETLER; ÇEVİK PRATİKLER; ÖRGÜTLER ARASI YENİLİK; BİRLİKTE DEĞER YARATMA; YENİLİK İÇİN SÖZLEŞMELER

## INTRODUCTION

Current business literature discusses agility within the context of a firm, but no firm lives in isolation: both transaction cost economics and open innovation literature underlines that firms choose to collaborate with outside partners under certain circumstances, especially in times of uncertainty. Thus, studying agility as an intra-firm dynamic capacity is not sufficient to explore the current scene, and my research aims to cover the inter-firm realms.

Transaction Cost Economics (TCE) theory studies the firm's decision to choose vertical integration vs. market transactions mostly under exploitation scenarios, and even Williamson (Williamson, 1981) underlines that under innovative scenarios, TCE perspectives might not suffice as TCE would generally recommend preferring vertical integration under uncertainty. What brings sustainable competitive advantage to a firm is mostly its ability to bring external knowledge closer to the firm's core and its ability to exploit that knowledge (Teece 1994, Markman et al., 2005).

An exogenous technological innovation may have a significant impact on firm boundaries, while the extent of such impact differ based on the asset specificity, information symmetry, and opportunism potential of the context (Afuah, 2003). In response, firms depend on their dynamic capabilities to explore and win over the uncertainties in blurred market boundaries, shifting market players, and unclear industry structure through innovation (Eisenhardt & Martin, 2000).

Among several contemporary frontiers of innovation management that challenge researchers and practitioners alike, agile innovation is emerging as an important area. Agility, which is a combination of speed and adaptation, is a way to deal with the unexpected. Agile innovation methods, although developed in the software cocoon until very recently, provide responsiveness and helps managing uncertainty praised in innovation project management (Loch, DeMeyer, & Pich, 2006). Thus, it is fast becoming a highly desired quality of innovation activities which involves

many surprises due to its increasingly more complex nature. For this reason, agile approaches are praised and voiced more frequently by innovation practitioners in recent years (Reeves & Deimler, 2011).

In this study, I propose the extension of the dynamic capabilities theory by defining agility as a dynamic capability that creates a competitive advantage for a firm in a cross-boundary context. In doing so, I begin with the innovation speed theory (Kessler and Chakrabarti, 1996) which focuses on innovation speed dynamics within a firm. I then pivot the focus on speed alone to speed and adaptability, i.e., agility and then move to the boundaries of the firm where the firm collaborates with outside partners in an agile manner. This requires the firm to reconsider its formal and informal means of collaboration, such as contracts, team structures (customer-and-provider vs. single team), and target achieving methods (fixed scope and cost projects vs. joint exploration).

Innovation projects today cross organizational boundaries more often than they did in the past. As firms “recognize that they cannot themselves maintain cutting-edge technology in every field required for the success of their product” (Gilson, Sabel, & Scott, 2009), they seek complementary capabilities and assets of other firms to integrate into their innovation efforts (Lichtenthaler & Lichtenthaler, 2009; Rycroft, 2007). However, even in the face of complementarity that motivates collaboration, inter-organizational collaboration for innovation is hardly guaranteed to work and deliver results on time (Tortoriello & Krackhardt, 2010). Unlike intra-organizational projects which mostly face task related complexities, inter-organizational collaboration projects also face relational complexities due to differences and conflicts among the interests of parties involved (Loch, DeMeyer, & Pich, 2006).

Incumbent firms are usually anxious that their businesses and customer interactions may be taken over by these newcomers and are looking for ways to innovate within their domain ahead of the potential competition. In order to realize this goal, they need to look for new ways of deploying new technologies in their business contexts.

The challenge is the speed and the knowledge they need to acquire to realize these innovations. Knowing the limitations of their own corporate culture and the difficulty in changing existing fine-tuned, well-integrated processes, they realize that they cannot act as who they are and expect to compete with their fast-moving competitors while continuing to act as themselves. Thus, a recent wave of business news talks about “hundred and twenty-four-year-old startups” (Lohr, 2016) and a hundred and forty-six-year-old bank calling itself a “tech company” (Brooker, 2015) by focusing on Silicon Valley practices. This means adopting practices like agile, which is commonly practiced by new technology companies and startups. The strength of the startups is said to come from the “lean startup” dynamics, a book and a term coined by Eric Ries (Ries, 2011) that reflects the iterative, explorative side of the startup culture based on agile software development practices and the Minimum Valuable Product conceptualizations. So, the argument goes, the same practices can be applied at the corporate scale to become as innovative as startups.

Recent business literature has since been trying to map these practices to the enterprise world. The agile concept has been ‘borrowed’ by some other areas such as innovation, strategy development, product development and the like where uncertainty is managed by setting up cross-functional, self-governing teams that work on iterative chunks of work to uncover ambitious, innovative goals (Rigby et al. 2016). The concepts, by their nature, resemble lean practices but I choose to follow the ‘agile software development’ and ‘agile innovation’ path rather than the ‘lean software development’ (Poppendieck & Poppendieck, 2003) and ‘lean innovation’ (Sehested and Sonnenberg 2011; Hoppmann 2009; Humble, Molesky and OReilly 2015; Browning and Sanders 2012; Cross 2013; Schuh, Lenders and Hieber 2008) path of conceptualization. Lean manufacturing stems from the Toyota Production System (Ohno, 1998) with a strong focus on zero-inventory and removing ‘waste’ from the value chain in high-volume production environments, mostly relating to ‘exploitation’ side of a business. Agility concept, on the other hand, focuses on handling less predictability in environments where demand is

volatile and the requirement for variety and flexibility over time is high (Christopher, 2000).

The practitioners in the innovation domain have also shown interest in the agile innovation trends. In their 2014 paper called “*Delivering Agile Innovation*” (Coasert, et al., 2014), the authors studied consumer and retail firms in Belgium and the Netherlands, where they found that the 66 per cent of executives they interviewed do not believe that they no longer can solely report on internal innovation. Agility and speed to market are the main drivers in their decision to work with external parties. The authors then list nine principles of agile innovation when working with external parties, especially with startups and entrepreneurs. In this way, they make the case for (1) being agile, (2) cultivating an agile culture of experimentation, (3) thinking simple and acting fast, (4) identifying the right team, (5) determining the right governance framework, (6) maintaining open and frequent communication, (7) adapting processes but breaking rules when necessary, (8) defining and measuring success, and (9) iterating and working incrementally. The growing number of startups, their agility and ability to deliver on the new wave of digital technologies create a new imperative for the corporations to learn from this new community. This imperative is also directing corporations to see the startups not as a threat of disruption but as engines of innovation and look for numerous means to work with them (Chesbrough & Weiblen, 2015).

This dissertation focuses on agile practices, a new trend of perspectives and preferences that stems from software development as an approach to innovation. Agile follows a school of thought that stems from Lean Manufacturing practices, however it has its differences, and I chose to use agile instead of lean as the latter is mostly about optimizing exploitation workflows while the former is more suitable to exploration workflows. Lean’s primary focus is to eliminate waste in the process. Agile practices, on the other hand, require cross-boundary teams with reduced hierarchy and borders that search for a final product through short, iterative cycles. The process may include waste as well as some of those iterations can be used to prove failures with the benefit of learning.

In this study, I focused on agility instead of innovation speed theory as the latter emphasizes speed alone while agility represents a framework that allows for speed *and* adaptability at the same time. Agile practices, also, by definition, put the focus on “customer collaboration over contract negotiation,” thus assuming a cross-boundary collaboration. Innovation Speed literature, on the other hand, focuses primarily on an intra-firm perspective. Markman et al. similarly criticize innovation speed: “the construct of speed and its function in innovation are frequently underspecified (Markman et al., 2005)”.

This dissertation also complements the dynamic capabilities and open innovation research: both Chesbrough (2007) and Lichtenthaler & Lichtenthaler (2009) work on the flow of information from one side of the inter-firm boundary to the other. In this study, I focused on co-exploration activities where teams from both the focal firm and its partner, in a self-managing manner, can get together and search for an innovation through iterative cycles under flexible contractual agreements.

One of the objectives of this dissertation is to explore contingencies governance methods in inter-organizational innovation projects under time pressure. In doing so, my objective was to understand why and which agile coordination practices and contractual arrangements in inter-organizational projects succeed or fail in the face of varying demands triggered by competitive pressures to finish innovation projects in shorter time. While existing research and theory focus more on how complementarities motivate inter-organizational collaboration for innovation projects in the first place, my objective was to expose factors that make them work in an agile manner. Particularly, I have focused on the way ‘compatibility of practices’ impacts how collaboration works (as separate from the complementarity of assets and capabilities that motivates collaboration).

The research setting was a large-scale telecommunications and technology firm based in Turkey, and I have used multiple innovation projects as cases, all conducted in collaboration by the focal firm and its innovation partner firms. Following the theoretical background and research design presented further below,

I have reported findings from the interviews and built a model for inter-firm agile innovation.

The discussion is followed by the implications for theory and practice and a conclusion section. In brief, I found that agility is a dynamic capability and my research well locates it in the seizing phase of an innovation, which focuses on value creation (Teece, Peteraf, & Leih, 2016). Agile's "cross-functional teams" dynamics enables resources from both the focal firm and the partner firm to work as a single team on very frequent iterations. If the maturity of teams in agile practices match and "compatibility of practices" can be established, then agile innovation allows for seizing opportunities and creating value fast compared to other transactional alternatives. I would argue that the agile capabilities of the partner firms and the compatibility of those with those of the focal firms demonstrates a "value co-creation" perspective when investigating joint innovation efforts. This is somewhat contrary to the extant literature where inter-firm innovation is studied mostly from a unidirectional, transactional knowledge flow perspective. I also found that when the compatibility of practices is high, collaborating parties can resort to informal methods for governance as trust is easily established throughout the inter-firm collaboration and governance may move away from the contractual basis. If the compatibility of practices is low, then governance is mostly left to formal methods such as contracts and most discussions are managed through the contractual framework.



## **LITERATURE REVIEW**

Today, innovation is an area where firms collaborate across boundaries. In the following sections I first review transaction cost economics, which historically is a first approach to firm activities across boundaries. Following that, I review the dynamic capabilities theory in relation to innovation activities. Then I introduce more recent streams in innovation management domain to complement the perspectives on cross-boundary innovation practices and governance methods.

### **2.1. THEORY OF THE FIRM AND FIRM BOUNDARIES**

Why do firms exist? This original question has been asked by many scholars to understand what makes a firm. In other words, why do firms emerge in the abundance of the price mechanism? According to Coase (Coase, 1937), there is a cost of using the price mechanism. First, it is a cost to discover what the price should be; second, a cost is incurred to negotiate and write a contract for this price; and a third cost incur in order to enforce this contract. There are also other problems such as determining the duration of the contract as longer contract durations tend to give the buyer better prices while removing flexibility in the way the buyer wants to work with the supplier unless they agree to engage in a flexible contract – which, then, is difficult to enforce over time (Coase, 1937).

From a Coasean perspective, a corporation is a set of choices to make or buy decisions. In other words, a firm chooses to either vertically integrate or use market transactions to operate. Thus, when new practices such as agility are discussed, research on cross-boundary collaborations and learning is especially interesting. The original question then expands to the following form: why do firms exist as they are? In coming up with an efficient decision set in formulating the firm activities, one ends up with firm boundaries (Coase, 1937; Williamson, 1981). Boundaries are virtual conceptions that determine what activities are to be performed within a firm and what is left out. They, however, become material

conceptions through contracts as contracts demonstrate what resources and services are to be acquired from outside the boundaries of the firm.

So, it is not imperative that the price mechanism is the sole alternative and all firms have to decide when and how to allocate resources internally and when and how to use market exchanges. In order to illustrate this, Williamson speculates on Adam Smith's infamous pin-making example by introducing alternatives such as creating eighteen distinct transactions of pin-making between eighteen distinct entities of ownership; making these entities to be collectively owned by multiple capitalists or giving their control to a single capital owner. As another alternative, the pin-making firm could decide to be vertically integrated to include wire making (Williamson, 1996).

In order to understand and guide organizations in this make vs. buy decision, and how firms' boundaries are and should be formed, Transaction Cost Economics (TCE) focuses on three attributes of transactions: frequency, uncertainty and asset specificity. As the frequency of the negotiations and haggling increases, transaction costs increase. For uncertainty, any firm wants to avoid future risk as uncertainty increases and decide to vertically integrate, for example, to secure its strategic supply. When the asset specificity is greater, the buyer and the seller try to set up an exchange that has good continuity properties as each is locked into the other (Williamson, 1981). Opportunistic behavior and moral hazard are potentially significant as information asymmetry and bounded rationality results in incomplete contracts. In TCE terms, vertical integration is preferred when hazards of the market outweigh the benefits of using the market exchange.

TCE focuses on a firm's efficiency. For Schumpeter, however, it is the process of creative destruction, the process of industrial mutation that revolutionizes the economic structure from within that defines the essential fact of capitalism. This means that a system that is stable, repeatable and fully utilized at all times may be inferior to a system that acts otherwise over the long term as the latter may be doing so for long-term performance (Schumpeter, 1943).

The above situation have also echoed when Peter Drucker underlined the challenge between running an optimized organization today and becoming an innovative one for the long term. “it is organizational inertia which always pushes for continuing doing what we are already doing. At least we know – or we think we know – what we are doing. Organization is always in danger of being overwhelmed by yesterday’s tasks and being sterile by them”. Yet, the modern organization must be capable of inducing change and innovation by moving expensive and scarce resources of knowledge from areas of low productivity to areas of opportunity (Drucker, 1970).

The relationship between innovation and firm boundaries is thus yet to be studied further. Firms exist because they choose to perform certain activities within their boundaries rather than using the market exchanges, but this transaction costs economics approach applies most when there is a certain level of certainty and recurrence of transactions, or, in other terms, under a certain equilibrium (Williamson, 1981). One of the criticisms argues that Williamson may have omitted more dynamic scenarios because many innovation-related activities tend to occur within firm boundaries and are not described in transaction-specific terms (Ghoshal & Moran, 1996). Williamson also acknowledges that his treatment of efficient boundaries within a firm is only a part of the organizational issues: either a firm makes a component itself or buys it from an autonomous supplier. Alternative cases such as joint ventures and franchising are not taken into consideration (Williamson, 1981). In fact, he acknowledged that added complications would arise when innovations are introduced. Among its complications is the problem of timeliness. This is when non-standard forms of organizations such as parallel R&D and joint ventures are applied. Timing is also noted as a crucial factor when events are fast moving or learning-by-doing becomes essential. Equilibrium contracting may be superseded by alternative means when responsiveness in real time becomes a critical concern. (Williamson, 1981).

Research later points out to strategic technology alliances and acquisitions as alternatives to the sourcing of technological capabilities over a market interface

(Vanhaverbeke, Duysters, & Noorderhaven, 2002). However, this research also points out that sourcing preferences may change over time. In the early stages of an industry, firms might prefer strategic alliances, but as the industry matures, acquisitions may take precedence.

Knowledge-based sourcing activities require special attention and should be seen as a make-or-ally decision rather than a make-or-buy decision. In *Make, Buy or Ally? Theoretical Perspectives on Knowledge Process Outsourcing through Alliances*, Mudambi, et al. (2010) locate institutional alliances that are created through a separate corporate entity such as a joint venture closer to the focal firm while contractual alliances that are created through a legal agreement on contribution and benefits are found to be closer to market transactions. Resource integration, transaction-specific investment, and governance choices in Knowledge Process Outsourcing are demonstrated in Figure 1. From the transaction cost perspective, the authors find that the dyadic relationship between two firms are organized as an institutional alliance when the knowledge process is considered complex and proprietary, and the environment is perceived as uncertain. On the other hand, if the perceived behavioral uncertainty of the partner firm is considered low, primarily due to former ties, the transaction is more likely to be organized as a contractual alliance. Yet, the availability of a skilled talent pool, cultural compatibility, and locational specifics may also direct the governance choice (Mudambi & Tallman, 2010).

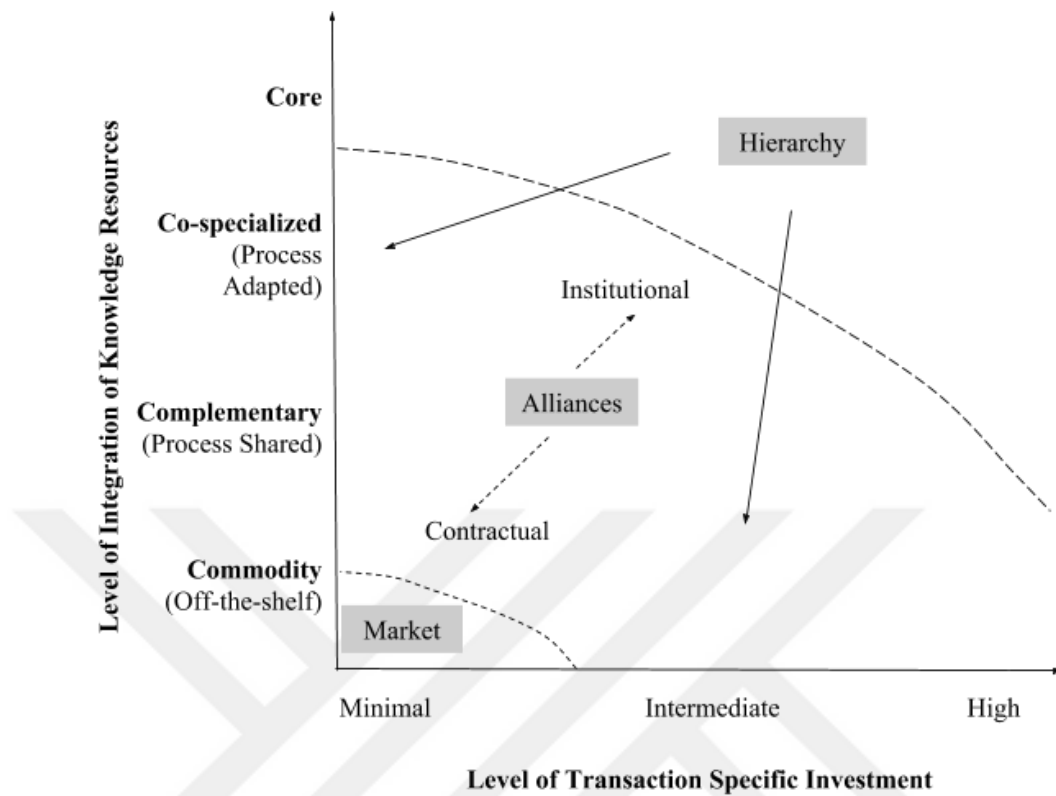


Figure 1 Knowledge Process Outsourcing (Mudambi & Tallman, 2010)

## 2.2. DYNAMIC CAPABILITIES

An alternative response to Coase's original question on why firms exist, is centered on knowledge by rejecting the moral hazard conceptions and selfish motivations of individuals. "Organizations are social communities in which individual and social expertise are transformed into economically useful products and services" by not only transferring knowledge but also by creating knowledge. This ability to create and apply knowledge is called combinative capability (Kogut & Zander, 1992). "The importance of the ability to generate new knowledge suggests a different view on the 'boundaries' of the firm, that is, what a firm makes and what it buys. Firms invest in those assets that correspond to a combination of current capabilities and expectations regarding future opportunities. Alternatively, in other words, the knowledge of a firm can be considered as owning a portfolio of options, or

platforms, on future developments. (Kogut & Zander, 1992)“. It is then imperative that firm boundaries are formulated based on future opportunities and the firm’s ability to innovate towards those opportunities.

Based on the firm’s ability to combine new capabilities, firms take make decisions when a new component requires production knowledge very similar to what the firm already knows (path dependence), purchase technologies when the suppliers have superior knowledge and license new technologies when a knowledge transfer can be combined with existing capabilities. Firms are pressed towards buying when immediate survival pressures are seen (Kogut & Zander, 1992).

According to Teece and Pisano, winners in the global marketplace have been the firms that can demonstrate timely responsiveness and rapid and flexible product innovation in environments where the character of the environment is shifting. The firms are required to create certain strategic responses to a high level of time-to-market and timing requirements. The environment is explicitly competitive as the pace of innovation accelerates, and determining the nature of future competition and markets become further difficult (Teece & Pisano, 1994).

Dynamic capabilities framework thus extends the capability-based view for firms in environments for rapid technological change. They can be summarized as the subset of the competencies/capabilities that allow the firm to create new products and processes as they respond to changing circumstances in the markets they operate. The ‘capabilities’ term emphasizes the importance of adapting, integrating and reconfiguring internal and external organizational skills, resources and functional competencies to match the new environmental requirements. The term ‘dynamic’ then emphasizes the reference to a Schumpeterian world of innovation-based competition on rapid technological change, time-to-market criticality, inability to determine the state of future markets and competition, and the 'creative destruction' of existing competencies (Teece, Pisano, & Shuen, 1997). When applied to the theory of the firm, competencies, and capabilities are seen as ways of organizing and getting things done which cannot be sourced using the price

mechanism. Thus, the “very essence” of most capabilities and competencies is that they are not readily available through markets (Teece, Pisano, & Shuen, 1997).

This does not mean that firms are in a position to build all the necessary capabilities by themselves without working with externalities. The ability to acquire technology externally is as equally crucial as developing technology internally and in order to enhance their ‘absorptive capacity,’ firms should build upon their learning activities and skill accumulation because “the boundaries of the enterprise need to be artfully contoured for each major innovation” (Teece D. J., 2009).

Absorptive capacity details this boundary-crossing capability of acquiring knowledge and combining it with the existing knowledge base and requires specific capabilities of the internal staff because hiring new technical staff alone do not respond to the need to combine new technical knowledge with existing procedures, routines, complementary capabilities and relationships in a timely manner (Cohen & Levinthal, 1990). This can be extended to different boundary-spanning roles (Tushman, 1977; Teece, 1996) within the organization as well as across the organizational boundaries. This included the role of an ‘idea scout’ and an ‘idea connector’ (Whelan, Parise, de Valk, & Aalbers, 2011). However, just as the organizational knowledge is tacit, the organization’s absorptive capacity also depends on the links among a set of individuals. Thus, absorptive capacity spans a broader scope than the individuals themselves (Cohen & Levinthal, 1997).

Some authors (Lichtenthaler & Lichtenthaler, 2009) extend the absorptive capacity research with capacity and capability-based framework to cover various flows of information and co-exploitation. In this framework, six knowledge capabilities are defined to describe a firm’s capabilities for managing different knowledge processes for exploration, retention, and exploitation inside and outside the firm; all grouped under a dynamic capability called “knowledge management capability.”

In this approach, each of the internal and external explorations, retention and exploitation steps are associated with a different capacity. Inventive capacity is the firm’s ability to generate new knowledge inside the firm while absorptive capacity

is the ability to acquire external knowledge and to incorporate this into the firm's knowledge base. Transformative capacity is the firm's ability to internally retain its knowledge over time through assigning resources, by reactivation and synthesis of knowledge with additional knowledge and hence reactivating this knowledge over time. Connective capacity, a much-neglected area, is then the knowledge retention ability outside the firm's organizational boundaries and through inter-firm relationships, alliances and other relationships. Innovative capacity and desorptive capacity then take this knowledge and related inventions into the final market through commercialization. Innovation capacity is the firm's ability to exploit the knowledge within the firm's boundaries while desorptive capacity is to exploit the knowledge outside firm boundaries (Lichtenthaler & Lichtenthaler, 2009).

The framework systematically approaches the innovation process from a knowledge management perspective and its different forms throughout the exploration, retention and exploitation steps. Managers then should actively reconfigure and realign their knowledge management capabilities to transform a firm's knowledge base as markets and technologies change. Furthermore, decisions on developing knowledge capacities and knowledge management capacity need to be aligned with a firm's strategy while structural (e.g., spatial separation) forms, contextual mechanisms (systems, processes, and beliefs) and leadership mechanisms also contribute to reconfiguring the knowledge capabilities. In result, the framework helps broaden managers' perceptions of knowledge management, how this capacity should be built to support reconfiguration and realignment, how changes in organizational structure and culture should be addressed such that the firms can adapt to changes in their environment (Lichtenthaler & Lichtenthaler, 2009).

*Table 1 Overview of Lichtenthaler & Lichtenthaler's Framework*

	<b>Knowledge exploration</b>	<b>Knowledge retention</b>	<b>Knowledge exploitation</b>



<b>Internal (intrafirm)</b>	Inventive capacity	Transformative capacity	Innovative capacity
<b>External (interfirm)</b>	Absorptive capacity	Connective capacity	Desorptive capacity

A very similar capability called multiplicative capability is the ability to exploit innovations outside the boundaries based on knowledge transfer and partner selection skills while relation capacity is the ability to select and work with firms under alliances and joint ventures (Gassmann & Enkel, 2004).

Another dimension to explore the knowledge transfer choices is to analyze different types of innovations. Although it is difficult to come up with a classification of innovation types and vertical integration choices related to them, Teece (1996) uses two types of innovation to discuss such relations by also taking firm capabilities into account.

An autonomous innovation, such as the introduction of a faster microprocessor (e.g., the Intel Pentium technology) using the same architecture can be introduced without making significant changes to the other parts of the system. If the firm has the capabilities to exploit within the firm, internal development might work without problems, but if the needed capabilities are outside the firm, relational structures such as virtual teams can work. In the case where the needed capabilities should also be created from scratch, either internal development or equity alliances should be preferred to manage contractual issues and appropriability (Teece, 1996).

In a systemic innovation, most components of the system throughout are as well impacted, as in the introduction of the audio CDs to replace vinyl records and cassette tapes (Teece, 1996). For systemic innovations, tight control, strong integration, close coordination of staff and a hands-on approach to intellectual property issues are needed. However, some competences may remain outside the boundaries of the firm which, in result, may require alliances to be formed. If the

innovation requires entirely new capabilities to be developed, the firm's investments are again preferred over network arrangements (Teece, 1996).

Other research focused on recent developments on what Williamson called "hybrid" modes of organization, such as long term contracts, joint ventures, alliances and the like to understand the relationship between firm boundaries and innovation, so the original question about the nature of the firm turns from a 'make vs. buy' decision to 'make vs. buy vs. ally decision' (Jacobides & Billinger, 2006).

The relationship between the vertical integration decision and the innovation needs can also change over time. A competence that is not priced on the market may need to be exploited internally at first, but as the market catches up and the technology becomes a commodity, the firm may prefer to move to external resources (Teece, 1996).

Noteboom et al. (2007) argue that the cognitive distance between firms that hold different resources and innovative performance are related. Performance differs when resources are either very similar or very different. According to his research, there is an inverted U-shape relationship between cognitive distance and innovation performance: as cognitive distance increases between involved firms, it has a positive effect on learning by interaction as it allows for opportunities of novel combinations. As the cognitive distance exceeds a certain point, however, a sufficient basis for mutual understanding disappears. In other words, the challenge is to find a partner at sufficient cognitive distance to tell something new, but not so distant as to preclude mutual understanding.

One of the focus areas of dynamic capabilities is organizational processes. How internal activities are integrated within the firm and with outside parties, make a difference on a firm's performance. Those processes include routines for gathering and processing information, how customer experiences are linked with engineering design choices and how external activities, technologies, and suppliers are coordinated. The choices made in the design of those processes make a difference in development costs, lead times and quality. Incumbent firms are then challenged

when systemic innovations hit the market and require those processes to be refined. Such changes may even change the boundaries of the firm through additional integration or disintegration (Afuah, 2001; Wolter and Veluso, 2007). Teece and Pisano (1994) give the example of ‘lean production’ model that has transformed the Taylor or Ford model of manufacturing organization within the automotive industry. Lean production changed not only shop-floor practices and processes but also higher-level management practices such as innovation management and contracting with suppliers. Japanese engineering teams’ success in creating high-performance cars, or as consumers would call them (Womack, Jones & Ross, 1990), high-tech wonders that perform better than their Western competitors, is mentioned as an example. This ‘lean innovation’ success, had put engineers in charge of the design process for meeting new market requirements while suppliers were not selected based on their bids, but on the basis of past relationships and performance. The contractual forms allow both parties to work on mutual benefit using a ‘basic contract’ that lays the basis for a cooperative relationship, one that is fundamentally different from the relatively adversarial relationships between supplier and assembler in the West (Womack, Jones & Ross, 1990).

Transaction cost economics and capability-based theories seem to differ fundamentally on how firm boundaries are formed and evolve over time. However, recent research points out that these two theoretical perspectives may be complementary at worst. Recent scholars argue that this false dichotomy between the two theories should be replaced by an approach that takes capabilities and transaction costs as intertwined (Argyres & Zenger, 2007; Jacobides & Winter, 2005).

However, it is difficult to come up with a general, overarching theme on how firm’s integration decisions are formed in the case of a technological change when both transaction cost economics and dynamic capabilities are considered. Additionally, there may be industry-specific differences between those formulations. Yet, there is an ‘interplay’ between the two theoretical perspectives in the context of innovations. While Wolter and Veluso’s (2007) research within the manufacturing

industry argues that uncertainty under a technological change is a significant factor that shapes boundary formulations, TCE argues for the incompleteness of contracts due to information asymmetries and bounded rationality. Opportunism is an additional risk for both transacting parties hold-up, ex-post. Uncertainty amplifies the transaction costs both by complicating the contracting phase and by contract updates and renegotiations as unknowns become known over time. Thus, the higher the uncertainty, the higher the tendency to move towards vertical integration. The competency perspective looks at the problem differently: in the case of a technological change, existing processes and resources may become rigid in absorbing new knowledge and innovation where market dynamics may allow reaching to the right suppliers quickly. This also prevents investments from becoming obsolete should the uncertainty causes misguided decisions in resources or capital goods. According to these arguments, vertical disintegration is the answer to technological uncertainty.

The empirical data in various industries showed variations in response to those theoretical perspectives. Modifying boundary formations is not the only way to respond to uncertainty. Today, a spectrum of interactions between firms is the practice rather than a discrete 'market vs. integration' approach to innovation. In result, firm boundaries are becoming blurred and turning into a continuum (Araujo, Dubois, & Gadde, 2003). In the next section, I walk through a more practical perspective on cross-boundary innovation, but I revisited selected conceptions from both the TCE and dynamic capabilities perspectives when summarizing the literature review.

### **2.3. CROSS BOUNDARY INNOVATION**

Innovation is very often thought of as a collaborative process of multiple actors today. But this was not the case for the most of management history. In this section I try to review the historical background that shapes our understanding of cross-

boundary innovation. Then I summarize the contemporary theoretical perspectives such as open innovation.

Charles Darwin was the beneficiary of a father whose highly successful angel investments in the first industrial revolution were accompanied by dynastic alliances with the enormously wealthy Wedgwood family. The Cavendish Laboratory at Cambridge University, founded in 1874 under the initial Cavendish professor James Clerk Maxwell, was a gift of William Cavendish, Seventh Duke of Devonshire. Alfred Loomis sold out of his successful investment banking firm before the Crash of 1929, and he created a physics laboratory on his estate in Tuxedo Park, New York, where he financed and participated actively in work that contributed to the invention of radar in time for the Second World War. What links these and a host of other instances is the funders' utter lack of interest in economic or financial return (Janeway, 2012).

Habermas summarizes the dynamics of science-making before this period:

“the modern sciences produce knowledge which through its form (and not through the subjective intention of scientists) is technically exploitable knowledge, although the possible applications generally are realized afterwards. Science and technology were not interdependent until late into the nineteenth century. Until then the modern science did not contribute to the acceleration of technical development nor, consequently, to the pressure toward rationalization from below. Rather, its contribution to the modernization process was indirect. (Habermas, 1989).”

From the 1920s to 1970s, central research laboratories were funded by the monopoly profits of the great corporations (Janeway, 2012). It was through this process the big corporations moved into a space which was previously funded by wealthy individuals based on curiosity and philanthropy.

During World War II, the engagement between the state and science and technology became quite clear: it was the development of many military capabilities that allowed for later progress in space travel, magnetic resonance imaging (MRI), and

computing. Despite the decrease of war-economy demand, investments in science and technology improved in the post-World War II period. At war's end, Vannevar Bush, who had served Roosevelt as founder and director of the Office of Scientific Research and Development (OSRD), delivered to President Truman, a proposal for continuing this investment of public funds. In *Science, the Endless Frontier*, Bush argued that the U.S. did not have a national science policy and that utilization of science in the nation's welfare has only recently started, pointing out that a central entity is missing in the government structure to formulate and execute the national science policy. "The Government should accept new responsibilities for promoting the flow of new scientific knowledge and the development of scientific talent in our youth. These responsibilities are the proper concern of the Government, for they vitally affect our health, our jobs, and our national security. It is in keeping also with the basic United States policy that the Government should foster the opening of new frontiers and this is the modern way to do it" Bush claimed. He suggested research in military problems, public health, certain medical research, and other research that requires expensive capital facilities should be invested further by active government involvement and support (Bush, 1945).

Later on, when the Cold War period and Kennedy's space program took off, it required another scientific and technological capability building in the U.S. with many people signing up for science and engineering faculties (Friedman, 2005). The New York Times greeted the Bush report on the day it was published and later resulted in the foundation of the National Science Foundation and the National Institutes of Health, despite it grew out of a national military crisis (Bush, 1945).

However, state funding in research and development was not the ultimate position for the government. Another crisis, in the mid-1970s, have triggered the establishment of the missing link between science and technology and the market: commercialization (Loise & Stevens, 2010).

In the context of these crises, the public has questioned many policies, one of which was the federal government funding for research. The Economist describes those

days in its December 2002 issue: “Remember the technological malaise that befell America in the late 1970s? Japan was busy snuffing out Pittsburgh’s steel mills, driving Detroit off the road, and beginning its assault on Silicon Valley. Only a decade later, things were very different. Japanese industry was in retreat. An exhausted Soviet empire threw in the towel. Europe sat up and started investing heavily in America. Why the sudden reversal of fortunes? Across America, there had been a flowering of innovation unlike anything seen before” (Loise & Stevens, 2010). In the early 1980s, the federal government held approximately 28,000 patents, where only 5 per cent of those were licensed to the industry for the production of commercial goods. The ownership of federally funded inventions would remain with the government, not leaving any ownership with inventing institutions. Instead, the government would make those inventions available to anyone who wanted to practice them through non-exclusive licenses. This approach posed a practical problem because many industries would then choose not to invest in technologies using those patents as anyone else could copy the same inventions and undercut the prices of competing goods because they would not have to pay for the license fees. The Bayh-Dole Act re-organized the roles in this domain, leaving ownership rights with the inventing institution and allowing for exclusivity in licensing. According to *The Economist*, this was United States’ “most inspired piece of legislation” between the 1950s and 2000s as it “unlocked all inventions and discoveries that were made with the taxpayer’s money.” As a result, between 1996 and 2007, university-licensed products created 279,000 jobs as well as a \$187 billion contribution to the GDP in addition to an entirely new industry called biotechnology – holding 1.42 million jobs in 2008 (Loise & Stevens, 2010). In 2003 alone, American universities collected \$1.3 billion from patent licenses (Friedman, 2005).

The Bayh-Dole Act was not the only single factor for all innovation development in the U.S. – nor is the U.S. the only country in the world that has pushed for innovation policy reforms. However, it underlines a commonly accepted proposition that developments in science and technology research would spark

inventions, inventions would be commercialized through innovation and entrepreneurship to create new jobs, growth, and development.

Despite this collaboration with the universities, Chesbrough calls the post-war innovation system of many U.S. companies 'Closed Innovation'. In his seminal book, *Open Innovation, The New Imperative for Creating and Profiting from Technology* he compares and contrasts two periods of corporate innovation (Chesbrough, 2003). In the golden age of the closed innovation model, as described until this point, large companies invested in large central research labs and enjoyed important downstream market positions which allowed them to capture a significant portion of the value they created in their labs. This value would then be reinvested into more research, and a virtuous cycle would be established. The output of the research activities would be managed as a knowledge bank – i.e., ideas would be put on the shelf until a downstream business was ready and willing to use them.

According to Chesbrough, some factors caused an erosion of this model since 1980s except for only a few industries continuing to enjoy the closed innovation model because of the strong intellectual property rights, strict regulations, and a shortage of start-ups and venture capital. However, other industries experienced the following four erosions (Chesbrough, 2003):

The first erosion factor is the availability and mobility of skilled workers due to many reasons. This caused information to be more widespread, which allowed new companies to hire experienced staff trained by another company or hiring consultants. The trend created a highly-talented market, which allowed engineers to surf across companies, allowing even start-ups to pioneer the commercialization of new technological promises. Individuals were also incentivized to leave the larger firms to gain a higher return by joining new companies or by investing in their continuous education.

The second change was the increasing number of venture capital firms. Chesbrough notes that the venture capital investments in the United States increased from \$700 million in 1980 to more than \$80 billion in 2000. Today, many notes that the initial



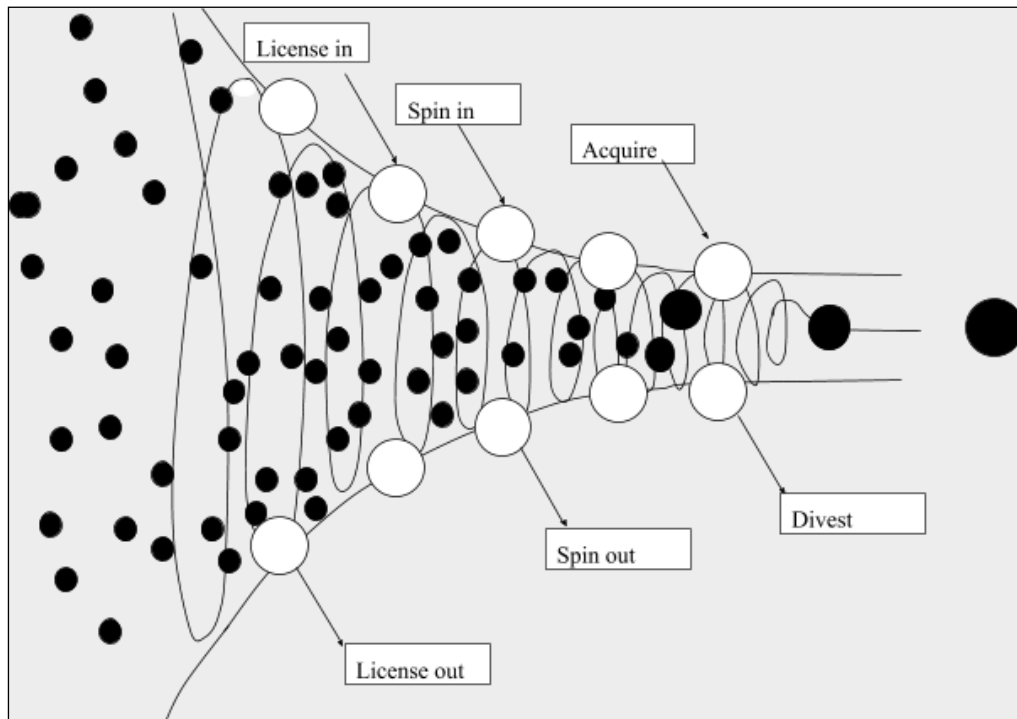


Figure 2 Open Innovation across the firm boundaries (Kirschbaum, 2005)

investment for a start-up has decreased to lower levels compared to 2000. All these factors allowed risk taker corporate staff to join the start-ups, taking with them the learnings of the corporate R&D labs.

The next erosion factor was the availability of new channels for ideas sitting on corporate shelves. Along with the mobility of the workers and venture capital, globalization and access to new markets allowed disillusioned corporate employees to look for new external options to pursue their ideas, including spin-offs.

As the forth erosion, the increasing capability of external suppliers, powered by the outsourcing paradigms since the 1980s, allowed any new firm to use these shared capabilities and quickly build upon existing and accessible technical knowledge in the marketplace.

In result, many ideas sitting on corporate shelves started to leak out, causing the closed innovation paradigm itself to erode (Chesbrough, 2003).

These erosions are later accompanied by some knowledge diffusions: meaning knowledge monopolies reached their end and knowledge was democratized across. These diffusions are exemplified by changes in the number of patents held by the top-twenty patent holder companies in the U.S., the changes in the number of patents held by non-U.S. companies in the U.S., and the changes in the sizes of the companies that invest in industrial R&D in the U.S over time. These are also accompanied by changes in workforce policies (e.g., pension schemes becoming highly mobile across companies an individual works for). Even though Chesbrough's analysis focuses mostly on the dynamics of the U.S. market, he still builds a strong case for increasing adoption of the Open Innovation model.

Creation of a new product or service can occur in various forms as the ideas and business models move across the boundaries of an organization. In early stages, to the left of Figure 2, new ideas, knowledge, patents or artifacts can be licensed in from outside, or if they do not find a fit in the downstream processes of that firm's commercialization process, they can be licensed out. In further stages, as the product becomes more materialized the business entity that is responsible for it can be acquired or have spinned-out (Kirschbaum, 2005). Open Innovation paradigm, in brief, is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively (Chesbrough, 2006).

Chesbrough argues that the Open Innovation paradigm, even though it builds on previous works, deserves to be studied as a separate paradigm. It is not that knowledge and learning are addressed the first time within the innovation context. Kogut and Zander, address knowledge and learning when they reject the transaction cost theory approach, place the knowledge of the firm as the basis of its existence, and define "combinative capabilities" as the ability of the firm to synthesize and apply current and acquired knowledge (Kogut & Zander, 1992). Previous knowledge-based theories around the firm such as absorptive capacity (Cohen & Levinthal, 1990) places the firm always as the locus of innovation, and information flow was mostly from outside towards inside (outside-in). However, Type II errors

(false positives) - the evaluation of new projects as “no fit” for the business model of the firm, could be spinned-out (inside-out).

Chesbrough’s bi-directional, two-actor based model of outside-in and inside-out knowledge flows for open innovation was quickly enriched. Gassman and Enkel (Gassmann & Enkel, 2004) re-categorized open innovation into three processes. The outside-in process enriches the company’s knowledge base through the integration of suppliers, customers, and external knowledge sourcing to increase a company’s innovativeness. The inside-out process earns profits by bringing ideas to market, selling IP and multiplying technology by transferring ideas to the outside environment.

The coupled process, as seen in Figure 3, couples the outside-in and inside-out processes by working in alliances with complementary partners in which give and take is crucial for success.

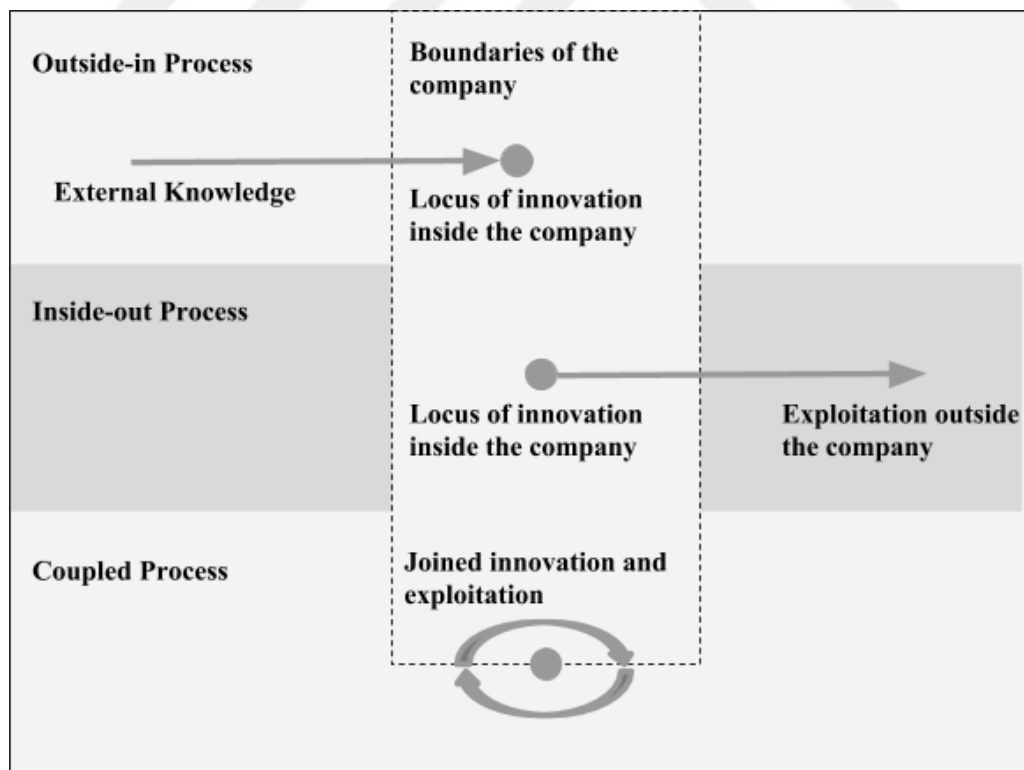


Figure 3 Coupled Process (Gassmann & Enkel, 2004)

Further research elaborated on other relational forms between organizations when studying innovation research. Howells, analyzed innovation intermediaries in 2006 (Howells, 2006). The de facto understanding towards intermediaries in the innovation process is that they operate in a triadic, one-to-one-to-one basis between a supplier and her customer. Howells' analysis demonstrates that innovation intermediaries are increasingly involved in complex relationships such as many-to-one-to-one, one-to-one-to-many, or even many-to-many-to-many relationships.

Innocentive, one such intermediary, helps 'seekers' in formulating their problem statements, publishes these problems to its network of 'solvers.' Seekers typically fund a financial reward, which is awarded once Innocentive pre-sorts the solutions and the seeker evaluates the solution. In this anonymous process, Innocentive handles all the communication as well as the transfer of the IP rights between the solver and the seeker. These models are not without challenges: getting the seeker's scientists involved in problem definition, selecting the right problems. Due to the anonymous nature of the relationship and the seeker scientist's definition of the problem, solvers might not understand the context well enough or the seeker scientist may prematurely guide them in the wrong direction as she has a particular assumption as to how a particular problem should be solved (Sieg, Wallin, & Von Krogh, 2010). Intermediaries can be further analyzed and categorized under three groups: platform providers such as Hypios and IdeaConnection offer platforms for others where innovating companies can post their technological needs or offerings; software companies such as Inno360, Spigit, create platforms for ideation and searches; and crowdsourcing companies such as IdeaScale and Threadless provide access to consumers (Roijakkers, Zynga, & Bishop, 2014).

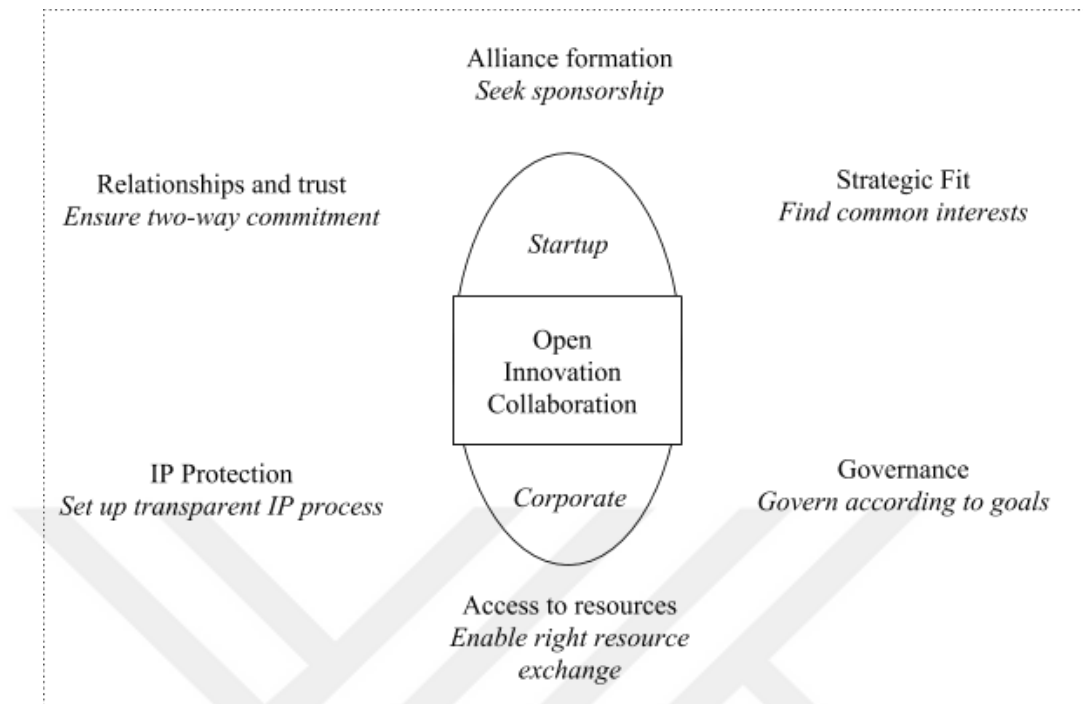
Some issues surface due to this firm-level focus: open innovation have studied with a narrow, managerial perspective that is focused on topics mainly relevant to top management and the firm perspective prevents the understanding of an unbiased view on the collaboration between various innovation partners. A dyadic or innovation network perspective is required to understand the real incentives of all the partners involved. The research should be then also extended to understanding

the “mechanism driving open innovation within an organization” (Vanhaverbeke, Chesbrough, & West, 2014).

Even though Chesbrough’s original work was on his research at high-tech companies, in 2006, he extended his research to demonstrate that this new paradigm have also been used in other industries such as chemicals, medical devices, aerospace, thermoplastics and consumer packaged goods, which can still be categorized as research in the production industries (Chesbrough & Crowther, 2006). In 2010, *Open Services Innovation* was published where Chesbrough studied services companies such as Xerox, GE Aviation, KLM Royal Dutch Airlines, and Merrill Lynch to demonstrate the usage of open innovation in the services arena (Chesbrough, 2010).

Recent research has also focused on developments on “hybrid” modes of organization, such as long-term contracts (Williamson, 1996), joint ventures, alliances and similar in order to understand the relationship between firm boundaries and innovation. Therefore, the original question about the nature of the firm turns from a ‘make vs. buy’ decision to ‘make vs. buy vs. ally decision’ (Jacobides & Billinger, 2006).

A recent working paper (van der Boezem, Schobe, Pascucci, & Dries, 2015) on the collaboration between startups and corporates focus on the dynamics of open innovation collaborations in a detailed manner. At the center of the research are StartLife, an intermediary that has worked with 120 startups since 2008; Foodcase, a startup focusing on an innovative way to produce ready-to-eat meals that are shelf stable at ambient temperatures; and Gate Gourmet, a market leading airplane catering and provisioning firm.



*Figure 4 Best practices for corporate-startup collaborations (van der Boezem et al., 2015)*

The paper identifies some critical success factors for the study to understand the critical success factors in the high-tech industries and how they compare to the agri-food industry. These factors are grouped under alliance formation, strategic fit, governance mode, access to resources, relationships and trust and intellectual property (IP), as shown in Figure 4. Research found that Foodcase and Gate Group partnered strategically, with a Gate Group equity stake in Foodcase, with no Gate Group executive taking a seat in the board of Foodcase. Foodcase continues to work with other partners to increase its sales while it is also financially supported by well-known financiers as well as StartLife. In R&D collaboration, both sides allow unrestricted access to resources, to technology as well as market and customer data while there was not enough data to conclude on relationship and trust dimensions. On the IP protection side, Foodcase did not hold any patents, but trade secrets were enforced across the partnerships (van der Boezem, Schobe, Pascucci, & Dries, 2015).

The authors also report some findings as a result. Open innovation makes it possible to innovate and differentiate successfully in a market that is generally considered to be slow and has a low degree of innovation, yet is highly competitive. Building a network of partners and having clarity in what partners to involve within which stages and how to involve them is critical for a startup to invent and commercialize the concepts successfully. Further, it was found that best practices and success factors identified for the high-tech industry applied to the agri-food industry, but authors would note that more research would be necessary to confirm this. The value of a facilitator was critical for Foodcase and authors note that the role of this intermediary is understudied in the literature. Lastly, Foodcase leveraged the strengths of Gate Gourmet to access the market while being conscious about its weaknesses, but it is only through this consciousness Foodcase became successful in achieving competitive advantage – it did not come automatically due to the corporate-startup partnership (van der Boezem, Schobe, Pascucci, & Dries, 2015).

More structured frameworks are being developed to formulate how open innovation should be governed within an organization. Enkel et al. (2011) formulate a 5-level framework. At the center of this framework are leadership, incentives, and communication. Leadership addresses not only spoken and written support for open innovation but also ‘walking the walk.’ The incentive system needs to cover targets, assessments, and awards. Communication addresses both strategy communication to the organization and sharing success stories back with the organization. The initial environments where this model is tested also point out to some practical concerns: the attitude of legal and IP departments should support open innovation while the best attitude is mentioned as seeking to create win-win contracts (Enkel, Bell, & Hogenkamp, 2011). Sabiölla et al. (2017) formulated a more detailed framework for management of open innovation where six factors are identified as main pillars: strategic alignment, governance, methods, information technology, people and culture. Strategic alignment ensures that the open innovation strategy is in alignment with the organization’s business and technology strategy. Governance tries to address cross-boundary decision making, roles and responsibilities, partner

relationship management and intellectual property management. Methods address tools, techniques, and practices related to knowledge exploration, retention, and exploitation. Information Technology factor maps those to practical software and hardware to enable a smooth execution. Culture addresses the values and beliefs about open innovation within the organization as well as risk attitude and leadership attention.

We can summarize that for any cross-boundary innovation to work, some critical factors need to be observed. Among those, strategic fit, culture and communication, processes and governance take precedence. However, the research so far has not focused on how innovations work on a day to day basis and how these maps to those critical factors.

As demonstrated in the Foodcase example, there are multiple variations of collaboration modes that are applicable even in tight integrations, so joint-ventures are not the only option today - ranging from investing in a minority stake in the innovation partner to newly formed contractual forms. Joint ventures and even investments in startups may still require a lot more up-front investigation and may limit innovation potentials due to exclusivities, thus increasing transaction costs. Thus, it is still worthwhile to explore contract-based, market exchange scenarios in radical explorations scenarios.

So, before moving on to contracts, it is worthwhile covering urgency and agility within innovation research literature.

## **2.4. INNOVATION URGENCY AND AGILITY**

The introduction of new technologies in transportation and communication has also allowed economies of speed (Chandler, 1977). In an example by Drucker (1985), a pharmaceutical firm would continuously review its innovation process to assess whether their drug developments are going “at the right speed.” This is because “global competition and diversification in the sources of new knowledge compels firms to make decisions faster, and to reduce time to market in order to capture



value from technological innovation (Teece D. J., 1996)“. Those companies who fail to respond promptly allow for disruptive technologies to emerge and invade the “slacks” in established value networks with stunning speed (Christensen, 1997).

Traditional manufacturing required long lead times between activities to resolve conflicts between activities using the same resources. In order to plan for better production output and lower costs, they would depend on forecasts and economics of scale. In result, they paradoxically build up more inventory and lengthen lead times, thus getting trapped in the ‘planning loop.’ An alternative approach is to reduce time consumption in first manufacturing, then sales and distribution and finally in innovation. Japanese manufacturers made many organizational changes to achieve fast-paced innovations such as emphasizing smaller but much more frequent increments in new products, using cross-functional teams, and localizing responsibility, hence using time as a source of competitive advantage (Stalk, 1988). Those cross-functional teams take a ‘rugby approach’ in iteratively working on a single problem from start to finish and revisit its direction when new information becomes available. Learning is both multilevel and multifunctional, meaning that all levels within the organization learn from those iterations while team members are also encouraged to learn from other team members with different disciplines (Takeuchi & Nonaka, 1986). As most market-based learning comes from customer feedback, and the iterative approach enables the innovators to close the customer loop by experimenting and fine-tuning. This allows them to learn whether a particular innovation may be a hit by the customers and adjust to the customers’ reactions (Stalk & Hout, 1990).

Urgency and time pressure require innovative organizations to formulate team structures and innovation processes accordingly (Scranton, 2006). Pearson (1990) makes a classification of innovation projects based on three dimensions, namely the uncertainty on the market (ends), the technical approach to be used (means) and time pressure to realize the innovation. The following uncertainty map gives implications for the management of innovation projects.

*Table 2 Uncertainty Map (Pearson, 1990)*

Uncertainty about			Issues raised and implications for strategy
Means	Ends	Urgency	
Low	Low	Low	Fairly straightforward, maintaining motivation and providing resources is important
Low	High	Low	Requires systematic market analysis – use idea generation techniques, enter markets sequentially.
Low	High	High	Prioritize and enter rapidly – use joint ventures or acquisitions, do not spread resources too widely.
Low	Low	High	Generate commitment – rugby team approach, give high priority and provide necessary resources.
High	Low	Low	Planned and sequential testing – use alternative approaches, consider doing more background research.
High	Low	High	Set up competitive projects – parallel technical activities, buy in technical skills, know when to stop but do not give up too soon.
High	High	Low	Background, exploratory research – encourage ‘free’ activity and ‘bootlegging’, be open to opportunities
High	High	High	Multiple approaches – spend heavily on basic and exploratory research, try not to get caught in this area.

In tackling innovation under specific scenarios, creating parallel streams, using external teams through joint ventures and taking multiple approaches were being adopted. On the other hand, Hoedemaker et al. underline that there is a limit to concurrency in new product development and communication issues arise as team complexities surface (Hoedemaker, Blackburn, & Van Wassenhove, 1999).

However, there is a significant pressure to act in urgency. As the product life cycles shorten and customer demands are increased, speed to market becomes a more critical determinant of success or failure for a firm, and this is especially true for markets affected by radical technological innovations. In the case of radical innovations, product-class conditions change dramatically, and if the incumbent firm does not build and gain the necessary product development capabilities in time, it risks failure. This urgency is very much related to winning a dominant market share before any other competitor can. If the firm can reach this market-share rapidly by introducing new products, it can then use this position to enjoy economies of scale and new opportunities for learning. Furthermore, this market share can allow the firm to position its product as the industry standard, which allows the firm to restrict competition severely (Lambe & Spekman, 1997).

Today, there is even more talk about speed. One example used is the chessboard analogy: you put one piece of grain into the first square on your chessboard, two into the second, four into the third, and continue in that order. Once you reach the second half of the chessboard, the growth is so phenomenal that no one can hardly compute the amount of grain. The same is happening in digital technologies today with increasing computing power, network bandwidths, storage, and memory at much lower costs than imaginable – and it is not only the computing field that benefits from these changes (Brynjolfsson & McAfee, 2014). From telecommunications to transportation, all infrastructure becomes more affordable and faster to disrupt many incumbent industries in the process. Banks have moved to the Internet and e-commerce is practically removing national boundaries and tax walls. This exogenous impact of exponential technology advances is forcing decades-old industries to look for new ways of connecting with their customers or else; other new entrant companies do (Kessler & Chakrabarti, 1996; Carbonell & Rodriguez 2006).

Under these circumstances, and in an iterative fashion, risk-taking firms may release new products to the market quickly to explore the market with the intention to tweak and improve as market segments are not formulated yet (Chen et al., 2010).

“Faster development is one of the most practical ways to gain a competitive advantage and exerts a positive impact on new product performance. Findings from this study suggest that the “hype” associated with innovation speed is largely justified. Our results show that innovation speed has a positive effect on superior new product performance supporting the argument that faster development means higher returns and an increased market share. (Carbonell & Rodriguez, 2006)”

Innovation speed, defined as the time elapsed between the conception of innovation and the ultimate commercialization of it, then refers to the activities throughout the product development process and is considered a rarely studied factor in the literature. The unit of analysis has varied from individual level to project to an organizational level. Kessler and Chakrabarti’s work is also at the project level (Kessler & Chakrabarti, 1996). In their model, exogenous factors such as competition, technological and demographic dynamism all put pressure on the firm to increase the speed of innovation while regulatory restrictiveness is observed as a negative factor. However, what happens within the firm is the core of their analysis. They analyze the firm context under two dimensions: strategic orientation for speed and organizational capability for speed.

At the strategic level, an emphasis on speed, goal clarity, and project support are found to be positive contributors to speed while project stream breadth and degree of change are found to be otherwise. External sourcing is also observed as a positive contributor to innovation speed: “Regardless of how many projects are undertaken or how ambitious each project is, time can still be saved if organizations consciously limit internal tasks required and seek out external components. Firms often lose time because they insist upon doing all the work themselves, instead of speeding up projects by selectively borrowing already-completed advances made by others (Kessler & Chakrabarti, 1996)”.

Project change is also explored in detail: “radical innovation is more complex and increases risks and uncertainties, information needs, workloads, and the number of people involved in projects. Consistently, some recommendations to reduce time to

market involve (a) following the Japanese principle of kaizen, or taking frequent & small steps forward and (b) developing underlying core technologies and product platforms, which spawn a number of rapidly marketable, incremental products over time to address various product niches in a defined segment (Kessler & Chakrabarti, 1996).”

At the organization level, some staff-related factors have been identified: the presence of an active project champion, the strength of the project leader, the experience of team members and representativeness of the teams. Among those, representativeness of teams emphasizes that the participation of internal and external interest groups influence innovation speed, as this enables a better market fit for the resulting outcome. Furthermore, the lack of good relationships with outside stakeholders can slow down products in getting to market (Kessler & Chakrabarti, 1996). In addition to staff-related factors, some structure-related factors have been identified: (1) team empowerment represents whether the team can make project decision on its own, without having to go through approval gates and cycles, (2) project integration corresponds to whether the information is broken down to smaller units and these pieces are continuously passed from one process to another in small batches, and (3) process organization considers whether the physical distances of the team members are minimal such that they can communicate and collaborate at an arm’s length, as such teams have better chances of innovating faster.

Software development practices have emerged since the 1950s with the introduction of large software development programs in the military and space research. In later decades, software development also proved to be a means of improving productivity and efficiency in the business world, with increasing complexity and challenges. This initial heroic or craft-based software development period was mostly heroic with ‘converts’ from other educational backgrounds moving into the field and continued between the discussions of whether software development was art or craft. The second period started in 1968 as the term ‘software engineering’ was proposed at a NATO Conference as an answer to the

then-crisis of software development – the problem that most projects were neither on time nor on budget (Sommerville, 2011). Later decades saw the developments around standardization of these practices, establishment of institutes such as the government-funded Software Engineering Institute (SEI) at the Carnegie-Mellon University and maturity models such as the Capability Maturity Model (CMM) of SEI, the PRINCE (PRejects IN Controlled Environments) of the United Kingdom, and other various certifications. ISO 12207 Software Lifecycle Processes was also introduced in 1995. From an institutional perspective, this was the period when the software industry had received global certification standards of software vendors as well as individuals in software project management. The focus was to create a repeatable, foreseeable software development practice with well-defined phases of software projects: analysis, design, development, and testing. Also called the Waterfall approach, this methodology became the mainstream, silver-bullet approach to software development and landmark customers (such as the U.S Army, NASA, the U.S. Government, major financial institutions) required software vendors to work under these models and to submit certifications in CMM or similar. As the concept of isomorphism (DiMaggio & Powell, 1983) suggested, many organizations (vendors or internal development teams) went after these certifications as well.

Although these methods provided better results in certain areas, this engineered approach did not solve the software crisis in its entirety. Thus, the 21st decade was met with a new approach, and the new era can be called the ‘Agile Period.’ The late 1990s saw the emergence of some practices such as eXtreme Programming (XP), Scrum, and other similar practices but it was in 2001 when some software practitioners declared the groundbreaking ‘Agile Manifesto.’ These practitioners refused to work on contracts and pre-committed plans for long and subject-to-change requirements and proposed a new, agile model with some main assumptions. The manifesto summarizes these as follows: “we have come to value: individuals and interactions over processes and tools, working software over comprehensive documentation, customer collaboration over contract negotiation,

and responding to change over following a plan” arguing that based on their experience, these concepts fit the nature of software development better (Beck et al., 2001).

After almost two decades since its rise, today agile practices are characterized by some specific themes. The idea with ‘failing fast’ is to reduce the risk of long-running, costly projects and typically ensured by fast feedback cycles and iterative development. Iterative development is different from incremental development in the way it executes the entire analysis, development, test and deployment cycles in periods of weeks, so there is an immediate and continuous feedback cycle embedded within the process. The work is then made visible through some ‘information radiators,’ i.e., Kanban boards, displays, and graphics, mostly in non-digital forms, so there is complete transparency over the entire project status.

Agile prioritizes responsiveness over cost-efficiency when needed. It also takes a risk by reducing the focus on predictability to explore value opportunities. Fast feedback cycles are the only means to mitigate risk. It also empowers autonomy at the team level, reducing the need for oversight. It is thus considered similar to lean practices (Womack et al., 1990). Organizations are designed based on outcome instead of specialty since outcome orientation requires the coordination of multiple teams with different disciplines. These cross-functional teams reduce the cost of hand-offs, allows a reduction in batch size and a decrease in cycle times. One of the challenges then is in the outsourcing arena: the feedback loops is severely constrained at contractual boundaries and designing formal, service-level agreement-based protocols throughout outsourcing models risk bureaucracy (Narayan, 2015).

There is limited scholarly research on agile concepts topic from an organizational theory perspective. Mangalaraj et al. have listed the developments on this front in their conference paper (Mangalaraj, Mahapatra, & Nerur, 2009). Their approach is to study ‘deinstitutionalization’ in this context as they explore this innovation in the software development field. Institutional entrepreneurship is also a concept that can

be employed to understand the developments. According to Greenwood and Suddaby, any theory of institutional entrepreneurship must explain how, and which; embedded actors can envision, then impose, alternative futures (Greenwood & Suddaby, 2006). It is more likely that institutional entrepreneurship emerge from less embedded organizations at the periphery of a field. The original group of people who signed the Agile Manifesto in 2001 was mostly the consultants living at the boundaries of the industry. None of them are known to work a major software vendor, educational institution or a member of the certification organizations at the time. They were mostly free-floating contract-based developers/consultants.

Despite the limited scholarly interest, this new practice was adopted significantly and created major impact on prioritization and the collaboration of different parties in software development, challenging mainstream methodologies. Since then, the agile concept has been ‘borrowed’ by some other areas such as innovation, strategy development, product development, human resources and procurement where uncertainty is managed by setting up cross-functional, self-governing teams that work on iterative chunks of work to uncover ambitiously, innovative goals (Rigby et al. 2016).

The concepts, by their nature, resemble lean practices but I have chosen to follow the ‘agile software development’ and ‘agile innovation’ concepts in this dissertation, rather than the ‘lean software development’ (Poppendieck & Poppendieck, 2003); ‘lean innovation’ (Sehested & Sonnenberg, 2011; Hoppmann J. , 2009; Humble, Molesky, & O'Reilly, 2014; Browning & Sanders, 2012; Schuh, Lenders, & Hieber, 2008) and lean startup (Ries, 2011; Blank, 2013) paths for conceptualization.

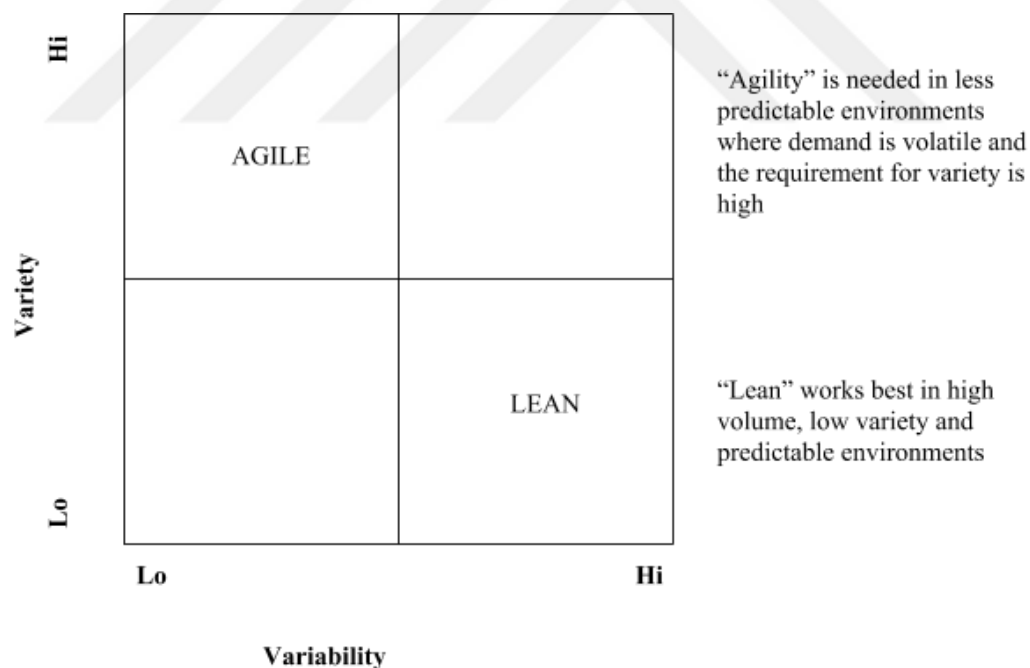
Lean manufacturing stems from the Toyota Production System (Ohno, 1998) with a strong focus on zero-inventory and removing ‘waste’ from the value chain in high-volume production environments, mostly relating to the ‘exploitation’ side of a business.



Agility concept, on the other hand, focuses on handling less predictability in environments where demand is volatile and the requirement for variety and flexibility over time is high (Christopher, 2000):

“Agility should not be confused with ‘leanness.’ Lean is about doing more with less. The term is often used in connection with lean manufacturing to imply a ‘zero inventory,’ just-in-time approach. Paradoxically, many companies that have adopted lean manufacturing as a business practice are anything but agile in their supply chain. The car industry in many ways illustrates this conundrum.

While leanness may be an element of agility in certain circumstances; by itself it does not enable the organization to meet the precise needs of the customer more rapidly. Webster’s Dictionary makes the distinction clearly when it defines lean as ‘containing little fat’ whereas agile is defined as ‘nimble.’”



*Figure 5 Christopher's visualization of Agile vs. Lean (Christopher 2000)*

Christopher defines agility ‘as the ability of an organization to respond rapidly to changes in demand both in terms of volume and variety’ (Christopher, 2000). It is still possible to form hybrid strategies, where the fashion chain Zara is an example.

Zara uses both agile and lean supply chain dynamics to respond to changing demand in a fast moving industry. Agile companies like Zara identify some partners whom they work with through linked systems and processes. This is supplemented by a high level of shared information and multiple collaborative working relationships across the organizations at all levels. Reducing complexity through breaking down functional silos, multi-skilling and cross-functional work also support organizational agility.

The whitepaper “*The Rising Need for Innovation Speed*” (Ringel, Taylor, & Zablit, 2015) starts with a quote, similarly underlying the importance of speed: “Size can give you scale, but for innovation, speed is more critical”, which uses fashion retailer Zara’s unmatched two to four weeks product development, manufacturing, and delivery cycles as an example in competitive markets. Boston Consulting Group, in their 2014-2015 Global Innovation survey finds that, the 36 per cent response rate to the “development times are too long” response to the “biggest obstacle in generating a return in innovation” question has increased to 42 per cent from 2014 to 2015. Boston Consulting Group also recommends short iteration cycles, dedicated teams, setting and measuring the right metrics and failing fast and failing cheap, noting that this may sound easier than done as it runs counter to most entrenched company cultures.

Bhens, Lau & Markovitch (2015) report titled “*Finding the speed to innovate*” also stress that innovating quickly and cheaply, testing, refining through iterations and delivering products continuously has become a competitive advantage. In their paper “*Agile Innovation*”, Rigby, Berez, Caimi, & Noble (2016) underline the importance of a shared goal across various disciplines, self-governing teams, and transparent decision-making authority to enable an agile architecture to speed up innovation.

These concepts were also reflected in “*The Secret Story of Agile Innovation*” (Rigby, Sutherland, & Takeuchi, 2016). Morris et al. (2014) position agile innovation’s iterative cycles as a means of learning, which, is the core and essential goal in highly

competitive markets. In his article on experimentation titled “*The Barriers Big Companies Face When They Try to Act Like Lean Startups*”, Kirsner (2016) concludes with the following: “Most large companies are populated more by skilled operators than by innovators hunting for underserved markets or new business opportunities. However, some companies are finding that the lean startup approach provides tools that can help employees behave more like innovators and get them talking early and often with customers. The challenge is adapting something built for the entrepreneurial world so that it can work effectively in an environment full of standard operating procedures, immutable policies, and executives who want to leave their mark on everything.” It is this set of challenges that are worth exploring to understand how agility makes its way in the corporate world.

So, it is worthwhile to explore agile practices, which are driven by high-speed competition and the pressure of “disruptive innovations” coming from different sides, be that of startups or technology companies moving across industrial boundaries with their massive customer databases, technology skills, and financial power. However, this exploration should take into account not only the focal firm under consideration but also the partners around it and understand how their collaboration styles as well as how their boundaries are affected.

## **2.5. CONTRACTING FOR INNOVATION**

There is also research focusing on new evidence that the conventional transaction cost theory and its stance on contracts are being replaced with a broader model of contracting called ‘contracting for innovation.’ The claim is that this new mode of contracting supports an iterative and collaborative mode of innovating by responding to the uncertainties that exist in the process while taking ex-ante and ex-post threats such as the hold-up problems or opportunism into consideration (Gilson, Sabel, & Scott, 2008). The reasoning behind this change is that the complexity of technology and the rate of change make it impossible for a single firm to master all the technological skills and know-how required to innovate successfully. There is, however, a challenge of incompleteness in writing those

contracts. These contracts need to cater to the needs of contracting parties in the absence of an ex-ante detailed definition of the desired output other than a joined willingness to produce it, no commitment to a particular volume of work and no single party being able to define the entire work items by itself. Contracting parties should also be able to work iteratively, either co-located or in their locations, but still need to respond to each other's requests promptly. As in the case of Boeing 787's joint development with multiple parties where one supplier's output becomes the input of another, the need to coordinate all vendors to work on a particular schedule are further challenges. As contracting parties still need to make a specific investment for this project and expect returns on it, they also need to come up with a way to divide the future gains from this collaboration (Gilson, Sabel, & Scott, 2008).

Gilson demonstrates that neither "hard" nor "soft" contract terms can, standing alone, solve the problem of incomplete contracts and renegotiation afterward is also prone to moral hazards. Apple-SCI contract for both manufacturing and co-design has put in place many practices to manage the iterative co-design process, which, eventually increase switching costs as both parties have invested in the relationship and contributing to each other's knowledge base. Apple also can review almost all steps of the production and pricing and has the final authority for approvals, supplemented by a dispute resolution process and a referee mechanism. Even though switching costs have been perceived as 'unfortunate frictions' that prohibit access to competitive alternatives in other scenarios, in the case of contracting for innovation, they act as supporters of a healthy relationship between the contracting parties as they make backing out of the contract costly and help avoid opportunism. Gilson summarizes that 'Thus, we see a braiding of explicit and implicit contracting that supports a co-design contract: explicit provisions that create knowledge and routines that raise switching costs and a dispute resolution mechanism that builds mutual knowledge of the propensity to reciprocate and deters behavior that could undermine the cooperative equilibrium. In this way, the collaborative mechanism that produces the information necessary to the project's success also provides the

constraint on opportunism that allows collaboration—and innovation—to continue’ (Gilson, Sabel, & Scott, 2008).

Recent research on the United States government’s software contracts looks at the government innovations both from an innovation and also from a contractual perspective (Mergel, 2016). Governments typically publish requests for proposals for “big designs up-front,” meaning work is budget driven, and defined around protecting the government from opportunism of the vendors, meaning they are entirely risk averse based on risks and regulations. The contracts are mostly fixed-price, assuming that the cost of a new service or product that is being developed for the first time can be determined a priori. Specifications are written by government officials who try to minimize risks as much as possible but who do not take part in the actual production and are reviewed by vendors who do not have a detailed understanding of the actual needs before they are far into the project. These patterns create challenges as they prioritize risk aversion and cost over collaboration and learning.

However, there is a change in trend to enable agile innovation: “updated acquisition policies allow agencies to use agile methodologies when they write request for proposals from vendors. Using Agile BPAs (Blanket Purchase Agreements), vendors, who were already preapproved on the agency schedules, have to showcase prototypes of their final products and agree to deliver their products using agile methodologies with sprint cycles. Under this framework, the expectation is that government agencies invest in smaller projects and increments and open opportunities for small businesses to compete for government contracts. This reduces the risk exposure and avoid sunk costs of ‘grand design’ projects (Mergel, 2016)“. This new approach allows clients, end users and contractors to collaborate since the definition phase of a project and enable for adjustments throughout an entire project. I believe that this “contracting for innovation” dimension should not be overseen in studying the firm’s conquest for agility.

Apart from contracts which are formal governance mechanisms, normative governance mechanisms such as trust are considered a means to ensure non-opportunistic behavior. Familiarity, i.e., prior collaboration between the firm and its partner, is considered as a trust-building precedent (Gulati, 1995). Recent research demonstrates that the presence of prior collaboration is also dependent on the type of innovation under discussion. In the case of incremental innovations, prior collaboration reduces the need to include strong terms and conditions to avoid contract breaching. In the case of radical innovation projects, even if prior collaboration exists, it becomes helpful to enhance the contract with contract breach safeguarding terms. If no such collaboration exists, it is then strongly advised to include safeguarding terms to ensure successful execution of radical innovation projects (Hofman, Faems, & Schleimer, 2017).

Performance-based contracts (PBCs) provide a certain freedom in their incompleteness with the expectation of fostering innovation. They strive to increase the innovative behavior of a partner by allowing the partner to determine the best way to accomplish work. Incomplete contracts depend on relational governance such as trust and relational forms to complement their incompleteness, but they may still be subject to opportunism. However, PBCs argue that, a) there is an inverted U-shaped relationship between low term specificity and innovation and, b) this is moderated by paying the partner based on its performance rather than processes and incentives. The challenge here is the fact that innovation is risky and a risk-averse partner may take conservative decisions and establish greater control at the expense of creative freedom (Sumo R. , Valk, Weele, & Duysters, 2016). As agile practices are mostly about reducing uncertainty by dividing work into smaller batches and up-front acknowledgment of not knowing the end result from day one, I argue that they are quite suitable for reducing risk and allowing a higher return on Performance-Based Contracts.

Whitley and Willcocks (2011) introduce the concept of ‘maturity’ in the relationship between the focal firm and its partners, with a focus on contracts. Lower levels of maturity can be categorized as contract administration and contract

management, which are driven by hype, fear and a certain focus on costs. A more mature relationship moves focus partly to quality, more trust is built, and renegotiations and alternative partners are also brought into the picture. The highest level of maturity is collaborative innovation where the relationship is both institutionalized and commercialized, and the focus has shifted to added-value. However, research shows that this level of maturity is rarely achieved.

For the innovation potential to be achieved, certain attributes are needed on both sides of the collaboration. These include technical, leadership and organizational skills on the focal firm's side. The partner should match those by building insight into the focal firm's domain in addition to its technical base. They should also build the style of governance to support innovation in their context that creates the levels of trust that is seen within a single organization (Weeks & Feeny, 2008).

In order to achieve high levels of maturity, Whitley and Willcocks introduced a framework for collaborative innovation through four practices. These four practices support each other in a cyclic manner:

The *Leading* Practice: The relationship should ensure that both parties share the responsibilities for mitigating risks and exploiting opportunities through a new form of contracting.

The *Contracting* Practice: The contracts should provide incentives for innovation and high performance; as a contract organized solely on cost and service issues do not encourage innovation. If parties keep referring back to the contract and they are in dispute, trust is lost; therefore, the general outline of the contract may be more critical than its details.

The *Organizing* Practice: Innovation is achieved through addressing a series of adaptive challenges that require experimentation, discoveries, and organizational adjustments. The organizational governance should allow for co-managed, multifunctional teams across organizational boundaries to address those challenges.

The *Performing Practice*: These in result complete the cycle by creating a highly personal, competence-based and motivational trust among collaborating parties (Whitley & Willcocks, 2011).

## **2.6. SUMMARY OF LITERATURE REVIEW**

Most cross-boundary innovation literature focuses on the “what” perspective of collaborations: inbound and outbound innovations at different stages of product development are one of these perspectives. Other research focuses on the number of actors and their interchanges, as in the innovation intermediary research. I argue that the “how” perspective of cross-boundary collaborations is an essential aspect of how inter-firm relationships can be set up for a successful result.

The extant literature focuses solely on the inner workings of the focal firm when analyzing dynamic capabilities. In the inter-firm innovation scenarios, however, the partnering firms’ capabilities should play a significant role in defining the anticipated innovation outcome. Similarly, both the practitioners and scholars in “agile innovation” focus on only one firm when analyzing the dynamics of agile. Some of these only discuss innovation teams in generic terms such as self-governance and decision making but do not refer to collaboration between partners. Some literature exclusively talks about collaborating with startups or corporate venture capital (Chesbrough & Weiblen, 2015) but their discussion is limited to the forms these relations take place, but not how they are executed. My approach is to explore an innovation locus firm and look at its relationships by taking both internal and open innovation into account to understand how firm boundaries are reformulated to adapt to agility needs.

Most agility literature does not take cross-boundary innovations into account. Self-managing teams and iteration require many loose ends such as teams built around trust, no up-front defined deliveries, and self-managing and continuous re-



prioritization. However, when team members from two or more firms start working together, many dilemmas and conflicts arise around sharing intellectual property rights, commercial benefits, sharing costs if the intended innovation is not reached or contractual terms cannot be forced.

Contracts are the typical means of governing how hold-ups, hostage situations, knowledge spillovers, and opportunism are managed throughout an inter-firm relationships' life cycle (Nooteboom B., 2004). When the development or acquisition of competitive advantage cannot be achieved through internal development or vertical integration, contracts also govern the acquisition of knowledge, innovation and new product development processes. These contracts can enable various forms of collaboration, from strategic alliances to outsourcing. Hagedoorn and Zabel's field study (2015) finds that firms very often rely on contracts for governing open innovation projects and intellectual property rights. The general issue with those contracts involves the trade-off between brevity, flexibility; as well as the trust provided by flexible open terms and the distrusting nature of inflexible detailed terms. Especially those contracts with detailed default or penalty clauses for poor performance deter innovative problem solving and cooperation (DiMatteo, 2010).

In summary, there is an interesting research opportunity at the intersection of cross-boundary innovation, agility and contractual forms of governance.

## **RESEARCH DESIGN**

### **3.1. RESEARCH CONTEXT**

This research is centered on a telecommunications and technology firm based in Turkey. I have used the pseudonym Theta for the firm throughout this document. Theta has been a communications service provider (CSP) in the market for almost two decades. It has seen very steep market growth in its first decade as the market was growing from almost a non-existent position. It had enjoyed quite high-profit margins. The fast growth forced the firm to create a culture which is very dynamic and fast. The competition required the firm to respond to new developments in the market very fast, while high paced growth required it to continuously readjust its capabilities and resources to meet the new demand patterns. The market at the same time had become more and more regulated over time, which forced Theta to also keep up with exogenous changes promptly.

In recent years, Theta's market dynamics has changed in notable ways. Since the number of customers a firm can market its essential communication services are limited, growth in these products and services hit a flat line for all operators in the market. With the advent of 4.5G data networks, the capital investment into existing infrastructure and new fiber network lines as well as the license fees required a new cost discipline. However, it was not possible to pass these costs on to the customer directly. On the other hand, OTT (Over the Top) players such as Apple with its iTunes music service, Netflix, Facebook, Google – especially with YouTube, Spotify and others have entered the market with highly demanded music and video services. OTT players have changed incumbent business models in the content business, but they also had a significant impact on the CSP businesses: they required and consumed most of the new high bandwidth and fast data networks provided by the CSPs while enjoying the benefits without sharing any of the profits with them. In certain markets this situation was being regulated by rules under the name of “Net Neutrality,” in other markets, the OTT players would merely depend

on customer demand and would not negotiate any terms with the CSPs to change the revenue distribution model.

All these changes in the business context required Theta to look for new capabilities to stay competitive in the market. First of all, it decided to create its own content distribution business, aiming at taking a share of the profits from the highly demanded streaming-based music, video, and television content businesses. This meant licensing content from content producers and then providing digital applications to stream and serve those to the consumers. It also meant a change in the business model. Instead of selling data packages directly to the consumer, it would bundle content packages such as unlimited, high-quality music services with different price points:

*Table 3 Theta's music subscriptions (as of October 2018)*

Subscription	Subscription Fee
Premium Music subscription	17,99 TL / month
Video Music subscription	9,99 TL / month
Premium Music subscription (annual)	9,99 TL / month (12 months commitment)
Starter subscription	11,99 / month

Additional revenue streams were then created, such as downloading music to a consumer's mobile phone so they did not have to stream their favorite songs every time, especially when they had a weak data connection or when they were abroad:

Package	Package Fee
Download 25 songs a month	7,99 TL / month

Download 50 songs a month	12,99 TL / month
Download 25 songs a week	3,99 TL / week

Theta also added other content businesses to its target portfolio such as learning content, search and messaging applications. In order to compete in these new markets which required a much more responsive and competitive approach taken by the likes of Apple, Spotify, and Netflix, it then also decided to explore new ways of work. In 2015, Theta started exploring agile practices in one of its divisions to speed up its campaign generation capabilities using the Kanban method. Impressed with the success of the deployment of agile, Theta decided to deploy it to a broader base, especially in the software development area. However, this not only required Theta to change its working practices, but also the working practices of its partners as most software projects were being carried out with one or more technology partners.

My research was well positioned at this time as I was able to observe different projects with different stages of practice changes. Some projects began or continued with more classical, waterfall-based software development practices where cost and scope, as well as innovation targets, were fixed in the beginning. Some others began with the waterfall approach but then looked for ways to become more agile and other projects began with agile in mind and continued that way.

Another change that was introduced to the collaboration methods of Theta was the way contracts were outlined with software development partners. Initially, there were two main methods to initiate a joint project: a fixed price contract and a time-and-material contract, also known as the person-day contract. In the fixed price contract, the project was defined up front with a fixed scope and one or more candidate firms would bid for it and the awarded party would work together with Theta on the project's delivery. The price would be agreed on at the time of contracting and if the scope was managed well; the partner could reach the profit

margin it had anticipated at the time of contracting. If the scope or other performance factors could not be managed well, the cost of the project may very well go out of control for the business partner, also leading to timeline issues. The risk of the project was mostly carried by the partner, not the focal firm, Theta. When the project was complete, the relationship would typically end or get extended through another scope work. The appropriation for the focal firm was the value created from the project while the partner only made a profit or loss based on its realized cost basis.

The other contract type, the person-day contract was typically associated with one or more projects. The daily rates of the people who were going to work on the project are decided through the contract, possibly broken down by the role and seniority. The partner can estimate a profit margin based on the initial estimates of the number of people that are going to work on the project and the duration, but it does not commit to any outcome success. It is the sole responsibility of the focal firm to manage the efficient use of those resources to ensure project success. Thus, the risk related to the success of the project and the costs associated with it solely on the focal firm's side but the firm might still prefer this type of contract to have flexibility in the number and type of resources it can utilize as the scope changes.

However, in about the same period the agile practices were deployed at Theta, the contracting department and the software teams decided to deploy a different, outcome-based contract type to get costs and scope risks under control. Based on a new variation of the Function Point Analysis (FPA) literature, the new contracts would not look at the types and roles of people involved, which are the inputs for a particular work to be done; but instead focus on the outcomes: each specific artifact, such as a screen, a data processing transaction or a report was assigned a Function Point value and the partner is going to be able to charge when this artifact is delivered to its customer in the production environment. The partner then determined which expertise, roles and seniority they were going to need to deliver those artifacts and if the project scope changed, it bore fewer commercial risks as its delivery was based on piece-based prices which were typically in the range of

days or few weeks and could easily accommodate changes in the direction of the project targets. However, the delivery was solely dependent on the delivery performance of the vendor, and this reduces the cost risk of Theta.

The introduction of these two changes, namely agile practices and performance-based contracts created a new context for Theta's projects. They did not guarantee any success on one front alone but allowed project managers from both sides to manage scope, delivery and cost risks if managed carefully in combination. In other words, a project manager could use agile practices to manage scope while the performance-based contract could ensure better cost control. If a project would use one or the other at a different level, it could observe varying results.

This also required the business partner to be able to operate in alignment with Theta. Acting under the performance-based contract was applicable through the contract and project management life cycle. Using agile practices was, however, not. It also required the collaborating partner to have the corresponding skills in agile software development.

### **3.2. RESEARCH METHOD**

According to Creswell (2014), quantitative research researchers typically test theories as an explanation for answers to their questions. In qualitative research, the use of the theory varies. In some research cases, the researcher reaches to a new theory at the end of the research. In other cases, the researcher brings the theory at the beginning to provide a lens to shape what is looked at, as in ethnographies. My research approach is more similar to the latter, where I tried to bring some theories to understand agility in an inter-firm setting.

My research is designed as a case study in a single firm environment. A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context. Case study research includes both single- and multiple-case studies and even though some research domains make a clear distinction between the two, single- and multiple-case studies are two variants of the same methodological

framework. In multiple-case studies, each case must be carefully selected to either predict similar results or to predict different results for predictable reasons. If one designs a case study with 6 or 10 cases and it turns out as predicted by a theoretical proposition, these 6 or 10 cases would have provided compelling support for the initial proposition (Yin, 2003).

I have used a qualitative approach based on autoethnographic methods and have conducted in-depth, semi-structured interviews with project managers and team leaders. I have been working as a manager at Theta, and I am in charge of projects similar to those in the sample. Therefore, my experiences and observations have been vital in interpreting the results. An auto-ethnographer's prior knowledge about the 'native language,' feelings they share with the subjects and empathy are listed as advantages compared to outsider ethnographers (Hayano, 1979). However, I have not been directly involved in those projects for the period selected as part of this study. In result, this enabled me to both have a deep contextual insight into the nature of the projects researched but also maintain a certain level of observant distance to the interviewees. Knowing the 'native language' of agile practices and software-based innovation projects, in general, helped me locate the significant research problems around contracts and cross-boundary agile practices easily. I then used the case-study approach to go deeper in understanding the dynamics of such projects and contingencies in this space.

In order to understand contingencies in the compatibility of agile practices between the focal firm and its partners, I studied innovation projects executed by different innovation partners. These collaborations might be covered with different contract types, and each project may have a different time pressure dimension attached to it. Due to the need to explore the dynamics in depth, a handful of projects are explored via semi-structured interviews.

In order to explore the dynamics between the compatibility of software development practices, and time pressure for innovation, I explored the answers to the following central question and the related three sub-questions:

Main question: How does the need for agility affect inter-firm project governance?

Sub-questions:

1. What new inter-firm practices emerge as a response to the urgency in innovation?
2. What are the effects of contracts on agile projects?
3. How does the match of capabilities on both sides of the inter-firm dyad effect collaboration efforts?

Four projects were selected as cases to be able to observe, compare and contrast different combinations in innovation practices (agile vs. classical), contracts (fixed-price vs. performance based) and different levels of time pressure.

For each case, interviewees were chosen from the management teams of the project. As focal firm typically would employ various managerial roles around the projects, such as team managers, department managers, and project managers, it was possible to conduct 2-3 interviews for each project from the focal firm. From the partner firm, typically a project manager or a department or general manager would have had an overview of the project. In total, a total of 10-15 interviews were conducted, each interview taking 45-60 minutes, recorded and transcribed verbatim.

I had planned to begin the interviews with a set of predefined questions based on my theoretical perspective. However, I had also allowed the interview to explore unforeseen areas based on the dynamic flow of the interview. This semi-structured interview method (Creswell, 2014; Yin, 2003) allowed me to verify that my theoretical propositions were not shadowed by more important concepts that I have not considered before.

Saturation is the key to decide when to stop collecting empirical data and this can only be assessed along the code and analysis of data collected. Saturation means that research has produced some significant outcomes and to continue with more



cases with the same set of interview questions would not likely lead to different results. The analysis of codes developed helped me conclude whether empirical saturation had been reached.

### **3.3. DATA COLLECTION**

I have chosen several cases that sample the factor space. In other words, I have chosen innovation projects that Theta ran with different partners, and under varying levels of urgency. I have chosen four different projects and conducted three-four interviews per project, with a total of 15 interviews. For each project, two or more managers from Theta and at least one manager from the partner organization were selected. The partner companies were typically smaller in size so it was typical that they had fewer managers involved with the project whereas Theta projects could simultaneously be governed by project managers, program managers, team heads and department managers and this allowed to conduct more interviews for each project. All chosen agile projects apply agile practices to some degree. Cases were selected with a convenience sampling method, and considering not only how the partners' practiced compatibility with Theta varies, but also whether the contractual forms used in the projects were different. This selection allowed me to compare different combinations and explore reasons behind project performance in terms of contingency conditions. I have not looked for successful projects alone as negative examples also provide insight into those contingencies.

The selected four software development projects have run in Theta in the period of 2015-2017. The projects were typically sizeable product development projects, with running durations ranging between 12 and 36 months, excluding initial RFP (request for proposal) and contracting phases. Depending on the project, RFPs were published to between three and twenty-eight potential bidders, and a technical evaluation was performed to shortlist the potential partners, who later submitted their financial proposals and contractual terms.

All four projects researched had different levels of novelty, and in different areas, such as location-based mobile applications, complex event processing, gamification or analytics. Due to the size and project timelines as well as their innovative nature, each project struggled to maintain its governance form, and most had to revise as shown in the table below:

*Table 4 List of Projects Interviewed*

Project Code	Contractual Form	Methodology
A	Started with Time & material, later changed to Fixed Price	Started in Agile-like mode, later changed to Waterfall
B	Fixed Price	Started with Waterfall, later moved to Agile
C	Performance-Based & Fixed Price	Started with Waterfall, later tried Agile
D	Performance-Based	Agile

### **3.2.1. Project A**

Project A started as a massive program in a wholly owned subsidiary of Theta to replace a system the subsidiary was using to service Theta's customers. The previous system in use was an implementation of a commercial off-the-shelf product which required heavy customizations to match Theta's needs, and the

purpose of the new project was to build a more suitable product for its own needs. The program's original phase was developed by the subsidiary where Theta only provided project management capabilities.

As the budget estimates for subsequent phases proved to be a lot larger than initially anticipated, Theta decided to discontinue the role of its subsidiary, and moved some of the subsidiary's resources into its own teams to work on a 'framework' for reusable components. At the same time, it created a time and material contract for the remaining implementation of the project using this framework with a partner. The partner was required to bring service management expertise, new technology experience, and extra resources during the project period. The partner's implementation team was thus dependent on the framework team to build its components while the framework team needed the implementation team to identify and validate new requirements for the framework. This required the framework to be developed in parallel to the implementation layers being developed based on user requirements, which meant that the two teams needed to work on the same schedule but in a cross-dependent manner. In turn, this increased the amount of communication and cross-validation needs. Teams worked very closely in a shared location, and both Theta and partner resources put extra hours, side by side, to meet the deadline. Even though they did not formally declare moving to agile practices, the teams' daily routines and use of shared information boards and post-it notes for transparency were inspired by agile practices.

The first implementation phase was executed using a time and material contract. However, the actual costs exceeded Theta's management teams' original estimations significantly. Schedule performance was also worrying. Combined schedule and cost concerns triggered Theta to re-evaluate their approach for the subsequent projects and to ensure cost and schedule discipline, and they convinced the partner to switch to a fixed-price contract model. This seemed to reduce the risks on Theta's side while the partner had to deal with cost overruns or manage the project more proactively. However, they needed both framework features and implementation requirements to be made available on time to do their part of work

in time and on budget. In order to manage risks and ensure long term visibility, the teams agreed to move back to a waterfall-based planning approach. However, these attempts also failed to match expectations significantly, and the partner this time started to face financial difficulties and penalty risks. The actual project timelines were exceeded again, with budget overruns on both sides. After completing project #5 almost two years later than originally planned, the Theta team decided to continue with the remaining projects with its internal teams, discontinuing the contract with the partner. This research stopped at the time the partner contract was terminated as the fully internal projects were in the initial setup phase at the time of this writing.

### **3.2.2. Project B**

Project B was a marketing intelligence automation project, with a focus on modernizing an existing system with new, innovative capabilities and meeting Theta's extra workload and new marketing automation requirements. It was considered as the next-generation implementation of such tools and won some awards within the telecommunications industry when implemented. The project team decided that they would need at least an external platform to build the new automation system and consulting and field expertise from outside to come up with new, innovative ideas. They published a request for proposal (RFP) to some global vendors that provide such a platform and the consultancy associated with it. Even the vendor that provided Theta's existing platform for the last couple of years did not meet the new requirements in a satisfactory way. In result, Theta decided that if risks were to be taken, they would prefer to work with the vendor that is based in the same city so they could improve the product without having to meet language or location barriers. Even though this vendor's product was on par with other vendors in the RFP process, Theta still foresaw that some significant enhancements would be needed to meet its high performance and high response time requirements. The partner, on the other hand, was initially convinced that the product would be able to meet those requirements with some configurations and minor enhancements. The project was contracted with a fixed price model with a one-year timeline.

However, early into the project, it became evident to both parties that the product with its functionality would not deliver the results expected in the timeline contracted. After a few initial discussions around the contract, scope change and penalties, the teams decided to join forces and take a different approach. In this new model, the partner moved its product development team into Theta's office, and Theta provided some developers to work on the partner's product to develop a new highly scalable module for caching to meet Theta's performance needs. The project plan was split into two so that high priority features could still be delivered to the internal customers at the end of the first year. The teams then started to work in an agile manner, iteratively building the scalable cache features and internal customer implementations.

The contractual format did not change, but some adjustments were made. The penalties were relaxed and additional budget was created for some scope changes. Both Theta and the partner focused on getting the most value from the project rather than controlling costs. Theta ensured that it delivered a state-of-the-art solution for its customers while the partner ensured a successful, reference implementation as well as a highly scalable module that it can position to its future customers. The teams then agreed on a revenue-sharing model for subsequent sales of this module so Theta could also benefit from its investment in the long term.

### **3.2.3. Project C**

Project C was a sales and marketing channel application to enable the sales force with a tablet-based experience in the field. The Theta team that was working on the project did not have mobile application development experience, and they were in need to work with a partner that can help them deliver the project.

The partner joined Theta using a performance-based contract according to new company policies. This was the first time both the partner and the associated Theta team was using a performance-based contract. Both teams were working on other projects in the more classical time and material contract model for some time and

the partner's other teams were in charge of maintaining a backend system that the new mobile application would need to integrate. This gave the confidence that the partner team needed to prioritize the requirements on the backend system and prioritize the integration needs required from the mobile application a lot easier.

The partner team started working on a remote location with its developers with a single point of contact at the Theta location, responsible for bridging the two sides. The partner team was mostly comprised of developers while Theta provided the business analysts and the project manager. The partner had moved to agile practices recently, and since the beginning of the project, its development team was running biweekly Scrums, using its single point of contact at the Theta site as the product owner. From Theta's perspective, it was still a fixed price, fixed schedule contract even though tasks and milestones were built upon function point analysis.

As the project moved into its first quarter, Theta's new department manager realized that the contracted scope and the contract amount were inconsistent with the project's ambitions and would not meet the deadlines. The partner team eventually agreed that they would have a problem with the current mode operation and accepted to move to a joint, agile development mode. They also agreed to bring the development team to Theta's location. Theta team was inexperienced with Scrum, but they had training in the Kanban methodology and had internal coaching support. They insisted on using Kanban instead, and the partner agreed. The contract needed few modifications to iterative scope changes because payments were fixed to a certain scope and even though the partner was delivering new features based on prioritizations, the contract did not allow them to get paid accordingly. This inconsistency between the contract and agile ways of working was not something that could not be resolved, and certain resolutions were provided. However, after trying the agile methodologies for half a year, Theta also became convinced that the partner's expertise in mobile application development and its understanding of the sales and marketing business would not suffice for successful completion. The contract was cancelled, and Theta contracted another partner that it trusted more in terms of domain and technology knowledge, with a revised timeline.

### **3.2.4. Project D**

Project D was a two-sided training product. Theta was using the product to provide content, measurement, and reporting of training activities to its employees and partners. The same product was also being marketed to other enterprises as a cloud service so they can also upload their content and provide this content as well as measure and report on the training activities of their employees and partners. The product was in use for some time in maintenance mode, and a partner was providing resources to a larger extent. The emergence of mobile technologies and new features were indicating that a higher delivery performance would be needed. The performance of the partner was questioned and the corporate policies to move to a performance-based contract allowed the relevant Theta team to look for a new partner.

Although the new partner selection process did not have agile methodologies as a requirement in the request for proposal, the team quickly volunteered to take the agile training sessions that started in Theta. As the project contract was tailored based on outputs, the team was able to use the contract without any modifications to switch to Kanban methodologies early on. The partner team did not have much agile experience or training, and they could not join the Theta's training sessions due to cost concerns and training capacity limitations. Theta was providing a handful of product owners, business analysts and Kanban masters for the project while the partner had more than a dozen developers working on delivery. All of those developers were working at a remote location but within the same city. This forced the Theta team to both use technology but also move to the partner location a few times a week to both bring the team up to speed in agile methodologies and ensure successful execution of the project.

After a few months, when the teams felt more comfortable about their interpretation of agile, they decided to split the teams into two. One of the teams took sole ownership of the internal product while the other began focusing on the external product. One of those teams also moved to Scrum.

The project teams were both satisfied with the contractual model and the agile methodologies but were looking for ways to improve them over time. The switch over to both those models proved to require additional time and cost that could not have been estimated at the beginning, but they were confident that they were able to apply the same models in other projects more efficiently next time.

I conducted two rounds of interviews with 15 interviewees. The initial round was performed with three Theta managers during 2017 and a manager from a partner. The interviews' main focus was on achieving agility while working with external partners on innovation projects. Time pressure, boundary formation, and dynamic capabilities formed a theoretical reference frame while I was looking for inter-boundary specifics of agile practices. However, as I conducted the interviews, it became evident that contracts were still forming a significant part of the relationship between the focal firm and its partners. This triggered me to go back to the innovation literature, and investigate the contracting for innovation research. It also brought questions about trust, search and implementation costs from the TCE literature also into the theoretical reference frame.

Based on the outcomes of those interviews, I have decided to include contractual aspects to my research and refined my theoretical reference frame accordingly. In the second round of interviews, conducted in 2018, another 11 interviewees were interviewed, eight from Theta and four from its four collaborating innovation partners. All interviewees have had managerial responsibilities during the projects, either as team managers, project managers, product owners or account managers. The interviews lasted an average of 44 minutes. The following table lists the details of those interviews:

*Table 5 Interview Details*

Project Code	Interviewee and Role	Firm	Period	Duration



A	N.C. – Team Manager	Theta	June 2018	00:42
	M.C. – Analyst Lead	Theta	April 2017	00:18
	E.E. – Project Coordinator	Partner	July 2018	00:46
	K.T. – Development Lead	Theta	July 2018	00:45
B	I.P. – Team Manager	Theta	Nov 2017	00:44
	C.Y. – Unit Manager	Theta	July 2018	00:54
	O.O. – Project Manager	Partner	April 2017	00:39
	E.M. – Project Manager	Theta	July 2018	00:40
C	O.U. – Unit Manager	Theta	June 2018	01:10
	N.G. – Resource Manager	Partner	June 2018	00:51
	E.G. – Project Manager and Product Owner	Theta	July 2018	00:49
D	S.B. – Unit Manager	Theta	Nov 2017	00:36
	T.H. – Product Owner	Theta	June 2018	00:52
	C.E. – Analyst Lead and Scrum Master	Theta	July 2018	00:42

	A.G. – Technical Account Manager	Partner	July 2018	00:42
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### 3.4. DATA ANALYSIS

The interviews were later transcribed, reviewed and edited to ensure clarity. In order to transcribe the interviews, first, an online tool was used. This online tool resided at <https://voicedocs.com/en>. It requires a subscription and takes a payment based on the number of minutes transcribed.

The interviews as sound recording files were uploaded to this online tool. The tool supported English, German and Turkish as the input language. The Turkish transcription success was far from a 100 per cent accuracy. The interviews contained many English terms and product names, and not all interviewees had the same level of clarity. One section of an interview, transcribed by the online tool, can be seen as below:

ya böyle yüzde yüz ihtiyaçlarımıza. karşı da nokta da mı bu ürünler ozaman yoksa olur. matematiksel bir model ortaya koyarak kişilere her ihtiyaç olur ve biz ne ihtiyaçları imar. ihtiyaçlar olarak bir puanlama yaptık ve yüzde 101 sonuç görmedik, yüzde seksen'ler civarındaydı, birbirine çok yakın değerler çıktı aslında değerlendirmemizi ona göre yaptık peki kontrat hakkı ekstra istek, kontrat var yoksa? n? n? n? n? n nasıl formüle ettiğiniz şeyi şey aslında? limitsiz lisans. [REDACTED] in grup şirketlerinde yüzde 50 l'ine sahip olduğu grup şirketinin ilimsiz bir şey var onu. dışarıda bir [REDACTED] böyle bir bu ürünü alıp kendimi bir insansın gibi bir şey yapmak istediği durumda bir proje maliyeti devamlı çalışıyor durumda kullanmayız olur mesela bizim danışmanlığımızı yürüyeceğine inandığımız bir konu olursa biz orada herhangi bir şeye ev ama her hangi bir ücret ödeme durumu da iyi olur. onun dışında yıllık bakım sözleşmesi gibi bir konumuz var galiba belli hisselerimiz var işte her bender ile yaptı gibi

*Figure 6 Sample auto-transcription*

Such texts required manual correction, and the sample above was finalized as follows:

Q: Yani böyle yüzde yüz ihtiyaçlarımızı karşılar noktada mıydı ürünler o zaman yoksa...

A: Belli bir matematiksel bir model ortaya koyarak işlerin her ihtiyaç, işte operational business ihtiyaçları olarak, mimari ihtiyaçlar olarak bir puanlama yaptık, yüzde yüz bir sonuç görmedik, yüzde seksen'ler civarındaydı, birbirine çok yakın değerler çıktı aslında, değerlendirmemizi ona göre yaptık.

Q: kontrat şey mi fixed price tek bir kontrat mı var, yoksa nasıl formüle ettiniz?

A: Şey aslında. Limitsiz lisans. [REDACTED]'in sahip olduğu grup şirketlerinde, yüzde 51'ine sahip olduğu grup şirketlerinde limitsiz bir şey var . Onun dışında [REDACTED] bu ürünü alıp kendi bir instance gibi bir şey yapmak istediği durumda bir proje maliyeti [REDACTED] la çalışacağı durumunda kullanmak zorunda ama mesela bizim danışmanlığımızla yürüyebileceğine inandığımız bir konu olursa biz orada herhangi bir şeye, [REDACTED]'a herhangi bir ücreti ödeme durumunda değiliz diye okuyorum sözleşmeyi. Onun dışında yıllık bakım sözleşmesi gibi bir konumuz var galiba belli SLA'lerimiz var işte her vendorla yaptığımız gibi.

*Figure 7 Sample manually corrected transcription*

If the online tool was not used, transcribing a 45-minutes long interview would have taken between five and seven hours, manually, by listening to the recording back and forth and then typing it. The advantage of using the online tool is in its efficiency. First of all, it captures approximately 60-70 per cent of the words correctly. These words may still need minor modifications at word ends. Secondly, the online tool splits the text into segments and would automatically play the sound on each segment once you click on it and stop there until the user selects to move on to the next segment.

A: 10 firma aslında RFP'ye diye yanıt verdi. RFP öncesinde bizim ciddi bir RFP çalışmamız oldu, bir önceki projenin RFP'sini de baz alarak, onu üzerine build ederek, yeni ihtiyaçlarımızı da gözönünde bulundurarak 10 firma yaklaşık bu sürece katıldı ve

*Figure 8 Sample transcription segment, highlighted*

This allows the transcriber to finalize the corrections on a segment, and then move on to the next segment. The tool would use about 15-20 minutes to come up with the original transcription and then an additional two hours would be needed to make all the corrections.

As the texts required insight into many terms around software practices, agile concepts, and many industry-specific contexts, I edited all the corrections on the auto-transcribed texts. In result, 65,651 words in 15 interviews were transcribed.

The transcribed texts then were coded using a qualitative data analysis tool, named QDA Miner<sup>1</sup>. QDA Miner allows these transcribed texts to be loaded into the tool as a separate 'case.' It then provides a code capability. Multiple codes can be created and for convenience, they can be grouped under code categories. These codes can then be used to mark a particular session on the text and mark it with the selected code. The tool then shows all the codes within a panel on the right, next to the text and as the text scrolls up and down, so do the associated codes.

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<sup>1</sup> available at <https://provalisresearch.com/products/qualitative-data-analysis-software/>

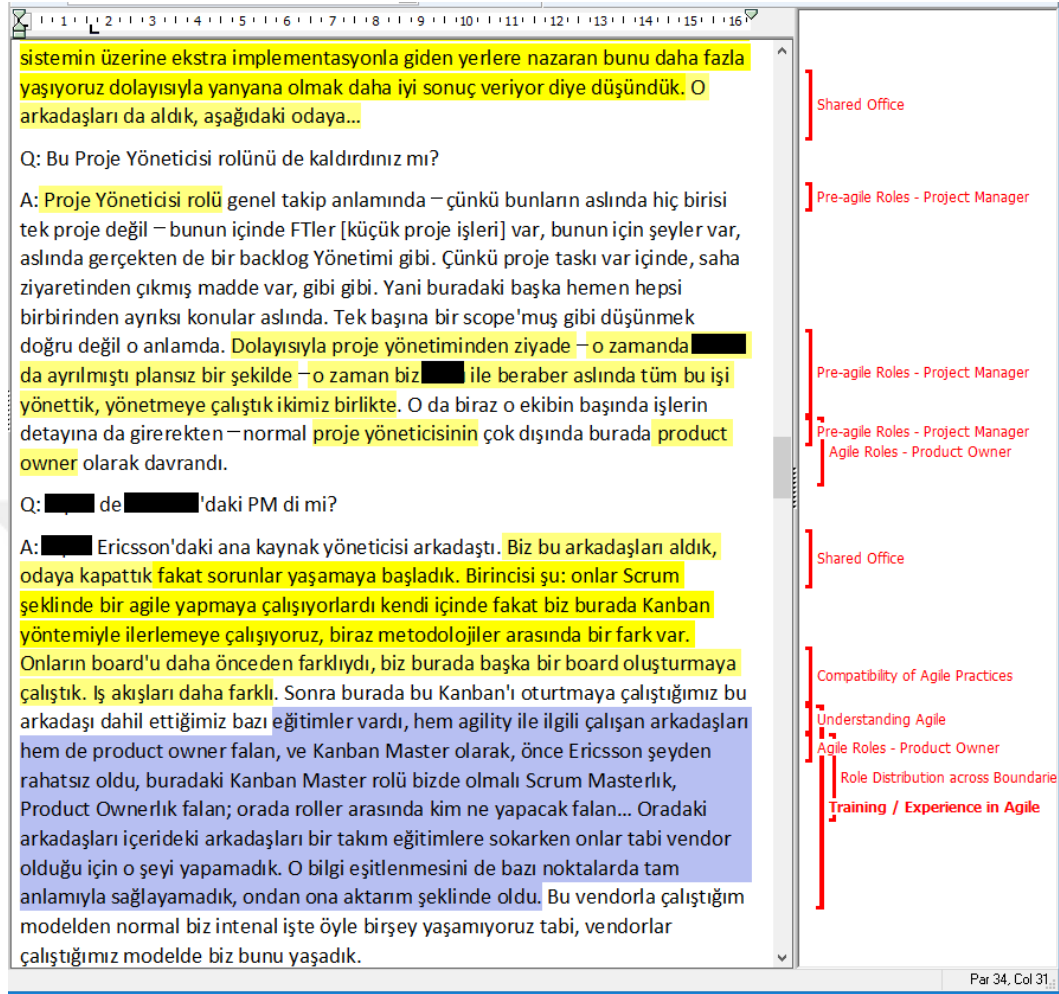


Figure 9 Sample screen image of coding in the QDA Miner tool

The tool then allows a particular code to be searched within the entire list of cases, counts the number of occurrences of a code, the number of cases it appears in as well as the percentages of those occurrences.

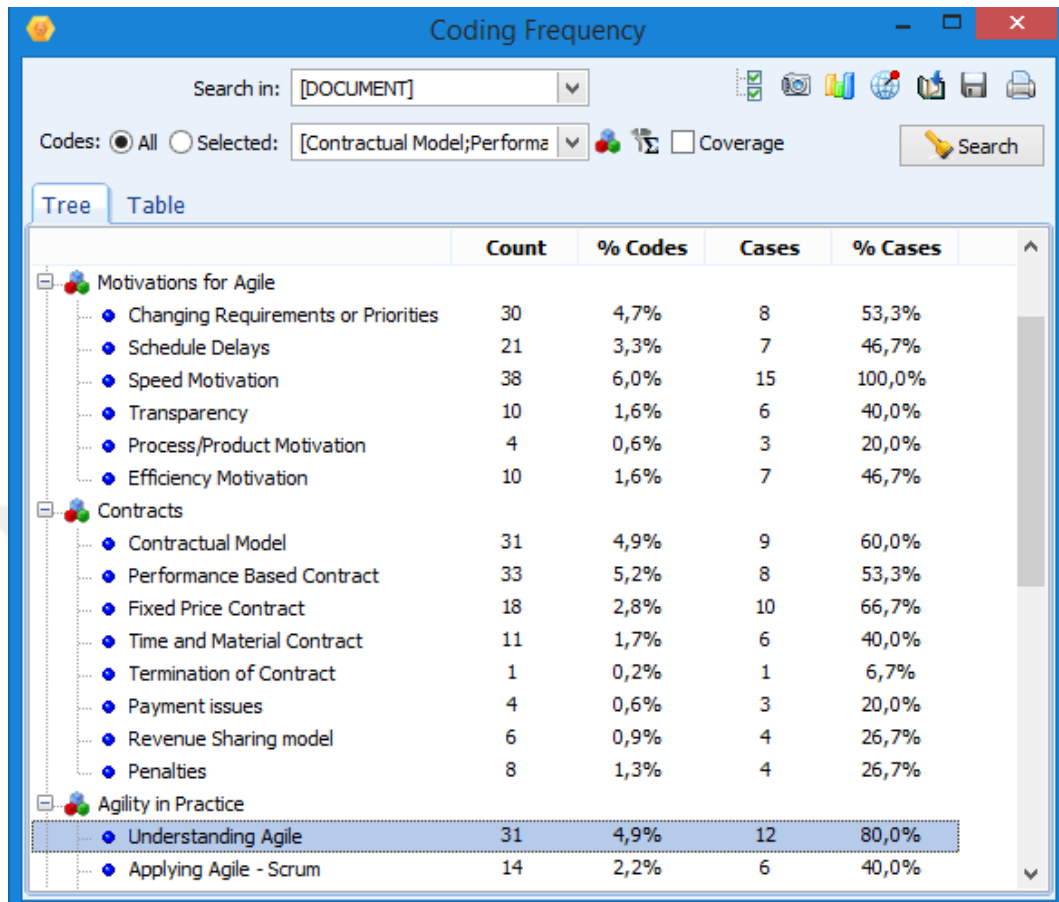


Figure 10 Sample coding and coding frequency screen from QDA Miner tool

The complete list of codings and code categories are in Section 4.

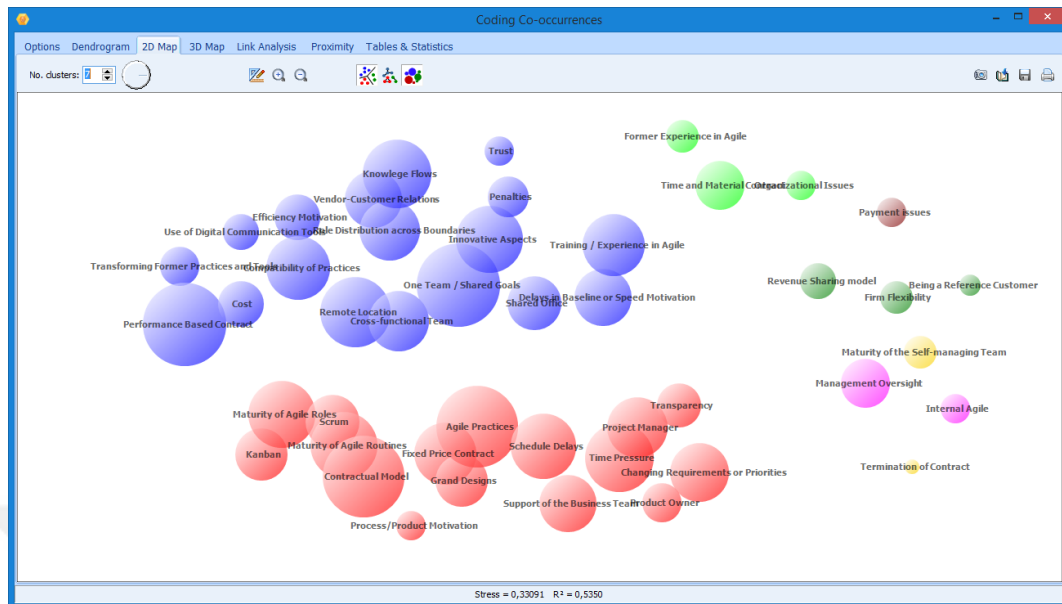
This allows the researcher to iterate the number of codes to come down to a significant number, merge rare occurrences into similar but more general terms or split one code into two. As the coding exercise takes significant time and aims to capture a coherent view across all the cases, it is imperative that the first coding pass needs to be extended with a second or third pass on the text and codes to reach to a convergence.

I have followed this iterative practice and passed through the cases at least three times, merged many codes and removed very rarely used ones. However, I did not remove some of the rarely used codes as they were relevant from the literature

review perspective. Such codes include ‘Termination of Contract,’ and ‘Penalties.’ So, the rareness of their existence was still significant and could be discussed.

QDA Miner tool not only allows for analyzing the coding exercise but it also performs proximity analysis between coding pairs. This allows the researcher to understand whether certain coding pairs appear in the interview texts significantly closer to each other. The researcher can then interpret these pairings to understand whether two codes with different theoretical backgrounds appears close to each other in particular research. However, the particular location of a code within a text and its proximity should not be over-interpreted.

As an example, the following code co-occurrences graph denotes the number of segments, each in a different color, and some codes remain at a distance to the main themes, on the right. The tool was given the input to use a window of 6 paragraphs for detecting co-occurrences. This is an input provided by the researcher. Other alternative occurrence detection options such as ‘occurrence within the same case’ or ‘within the same paragraph’ could also be selected. As the tool does not know the nature of the research, this is an iterative process where the researcher uses the tool to support in understanding the data at hand. In result, such views allow the researcher to cross-check their overall understanding of the research findings using a visual tool. Here, for example, “Payment Issues,” “Termination of Contract” and “Time and Material Contract” seem to be less linked to other codes.



*Figure 11 Sample coding co-occurrences in a 6-paragraph window*

### 3.5. FROM FIRST-LEVEL CODES TO BUILDING A MODEL

In qualitative analysis, the level of detail for a particular code and how that code is later used to induce a meaning may vary. However, it is the research question(s) that eventually define the level of abstractions that are built based on the codes in subsequent phases. For practical uses, I grouped them under code groups in the QDA Miner tool to understand common themes in the research.

In my coding process, I chose to first use a particular word, or a phrase to understand the significance of a particular term, practice or concern. I later looked at each project to summarize those codes by using informant quotes from multiple interviewers. This allowed me to understand a project-specific perspective. Later on, I took a cross-project view and tried to analyze and group the codes to form a model based on the extant literature and the empirical analysis in this dissertation.

As an example, in the text shown above in Figure 9, the interviewee makes some references to roles on both the focal firm and the partner firm. Some of those



mentioned roles are from the pre-agile world, such as the “Project Manager” while the remaining are from the agile world, such as “Kanban Master,” “Product Owner” and “Scrum Master.” However, the inter-firm innovation process does not allow only agile-only roles to be used because of the relational context between two firms. The other concern is that in their approach to agile, each firm wanted to apply a different agile methodology, namely, Kanban and Scrum when they brought two teams into a shared office. When they were working in isolated offices, this might have worked, but since those two methodologies both have different day to day and bi-weekly rituals, a new problem arose. So, both firms need to come up with a compatible application of those roles in an inter-firm context. Hence, I also introduced a code named “Compatibility of Practices” which underlines this concern.

Once this coding exercise is complete, I attempted to categorize them under a number of themes, such as “Contracts” and “Agility in Practice.” This in result provided six categories and about 35 codes, which emphasized some terms and concepts that were the most significant in this study. The next step was to build a comprehensive model that summarized the findings suitable for data-backed case study of the dynamics of an inter-firm agile innovation effort. These are demonstrated in Section 4.

## **FINDINGS**

In this section, my purpose is to identify common “themes” by grouping codes that are connected conceptually and related to the literature review of this thesis. However, in order to demonstrate that each project interviewed provides supporting material towards a common set of findings, I briefly summarize each project’s interview results in section 4.1. In subsequent sections, I take a cross-project perspective to see how these findings can be grouped under some common themes, supported by informant quotes.

### **4.1. SUMMARY OF FINDINGS FOR EACH PROJECT**

#### **4.1.1. Project A**

The initial phases of the project, where Theta was working together with its subsidiary had started experimenting with agile practices. “When no other team here were using agile practices, we started using post-it notes on the wall and developers and analysts [in a cross-functional team format] closed into the same room.” The project turned out to be significantly larger than originally planned. Having certain expectations about total cost and having later attached those to a fixed price contract to limit risks seem to be the most important decision Theta took throughout the project and “With the change of the contract, it turned into a turnkey, fixed price project.” This in result caused the partner to focus on costs and risk minimization. They shifted back to expecting very detailed documentation from Theta in anticipation of better planning. They also moved back their team to their own offices to “... support us” so that they could control daily costs, also by trying to utilize their resources on other projects. These are typically against the discourse of agile practices. From the partner perspective, the contract was prioritized against customer collaboration and moving people away from Theta’s offices increased the miscommunication risks. As resources were also used on other projects to minimize project risks, they also lost touch with Theta even further. “[If I were to sign the same contract again], I would choose agile. Moreover, if I had made the decision

today, I would certainly not want to work with a partner that cannot work agile, that does not work agile because they have to work from another office”, a Theta manager reported. The partner manager in retrospect agrees: “This project should have been agile. We had many difficulties because we could not run agile and because we had to squeeze this into a fixed price contract”. The real challenge “was to understand the task at hand, was to ensure that everyone had the same understanding in their heads”. Additionally, “none of the projects took less than a year. In that case, people change, requirements change, when you put it into production a year later, the users and requirements no longer exist. There was a need for better time-to-market [i.e., more frequent deliveries], that would also reduce the overall time spent”. Too much time was spent in the documentation but “in an agile process, with much more communication, it would have been a more successful project for everyone”.

In result, Project A teams had challenges in managing to establish a common set of practices by establishing the right set of distribution of roles across boundaries, coming up with shared routines, using either a shared location or advanced set of communication tools to ease day-to-day work. The contract was the primary reference when conflicts arose, but it was not designed to support these practices even though it was revised once and its form had changed from a time and material contract to contain cost and schedule risks.

#### **4.1.2. Project B**

Project B demonstrates a positive example of the compatibility of practices across the inter-firm boundary while working on a joint innovation project. The project had some delays early on and “[Theta] told them to revise the plan so that [Theta] would follow it, but the plan was revised four or five times because every time there was a different problem.” To mitigate their perceived risks around not meeting the planned dates, both teams moved to a shared location. They also formed some mixed teams from both firms to work on specific sub-projects. Even though the contract did not require agile practices, they also started applying agile routines

such as daily meeting and reducing the importance of task-management by the project manager by using a shared Kanban board. “in agile, the team follows the work items by themselves, they own the tasks. In Waterfall, the project manager has to follow every task. Did you do it? Yes, you did. [In agile], the board is always in front of the team; they talk about it every day.”

Before the project, the partner’s team had experience in Scrum while Theta’s relevant team did not have much experience with it even though other teams across Theta were involved in Kanban. Theta called in their experts in agile to train its project team and to create squads (i.e., agile teams) formed of both its staff and that of the partner. Over time, both teams improved their level of maturity in agility and reached to successful completion of the revised plan. Today, Theta “supports [the partner] in agile, such as sharing best practices”. Doing agile work across boundaries was a specific challenge of its own and required a certain level of management oversight. “We typically expect an agile team to resolve its issues. A squad should warn its members, give feedback and even remove the unfit. However, in a partnership scenario, there is a contract in place, and it is not easy for individuals to solve all those issues alone. There is a need for a certain level of maturity and the management can be a catalyst for such a maturity.”

The contract of the project was a fixed price contract and was not revised despite the changes in plan and methodologies. The overall costs structure remained unchanged, but management teams agreed on interpreting “penalties in a flexible way by including the procurement teams”. This is also seen as a requirement to enable agile across boundaries because “If there are penalties, it is challenging for that team to become a real team, to execute a perfect Scrum or Kanban because the managers do everything to protect themselves against a penalty. If you want to work in an agile manner, you need to address the penalty clauses in the contracts differently.” If penalties play a major role, “teams start playing attack and defense between themselves, and those teams never become a real team.”

#### 4.1.3. Project C

In Project C, the focal firm had signed a performance-based contract with its partner, but the contract was also formed as a fixed price for a fixed set of deliverables. This was one of the first performance-based contracts the focal had signed with any partner, and payment terms were tied to those deliverables fixed at the time of the contract. However, the priorities and contents of the deliverables started immediately after the contract was signed and the teams struggled to interpret or revise the contract to adequately allow for an efficient execution while working towards the project goals.

In order to adjust to the continuous flow of changes in scope, the Theta team started to look for alternatives. The partner team had prior training in agile, and they were running Scrum in their own office. There was a project manager from the partner team being present at the Theta site, bridging the world between the two teams, acting as a Product Owner for the partner team. The partner team had the developers and Theta team had the business analysts. Theta team had little experience with either Kanban or Scrum but had Kanban training and sufficient support from other teams and consultants in rolling out Kanban practices. Theta team quickly became “convinced that the project would not deliver on time”. The Theta team first asked the partner team to increase the number of resources, but quickly they discovered “that was not very effective either”, a Theta manager reported: “Why did we want to switch over to agile? Was this team effective, we could not observe. We asked them to bring their team into our offices, we could take over their day-to-day management and we could establish a joint team spirit. When some backlog item’s analysis was completed, we found that it was, in fact, incomplete; our customer was asking for A, the outcome was a C. So, we thought we could do a lot better when people could sit together and communicate side by side”. However, when the partner team moved into Theta offices and started to work together, a new set of problems “started. The partner was running in Scrum, but we were trying to perform Kanban, there was a difference between these methodologies. They were using a different board before. We had a new board here. Then the partner raised a concern

about the distribution of roles: they wanted to have the Kanban Master role, and what about the Product Owner? The training sessions provided to us were not available to the partner team. There were disconnects, and we failed to establish alignment between the two teams.” Even though both teams were running a mode of agile and had a good understanding of how agile roles should behave, they did not have sufficient experience and guidance on how to distribute the roles in an inter-firm project context.

Even though the contract was a performance-based contract that ensured the partner gets paid based on what it delivers for the focal firm, it still had the conception of a fixed, Waterfall scope management perspective. This is in contrast to an agile way of progressing throughout the project, where the scope and the prioritization of scope items can change over time. So, adding to the set of challenges were the alignment between the contractual model and agile’s continuous iteration and re-prioritization model. A manager summarized the mismatch between the contract and the work practices as follows: “You need to deliver me this package, I planned this based on team’s [capacity], and then I put that item at the end of the backlog and prioritized another backlog item. [The contract and the agile practices] started to contradict with each other. So, if you ask me, trying to work with agile with such a contract was not very appropriate.” This demonstrates that this performance-based contract focused only on the performance of the outcomes but did not allow for inherent characteristics of the agile mode such as change, learning, iteration, and re-prioritization. According to a partner manager, “you need to respond to change. However, we could not manage this right. If we could have managed the cultural change [of the teams] without rushing through it, more slowly, we could have established success. Looking forward, if we are to engage in such a model again, first we need to establish that there is one, joint team and the contractual model needs to be aligned with the [agile] work practices.” This demonstrates that moving to a performance-based contract model without understanding the contrast between classical Waterfall development models and the new, agile processes complicates the contract management further.

#### 4.1.4. Project D

Project D started with a performance-based contract. “In the previous project, we were working with a different partner using a time and material contract. Project D started with a new partner using the performance-based contract. We started to see the difference between the two models in the first few months of the project. The new model required the partner to move to a mode of operation where the effort spent did not matter anymore but the outcomes mattered, so it meant that they should keep working on a work item until it was put into use.” This caused the partner to align with the focal firm to focus on creating value rather than putting hours into the project. A Theta manager reported: “In the classical format, you have those sticks in the contracts, penalties, and enforcement actions. That is the traditional perspective. You do not fall into those discussions anymore. This is what is written in the contract; this is a penalty rather we focus on how we can do things better, together. An example is the gamification features we worked. We did not ask them to go on work on it, but they heard about the discussion and brought some ideas to the table. This brings up a co-innovation [opportunity].”

Agile practices had their challenges: “Of course, you have new difficulties. First of all, the new world is full of action, compared to the previous world, for example, in Scrum, you continuously set targets in each sprint [i.e., a three-week window], and the teams have the responsibility to stay within that target, both the partner and Theta. So, it is a team that is working continuously hard.” Another challenge is the increased transparency across the boundaries. Sometimes the focal firm needs to make a certain decision in a certain phase of the project concerning how the project team’s structure should evolve based on learnings from prior phases. This might even include reducing the team size, changing the innovation partner or enlarging the internal team rather than provisioning more work from the innovation partner: “you might be talking about adding more resources to your team rather than to the partner’s team, but you also want to maintain the synergy. Would talking about this in a team meeting break the trust? You have dilemmas like those. There are things they should not know. Yes, we have trust, but it sometimes pushes the limits.”

## 4.2. GROUPINGS OF CODES

Based on the findings and an analysis of codes, I group them under some categories for convenient analysis. The codes are related to inter-firm innovation, why it is preferred, its advantages and challenges; and then why firms prefer agile practices for innovation processes. The codes related to inter-firm innovation and agile methodologies were consistent with the practice literature of agile and the theoretical literature of inter-firm innovation. However, the literature lacks an in-depth analysis of these two together, and my research attempts to cover the dynamics at the intersection of these two based on the framework provided by the literature review.

Here is the list of categories I grouped my codes under:

*Table 6 Categories of Codes*

Category	Brief Description
<b>Inter-firm Collaboration</b>	Why firms choose to work with external partners. This is more a validation of my research context and demonstrating that my research is in line with extant literature.
<b>Motivations for Agile</b>	Why, despite sometimes starting in non-agile mode, firms try to move to agile processes.
<b>Co-location</b>	The location-specific findings as well as technology and tools that can promise a complementary function
<b>Agility in Practice</b>	Some codes that come forward as part of the agile day to day execution of an inter-firm agile project development
<b>Role of Management Teams</b>	Despite agile mode's focus on self-managing teams, what role leaders/managers still play in an inter-firm context



<b>Contracts</b>	The contractual models, problems and opportunities that exist with each of those models about agility
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### 4.3. CHOOSING INTER-FIRM INNOVATION AND AGILE

Some common themes can be reported on why Theta chose to pursue joint innovation, using knowledge, skills, and resources of outside parties in realizing innovative activities. The most pressing issue in those decisions seems to be knowledge flows.

*Table 7 Code Frequencies for Category: Inter-firm Innovation*

<b>Code</b>	<b>Count</b>	<b>% Codes</b>	<b>Cases</b>	<b>% Cases</b>
<b>Firm Flexibility</b>	5	0,8%	4	26,7%
<b>Knowledge Flows</b>	46	7,2%	12	80,0%
<b>Cost Advantages</b>	10	1,6%	6	40,0%

In one project, they chose to work with an existing partner they have been in successful collaboration with for some time. However, in this particular project they had different expectations: “Yes, it is important to have business know-how and business processes here but the focus was on bringing resources that would bring in a vision on mobile application development, mobile applications using maps. Yes, okay, we were able to use the product they produced but was it very visionary? Nope!”

The partner would typically be an expert in one technology area to complement the project team in a fast-moving environment. “This is a true expertise area, and I mean reading in-memory data [streams] and processing them like this requires serious research and development. We did not think we could put the R&D effort at the time. We did not think we were capable of it, we did not have the know-how, and it is a particular area. If we were to write this again, it would take 2-3 years at least. Could we do it? Probably yes, but it would have required serious research and development investment.”

The partner would also agree that this is a deep expertise Theta could not build itself. “No. There are many ideas behind this, it looks simple, and many of our customers think they can do it themselves – even a few tried but failed. Some even tried to become a competitor to us. Could Theta do it? Maybe in a much longer period but not on the same timescale we have here because we have put it through stress tests and other things and other difficulties to bring it here. Many challenges at the network layer, many challenges at the event processing layer. There were many sleepless nights. Moreover, because of those efforts, it can perform today. It is a long journey. Someone prepared to go through this journey can come up with a result, can succeed but, you know, that also requires Theta to approach this as a product company. That is very important.”

Small firms also have the benefit of bringing a certain level of flexibility, especially when it comes to resource management. A project, through its evolution, might need a new set of skills to be brought in. The partners “are much more flexible when it comes to managing resources. When the work backlog increases suddenly, or when someone leaves the company, they can quickly fill that gap. For us, that would be a difficult period.” These flexibilities work in favor of schedule requirements for the focal firm. By both bringing external know-how and flexibly using resources, they can work towards the schedule targets.

However, working with external parties alone does not solve the issues that arose by time pressure. Working styles are also evolving, mostly in the direction of agile practices.

*Table 8 Code Frequencies for Category: Motivators for Agile*

<b>Code</b>	<b>Count</b>	<b>% Codes</b>	<b>Cases</b>	<b>% Cases</b>
<b>Changing Requirements or Priorities</b>	30	4,70%	8	53,30%
<b>Schedule Delays</b>	21	3,30%	7	46,70%
<b>Speed Motivation</b>	38	6,00%	15	100,00%
<b>Transparency</b>	10	1,60%	6	40,00%
<b>Process/Product Motivation</b>	4	0,60%	3	20,00%
<b>Efficiency Motivation</b>	10	1,60%	7	46,70%

The projects I have studied have experimented with agile at a particular stage, mostly after realizing that deadlines are under threat and that there are cost overruns. Agile was perceived as a means to remedy those risks. Time pressure was “an important factor in defining the direction” those projects took. As the projects started to see delays in keeping up with the timeline expectations, managers realized that they “are not able to meet the ends if [they] continue at this speed.”

Some internal teams have previously demonstrated success with agile, and it was observed that agile “makes a significant difference” in performance which encouraged the teams to use it with their collaboration partners as well. Some teams

have had a prior positive experience in working with similar practices when both teams worked “together side by side, late nights but as a single team”, where team members thought that “they were on the same ship”. Partners, on the other hand, have also had experience with agile practices, both from working with other firms but also from running agile teams internally while working with Theta in classical terms. Their experience with running in this mode had demonstrated “an incredible efficiency”.

Moving to agile creates additional responsibility for the focal firm’s teams as agile requires both sides to work as a single team and “there is a ‘do it together’ concept”. In result, if there is a failure, “the failure is also yours” because there is only one team. However, the focal firm teams thought that they would benefit from agile because it would allow them to demonstrate “internal customer satisfaction by delivering new features at the end of each sprint”.

Agile was also seen as an opportunity to provide higher visibility into the team’s day to day activities when teams thought they “did not have full insight into what the partner’s team was working on”. “Nobody can hide in the shadows anymore,” an interviewee reported.

In other cases, both teams agreed to move to agile “because of mutual trust, not by some external force”. For the partner team, it provided a set of advantages such as creating a better alignment, being close to the customer, and knowledge transfer. It also allows to control the scope of large projects, avoid throw-away work and also provide a better financial model as deliveries can be made available in shorter periods, thus reducing financial risk.

Moving to agile meant teams need to work a lot more often together; the teams are expected to “sit together”, preferably in the same locations and “look at the same boards”, utilizing shared communication artifacts. Agile practices assume cross-functional teams that cut across organizational boundaries, even within a single organization. In inter-firm scenarios, this meant “a loosely-coupled structure”, that is not a rigid but an overlapping model that allows co-innovation.

#### **4.4. PRACTICING AGILITY IN AN INTER-FIRM CONTEXT**

In the previous section, I have summarized my findings in why Theta chose to work with outside parties in its innovative efforts and why it also found using agile practices more and more often beneficial. However, putting those together is not straightforward at all times. Running agile practices within firm boundaries requires less organizational change as it only requires one organization to change its behavior, albeit not trivial. However, the focus of my research is to understand agility in inter-firm context, so in this section, I summarize my findings in this context.

One firm running in agile mode does not guarantee that the other party is able to match its steps automatically. Agile practices have specific challenges in inter-firm scenarios.

##### **4.4.1. Co-location**

First is the problem of co-location. Agile methodologies enable but also require the team members to communicate very often. The most common exercise of communication is the daily standup meetings where all members of the team get together in front of a board for 20-30 minutes and talk about what they accomplished the previous day, what they will work on that day, what roadblocks they have hit and so on. The purpose is to work on minimal task items, preferably not more than a few days so any team member can pull work from the board when she becomes available. Additionally, every team member has clear visibility into what other members are working on to get a sense of the overall velocity of the project at hand. This also allows every member to be aware of the issues faced and offer help to remove roadblocks. Some agile practitioners also prefer to work on the same tasks such as software development and testing together. Other routines such as bi-weekly retrospective meetings and planning meetings also require close collaboration. Co-location is a significant enabler of this communication and use of

digital tools such as video conferencing seem to lack the ability to provide the same communication.

*Table 9 Code Frequencies for Category: Co-location*

<b>Code</b>	<b>Count</b>	<b>% Codes</b>	<b>Cases</b>	<b>% Cases</b>
<b>Remote Location</b>	23	3,60%	12	80,00%
<b>Shared Office</b>	14	2,20%	8	53,30%
<b>Use of Digital Communication Tools</b>	6	0,90%	6	40,00%

Not all teams could co-locate for the daily rituals and retrospective meetings that agile practices require. This is mostly due to logistics issues, but as we dig deeper, we can understand that this is more a management team choice and demonstrates a broader understanding of agility and its constituents. Not all teams start agile joint-innovation with the understanding that there is an inherent need to have a much higher level of communication among team members. As the project progresses, some teams used teleconferencing and video-chat applications to close the gap while other preferred to meet at the focal firm's offices in certain days of the week and the partner firm's offices in the remaining days.

One partner firm agrees that co-location contributes to speed: "yes, part of our firm worked here, to speed things up, the more we could shorten the loop between the customer and delivery, the more we were able to create value". The focal team member agrees: "[having the team co-locate] must have speeded things up because in the previous setup, we had many disconnects in terms of communication as they were not here; and when our requirements were not understood correctly, we observed that the outputs [of their work] had problems. That is why we switched to co-location. Now the entire team is here. I think it is difficult to support agile rituals

virtually. Can it be done? Maybe. However, we could not achieve it. The remote partner should take part in your rituals, be part of your team. We could not achieve that when the partner was remote.”

Another partner firm moved their team to a closer office, but they could not move all their team members into Theta’s office space. So, they chose to send some representatives: “It was tough to work with the [partner]. They had moved their office to Kozyatağı to be able to get to work with us more comfortably; we had to work with their representatives in an agile mode here. The biggest problem was we could not involve their entire team in the agile work. This left us behind in terms of getting the benefit from agile by working closely with the partner team members.”

In one case, the product owner from the focal firm decided to be present at the partner’s office 3-4 days a week as that is where the majority of the project team resided. In most other cases, where the focal team had significant size, the partner was asked to be more present at the focal firm’s offices. “In that sense, they shared the same location and breathed the same air. Moreover, this helped them jump over the hurdles they faced a lot faster. Alternatively, I would have to call them in their office, and that would have been harder.” In one project, the focal firm’s perception was that the partner firm deliberately tried to keep their team away from the focal firm’s offices: “we did consider agile. Let us not call that agile, but their developers are working here, being together with our team without calling it Scrum, but working together – actually, that is the whole purpose of this [agile]. Maybe that is a general attitude of partner firms, when they dedicate a resource to us at our offices, you ask those people questions or discuss an alternative approach, and they thought they could not use their team members efficiently. Would it be more effective had they worked here? It would be more effective for Theta. They would have a desk here, they would have a sense of belonging, and we would have a sense of control, and we could intervene in case we needed to. However, that was not the practice.” The partner team had different working-hours than the focal firm, so they chose to keep their team remotely. In agile practices, one of the standard rules is that team members would be entirely dedicated to a particular project; they would not

timeshare between different projects and project teams. This is against the 'efficiency' perspectives of classical management, and that is why agile is called to prioritize responsiveness over efficiency. So, even the office location is typically perceived as a logistics issue at first, it seems to be an indicator of how well agile is understood across the inter-firm collaboration.

#### **4.4.2. Compatibility of Practices**

How agile practices are applied are not uniform across the board and has a high dependency on prior knowledge or experience with agile. The textbook definition of agile practices is expectedly applied differently in the field based on many factors, such as experience, maturity, culture and existing governance mechanisms. What we also observe is that agile practices in firms that have deep experiences in the pre-agile world affect how much an incumbent firm can transform its practices to agile ones over a short period. This is consistent with Coombs and Hull's discussion paper where path dependency is analyzed in three domains within the firm: the technology-as-hardware domain, the knowledge base domain and the collection of routines domain (Coombs & Hull, 1998). The latter include routines which deploy the existing knowledge base of the firm in order to make sense of particular problems in the area of product development, which are characterized by their sheer repetition.

So, when a firm with a collection of routines in product development wants to adopt a new set of routines, i.e., agile routines, they are dependent on their previous practices. This brings the question of different levels of adoption of the same textbook definitions of agility in reality. Now, having a second firm in the inter-firm collaboration process with yet another history and a different adoption level complicates overall day-to-day collaboration through agile rituals create another dimension of the overall joint innovation practice. Most of the codes in the text underline the different facets of those practices both on the focal firm and the partner firm side.



In one particular case, this can be observed as follows:

“Q: Did you or the partner have Scrum experience beforehand?

A: The partner did, but we did not. In phase I, we used a Nexus of Scrum. In the second phase, we are using Scrum directly. We have three analysts plus one on the partner side. Moreover, then the partner has four developers, and then a project manager.

Q: Why do you need a project manager?

A: To build the optimum project plan.

Q: So, it is different from a Product Owner.

A: He is both a Product Owner and a Project Manager.

Q: So, you are not only doing Scrum; it is Scrum plus project management?

A: Well, we still have a project plan based on the contract. We do follow in the background what is going to finish in six months, and what is going to happen in the next three months. It is not like a Waterfall, but we do follow the iteration plan in detail.

Q: Does he also manage the payments?

A: No, our project manager does that. There are other pieces of work that needs to be integrated internally; our project manager handles those as well.

Q: So, it is Scrum plus plus then?

A: Yes, it is.”

The partner of another project had a different experience: “We started to run agile internally with the support of an external consultant, and with no interaction with Theta. We decided to use the “Scrumban” methodology. There is such a practice,

which is 80 per cent Scrum and 20 per cent Kanban but you follow the work items on a single board. This application was very successful, and we applied it to other teams in our firm, teams are still using this. Then Theta asked us to merge the teams. They were early in the process of getting trained by another external consultant through workshops in agile practices [mostly in Kanban]. I asked my consultant, and he told me that this would be risky to transform as we had spent six months to bring the team to a particular level. Now we were to position them under our customer's management, and we did not know their maturity. However, Theta insisted and [when we merged the teams,] they appointed a Product Owner with a project management experience. Then we faced a lot of unforeseen issues”.

The Theta manager provides a similar view: “Initially the partner was doing Scrum, and in Scrum, you fix the scope [for a certain period]. Now, our world is not like that. We go back and forth, continuously. So, some teams can fit into Scrum, maybe that is also the goal, but in practice life is different. So, we got questions like ‘we were doing Scrum, why are we doing it like this?’ The difference between their expectations and our work style – we were applying a particular interpretation of Kanban, we have an “urgent band,” for example. Apart from all the beneficial routines of agile, there are a number of things that we evolved for our convenience. So, we had some disconnect there.”

“We should not jump on the bandwagon so quickly,” the partner interviewee reported: “We forced two teams that did not know each other well to work together. It is the social structure that brings success here. We took a successful, working model and carried it to another context, and it became unsuccessful”. So, after trying Kanban at the focal firm offices with the partner, the Theta asked the partner to “go back to Scrum, as that is what you do best”. The partner then decided to move back to its own offices and switched back to Scrum as they found that practice to be a lot more efficient.

On a more positive example, a partner manager reported that “it is important for both parties to be open to collaboration. When we formed the team, we selected

team members that are open to communication [- not just technical experts]. There is a learning curve, but we turned into a team that can move together. It is important for teams to act as one and we organized some team events to enable that. We have been working in this manner for two and a half years now. We started with Kanban and then divided the work into two teams, one to continue with Kanban and the other to start on Scrum. Our prior experience of agile contributed to our success here at Theta.”

Third, focal team members had a challenge in leaving project control and oversight activities, which are required by the traditional Project Manager role. Moving to a shared responsibility model meant letting go of the normal controlling mechanisms for the focal firm. This also meant losing control as “milestones were delayed”. One focal team manager reported that she “expected a certain feature to be delivered by a certain date and now the entire team, including our people, reported that it could not be done. In a classical vendor relationship, you can tell them to ‘do whatever is needed to complete on this date’, but [as part of agile practices] you are expected to accept that the team comes up with the plan, and then again you need to push your vendor to deliver [to your internal customer]”. The project manager and product owner roles may start to get mixed up.

*Table 10 Code Frequencies for Category: Agility in Practice*

<b>Code</b>	<b>Count</b>	<b>% Codes</b>	<b>Cases</b>	<b>% Cases</b>
<b>Applying Agile - General</b>	31	4,90%	12	80,00%
<b>Applying Agile - Scrum</b>	14	2,20%	6	40,00%
<b>Applying Agile - Kanban</b>	13	2,00%	8	53,30%
<b>Agile Roles - Product Owner</b>	7	1,10%	3	20,00%
<b>Pre-agile Roles - Project Manager</b>	17	2,70%	6	40,00%
<b>Partner - Internal Agile</b>	4	0,60%	3	20,00%
<b>Training / Experience in Agile</b>	23	3,60%	8	53,30%
<b>Support of the Business Team</b>	17	2,70%	8	53,30%
<b>Cross-functional Team</b>	55	8,60%	15	100,00%
<b>Maturity of the Self-managing Team</b>	5	0,80%	4	26,70%
<b>Maturity of Agile Routines</b>	21	3,30%	8	53,30%
<b>Maturity of Agile Roles</b>	21	3,30%	8	53,30%
<b>Role Distribution across Boundaries</b>	18	2,80%	9	60,00%
<b>Compatibility of Agile Practices</b>	35	5,50%	14	93,30%

On reflecting those, I introduced a “compatibility of practices” concept to understand the match of innovation-related practices between the two sides of the inter-firm boundary. This concept is inspired by the cognitive distance discussion

in absorptive capacity (Nooteboom, Van Haverbeke, Duysters, Gilsing, & Van den Oord, 2007) but is different in the sense that in absorptive capacity, knowledge transfer is mostly unidirectional and transactional whereas in agile value co-creation, compatibility of practices describe a joint capability across the firm boundaries over a period of time.

#### 4.4.3. The Role of Management

Agile practices focus on empowering the teams and leaving as many decisions to the team as possible. The concept of agile leadership then focuses on empowering the team, motivation and other indirect tools, typically formulated as “servant leadership.” Even though these may work in an intra-firm scenario, the application of those to inter-firm contexts may need more work. The vendor-customer aspect of those partnerships does not diminish completely in agile projects either, even though agile promotes full transparency. Sometimes the partner teams “try to solve a problem before [the focal firms] hears about it” as it might seem like a weakness on the partner’s behalf. In retrospective meetings, the partner teams may “act less transparently [in giving feedback] because [the focal firm] is still a customer”.

*Table 11 Code Frequencies for Category: Role of Management Teams*

Code	Count	% Codes	Cases	% Cases
<b>Firm - Leadership</b>	12	1,90%	7	46,70%
<b>Partner - Relationship Management</b>	15	2,40%	9	60,00%

Even though agile aims for self-managing teams, in inter-firm settings, both the focal firm and the partner still look for management enrollment. Management oversight is needed for “conflict resolution” as certain issues would go back to financial impact discussions. The external partner needs “somebody to represent

[their] company, otherwise [they] feel that [they] are missing on certain things“. Seeing management teams of both sides aligned also bring the teams together much easier. When in a meeting, if a focal firm staff “starts to talk about the ‘partner’ when that person is sitting next to him, conflicts arise much faster”, one interviewee reported. In agile teams, if a team member does not fit the team, the team is expected to “warn, give feedback or remove that person”. In an inter-firm setting, this might become a challenge due to contractual limitations and vendor-customer relationships. Management oversight is found to “be a catalyst to establish a certain maturity across the team”. One partner expressed that “expecting to remove managerial roles is not realistic”.

#### 4.4.4. The Role of Contracts

During the interviews, it became evident that the most critical factor to consider while switching over to agile practices was the contractual forms those projects were running in as “the contracts [were found to be] very important”. The nature of the contracts limited or enabled agile practices as it is not perceived as ideal to “run agile while managing a fixed price contract”.

*Table 12 Code Frequencies for Category: Contracts*

Code	Count	% Codes	Cases	% Cases
<b>Contractual Model</b>	31	4,90%	9	60,00%
<b>Performance Based Contract</b>	33	5,20%	8	53,30%
<b>Fixed Price Contract</b>	18	2,80%	10	66,70%
<b>Time and Material Contract</b>	11	1,70%	6	40,00%
<b>Termination of Contract</b>	1	0,20%	1	6,70%
<b>Payment issues</b>	4	0,60%	3	20,00%
<b>Revenue Sharing model</b>	6	0,90%	4	26,70%
<b>Penalties</b>	8	1,30%	4	26,70%

I interviewed managers from four different projects with different contractual forms to understand the relationship between the contractual structure and implementation of agile practices. In most cases, the financial model between the focal firm and the partner is based on the utilization of resources in an expertise area. The focal firm solely owns IP. In one particular case, if the co-developed product is sold to other customers, there is a revenue sharing model.

An early trial with a performance-based contract included a fixed scope and budget in its design, while performance-based concepts were utilized for the initial cost estimation. In effect, it was still a fixed price contract. However, when the project performance proved that it would not deliver expected results, the teams decided to try agile practices within the same contractual framework, without making any amendments. This allowed the teams to handle changing requirements for the partner firm because “the customer told that they needed other features first, and that made much sense,” but since the overall expectations did not change and payments were tied to the baseline plans, financial disputes occurred. The conflict between the responsibilities of the Product Owner from the focal firm, who works on prioritizing work and the partner’s overall delivery responsibility for the existing contract meant that the focal firm “would be taking over all risks and responsibilities”. This, along with other challenges in the project, caused the focal team to back away from agile practices and move back to the classical, Waterfall based model to hold the partner accountable for the baseline timelines, scope, and cost. In result, we may conclude that, if not carefully designed, contracts can be a hindrance in moving to agile.

Another project managed to work around the contractual format through managerial intervention. When the project team understood that the expected delivery dates are not within reach, they “realized that, it would also harm [the focal firm] by solely expecting the partner to catch up and resolve all issues”. The focal team offered to add resources more importantly, expertise from its teams to the project and, asked the partner to co-locate. The contract did not have any clauses regarding working in agile practices and how it should be executed, but the project plan referred to “Scrum as the working principle”.

The real solution came from flexibly interpreting the contract by both parties. The focal firm relaxed on penalties, and the partner team showed flexibility on an additional or revised scope that created additional cost for the team. The focal team realized that “if there are penalties [on the table], it is tough for both sides to become a single team, to work in agile mode, and to perform a perfect Scrum or Kanban”.



“The traditional mindset has SLAs, penalties, sticks and control mechanisms.” However, “if you have penalties, the partner’s management is going to do all to protect themselves”, one manager noted: “Sometimes innovation takes time. If you do not give the team the opportunity and put pressure through the contract and penalties, you do not get the product you want in the end”. Another interviewee noted that “if there is too much pressure, the first things that get postponed are innovative ideas. Once we had the opportunity to take a deep breath and things started to proceed as we wanted, we started to put a lot more time and effort in more novel solutions”.

One of the project teams interviewed had a contract that was performance-based, modeled on the function point analysis method used in software estimation. The contract replaces the person-day contract, so the payments are only performed when a particular functionality is put into use as part of the project, rather than when the time is spent by special staff. One partner reported that “before, we did not follow very closely whether the project was delivered or not, because we were able to bill you regardless. When we switched over to performance-based contract model, we made sure that project progress is in place, and we would ask for clarifications, and we would follow up on items waiting on your side”. Both teams’ goals were unified under delivering the project. The focal team was able to “give the partner a visible plan” because of two-week sprint cycles using the Scrum method.

The projects for which interviews were conducted for were early adoptions of agile practices and performance-based contracts, so there were some challenges and issues reported as well.

Not all the work performed under performance-based contracts can be associated with function point analysis. “Modelling those under a commercial framework” can be a challenge. For partners moving to this model for the first time, if they cannot estimate their production metrics correctly, it can become “too complex to manage”. If performance-based contracts cannot be designed correctly and continue to include traditional fixed price or fixed scope aspects, these “contracts [can end

up being] problematic” and hinder moving to agile practices rather than enabling them. Whether “they achieved the expected efficiency” and both sides of the partnerships question higher production rates. One interviewee reported productivity as a “the disadvantage that can be turned into an advantage if [the focal firm] can win the [partner] team’s buy-in”.

Fixed price contracts, which promise financial visibility for both sides in the beginning, are repeatedly reported as “creating conflicts” as scope inevitably changes over time and risks are typically carried by either side of the partnership.

So, when asked whether they would have preferred to start their project with a performance-based contract knowing what they know today, most interviewees reported that performance-based contracts are more suitable for agile methodologies as long as the “budget and scope can be managed”. “this project should have been run in an agile mode. We could have used less documentation and more communication that way, and it would have become a much more successful project for everyone in the end”, one partner explained. “It seems more suitable,” another partner shared. In the classical time and material contracts, “I may not care whether my staff gets fully utilized or not. In [the performance-based model], I would look for bringing in a more experienced person to do the same work instead of using two staff. This would give me efficiency opportunities”, the partner also noted.

#### **4.4.5. Looking Ahead**

Despite its challenges, most projects found agile practices to contribute to innovation as “Product Owners from business teams are a dedicated member of the agile squad, moreover, they can discuss new ideas with the developers” during daily routines. Because of this frequent communication between the business teams, internal IT teams and the partner team members, new, innovative ideas are brought to the discussion even though the focal team does “not ask [the partner] to look into it”. The cross-functional nature of agile practices enables team members to remove

their assigned roles and all “sit around the same table”. In one project, the focal firm and the partner agreed to commercialize new product modules together through a revenue sharing model, which is later marketed to other telecom operators.

“The traditional mindset still dominates,” one interviewee reported, and predicted that “since agile practices have not matured yet, it is going to take a few years before everything settles”. Theta continues to roll out performance-based contracts today. Moreover, despite its challenges, partners reported that they recommended the performance-based contractual model to other companies when working in agile mode, both in the telecommunications industry but also in other industries such as banking where they saw fit. They report these projects as successful implementations. Function point analysis method requires specific training and discipline to calculate the size of work items correctly. There may, however, be variations to the performance-based contract model and not every firm choose the function point analysis method. One of the partners reported that they have a financial institution as their customer where, based on expert judgment, they use t-shirt size work items, such as small, large and extra-large to measure output.

#### **4.5. RESPONSES TO RESEARCH QUESTIONS**

My primary research question and sub-questions were as follows:

How does the need for agility affect inter-firm project governance?

Sub-questions:

1. What new inter-firm practices emerge as a response to the urgency in innovation?
2. What are the effects of contracts on agile projects?
3. How does the match of capabilities on both sides of the inter-firm dyad effect collaboration efforts?

As a response to the first question, the data I collected demonstrated that time pressure, increasing urgency, schedule delays and expectations to deliver projects faster than initially planned, all direct firms in looking for new ways to work within themselves but also with their innovation partners. Agile practices have become almost a de-facto standard in startup firms in recent years, but we also see the same trend in many incumbent firms as their businesses are put under pressure by not only their long-time competitors but also disruptors from other domains. Naturally, this strategic urgency also effects how they interact with their innovation partners in joint innovation efforts. The overall governance mechanisms move from a solid contractual delivery model to a more joint development model where boundaries become further blurred, contractual formats get modified by moving from fixed-price, penalty based, risk- and penalty-focused contracts to innovation output focused contracts. The day to day practices of working with innovation partners also require both parties to collaborate across the boundaries with increased transparency. This means both the focal firm and the partner firms need new capabilities to successfully deliver on joint-innovation projects while leaving aside some of the old, risk and penalty-based vendor-customer relationships.

In response to the second question, my findings demonstrated that contracts play a significant role in enabling or constraining the move to agile methodologies in joint inter-firm innovation projects. Fixed scope, fixed price contracts create friction points in executing an innovation project in an agile mode as agility inherently requires changing direction in terms of scope, needed skills and project targets. Time and material contracts, on the other hand, are more flexible and may be better aligned for the agile project approach, but the partner firm's commitment may not match the delivery and outcome focus of the focal firm. Performance-based contracts, especially with their outcome-based focus aligns the two parties in short-term outputs as agility also requires quick deliveries to enable iterative development based on frequent customer feedback and continuous learning. However, the contracts need to be also modified to allow for learning, and they should focus less on penalties and other risk management clauses.

In response to the third question, I have found that it is not solely adequate for the focal firm to move to agile practices as agility by definition requires cross-functional teams with little hierarchy to operate in a self-managing role as much as possible. This means that the teams should now be formed by members from either side of the firm boundary, but they need to act as one team all the time. Much of the bureaucracy needs to be trimmed because teams now have to work on 2-3 week delivery cycles to respond to iterative, fast-feedback based cycles. My research points out that at a given time each of the firms may be at a different maturity stage for their journey toward agility. In some cases, one of the firms – mostly the partner – may not even have embraced the agile practices yet but may be forced to due to the nature of the project. In other cases, the partner may be further ahead in their journey. However, what makes it essential for the success of the project is that the two firms need to reach a unison and some sameness in cadence. Once this level of compatibility is achieved, it also needs to be complemented with a modified level of leadership oversight and support. It is then also possible to relax some of the standard contractual controls for risk management as agility may bring additional transparency on delivery performance and cost management.

In subsequent sections, I also discuss my findings in comparison to the existing literature.

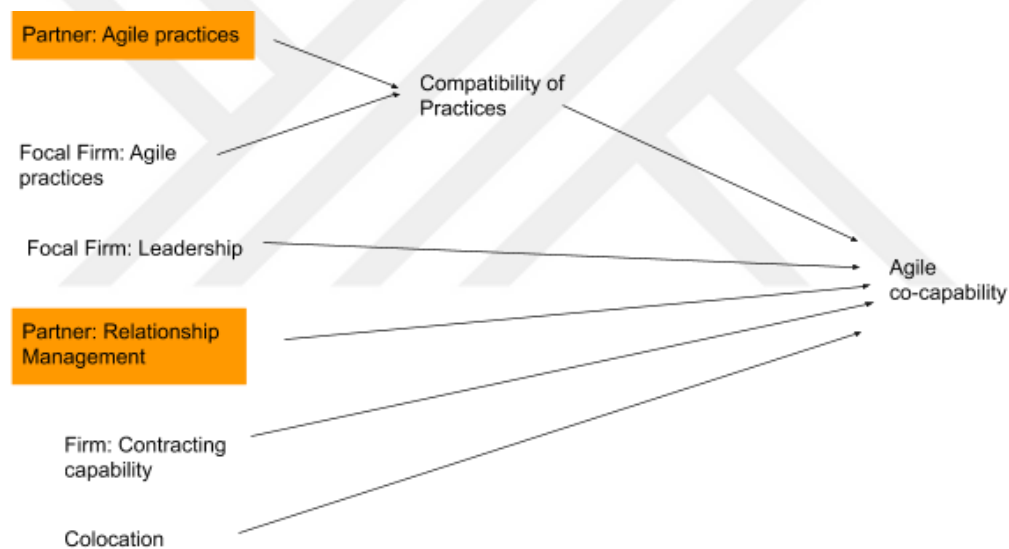
#### **4.6. BUILDING A MODEL**

My research scope overlaps with what Teece et al. (Teece, Peteraf, & Leih, 2016) call ‘seizing’ stage of dynamic capabilities in innovation, and it is particular to open innovation as a means of seizing innovation opportunities identified by a firm in an agile manner. My results on how cross-boundary agile innovation is realized point to three priority areas:

- 1 First, governance choices and related factors such as practice compatibility enable or obstruct whether these practices function in the ways expected.

- 2 Second, these effects are relational; i.e., management choices are not only contingent on focal firm or context, but also depends on the partner firm. In other words, a relational take on capability, or ‘co-capability,’ in cross-boundary innovation is a more fruitful way of approaching the matter.
- 3 Third, whether a contract type is appropriate is contingent on both contextual and relational factors, and presents a significant area of development for better governance.

To capture this multitude of effects, I propose a value co-creation model visualized in Figure 12.



*Figure 12 A Value Co-creation Model for Agile Inter-firm Innovation*

I grouped my findings under the following main factors that lead to agile co-capability:

- The application of agility on the focal firm and the partner firm and the compatibility of the said: the findings emphasize that firms choose to pursue agile practices to respond to time pressure in innovative product

development. They also expect agile practices to provide increased visibility into the day to day development of the new product. They are willing to take risks in changing their robust, -proven product development methodologies such as the Waterfall based development in expectation of better delivery times. They also do expect and direct their innovation partners to apply those practices in joint development efforts. I have found that while agility promises to respond to those urgency pressures as a dynamic capability had convinced Theta, the compatibility of practices between Theta and partners in executing day to day agile practices was still a concern.

- The leadership roles, both in the partner and the focal firm, continue to play a significant role in managing the overall relationship between the two parties despite agile's focus on self-managing teams.
- As a formal governance mechanism, contracts still shape the relationship between the focal firm and its partners in deploying agile practices. Even though management oversight can interpret contracts, and especially penalty terms at times of crisis to make way for the teams to get back on track, the capability to design and execute new contractual forms suitable for agile practices are found to be a significant factor in agile inter-firm collaboration scenarios.
- Last but not least, co-location is emphasized as a significant factor in successful agile execution. Even though new communication tools and technologies can be expected to address remote location-based issues, agile practices deliberately choose post-its, paper-based boards where team members can gather face to face every morning. This explicit and emphasized focus on communication and collaboration re-emphasizes the significance of co-location.

The concept of “agile co-capability” is found to be a result of these factors. Agile co-capability is thus by definition not only a dynamic capability of the focal firm in question but its ability to execute in an agile form with its partner.





## **DISCUSSION AND IMPLICATIONS**

### **5.1. STRATEGIC URGENCY**

In this section, I derive a common theme from my empirical analysis: As the pressure on innovation speed increases, most inter-firm collaborations tend to move to agile practices on both sides of the boundary, resulting in joint innovation teams.

With the increasing pressure on speed, agile practices are becoming more of a common practice among established firms (Blank, 2013; Kirsner, 2016). Their adoption has been broader in the startup community despite its roots in the pre-startup era, and now large, incumbent firms are also looking at agility as a way to respond to disruption challenges from startups and other technology firms. Those firms that felt the urge to respond to those challenges try some approaches, including acquiring startups, working with startups and behaving like startups. Each of these stages has mixed results. Broad application of agile practices can be seen as part of the third stage where large companies have been dropping their command and control structure to respond to strategic urgency requirements. This also means moving control from managers to teams to a certain extent. This focus of agile practices was not explored as part of this research but can be the subject of a further study. However, this particular research has uncovered that agile practices are contagious. Some cases demonstrate that despite not being the initially chosen methodology when starting a project, managers turn to agile practices voluntarily as a response to their time pressure crisis. When agile is deployed at one part of the organization and demonstrates a certain level of success, other projects that are facing time pressure and visibility hear about those successes and want to try those practices both within their teams and together with their innovation partners.

### **5.2. TEAM CULTURE AND CONTRACTING CAPACITY**

When a focal firm decides to employ agile practices, two aspects emerge immediately as prerequisites. First is the adoption of agile practices within the team.

Focal firms train their people from various prior roles into new agile routines and new agile roles. In this research, an external consultant team has been brought in to change the incumbent team's culture and practices. On the other hand, when applying the practices, the focal team acted mostly on its own, with support from the consultant team in biweekly, two-hour review meetings as well as ad-hoc supporting sessions. However, this cultural transformation exercise was not extended to partner firms. The partner teams had mixed experience with agile practices.

The second focus area was the contractual forms. Most projects had started before the urgency crisis hit them, so they already had a contractual form defined at the time they decided to try agile. However, when interviewed, it is a common theme among interviewees of the focal team that the suitability of the contractual form and the agile practices mattered. Some contracts were designed in a performance-based manner, so the teams that could execute those contracts in line with the agile practices managed to turn this into their advantage and get results from the agile inter-firm collaborations.

It should be noted that when the focal firm decided to switch to performance-based contracts, it was mostly to improve the quality of outputs from time and material contracts. Even though the team that worked on these contracts were also one of the first teams employing agility, agile practices were not the main focus of the contract design. So, even though most interviewees report that agile and performance-based contracts are the most suitable, there may still be an opportunity to design the contracts with agility in mind to reach better conclusions.

The need for new contracting forms denotes that incumbent teams are continuously looking for new ways of improving their sourcing of external knowledge. Without a deep understanding of the nature of the work partners are contributing to, it is a challenge to design the suitable contractual forms that can improve the focal team's innovation success while introducing further visibility into the partner's outputs and the overall cost structure. Designing a performance-based contract that is suitable

for agile practices, later on, demonstrates that firms need contractual design capacities that are suitable for new ways of work.

An agile team's culture is cross-functional and self-managing. In the focal firm studied, successful teams were able to absorb this culture and started to move away from the command-and-control structure into a more empowered model, even with a partner's team members around. In contrast, in one of the projects that had to move away from agile practices, and later from the collaboration with the partner firm, the team members confused the usual command-and-control culture with the new agile practices. This is understandable because unlike intra-firm agile scenarios, in the inter-firm agile practices, the classical "vendor-customer" dynamics are still in effect to an extent: not all decisions can be executed by the team alone as that may have implications on the relationships between the two parties. So, successful adoption of agile routines and agile roles matter significantly in agile innovation success.

### **5.3. PARTNER CULTURE AND CONTRACTING CAPACITY**

Partner teams' adoption of agile practices is mostly driven by the focal team's choice and request. Proposing to move to agile does not emerge as a typical pattern among the partner firms even though some has prior experience with one of the agile methodologies. They can choose to use an agile methodology as they do the work on their side of the boundary while trying to keep the usual command-and-control structure with the focal firm.

In other cases, partners choose to comply with the focal firm's request to switch over to agile practices, but there is little data to suggest that they trained their team members in this new paradigm. Agile's focus on "voluntary adoption" is not readily applicable to partnership scenarios as partners would need to comply with the pressure coming from the focal firm when they decide to transition.

Lean manufacturing has made a significant impact on the automotive industry since the 1960s and has been a significant focus of the existing research. Womack et al.

(1990) provide insight into the contractual relationship between the manufacturer and its suppliers. For lean automotive manufacturing, the dynamics of the relationship is different from using agile in the information technology industry. The partners in lean manufacturing are mostly optimized for the exploitation phase. The manufacturer provides a target price for the car it is going to produce and then derives the corresponding target costs of the parts and sub-assemblies it is going to source from the lower-level partners in the value chain. The contracts are so-called 'basic contracts' which documents the manufacturer and the suppliers' intent to work over the long term, with rules around determining price points, quality assurance, and proprietary rights. However, the actual execution of the contract is performance based. Suppliers are never kept in the dark, in any case. Through simple grading systems, suppliers can see their scores based on defective parts found on the assembly line, on-time deliveries and reducing cost. If the supplier cannot meet the expectations, the focal firm moves some of their supply to one of the other parts providers as a penalty. This also underlines that there are multiple providers for the same part in the automotive supply chain. The partner typically keeps a senior engineer at the focal firm location, but if problems go beyond that person's control, a team of engineers is shipped to the assembly plant to solve the issues (Womack, Jones & Ross, 1990).

The dynamics in the information technology industry is different. The focus of agile development is on the exploration, not exploitation. This brings more uncertainty for both sides. For the focal firm, the uncertainty about the delivery performance of a partner is a further risk and needs to be managed carefully. It is also not practical to use more than one partner for the delivery of the same part of a product. Thus, even though the contract can be designed similar to the 'basic contract' form with less focus on the penalty, other measures need to be in place to satisfy the risk aspect. Bringing the partner team members into the focal firm's offices was the common approach taken in Theta. These teams generally managed to bridge both the cultural differences quickly and started to recover schedule performance issues. In one of the cases, the partner team refused to bring their team members to the

focal team's office, quoting that they were using their team members in other customers' projects on a time-share basis and this would decrease their overall efficiency. The focal team has noted this behavior as the partner team's limited understanding of agility, and when they managed to bring in their team members to take over the remaining project work, they terminated the partner contract before the partner delivered the original scope agreed. In this particular case, the partner and the focal team had redesigned the contract, but interestingly they decided to move to a more fixed price model despite the delays in the prior phases of the project and a significant number of cross-dependencies between the focal team member and the partner team members. This demonstrates that contract design capability does not emerge automatically in the right form, at all times.

Teece et al. discuss the importance of flexible sourcing as part of gaining agility by outsourcing agility and maintaining contractual flexibility (Teece et al. 2016). However, their example of Foxconn being able to change the plastic screens with glass screens at the eleventh hour of iPhone going into production is more an exception than a rule. iPhone production is still at the manufacturing phase of a tangible product at this time. Agile innovation within the information technology industry, and especially with a significant portion of software, starts with a minimum valuable product and is iteratively built over time based on customer feedback over multiple iterations. Thus, Foxconn's one-off flexibility needs to be further extended to a software partner's flexibility.

#### **5.4. LEADERSHIP IN CONTRACT MANAGEMENT**

In addressing the challenges with inter-firm agile innovation, leadership still plays a significant role even though agile practices preach reduced influence from leadership. An agile leader is expected to not focus on solving the day to day challenges of a project but rather to focus on growing people, creating passion and mentoring the team in addressing their challenges within the project. The team is expected to self-manage itself in the final picture, including changing its members or even structure. Despite this preaching, moving to agile does not happen in a linear

trajectory. Using partners in innovation scenarios introduce further challenges as the firm boundaries are being crossed. The existence of a second leadership from the partner's side and the contractual model naturally limits the extent of the decisions the team can take. Having a commercial model of this relationship further complicates the matter.

In the Theta case, successful implementations demonstrated that leadership had to keep an eye on the team's performance and decision-making process quite closely. In some instances, they intervened to either modify or extend the contract or mutually agreed to interpret the contractual terms liberally. First, they became present in team review meetings to observe the behaviors of their team members and smoothen the communication. Second, they gave guidance on what the team can decide and what they needed to escalate themselves. Third, they interpreted the penalty and additional cost cases in a mutually acceptable manner without having to escalate issues further. Forth, they demonstrated to their teams that the leaders of the focal team and the partner team are there for the mutually beneficial outcome and their only goal was to deliver the innovation project on time and within expectations successfully.

In the less successful scenarios, the interviews revealed that there is less of an alignment between the management layers of Theta as well as the management teams of Theta and its partners. The day-to-day managers requesting partner teams to be present on-site were being either overruled or ignored by senior managers once the partner team management engaged with the latter directly.

The leadership's role plays a vital role in interpreting and executing the contracts in either scenario.

## **5.5. COMPATIBILITY OF PRACTICES**

The literature on collaborative innovation sheds little light on the capabilities and capacities of the partner firms. The focus is mostly on the learning capacities of the focal firms, the roles it needs to employ (Whelan, Parise, de Valk, & Aalbers, 2011),

and the practices they need to establish. The roles and capabilities of the partners are assumed to match the expectations of the focal firm. My research demonstrates that, especially in the case of agile, which is a paradigm of its own, the partner's ability to understand and apply agile practices is equally important as that of the focal firm. The cross-functional team structures of agile practices bring the focal firm and the partner firm members together at the team level. The daily stand-up meetings, biweekly routines and intense need to be present at the same location emphasize the alignment of the team cultures further. Under those circumstances, the knowledge base of the focal firm and the cost advantages it brings to the focal firm are not sufficient to execute during a value co-creation scenario.

The partner firms who have prior maturity in agile practices have a higher advantage in collaborating with the focal firms. The challenge is that there are many agile methodologies for the focal team to choose from, in part influenced by the project structure. If the partner firm is not capable and ready to engage in the preferred methodology, then the focal firm needs to put further effort into ensuring a successful execution.

The co-location of teams can be perceived on the physical dimension alone but its impact can be seen in a multitude of dimensions: increased communication speed and quality, openness and transparency and eventually trust are among the benefits of co-location. In most cases, the partner teams relocated to the focal firm's offices in a full-time or part-time plan but in one project Theta managed to move its key staff to the partner team location three or four days a week. On the other hand, partners who were not open to transparency or who did not wish to align their practices with those of Theta did not collaborate with the co-location requests. They chose to continue work in their own chosen methodology, and these projects were observed to be more prone to failure.

Agile practices require innovation teams to make as many decisions as they can and work on small iterations (e.g., 2-3 week development cycles). Once the innovation practice becomes a joint co-creation effort across the firm boundary with short term

iterations, the location proximity of the team members and the formation of the teams are not enough to ensure innovation success. They also need to work using the same methodologies and the same cadence. This requires an agile co-capability, i.e., the ability to work with external partners in an agile manner. This capability differentiates itself from working in an agile manner within one's firm boundaries as many new constraints and challenges need to be addressed in an inter-firm setting. Agile co-capability requires an understanding of those constraints and challenges and finding the right strategies and decisions to address them.

Agile co-capability is not only required for the focal firm. The partner firms need to be able to align with the focal firm in their day to day activities, resource allocation and utilization, and contracting. One of the main prerequisites of building an agile team is accepting an increased level of transparency as the boundaries become blurred. In return, this transparency brings out trust between the parties. Thus, the ability to operate in an agile manner is not only a capability of routines, but it is a capability for trust building and cultural match.

## **5.6 THEORETICAL IMPLICATIONS**

### **5.6.1. On Dynamic Capabilities**

My research provides two different sets of insight around dynamic capabilities. The first one is around agile processes. I would propose that agility is a critical dynamic capability a firm needs to have within the context of cross-boundary innovation to achieve sustainable competitive advantage in responding to various disruption threats in today's volatile environments.

Dynamic capabilities can be thought of in three categories:

- Sensing: this is the phase of identification, development, co-development, and assessment of technological opportunities in relation to customer needs;



- Seizing: mobilization of resources to address needs and opportunities and capturing value from doing so;
- Transforming / shifting: continued renewal (Teece, Peteraf, & Leih, 2016).

Agility matches all three categories of dynamic capabilities also in the context of inter-firm innovation, but the weight of it is observable more on the seizing phase – this is also where my research is focused. Once the technological opportunities are sensed, it enables working through relationships with technology partners and coming up with a final product that matches customers’ expectations in an environment where time pressure is extreme, and a multitude of options exist.

If these relationships could be contracted carefully, it would also enable both sides of the collaboration to manage their respective risks in a controlled manner and give way for further collaborations. Its “cross-functional teams” dynamics enables resources from both the focal firm and the partner firm to work as a single team on very frequent iterations. If the maturity of teams in agile practices match and compatibility of practices can be established, then agile innovation allows for seizing opportunities and creating value fast compared to other transactional alternatives.

For the sensing phase, agility may help in testing out ideas quickly and “fail fast” but my research projects have mostly started after this phase, so it provided limited insight for discussing the details of this phase. For the transforming/shifting phase, agility provides a high level of responsiveness to opportunities and continued renewal of the product or service to respond to threats. However, my research has not focused on these.

I should emphasize that the literature on agility is quite limited and this research could have been scoped to its intra-firm dynamics alone as even in those scenarios it is emerging as a dynamic capability most firms need to have in achieving continued success. Even in that context, agility could be studied with the lens of Teece et al. and this would be a theoretically relevant area to investigate as it

requires organizational change management, organizational design and other aspects of innovation management. I chose to focus on its cross-boundary dynamics instead as firms are leaning more towards exploring through their innovation partners. This is being further accelerated by the increasing speed of new technology introductions.

The second discussion I would like to have is around dynamic capabilities in general. Literature is quite hesitant in addressing the capabilities of partnering firms in discussing gaining competitive advantage. The focus is mostly on the focal firm. Lichtenthaler & Lichtenthaler (2009) provided a comprehensive list of capacities a focal firm needs to have in order to achieve its open innovation targets. One should note that the “knowledge exploration, knowledge retention, and knowledge exploitation” stages of this model are considerably aligned with Teece et al.’s “sensing, seizing and transforming/shifting” model. Nooteboom et al.’s work on cognitive distance also provides a perspective on the partner firms’ knowledge base in achieving absorptive capacity (Nooteboom, Van Haverbeke, Duysters, Gilsing, & Van den Oord, 2007). However, I would like to argue that the agile capabilities of the partner firms and the compatibility of those with those of the focal firms are a major success factor in achieving success under agile, collaborative innovation scenarios. First, the “desorptive” capacity of the partner firm, i.e., the outward knowledge transfer and the “absorptive” capacity of the focal firm need to match. However, this is still a transactional perspective in the sense that the knowledge that is referred to here is knowledge acquired or built a priori to the partnership with the focal firm. However, it is the capability to create new knowledge together with the focal firm based on its existing knowledge base is what matters in today’s dynamic environment. Dynamic capabilities literature needs to extend beyond the unidirectional “knowledge flows” perspective. Knowledge does not need to flow from one side of the firm boundary to the other at all times. Research needs to use a “value co-creation” perspective when investigating joint innovation efforts. This is why I propose the concept of “dynamic co-capability” to underline the cross-boundary nature of the practice in contrast to knowledge flows conceptualization.

This co-capability builds upon the compatibility of practices, leadership and governance mechanisms such as the contracts. This would allow for new opportunities in understanding the dynamics of inter-firm collaboration and provide additional insight into innovation practices. As agile practices enforce cross-team collaborations in value creation activities, they provide a solid research field in such an investigation.

### **5.6.2. On Contracting for Innovation**

As noted earlier, most transaction cost economics literature ignores innovation scenarios and focuses on transaction cost factors such as uncertainty, bounded rationality, opportunism and asset specificity. Inter-firm innovation is inherently exposed to uncertainty, bounded rationality and asset specificity as the focal firm is reaching out for an innovation partner in co-creating a new product or service through co-creation of new knowledge. The partnering firm has the knowledge assets the focal firm needs to achieve its innovative goals. The focal firm then needs to write a contract to protect itself from opportunism and hostage situations. In the case of regular transactions, specialized governance structures can be employed, but for specific investments, bilateral governance develops (Dietrich, 1994). Bilateral governance, also known as “relational contracting” tries to address these situations where firms build more flexible contracts using terms such as “best efforts” and “reasonableness” and some scholars furthermore use the term to refer to trust and reputation (Hagedoorn & Hesen, 2007). Familiarity, i.e., a prior collaboration between the firm and its partner, is considered as a trust-building precedent (Gulati, 1995). Recent research argues that if prior collaboration exists, it is then strongly advised to include safeguarding terms to ensure successful execution of radical innovation projects (Hofman, Faems, & Schleimer, 2017).

My research has some contributions to the contracting literature. First, in the fast-moving technology space, assuming to depend on familiarity is not realistic. Of all the four projects I investigated, none of the firms had prior working relationships with the focal firm’s project team. Some of them had previous relationships with

other parts of the focal firm's organization but mostly on other technologies. So, the theory cannot depend on assuming familiarity in building trust. I have found that the compatibility of practices can come in as an alternative to building trust. The compatibility of practices gives both firms a common language and a standard set of daily practices in approaching the innovation problem. Agile is a solid example of such practices. They enable both sides of the collaboration to build trust in the early stages of the relationship. The performance-based aspect of the contracts can further reduce the concerns around opportunism and hostage situations as both teams can trust that the cost aspect of the contract is regulated based on iterative work items, which are deployed to the end customer frequently for feedback. This ensures that the innovation projects can take the turns it needs early on. The focal firm can build trust by seeing deliverables early on. Information asymmetry dissolves at each iteration based on needs and priorities.

Second, I propose that if compatibility of practices is high, collaborating parties can resort to informal methods for governance as trust is easily established throughout the inter-firm collaboration and governance may move away from the contractual basis. If the compatibility of practices is low, then governance is mostly left to formal methods such as contracts and most discussions are managed through the contractual framework.

The interviewees also repeatedly reported that focusing on penalty clauses reduce risk-taking and indirectly reducing the innovative aspect of the relationship. This is also in contrast to focusing on safeguarding terms to ensure successful execution of radical innovation. The contracting literature focuses mostly on how penalty, force major, warranties and dispute resolution clauses are managed in inter-firm relationships. However, these clauses come into effect when the primary purpose of the contractual relationship is in jeopardy. Research should focus on balancing the protective focus of contracts with value creation focus and encouraging leadership suitable to agile scenarios. My research demonstrates that new practices such as agile create new opportunities for designing those inter-firm contracts. In result, I can propose that how new contractual forms can be designed can create an

additional competitive advantage for firms. There is ample research opportunity in this space.

Third, regardless of the contractual forms and terms, it is the managers that interpret, manage and execute the contracts. The legal or procurement departments write most contractual terms; however, it is the product development teams who manage those contracts. What I call the “management” of a contract is then related to how that contract is used to govern the relationship between the focal firm and its innovation partner. The partner’s ability to manage the contract from the other end of the relationship is equally important. Therefore, the leadership’s role is equally essential governing the relationship.

## **5.7. IMPLICATIONS FOR MANAGEMENT PRACTICE**

I focused on how open innovation is practiced in projects rather than its strategic aspects. Thus my observations here are focused on its execution.

First, managers should continue exploring how to manage agile practices in cross-boundary scenarios. Agile practices require building self-governing, cross-functional teams and this cross-functionality should be extended beyond the firm’s boundaries. Existing management literature in agile does not differentiate between intra-firm and inter-firm agile, but this research demonstrates that inter-firm agile practices require that teams should work as a single team and managers should govern and filter appropriability, confidentiality, and regulative concerns as teams get closer together, so no unwanted consequences arise. Managers must be alert that defensive approaches to leadership in cross-boundary innovation efforts can destroy the knowledge sharing climate necessary for innovation.

Second, managers should explore performance-based contracts in innovation scenarios. Agile practices with their iterative and piecemeal approach allow for these contracts. Managers should use frequent feedback cycles to validate and monitor the innovation journey and look for continuous improvement opportunities as soon as possible.

Third, managers should not depend on the initial contracting structures to govern their cross-boundary collaborations. Innovation is about uncovering unknowns and exploring new grounds and predicting the innovation trajectory and writing a contract based on that prediction can remain too optimistic in specific scenarios. Appropriation models, cost, timeliness and the content of the innovative work are all going to expose themselves throughout the trajectory and managers should look for ways to govern the collaboration with trust and shared goals. Assuming that trust can only be achieved through prior engagements is not realistic in innovation scenarios and each innovation may require an entirely new partner. Thus, managers must consider alternatives, such as compatibility of practices, to facilitate better co-capabilities.

## CONCLUSIONS

### 6.1. LIMITATIONS

My research is limited to a single company and is prone to all limitations a case study would have: it depends a lot on the characteristics of the industry, that firm's past relationships with its partners, and geographical and cultural norms. Furthermore, the period under discussion focused on the first three years of Theta's move to agile practices, so even though the duration is still significantly relevant for the collection of data, it still is prone to some "learning curve" behaviors. In other words, the patterns could evolve differently if the same were to be observed over a more extended period. On the other hand, this may also be the best period to observe the contrasts and challenges.

I did not focus on how contracts were designed and the way the partners were selected in too much detail. It is possible to take the research to an earlier point in the overall partner management cycle and focus on partner selection phases. By doing so in detail, it might be possible to come up with a "partner selection capability" within the context of agility to ensure agile joint innovation project success.

The selection of the projects was made based on involving some of the agile champions within Theta to be able to find the projects that put a strong emphasis on switching over to agile project development throughout the project cycle. I also selected projects executed by different divisions within the same organization and with a different set of innovation partners to cover a larger sample space. However, this is still far from the coverage of a quantitative analysis could reach but allowed me to look for common emergent patterns.

## **6.2. FUTURE WORK**

When I started this dissertation, my focus was mostly on how two firms, with two different cultural backgrounds, can step into day-to-day, heavy communication routine to successfully deliver critical innovation projects on time. Early on, I observed that contracts were coming up as a significant factor in the overall relationship, so I found myself obliged to focus on the governance aspects and were compelled to visit the contracting literature. However, I preserved my initial focus on the teams that were working together on innovation projects but kept my distance to the contract drafting and negotiating teams who were responsible for the structure and the content of the contracts.

In the future, it might be worthwhile to consider a different firm context using the same or similar set of questions. As one partner had indicated, they were using a different form of performance-based contracts based on t-shirt sizes, potentially indicating the randomness and variability in the field. The ideal form of contracts to support agile innovation may only evolve over time and can be longitudinally studied. Similarly, contract management and negotiation teams can also be studied.

I also kept the level of analysis at the meso level. However, micro-level phenomena can also be explored. For example, how agile practices influence the day-to-day behavior of individuals can be explored. How motivational factors of agile practices, namely their focus on visibility, voluntariness, and self-managing characteristics influence the individuals and their performance can be further studied. A critical perspective could also be employed to study agile practices.

Another perspective could be the role of consultants in firms' move into the agile world. Although noted in a few places, both Theta and one partner have used consultants in transforming their teams towards the agile world. The impact of those consultants can be studied further, especially when both the focal firm and the partners get consistent training in agility before embarking on a joint innovation journey.



From a methodology perspective, the next step could be to establish some hypotheses and then run empirical tests to validate those. This can allow verifying the research model quantitatively.



## REFERENCES

- Accenture. (2015). *Harnessing the Power of Entrepreneurs*. Accenture. Retrieved 02 10, 2016, from <https://www.accenture.com/us-en/~media/Accenture/next-gen/B20/Accenture-G20-YEA-2015-Open-Innovation-Executive-Summary.pdf>
- Afuah, A. (2001). Dynamic Boundaries of the Firm: Are Firms Better Off Being Vertically Integrated in the Face of a Technological Change? *Academy of Management Journal*, 44(6), 1211-1228.
- Afuah, A. (2003). Redefining firm boundaries in the face of the Internet: Are firms really shrinking? *Academy of Management Review*, 28(1), 34-53.
- Araujo, L., Dubois, A., & Gadde, L.-E. (2003). The Multiple Boundaries of the Firm. *Journal of Management Studies*, 40(5), 1255-1277.
- Argyres, N., & Zenger, T. (2007). Are capability-based theories of firm boundaries really distinct from transaction cost theory? *Academy of Management Proceedings*, 1-6.
- Beck, K., Beedle, M., Bennekum, A. V., Cockburn, A., Cunningham, W., Fowler, M., & et al. (2001). *Manifesto for agile software development*. Retrieved from <http://agilemanifesto.org/>: <http://agilemanifesto.org/>
- Bhens, S., Lau, L., & Markovitch, S. (2015). *Finding the speed to innovate*. McKinsey&Company. Retrieved August 12, 2018, from <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/finding-the-speed-to-innovate>
- Blank, S. (2013). Why the lean start-up changes everything. *Harvard Business Review*, 91(5), 63-72.
- BMBF. (2015). *Project of the Future: Industry 4.0*. Retrieved May 24, 2015, from Federal Ministry of Education and Research: <http://www.bmbf.de/en/19955.php>

- Bogers, M., & West, J. (2012). Managing Distributed Innovation: Strategic Utilization of Open and User Innovation. *Creativity and Innovation Management*, 61-75.
- Brooker, K. (2015, July 28). Goldman in Ventureland. Bloomberg. Retrieved 2015, from <https://www.bloomberg.com/news/features/2015-07-28/how-goldman-sachs-became-a-tech-investing-powerhouse>
- Browning, T. R., & Sanders, N. R. (2012). Can innovation be lean? *California management review*, 54(4), 5-19.
- Browning, T., & Sanders, N. (2012). *Can Innovation Be Lean?* Harvard Business Review.
- Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. WW Norton & Company.
- Bush, V. (1945). *Science The Endless Frontier*. The Office of Scientific Research and Development. Washington: United States Government Printing Office. Retrieved from <https://www.nsf.gov/od/lpa/nsf50/vbush1945.htm#ch1.3>
- Capgemini. (2015). *The Innovation Game: Why and How Businesses are Investing in Innovation Centers*. Capgemini. Retrieved 05 08, 2016, from [https://www.capgemini-consulting.com/resource-file-access/resource/pdf/innovation\\_center\\_v14.pdf](https://www.capgemini-consulting.com/resource-file-access/resource/pdf/innovation_center_v14.pdf)
- Carbonell, P., & Rodriguez, A. I. (2006). The impact of market characteristics and innovation speed on perceptions of positional advantage and new product performance. *International Journal of Research in Marketing*, 1-12.
- Chandler, A. D. (1977). *The Visible Hand - The Managerial Revolution in American Business*. Harvard University Press.
- Chesbrough, H. (2003). *Open Innovation, The New Imperative for Creating and Profiting from Technology*. Boston: Harvard Business School Press.
- Chesbrough, H. (2006). Open Innovation: A New Paradigm for Understanding Industrial Innovation. In H. Chesbrough, W. Vanheverbeke, & J. West,

- Open Innovation: Researching a New Paradigm* (pp. 1-14). Oxford University Press.
- Chesbrough, H. (2010). *Open services innovation: Rethinking your business to grow and compete in a new era*. John Wiley & Sons.
- Chesbrough, H., & Appleyard, M. M. (2007). Open Innovation and Strategy. *California Management Review*, 50(1), 57-76.
- Chesbrough, H., & Bogers, M. (2014). Explicating Open Innovation. In H. Chesbrough, W. Vanhaverbeke, & J. West, *New frontiers in open innovation* (pp. 3-28). Oxford University Press.
- Chesbrough, H., & Crowther, A. K. (2006). Beyond high tech: early adopters of open innovation in other industries. *R&D Management*, 36(3), 229-236.
- Chesbrough, H., & Weiblen, T. (2015). Engaging with Startups to Enhance Corporate Innovation. *California Management Review*, 57(2), 66-90.  
Retrieved from <http://www.jstor.org/stable/10.1525/cmr.2015.57.2.66>
- Christensen, C. M. (1997). *The innovator's dilemma*.
- Christensen, C., Raynor, M., & McDonald, R. (2015). What Is Disruptive Innovation? *Harvard Business Review*, 93(12), 44-53.
- Christopher, M. (2000). The agile supply chain: competing in volatile markets. *Industrial marketing management* 29.1, 29(1), 37-44.
- Christopher, M. (2000). The Agile Supply Chain: Competing in Volatile Markets. *Industrial Marketing Management*, 37-44.
- Coase, R. H. (1937). The Nature of the Firm. *Economica*, 4, 386-405.
- Coasert, M., Jensen, D., Beischel, M., Vogel, A., Saly, A. W., & Taylor, R. (2014). *Delivering Agile Innovation*. EY. Retrieved 2014, from <https://www.ey.com/gl/en/industries/consumer-products/ey-delivering-agile-innovation>
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35(1), 128-152.
- Coombs, R., & Hull, R. (1998). 'Knowledge Management Practices' and Path-Dependency in Innovation. *Research Policy*, 239-256.

- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. SAGE Publications, Incorporated.
- Dietrich, M. (1994). *Transaction Cost Economics and Beyond*. Routledge.
- DiMaggio, P., & Powell, W. W. (1983). The iron cage revisited: Collective rationality and institutional isomorphism in organizational fields. *American Sociological Review*, 48(2), 147-160.
- DiMatteo, L. A. (2010). Strategic Contracting: Contract Law as a Source of Competitive Advantage. *American Business Law Journal*, 47(4), 727–794.
- Drucker, P. F. (1970). *The Age of Discontinuity - Guidelines to our Changing Society*. William Heinemann Ltd.
- Drucker, P. F. (1985). *Innovation and entrepreneurship: practices and principles*. AMACON.
- Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: what are they? *Strategic management journal*, 21, 1105-1121.
- Enkel, E., Bell, J., & Hogenkamp, H. (2011). Open innovation maturity framework. *International Journal of Innovation Management*, 15(6), 1161–1189.
- Friedman, T. L. (2005). *The World is Flat*.
- Gassmann, O., & Enkel, E. (2004). Towards a theory of open innovation: three core process archetypes. *R&D management conference*, 6(0), 1-18.
- Ghoshal, S., & Moran, P. (1996). Bad for practice: A critique of the transaction cost theory. *Academy of management Review*, 21(1), 13-47.
- Gilson, R. J., Sabel, C. F., & Scott, R. E. (2008). Contracting for Innovation: Vertical Disintegration and Interfirm Collaboration. *Columbia Law Review*, 109. Retrieved from <https://ssrn.com/abstract=1304283>
- Gilson, R. J., Sabel, C. F., & Scott, R. E. (2009). Contracting for Innovation: Vertical Disintegration and Interfirm Collaboration. *Columbia Law Review*. Retrieved from <http://ssrn.com/abstract=1304283>
- Granovetter, M. (1973). The Strength of Weak Ties. *American Journal of Sociology*, 78(6), 1360-1380.

- Greenwood, R., & Suddaby, R. (2006). Institutional entrepreneurship in mature fields: The big five accounting firms. *Academy of Management Journal*, 27–48.
- Gulati, R. (1995). Does familiarity breed trust? The implications of repeated ties for contractual choice in alliances. *Academy of Management Journal*, 38(1), 85-112.
- Habermas, J. (1989). Technology and Science as "Ideology". In S. Seidman, *Jurgen Habermas on Societ and Politics* (pp. 237-265). Beacon.
- Hagedoorn, J., & Hesen, G. (2007). Contract Law and the Governance of Inter-Firm Technology Partnerships – An Analysis of Different Modes of Partnering and Their Contractual Implications. *Journal of Management Studies*, 342-366.
- Hagedoorn, J., & Hesen, G. (2009). Contractual Complexity and the Cognitive Load of R&D Alliance Contracts. *Journal of Empirical Legal Studies*, 6(4), 818-847. doi:DOI: 10.1111/j.1740-1461.2009.01161.x
- Hagedoorn, J., & Zobel, A.-K. (2015). The role of contracts and intellectual property rights in open innovation. *Technology Analysis & Strategic Management*, 27(9), 1050–1067. doi:10.1080/09537325.2015.1056134
- Hayano, D. M. (1979). Auto-Ethnography: Paradigms, Problems, and Prospects. *Human Organization*, 38(1), 99-104.
- Hoedemaker, G. M., Blackburn, J. D., & Van Wassenhove, L. N. (1999). Limits to concurrency. *Decision Sciences*, 30(1), 1-18.
- Hofman, E., Faems, D., & Schleimer, S. C. (2016). Governing Collaborative New Product Development: Toward a Configurational Perspective on the Role of Contracts. *Journal of Product Innovation Management*, 34(6), 739–756.
- Hofman, E., Faems, D., & Schleimer, S. C. (2017). Governing Collaborative New Product Development: Toward a Configurational Perspective on the Role of Contracts. *Journal of Product Innovation Management*, 34(6), 739–756.
- Hoppmann, J. (2009). The Lean Innovation Roadmap – A Systematic Approach to Introducing Lean in Product Development Processes and Establishing a Learning Organization. Braunschweig.

- Hoppmann, J. (2009). The Lean Innovation Roadmap-A Systematic Approach to Introducing Lean in Product Development Processes and Establishing a Learning Organization. (Doctoral dissertation).
- Howells, J. (2006). Intermediation and the role of intermediaries in innovation. *Research Policy*, 35(5), 715–728.
- Humble, M., Molesky, J., & O'Reilly, B. (2014). *Lean Enterprise - How High Performance Organizations Innovate at Scale*. O'Reilly Media.
- Jacobides, M. G., & Billinger, S. (2006). Designing the Boundaries of the Firm: From “Make, Buy, or Ally” to the Dynamic Benefits of Vertical Architecture. *Organization Science*, 17(2), 249–261.
- Jacobides, M. J., & Winter, S. G. (2005). The co-evolution of capabilities and transaction costs: explaining the institutional structure of production. *Strategic Management Journal*, 26, 395–413.
- Janeway, W. H. (2012). *Doing Capitalism in the Innovation Economy*. Cambridge University Press.
- Kessler, E. H., & Chakrabarti, A. K. (1996). Innovation speed: A conceptual model of context, antecedents, and outcomes. *Academy of Management Review*, 1143-1191.
- Kirkland, R. (2014). Artificial intelligence meets the C-suite. *McKinsey Quarterly*(3), pp. 66-75.
- Kirschbaum, R. (2005). Open innovation in practice. *Research-Technology Management*, 48(4), 24-28.
- Kirsner, S. (2016). The Barriers Big Companies Face When They Try to Act Like Lean Startups. *Harvard Business Review*.
- Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science*, 3(3), 383-397.
- Lambe, C. J., & Spekman, R. E. (1997). Alliances, External Technology Acquisition, and Discontinuous Technological Change. *Journal of Product Innovation Management*, 14(2), 102-116.
- Lichtenthaler, U., & Lichtenthaler, E. (2009). A Capability-Based Framework for Open Innovation: Complementing Absorptive Capacity. *Journal of*

- Management Studies*, 46(8), 1315-1338. doi:10.1111/j.1467-6486.2009.00854.x
- Loch, C. H., DeMeyer, A., & Pich, M. T. (2006). *Managing the Unknown, A New Approach to Managing High Uncertainty and Risk in Projects*. Wiley & Sons, Inc.
- Lohr, S. (2016, Aug 27). G.E., the 124-Year-Old Software Start-Up. The New York Times. Retrieved 2016, from <https://www.nytimes.com/2016/08/28/technology/ge-the-124-year-old-software-start-up.html>
- Loise, V., & Stevens, A. J. (2010). The Bayh-Dole Act Turns 30. *Les Nouvelles*, 185-194. Retrieved from [http://www.bu.edu/otd/files/2011/02/The\\_Bayh-Dole\\_Act\\_Turns\\_30.pdf](http://www.bu.edu/otd/files/2011/02/The_Bayh-Dole_Act_Turns_30.pdf)
- Mangalaraj, G., Mahapatra, R., & Nerur, K. (2009). Acceptance of software process innovations – the case of extreme programming. *European Journal of Information Systems*, 344-354.
- Markman, G. D., Gianiodis, P. T., Phan, P. P., & Balkin, D. B. (2005). Innovation speed: Transferring university technology to market. *Research Policy*, 1058-1075.
- Mergel, I. (2016). Agile innovation management in government: A research agenda. *Government Information Quarterly*, 33(3), 516-523.
- Morris, L., Ma, M., & Wu, P. C. (2014). *Agile Innovation: The Revolutionary Approach to Accelerate Success, Inspire Engagement and Ignite Creativity*. Wiley.
- Mudambi, S. M., & Tallman, S. (2010). Make, buy or ally? Theoretical perspectives on knowledge process outsourcing through alliances. *Journal of Management Studies*, 47(8), 1434-1456.
- Narayan, S. (2015). *Agile IT Organization Design*. Pearson Education.
- Nooteboom, B. (1999). Innovation, learning and industrial organization. *Cambridge Journal of Economics*, 127-150.
- Nooteboom, B. (2004). Learning and Governance in Inter-firm Relations. *Revue d'économie politique*, 114, 55-76. doi:10.3917/redp.141.0055



- Nooteboom, B., Van Haverbeke, W., Duysters, G., Gilsing, V., & Van den Oord, A. (2007). Optimal cognitive distance and absorptive capacity. *Research policy*, 36(7), 1016-1034.
- Ohno, T. (1998). *Toyota Production System: Beyond Large-Scale Production*.
- Pearson, A. W. (1990). Innovation strategy. *Technovation*, 10(3), 185-192.
- Poppendieck, M., & Poppendieck, T. (2003). *Lean Software Development: An Agile Toolkit*. Addison-Wesley.
- Quinn, J. B. (2000). Outsourcing Innovation: The New Engine of Growth. *Sloan Management Review*, 41(4), 13-28.
- Reeves, M., & Deimler, M. (2011). Adaptability: The New Competitive Advantage. *Harvard Business Review*(July-August).
- Remneland-Wikhamn, B., & Knights, D. (2012). Transaction Cost Economics and Open Innovation: Implications for Theory and Practice. *Creativity and Innovation Management*, 21(3), 277–289.
- Ries, E. (2011). *The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses*. Crown Books.
- Rigby, D. K., Berez, S., Caimi, G., & Noble, A. (2016). *Agile Innovation*. Bain & Company. Retrieved from <https://www.bain.com/insights/agile-innovation/>
- Rigby, D. K., Sutherland, J., & Noble, A. (2018). Agile at Scale. *Harvard Business Review*(May-June). Retrieved from <https://hbr.org/2018/05/agile-at-scale>
- Rigby, D. K., Sutherland, J., & Takeuchi, H. (2016). The secret history of agile innovation. *Harvard Business Review*. Retrieved 2017, from <https://hbr.org/2016/04/the-secret-history-of-agile-innovation>
- Ringel, M., Taylor, A., & Zablitz, H. (2015). *The Rising Need for Innovation Speed*. The Boston Consulting Group. Retrieved 07 18, 2016, from <https://www.bcg.com/publications/2015/growth-lean-manufacturing-rising-need-for-innovation-speed.aspx>

- Roijakkers, N., Zynga, A., & Bishop, C. (2014). Getting Help From Innomediaries. In H. Chesbrough, W. Vanheverbeke, & J. West, *New frontiers in Open Innovation* (pp. 242-255). Oxford University Press.
- Rüssmann, M., Lorenz, M., Gerbert, P., Waldner, M., Justus, J., Engel, P., & Harnisch, M. (2015). *Industry 4.0*. Boston Consulting Group. Retrieved from [https://www.bcgperspectives.com/content/articles/engineered\\_products\\_project\\_business\\_industry\\_40\\_future\\_productivity\\_growth\\_manufacturing\\_industries/](https://www.bcgperspectives.com/content/articles/engineered_products_project_business_industry_40_future_productivity_growth_manufacturing_industries/)
- Sabiölla, H., Kees, A., Mandercheid, J., Roeglinger, M., & Rosemann, M. (2017). What does it take to implement open innovation? Towards an integrated capability framework. *Business Process Management Journal*, 23(1), 87-107.
- Schuh, G., Lenders, M., & Hieber, S. (2008). Lean Innovation: Introducing Value Systems to Product Development . *PICMET 2008 Proceedings*, (pp. 1129-1136). Cape Town.
- Schuh, G., Lenders, M., & Hieber, S. (2008). Lean innovation: introducing value systems to product development. *PICMET'08-2008 Portland International Conference on Management of Engineering & Technology* (pp. 1129-1136). IEEE.
- Schumpeter, J. A. (1943). *Capitalism, Socialism and Democracy*.
- Scranton, P. (2006). Urgency, uncertainty, and innovation: Building jet engines in postwar America. *Management & Organizational History*, 1(2), 127-157.
- Sehested, C., & Sonnenberg, H. (2011). *Lean Innovation - A Fast Path from Knowledge to Value*. Springer-Verlag.
- Sieg, J. H., Wallin, M. W., & Von Krogh, G. (2010). Managerial challenges in open innovation: a study of innovation intermediation in the chemical industry. *R&D Management*, 40(3), 281-291.
- Sommerville, I. (2011). *Software Engineering*. Addison-Wesley.

- Stalk, G. (1988). Time -The Next Source of Competitive Advantage. *Harvard Business Review*(July). Retrieved 2017, from <https://hbr.org/1988/07/time-the-next-source-of-competitive-advantage>
- Stalk, G., & Hout, T. M. (1990). *Competing Against Time*. London: The Free Press.
- Sumo, R., Valk, W. v., Weele, A. v., & Duysters, G. (2016). How Incomplete Contracts Foster Innovation in Inter-Organizational Relationships. *European Management Review*, 13, 179–192.
- Sumo, R., Valk, W., Weele, A., & Duysters, G. (2016). How Incomplete Contracts Foster Innovation in Inter-Organizational Relationships. *European Management Review*, 13(3), 179-192.
- Takeuchi, H., & Nonaka, I. (1986). The New New Product Development Game. *Harvard Business Review*, 64(1), 137-146.
- Tang, H. K. (1998). An integrative model of innovation in organizations. *Technovation*, 5, 297–309.
- Teece, D. J. (1996). Firm organization, industrial structure and technological innovation. *Journal of Economic Behavior and Organisation*, 193-224.
- Teece, D. J. (2007). Explicating Dynamic Capabilities: The Nature and Microfoundations of (Sustainable) Enterprise Performance. *Strategic Management Journal*, 1319-1350.
- Teece, D. J. (2009). *Dynamic Capabilities and Strategic Management*. Oxford: Oxford University Press.
- Teece, D. J., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review*, 13-35.
- Teece, D. J., Pisano, G., & Shuen, A. (1997, Aug). Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 18(7), 509-533.
- Teece, D., & Pisano, G. (1994). The Dynamic Capabilities of Firms: An Introduction. *Industrial and Corporate Change*, 3(3), 537-556.
- Tortoriello, M., & Krackhardt, D. (2010). Activating Cross-Boundary Knowledge: The Role of Simmelian Ties in the Generation of Innovations. *Academy of Management Journal*, 167-181.

- Tushman, M. L. (1977). Special boundary roles in the innovation process. *Administrative science quarterly*, 587-605.
- Van De Vrande, V., V. W., & Gassmann, O. (2010). Broadening the scope of open innovation: past research, current state and future directions. *International Journal of Technology Management*, 52(3/4), 221-235.
- van der Boezem, T., Schobe, G., Pascucci, S., & Dries, L. (2015). *Startups: key to open innovation success in the Agri-Food sector*. [www.compete-project.eu](http://www.compete-project.eu). Retrieved 02 15, 2016, from [http://www.compete-project.eu/fileadmin/competefiles/working\\_paper/COMPETE\\_Working\\_Paper\\_21\\_Start-ups\\_and\\_Open\\_Innovation.pdf](http://www.compete-project.eu/fileadmin/competefiles/working_paper/COMPETE_Working_Paper_21_Start-ups_and_Open_Innovation.pdf)
- Vanhaverbeke, W., Chesbrough, H., & West, J. (2014). Surfing the New Wave of Open Innovation Research. In H. Chesbrough, W. Vanhaverbeke, & J. West, *New Frontiers in Open Innovation* (pp. 281-294). Oxford University Press.
- Vanhaverbeke, W., Duysters, G., & Noorderhaven, N. (2002). External Technology Sourcing Through Alliances or Acquisitions: An Analysis of the Application-Specific Integrated Circuits Industry. *Organization Science*, 13(6), 714-733.
- Weeks, M. R., & Feeny, D. (2008). Outsourcing: From Cost Management to Innovation and Business Value. *California Management Review*, 50(4), 127-146.
- Whelan, E., Parise, S., de Valk, J., & Aalbers, R. (2011). Creating Employee Networks That Deliver Open Innovation. *MIT Sloan Management Review*, 53(1), 37-44.
- Whitley, E. A., & Willcocks, L. (2011). Achieving Step-Change in Outsourcing Maturity: Toward Collaborative Innovation. *MIS Quarterly Executive*, 10(3).
- Williamson, O. E. (1981). The Economics of Organization: The Transaction Cost Approach. *American Journal of Sociology*, 87(3), 548-577.
- Williamson, O. E. (1996). *The mechanisms of governance*. Oxford University Press.

- Wolter, C., & Veloso, F. M. (2008). The effects of innovation on vertical structure: Perspectives on transaction costs and competences. *Academy of Management Review*, 33(3), 586-605.
- Womack, J. P., Jones, D. T., & Ross, D. (1990). *Machine that changed the world*. Simon and Schuster.
- Yin, R. K. (2003). *Case Study Research: Design and Methods*. Sage Publications.



**ETİK KURUL DEĞERLENDİRME SONUCU/RESULT OF EVALUATION BY  
THE ETHICS COMMITTEE**

(Bu bölüm İstanbul Bilgi Üniversitesi İnsan Araştırmaları Etik Kurul tarafından doldurulacaktır /This section to be completed by the Committee on Ethics in research on Humans)

**Başvuru Sahibi / Applicant:** Mehmet Kerem Kızıltunç

**Proje Başlığı / Project Title:** Agile Innovation and Film Boundaries

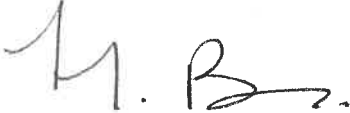
**Proje No. / Project Number:** 2018-30604-49

1.	Herhangi bir değişikliğe gerek yoktur / There is no need for revision	XX
2.	Ret/ Application Rejected Reddin gerekçesi / Reason for Rejection	

Değerlendirme Tarihi / Date of Evaluation: 24 Nisan 2018

  
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Üye / Committee Member


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