MIKKO RIIKKINEN

Facilitating or Enabling Value Creation?

Reconfiguring value creation
in financial services

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Dear reader,

Before diving into the world of FinTech, I would like to give some background information. I was not the top student in the gymnasium, and I took the university entrance exam several times. I moved from Joensuu, the city in which I was studying, to Berlin immediately after my first year of studies in 2006. Back then, "remote studies" meant several 48-hour trips from Berlin to Joensuu. I took two or three exams on each of the exam days, then I ran to make the train to Helsinki so I could catch the red eye flight back to Berlin. I was about to give up, but later I was fortunate enough to take several courses at Helsinki School of Economics (nowadays Aalto University), which finally sparked my interest in business studies.

After nearly a decade working in startups and banking, in 2015 I came across a new phenomenon known as FinTech (Financial Technology), which combined both of my interests, namely finance and technology. This opened an avenue for me not only to enhance my expertise professionally but also to continue my academic journey as a PhD Student at Tampere University. At the time, startup and bank collaborations were in their infancy, and my first research proposal concerned the co-creation of the two service providers.

However, the more discussions I had the more I started to understand that FinTech was more of an outcome, and not the cause. This meant adjusting my thinking from the FinTech perspective to putting FinTech into perspective. This change sounds like a no-brainer in hindsight, but it made a vast difference to the dissertation. Suddenly all the pieces of the puzzle started come into place. Thus, I recommend all future PhD students to take the time your research needs, and not to push it because you just want to have it done. If necessary, take a step backwards and start all over again. For me, this meant rewriting the synthesis of the dissertation approximately 20 times - which would have not been possible without all the support I received during those years.

ABSTRACT

FinTech, abbreviated from Financial Technology, is a phenomenon which was expected to disrupt financial services. However, the turmoil in the industry is not only to do with startups, having started already with the 2008 financial crisis. The digitalization and regulatory changes that followed forced incumbent financial service providers – including banks and insurance companies – to revise their business models, meaning the technology they create and what they get from their partners. At the same time, new market entrants, known as FinTech start-ups, are increasing their market share especially in payments and investments.

Previous research on FinTech has focused mainly on startups and innovation, meaning that industry-wide changes in value creation are yet to be discovered. The purpose of this dissertation is to explore and analyze how value creation is reconfigured in financial services. The research builds on four qualitative studies reported in articles that discuss the phenomenon from different perspectives.

The aim in Article I enhances the understanding of how Artificial Intelligence technology is used as a means of value creation in insurance services. Article II considers the changes from the perspectives of a market entrant and an incumbent. Article III analyzes service innovation from the market entrant's perspective, and builds a framework of the innovation stack. Finally, Article IV follows how incumbent financial service providers reacted to the FinTech phenomenon to find a strategic fit.

According to the conclusions drawn from these articles, digitalization and regulation transform the ownership of processes and resources as the foundation of value creation. As a result, a new framework for the reconfiguration of value creation is introduced in this dissertation. A new concept, namely the Value Enabler, is suggested. This refers to incognito service providers using Application Programming Interfaces (APIs) to share their processes and resources among their partners, which then in combination with their own resources and processes facilitate the customer's value-creation process. Managerial implications are presented and avenues for future research are mapped on the basis of the research results.

TIIVISTELMÄ

FinTech on lyhennelmä sanoista Financial Technology ja finanssiteknologian odotettiin disruptoivan rahoitusalaa. Rahoitusalan muutos ei kuitenkaan johdu pelkästään startupeista, vaan se alkoi jo vuoden 2008 finanssikriisistä. Digitalisaation ja sääntelyn muutosten seurauksena perinteiset finanssipalvelujen tarjoajat – pankit ja vakuutusyhtiöt – ovat joutuneet uudistamaan liiketoimintamallejaan. Samaan aikaan uudet tulokkaat, FinTech-startupit ovat kasvattaneet markkinaosuuttaan etenkin maksamisessa ja sijoittamisessa.

Aiempi FinTechin tutkimus on keskittynyt pääasiassa FinTech-startup-yrityksiin ja -innovaatioihin, mutta toimialan laajuisia muutoksia arvonluonnissa ei ole vielä tunnistettu. Tämän väitöskirjan tarkoituksena on tutkia ja analysoida, miten arvonluonti viritetään uudelleen finanssipalveluissa. Tämä tutkimus perustuu neljään kvalitatiiviseen artikkeliin, joissa ilmiötä tarkastellaan eri näkökulmista. Finanssipalvelujen arvonluontia ja liiketoimintamalleja tutkiessa huomataan, että digitalisaatio ja sääntely muuttavat prosessien ja resurssien omistajuutta arvonluonnin perustana.

Artikkeli I tavoitteena oli ymmärtää, mitä tekoälyteknologian käyttö tarkoittaa arvonluonnissa vakuutuspalveluissa. Artikkeli II tutki muutoksia markkinatulokkaan ja vakiintuneen toimijan näkökulmasta. Artikkeli III analysoi palveluinnovaatioita markkinatulokkaan näkökulmasta ja esittää viitekehyksen innovaatioiden luomiseen. Lopuksi Artikkeli IV keskittyi seuraamaan, kuinka perinteiset rahoituspalveluntarjoajat reagoivat FinTech ilmiöön löytääkseen strategisen edun.

Keskeisenä tuloksena tämä tutkimus esittelee uuden viitekehyksen arvonluonnin uudelleen virittämiselle. Lisäksi tässä väitöskirjassa ehdotetaan termiä "Value enabler" (arvonluonnin mahdollistaja) käytettäväksi uudella tavalla. Se kuvaa "näkymättömiä"-palveluntarjoajia, jotka käyttävät rajapintoja (API) jakamaan prosessejaan ja resurssejaan kumppaneille, jotka sitten yhdistämällä nämä resurssit ja prosessit tukevat asiakkaan arvonluontiprosessia.

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ABBREVIATIONS

FS	Financial Services
FinTech	Financial Technology
API	Application Programming Interface
PSD2	Payment Service Directive 2
GDPR	General Data Protection Regulation
AI	Artificial Intelligence
TPP	Third party provider
AISP	Account Information Service Provider
PISP	Payment Initiation Service Provider

ORIGINAL PUBLICATIONS

Publication I **Riikkinen, M., Saarijärvi, H., Sarlin, P., & Lähteenmäki, I. (2018). Using artificial intelligence to create value in insurance.** Published in the International Journal of Bank Marketing, 36(6), 1145–1168.

Publication II **Riikkinen, M., Lähteenmäki, I. & Nätti, S. (2018). Institutional logics as inhibitors or levers? The Case of Mobile Payments in Finland.** Published as a book chapter in Marketing and Mobile Financial Services – A Global Perspective on Digital Banking Consumer Behaviour.

Publication III **Riikkinen, M., Saraniemi, S., & Still, K. (2019). FinTechs as Innovators-Understanding the Service Innovation Stack.** Published in the International Journal of E-Business Research (IJEBR), 15(1), 20–37.

Publication IV **Riikkinen, M. & Pihlajamaa, M. (2022). Achieving a strategic fit in fintech collaboration – a case study of Nordea Bank**. Published in the Journal of Business Research, 152, 461–472.

1 INTRODUCTION

1.1 Background and research gap

Digitalization drives change in financial services. More specifically, Financial Technology, better known as FinTech, has been dominating newspaper headlines and coffee-table discussions in the field for nearly a decade. Previous research has focused on the definition of FinTech (Puschmann, 2017) and where it came from (Goldstein et al. 2019), and Dahlberg et al. (2015) concluded that more research on the service provider's ability to act locally or globally is needed. So where do we go from there? What will last when the FinTech 'buzz' finally settles?

Financial Service (FS) companies such as banks and insurance providers have traditionally been early adopters of new technologies. The introduction of service-provider-driven technologies such as telephone banking was followed by the addition of adaptable service technology, including online banking, and the more recent move to customer-controlled service technologies such as voice-controlled devices (Gummerus et al., 2019).

This digital transformation, which started with the conversion of existing analogue services and products to a digital format (Gassmann et al., 2014), has long been expected slowly to have an "influence in all aspects of human life" (Stolterman & Fors, 2004, p. 689), including FS. Consequently, new digital services such as mobile wallets, payment apps, and automated wealth advisors do not merely build on and improve existing services, they rather replace them (Basole & Patel, 2018), thereby inciting disruptive change in the industry.

Digitalization is transforming almost all industries (Tihinen et al., 2016), including FS, having increased customers' access to data and – with their consent – to third-party providers (Brennen & Kreiss, 2016). Consequently, incumbent service providers find themselves in a situation in which their individual and organizational capabilities do not fully satisfy the expectations of the market (Teece, 2018). The digital transformation brings about structural changes in the FS value chain that make it accessible to market entrants (Albrecher et al., 2019), thereby allowing an influx of companies with the required technical capabilities

such as start-ups and large technology firms to enter the financial services market. Unlike the incumbents, the new service providers would focus on certain parts of the value chain and/or a niche target group. These specialized services started slowly to gain a foothold, replacing the traditional decision-making via internal experts in traditional banks, and therefore shifting the power to the customer via easy-to-use applications (Basole & Patel, 2018).

Application Programming Interfaces (APIs) are changing the FS industry, too. The use of new technologies not only improves internal processes in banks and insurance service providers but also creates opportunities for product innovation, especially in how they interact with customers (Eling & Lehmann, 2018). Current technology, the development of mobile applications in particular, relies mainly on the use of APIs (Bavota et al., 2015). Originally created to connect two types of software on personal home computers, now in the 2000s they have become an essential element in various digital ecosystems (Wulf & Blohm, 2020). In short, APIs offer a common ground enabling services to communicate and exchange information, and thereby to create value together through such interaction. The use of APIs in Financial Services has attracted large technology companies, namely so-called "G.A.F.A" (Google, Amazon, Facebook, and Apple) (Moore & Tambini, 2018) and B.A.T (Baidu, Ali Baba, and Tencent) (Su & Flew, 2020), as well as start-ups, and has enabled them to enter the FS market. Unlike incumbents, not only do these companies have access to customer data, they also control the customer interface (Vives, 2017). APIs thus facilitate the evolution of these new ecosystems, in addition to creating new solutions on an existing platform (Manikas & Hansen, 2013).

Regulation in FS follows changes in the market. The regulation of new technologies poses challenges for policy makers given the need to enable innovation in environments in which the risks are not yet fully understood by customers or regulators (Ringe & Christopher, 2020). The current development of regulatory changes in FS, which affects the introduction of FinTechs, could be traced to the Single Euro Payments (SEPA) initiative, which purports to create tools and standards aimed at harmonizing payments across European borders (ECB, 2009). Figure 1 illustrates the progress of SEPA and related regulation.
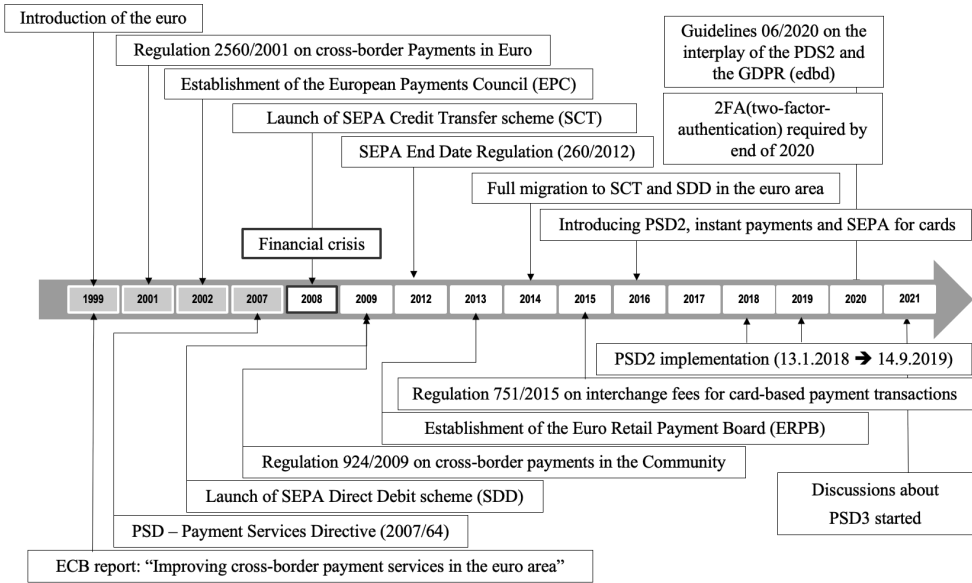
Figure 1. The development of SEPA (Single Euro Payments Area) and Payment regulation (partly adapted from an interview with Päivi Heikkinen/ Bank of Finland in 2016)

The Payment Services Directive (PSD Directive 2007/64/EC) is an EU-wide directive to regulate payment services and payment service providers throughout the European Union (EU) and the European Economic Area (EEA). The goal was to increase competition in the European financial services industry, opening the banking-dominated market up to non-banks. A further aim was to harmonize consumer protection as well as the rights and obligations of payment providers and users. This directive was followed by PSD2 in 2015, when the European Parliament accepted the European Commission's proposal to create a safer and more innovative European payments system (PSD2, Directive (EU) 2015/2366). The second directive was intended to protect consumers paying online and to make cross-border payments safe. For banks, however, it meant building new, innovative open banking solutions and opening APIs to third-party providers, which would now be able to challenge the status quo. PSD2 in particular creates a legal framework for two new types of payment services, namely payment initiation services (PIS) and account information services (AIS) (Wolters & Jacobs, 2019), which govern the way customers, new service providers, and incumbents operate in the new FS market. These shifts enable new market entrants to build their PSD2-compliant services, whereas incumbents struggle to meet the expectations of the regulators.

Under PSD2, customers decide who has access to data. In short, the directive forced banks to open their APIs to third-party service providers (TPPs), the FinTechs (Chiu, 2017). The aim is to promote two aspects: the use by Account Information Service Providers (AISP) of account information to collect, aggregate, and analyze payment transactions, and the building by Payment Information Service Providers (PISP) of a payment initiation service between the merchant's online service and the online banking platform. PSD2 enables customers explicitly to grant access to the TPPs to pull the account information, whereas there is no clear contractual requirement between the customer and PISP or AISP (PSD2, Recital 30). Customer agreements may be made ad hoc, but the customer has to have the opportunity to cancel without any cost (PSD2, Art 55). In this, the data-protection responsibility falls on the PISPs and the AISPs, meaning that they need to ensure no personalized data is shared with other parties and no sensitive payment data is allowed to be stored (PSD2, Recital 33). In sum, through this regulative change the customer is in control of their own data and can grant access to a TTP, who in exchange proposes generating something more than the AS PSP as the current holder of the data.

Enforcing new regulations takes time. The EU-wide regulation PSD2 was originally planned to be operational in Finland on 9 January 2019, but it was postponed by the Finnish Financial Supervisory Authority (FIVA) until 14 September 2019. This illustrates the challenges of implementing a new regulation, which has an impact not only on the technology of the service providers, but also on their business models (see e.g. Ringe & Christopher, 2020). Some third-party providers need to apply for authorization, registration, and notification, which depend on the business model of the service provider. Authorities granting such authorizations include the European Central Bank (ECB), the Financial Supervisory Authority (FIN-FSA), the Ministry of Finance, and the Ministry of Social Affairs and Health, as well as the Government depending on the type of new service (Finnish FSA, n.d.).

FS are also governed by mechanisms of trust. Service providers such as credit unions, banks, credit-card companies, insurance companies, accountancy companies, consumer-finance companies, stockbrokers, investment funds, individual managers, and government-sponsored enterprises (IMF, 2018) operate on the basis of trust between the provider and the recipient (Sirdeshmukh et al., 2002). Trust as a basic premise has created a business model in which loyalty between customer and service provider is an acknowledged prerequisite: when customers hand over their money to a bank they trust that they will receive it all

back when needed (Hansen, 2012). FS providers are traditionally highly regulated by local financial supervisory authorities and other governmental bodies (de Caria, 2011). However, the selling of flawed financial instruments to customers during the 2008 financial crisis – thereby abusing their trust – "led to a loss in confidence in financial institutions" (Uslaner, 2010, p.110). "FinTech" is a phenomenon within FS, referring to companies that offer innovative financial technology services (Puschmann, 2017). These new service providers, the so-called "FinTechs", with their new, innovative, and disruptive business models promise more flexibility, security, efficiency, and opportunities than incumbent providers (Gomber et al., 2018), which struggle with "old routines never overhauled and rigid business models are one of their primary issues to tackle" (Nicoletti et al. 2017). It has recently come to light that FinTechs offer disruptive innovations for specific services (Philippon, 2016), and the research continues through the development of a conceptual model for fintech adoption (Suryono et al., 2020). Although the term FinTech does not refer to a specific sector within FS or to business models (Arner et al., 2015), previous research (e.g. Nicoletti et al., 2017) has shown that business-model theory is a useful analytical tool.
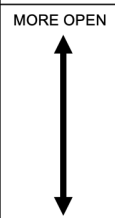
	INSURANCE			BANKING			
MORE OPEN ↑	THIRD-PARTY DATA	BEYOND INSURANCE	PLATFORM	THIRD-PARTY DATA	BEYOND BANKING	PLATFORM	**OPEN** ↑
	RISK-RELATED DATA	RISK-RELATED SERVICES	INSURANCE-AS-A-SERVICE	CREDIT-RELATED DATA	CREDIT-RELATED SERVICES	BANKING-AS-A-SERVICE	
↓	PROPRIETY DATA	INSURANCE	INSURER CHANNELS	PROPRIETY DATA	BANKING	BANK'S CHANNELS	↓
MORE CLOSED	DATA	PRODUCT	ECOSYSTEM	DATA	PRODUCT	ECOSYSTEM	**OPEN**

Figure 2. Comparing open insurance (modified from Standaert & Muylle, 2022) with open banking

Standaert and Muylle (2022) studied the drivers of open insurance, which is the counterpart of open banking, defining it as *regulation and standards*, *the market,* and *technology*. They further discuss the dimensions and performance impact of an open insurance strategy through open data, as illustrated in Figure 2 depicting the current differences between banking and insurance. Banks with ambition will build their own platform-based ecosystems, whereas the less ambitious will concentrate on acquiring FinTech companies (Boot et al., 2021).

1.2 Research position, purpose, and structure

This dissertation is positioned within insurance science. Research in this discipline has traditionally focused on topics such as property-liability insurance, actuarial science, life insurance, and industry insight/regulation (Weiss & Qiu, 2008). However, the Journal of Risk and Insurance highlights three special focus topics for the near future: Big-Data Techniques, Digitalization, and InsurTech. (Journal of Risk and Insurance, 2020). The **research phenomenon** explored in this dissertation is the transformation of FS enabled by digitalization, a shift in regulation, and the financial crisis of 2008. The digital transformation has the potential to impact insurer's value chain from products to marketing, underwriting, pricing, distribution, claims until the services offered to the customer (Albrecher et al., 2019). This research focuses specifically on the business model and how value is created and it crosses disciplinary borders between marketing, management, technology and legislation. Thus, insurance science constitutes a suitable basis on which to study the phenomenon. The **research context** is that of financial services. Finally, the **research purpose** is to explore and analyze how value creation is reconfigured in FS.
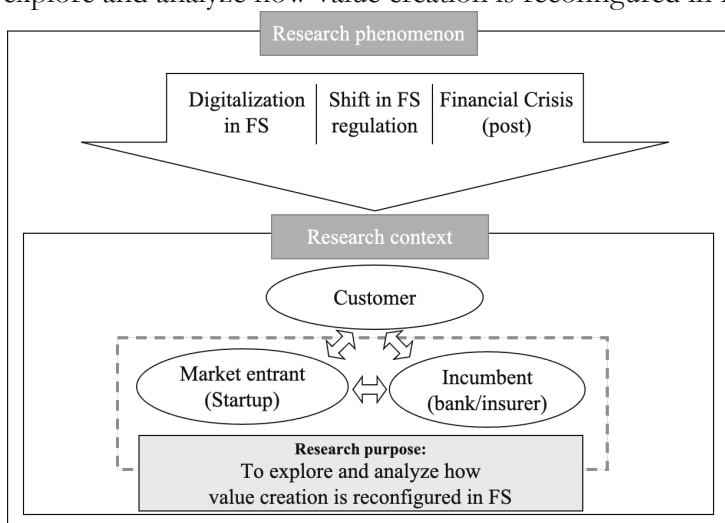
Figure 3. Research phenomenon, research context, and research purpose

This purpose is then addressed in four complementary articles whereby each one investigates the phenomenon from a different perspective as illustrated in figure 4. The first one takes the perspective of the *customer*, exploring the use of new

technologies such as chatbots to serve customers. The aim in this dissertation is to shed light on how customers eventually create value within their own processes, and how service providers can support it (Grönroos & Ravald, 2011) using artificial intelligence tools such as chatbots. The second article takes the *service provider's* perspective. The aim is to enhance understanding of the industry-specific cultural, cognitive, and regulative barriers (Thornton et al., 2012) that may hinder the development of new innovative services for providers, and how to approach them. This article reports on a study of mobile payments in Finland and analyzes interviews with representatives of a market entrant and industry experts. The third article takes the view of the *market entrant*. Little is known about how market entrants (FinTech startups) innovate their services, hence the article reports on a study of 10 startups using the framework of a service model (Edvardsson & Olsson, 1996) and service model innovation (Lusch and Nambisan, 2015). The fourth article focuses on the *incumbent*. Many incumbents aim to achieve innovation benefits from accelerators and incubators. However, it is not known whether specific organizational or industrial contexts are more suited to certain types of start-up collaboration (Shankar & Shepherd, 2019).
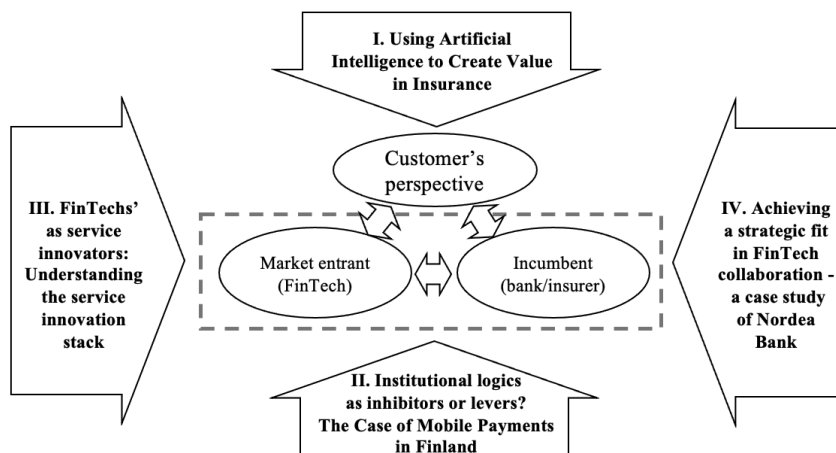
Figure 4. Research setting and the positioning of the articles

This dissertation comprises five main chapters. Chapter 1 introduces the three underlying drivers, namely digitalization, regulation, and the financial crisis, in more detail, and sets out the purpose and structure. Chapter 2 then describes the

key theoretical framework, studying value creation from the perspective of business models in FS. Chapter 3 presents the method and methodology used to address the research purpose. Chapter 4 summarizes the four articles on which the dissertation is based. Finally, Chapter 5 synthesizes the four articles and presents the findings as a whole. The concluding sections discuss the theoretical conclusions and the managerial implications, the limitations, and potential avenues for future research.

2 PERSPECTIVES ON VALUE CREATION IN FINANCIAL SERVICES

2.1 Business models

A company's business model (BM) could be described as the logic how it conducts its business, and both creates and captures value. Although the BM concept gained prominence mainly through the 1990s surge in the conducting of business over the internet, such as internet banking (DeYoung, 2005), it is still a valid framework within which to study value creation in FS in the 2020s. However, given the diverging focus areas of researchers, the BM literature mainly reflects themes such as eCommerce and the use of information technology in organizations (e.g. Dubosson-Torbay, et al., 2002), strategic issues including value creation, competitive advantage and the firm's performance (e.g. Zott & Amit, 2008), or innovation and technology management (e.g. Chesbrough, 2007). Nonetheless, scholars agree that the BM concept introduces a unit of analysis that differs from those previously applied in attempts to enhance understanding of organizations (e.g. Zott et al., 2010; Massa & Tucci, 2013), such as the product, the firm, the industry, or the network.

Given the prevalence of the business model, there are varying conceptualizations of it. First, Stewart & Zhao (2000) describe it as a *statement* of how a company will generate and sustain profit over a longer period. Second, Applegate (2000) perceives it as a *description*, referring to structure, relationships, and responsiveness in relation to external stakeholders. Third, Osterwalder (2004) calls it a *conceptual tool,* which comprises the logic that generates income using BM elements. Finally, Amit and Zott (2001, p.511) refer to BM as "the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities". All the definitions purport to capture the the core of the business, and there is scholarly debate on the constitutive elements. According to Alt and Zimmerman (2001), BM is a combination of *mission*, *structure*, *processes*, *revenues*, *legal issues*, and *technology;* Morris et al. (2005) identify six fundamental components, namely *value proposition*, *customer*, *internal processes/competences*, *external positioning, economic model,* and *personal/investor factors.*

Johnson et al. (2008) identify "four interlocking elements, that, taken together, create and deliver value" (p. 52).
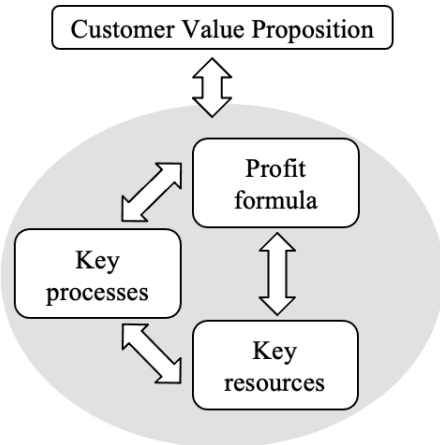
Figure 5. Elements of a successful business model, based on Johnson et al. (2008)

I chose to apply Johnson et al.'s (2008) BM elements (presented in Figure 5) in this dissertation for two reasons: first they simplify and summarize the discussion, and second, the article concerned is among the most frequently mentioned in the BM literature. The first element, the customer value proposition, is an essential tool with which to communicate the potential value creation to the customer. This requires decisions on three issues: 1. *All the benefits of using* a service; 2. *Favorable points of difference* as unique selling points; and 3. *The resonating focus* in direct comparison to alternative service offerings communicated to the customer (Andersson et al., 2006). The second element, namely a profit formula, is required to explain how the business creates value for itself given that creating value for the customer does not directly correlate with creating value for the firm (Pitelis, 2009). The profit formula includes the revenue model, the cost structure, the margin model, and resource velocity, and it defines how scalable the business could be (Johnson et al. 2008). With regard to the third element, companies build upon key resources such as people, technology, products, facilities, equipment, channels, and brands, depending on their value-creation model (Johnson et al. 2008). These resources could be further specified as *cognitive, human capital, organizational, information, physical, economic, regulative,* and *relational* (Moilanen et al., 2018). Finally, all successful companies have created operational and managerial processes that enable them to repeat the delivery of value in a scalable manner. Customers in today's digital world expect a seamless service experience between different service platforms (Basole & Patel, 2018). The underlying processes

within a company include business development, manufacturing, sales, and customer service, which in turn deliver the customer-value proposition they have communicated to the customer (Johnson et al., 2008). However, customers' purchasing decisions build upon seamless interaction among numerous digital platforms, which may be somewhat beyond the direct reach of the service providers' processes (Gummerus et al., 2019): this introduces a new level of complexity to value creation and value capture in a technology-driven environment such as APIs. The BM concept is a suitable theoretical lens for this dissertation in that it divides the company's core into elements and helps to shed light on its founding principles. Further, it facilitates explanation of the current logic concerning how value is created in FS and how it evolves. Business models also enable the development of concepts through which phenomena could then be explored and analyzed.

2.2   Value creation and the actors involved

The purpose of the BM is to describe how value is created. However, "no single entrepreneurship or strategic management theory can fully explain the value creation potential of e-business" (Amit & Zott, 2001, p.494). A prerequisite for exploring value creation is to understand the varying conceptualizations of *value* in itself (Bentler, 1992). These, in turn, are contingent on the perspectives taken, which include financial performance (Bebchuk & Fried, 2003), competitive edges (Porter, 1985), and value as an intangible social construct (Blyler & Coff, 2003; Heinonen et al., 2010). In fact, there are two fundamental theories behind value in the context of business studies. The first is *labor theory based,* whereby value is created in the production process of one or several firms and the outcome of the process is a product (e.g. Eggert et al., 2018). Here, the value materializes for the customer in the form of the price paid for a product at the time of its purchase, thereby creating the value-in-exchange (Grönroos & Voima, 2013). The second is utility theory, whereby products consist only of potential value. This means that the user creates the value while consuming the product (e.g. Sandström et al., 2008), which therefore lies in its utility and materializes for the customer over time: this is termed *value-in-use* (Heinonen et al., 2010; Grönroos & Voima, 2013; Vargo & Lusch, 2004).

As a result of the value-creation process, customers experience an improvement in their current situation (e.g. Grönroos, 2008; Vargo et al, 2008). Value creation has also raised interest among researchers, and both *value creation* and *value co-creation* have become critical concepts in studies focusing on service marketing (Grönroos, 2011). There are two levels to explore in the value-creation process, namely the micro and the macro. On the macro level, according to service-dominant logic (SDL) (e.g., Vargo & Lusch, 2008), customers and service providers contribute to the value-creation process, which then eventually materializes for the customer. However, the value is only metaphorically co-created (Grönroos, 2009) and "companies co-create and capture value in a value-exchange relationship" (Töytäri 2015, p. 256). On the micro level, companies provide the means to support customer's processes, which is known as service logic (SL) (e.g. Grönroos, 2006). Accordingly, the service provider facilitates the value-creation process by offering resources and tools, but is able to co-create value with customers only if a joint sphere of shared interests is formed (Grönroos, 2009). Companies aim to capture value through offering a set of specific resources and competences (Mygind, 2009). To do that, they need to manage customer acquisition and the varying customer-service channels in an active manner (Payne & Frow, 2005). However, *value capture* may be detached from the process, meaning that the creator of value may not have the long-term interest to capture or retain it.

In sum, value creation is a complex subject. For one thing, the term 'value' has various definitions. Zeithaml (1998, p. 14) described perceived value as the consumer's overall assessment of "the utility of the product based on perception of what is received and what is given", whereas Sanchez-Fernandez and Iniesta-Bonilla (2007, p. 429) defined value as "an outcome of an evaluative judgement". In accounting for the intangible nature of financial service products, I follow Heinonen et al. (2010), Grönroos and Voima (2013), Ballantyne et al. (2006), and Sandström et al. (2008) in defining *value* as *value-in-use* for the customer. Second, within the field of value creation, this research follows the 'Nordic School' and its key figures such as Grönroos, Strandvik and Heinonen (Gummerus, 2015), on the assumption that "instead of thinking in terms of how customers can be involved in the provider's activities, the interest should be in *how customers prefer to involve providers in their lives or business activities*" (Heinonen & Strandvik 2018, p. 3). Finally, value capture is analyzed in this research through the elements of the company's business model (Johnson et al., 2008), given that it can only support

customers' value creation rather than being in control of it, as traditional views suggest (Grönroos & Voima, 2011).

Value creation is a play involving various actors (Gummerus, 2013). The literature has focused on the roles of *service provider* (e.g. Grönroos et al., 2011) and *customer* (e.g. Smith & Colgate, 2007). This research rests on the assumptions that customers oversee value creation, and that "customers are active subjects who are embedded in their own contexts and are subjectively striving to achieve their well-being goals" Heinonen & Strandvik (2018, p. 2). Moreover, digitalization has enabled customers to act as active participants in the value-creation process (Payne et al., 2008). Technological changes have thus facilitated the unbundling and scattering of financial service offerings; therefore customers are now able to choose from among service providers and to re-bundle the services to their liking (Basole & Patel, 2018). This strengthens their role as part of the value-creation process within the new service ecosystem (Heinonen & Strandvik, 2018).
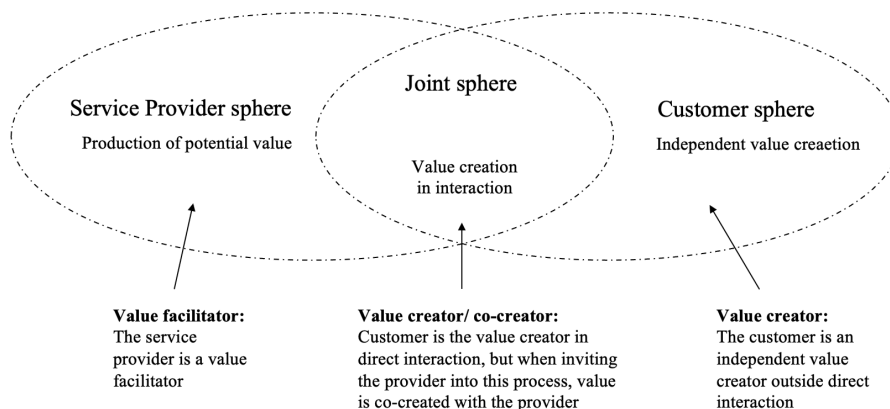
Figure 6. Value-creation spheres, adapted from Grönroos and Voima (2013)

Value creation is the sum of the actors' interactions. Co-creation occurs if two or more actors merge their processes into a single collaborative, interactive, and dialogical effort (Grönroos & Voima, 2013). These interactions take place between the customer's and the service provider's systems as illustrated in figure 6. The service provider only has one active role, namely as a *value facilitator* within the *provider's sphere.* The customer, however, actively co-creates value in collaboration with the service provider in the *joint sphere,* where it is the *value creator.* In the *customer sphere*, moreover, they create value without any direct interaction with the service provider (Grönroos & Voima, 2013).

2.3 The theoretical framework for the research

Every phenomenon requires specific lenses to capture it correctly. This dissertation builds upon Johnson et al.'s (2008) definition of the business model, given that the elements it comprises are well-known across industries. Furthermore, given the service-driven nature of FS, value-in-use is relevant to the context, and Grönroos and Voima's (2013) value co-creation spheres help to shed light on the roles of each actor in the value-creation process, and further to reconfiguration of value creation. Figure 7 below depicts a combined framework of business-model elements, value-creation spheres, and actors, which is intended to give a structure to this research. It shows how the customer functions independently as a value creator within the customer sphere (as in Grönroos & Voima, 2013), and how service providers can facilitate the value creation only within the joint sphere they access via a customer value proposition. The value proposition they have formed builds upon the elements of the business model (as in Johnson et al., 2008).

VALUE CREATOR (CUSTOMER):
THE CUSTOMER IS AN INDEPENDENT VALUE CREATOR

CUSTOMER

JOINT SPHERE

Value proposition

MARKET ENTRANT (STARTUP)

INCUMBENT (BANK/ INSURER)

Resources

Profit formula

Processes

VALUE FACILITATORS:
THE SERVICE PROVIDERS ARE VALUE FACILITATORS
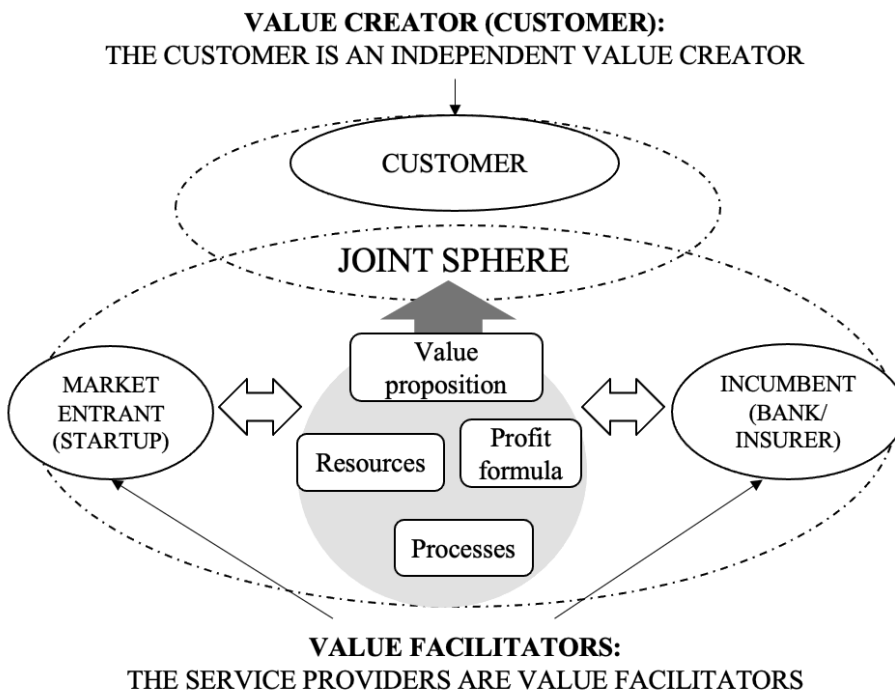
Figure 7. Preliminary framework based on Grönroos and Voima (2013) and Johnson et al. (2008)

In sum, there is not, as yet a thorough understanding of the implications of industry transformation on value creation in FS. The aim in this dissertation is to explore and analyze how value creation is reconfigured in FS by focusing on this context and observing it through the lenses of business model theory. Therefore, value creation and business model provide the framework within which to explore and analyze the phenomenon. In combination, these two will facilitate not only an exploration of what is happening but also a thorough analysis. Given the breadth of the studied topic, the theoretical framework will also give this research the necessary borderlines and structure.

3 THE RESEARCH STRATEGY

All research requires a strategy explaining how the data will be collected and what criteria will be used. Thus, the research purpose could be to describe, predict, or understand a phenomenon, or to solve a specific problem (Lincoln & Guba, 1985). Given that the aim in this dissertation is to shed light on the phenomenon, the purpose is to *explore and analyze how value creation is reconfigured in Financial Services. Exploring* in this context means collecting data using various methods, such as semi-structured interviews, videos, documentation, and observation. In addition, the researcher attended over 100 events around Europe, building a network of industry experts who helped to enhance his understanding of the phenomenon, and then to analyze it.

The exploratory nature of this research pointed to the need for qualitative methods (Yin, 1981). The amount of data gathered during the course of the process, extending from 2015 to 2021, is vast and categorizing it properly needed time. Furthermore, the aim is to bring to light new ideas and concepts rather than focusing on the justification of previous theory (Yadav, 2010). Adopting the strategy of building up something new also carries risks. To mitigate such risks, the data was stored comprehensively to allow different experiments over the research period. The decision to work towards an article-based dissertation from the very beginning also helped to mitigate the risks. In particular, in facilitating the in-depth investigation of a contemporary phenomenon, case-study method was applied in each of the four articles which allowed the characteristics of real-life events to be retained (Yin, 2015).

3.1 Research philosophy

All scientific research builds on philosophical and theoretical assumptions, the current research being no exception. The *epistemological assumption* is that knowledge is out there to be discovered, and that one needs to experience it in order to capture it (Arndt, 1985; Kuhn, 1962). Hence, this research relies on the author's interviews and participation given that there is something to discover. It is further assumed that knowledge creation comes through observing individuals rather than their relationships. From the perspective of critical realism, most of the world is socially constructed, making it possible, to some extent, to observe the real world (Easton, 2010). For this reason, the research data was collected through individual cases that support the critical realist's perspective on theory generation (Järvensivu & Törnroos, 2010). However, critical realism rests on the assumption that there is a real world out there independent of its observers (Easton, 2002). Before making conclusions, critical realists act as if the theories are true, without being confident of their accurateness (Easton, 2010).

Table 1.   Elements of the strategy, the approaches applied and the justification of choices

Element of the research strategy	Approach applied	Justification of the choice
Ontology and epistemology	Critical realism	Real-life phenomena can only be observed through structures; in this research, the literature on value creation helped in this regard.
Research approach	An abductive approach	The whole dissertation balances theory and collected data, and therefore an abductive approach helps to capture the phenomenon.
Methodology	Qualitative studies	Given the focus on a contemporary phenomenon, the case studies ranged from vignettes to extensive investigations.

Given the nature of the research setting, case analysis provided the best tools (Eisenhardt, 1989) for the individual articles, and the interviews made it possible to understand the informants' thoughts, evaluations, aspirations, and reasoning within their contexts (Granot et al., 2012). Hence, established methods such as semi-structured theme interviews were used, and Yin and Hollweck's (2014) recommendations were followed in evaluating the reliability and validity of the

qualitative cases. In addition, each individual article presents conclusions that are relevant to that specific case study.

3.2   Article-based research and data collection

The articles comprising this dissertation explore and analyze the phenomenon from different viewpoints. The role of the researcher is to offer clarifications of the phenomenon through the collection of data and critical realism (Hunt, 1990). However, the intuition, experience, and interpretation of researchers impact their actions in qualitative research (Gummesson, 2006). Table 2 below summarizes the research approaches adopted in each article, and the reasoning behind the choices.

Overall, qualitative methodologies are applied in the articles. This was a conscious decision based on generally limited understanding of the phenomenon in that point of time. Qualitative methods are well-suited for gathering data from different sources and to present the case (Baxter & Jack, 2008). The collection of data for Articles I, II and IV relied on abductive logic, which highlights the relationship between the empirical world and existing theory in the creation of new knowledge (Gummesson, 2000), whereas Article III relies more heavily on data generated through interviews. All conducted interviews were semi-structured and were first recorded and transcribed and analyzed after. The choice of abductive logic reflected the phenomenon under study. Thus, all four articles contributed to developing a framework that combined existing theory and the information collected through the cases.

Table 2. Research approaches, reasoning, analysis, and the author's role

ARTICLE	RESEARCH APPROACH	REASONING	ANALYSIS	AUTHOR'S ROLE
I. Using artificial intelligence to create value in insurance	General approach: qualitative and abductive	To understand the new context.	In this qualitative research the 10 example chatbots were studied and used as vignettes (Reinartz et al., 2011) to illustrate the research phenomenon and a framework was created, while case analysis was used to analyze the collected data.	First author of the publication, participating in all stages of the research process.
	Data generation: 10 of 117 identified chatbots	Using cases to illustrate the research phenomenon.		
	Data analysis: classification and conceptualization	To develop a framework explaining the phenomenon.		
II. Institutional logics as inhibitors or levers? The case of mobile payments in Finland	General approach: qualitative	To illustrate the transformation within the industry.	Qualitative methods were used to study the institutional logics involved. All the interviews were recorded and then transcribed before being analyzed using case study methods and finally a framework is suggested.	First author of the publication, participating in all stages of the research process.
	Data generation: semi-structured interviews	To collect the informants' views.		
	Data analysis: categorization and classification of interview data	To illustrate how institutional logics influence innovation in payment systems.		
III. FinTechs' as service innovators: analyzing components of innovation	General approach: qualitative	To capture the viewpoint of market entrants on their service innovation.	Qualitative methods were applied to identify 10 Finnish FinTech startups and their founders were interviewed at the Slush startup event using a semi-structured method in 2015 and 2017. All the interviews were recorded and transcribed before being analyzed and finally a framework is suggested.	First author of the publication, participating in all stages of the research process.
	Data generation: 2 x 10 open-ended semi-structured interviews conducted in 2015 and 2017	To describe the novel business model within FS.		
	Data analysis: the logic of case study research with comparisons between cases and classification	To create a framework clarifying the market entrants' differing approaches.		
IV. Achieving a strategic fit in fintech collaboration – a case study of Nordea Bank	General approach: longitudinal abductive and qualitative	To capture the transformation process of an incumbent bank.	Qualitative longitudinal study of Nordea as a single case focusing on three different ways of organizing innovation using multiple sources such as interviews, videos, websites, and observation. All the data was first organized by time and then analyzed by theme.	First author of the publication, participating in all stages of the research process.
	Data generation: 15 semi-structured open-ended interviews, observations, videos and presentations	To build a thorough understanding of the structures and its challenges within the organization.		
	Data analysis: categorization and classification to create a framework	To illustrate the formation of knowledges.		

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This dissertation comprises four articles, each drawing upon their own individual dataset. The data used is summarized in Table 2. Whereas Articles II, III, and IV relied on interview data, Article I draws upon secondary case data, namely chatbot transcripts. All the interviews analyzed in this research were first recorded and transformed to transcripts to ensure broad understanding of the content. The interviewees were carefully chosen to represent the people who were part of the phenomenon under study. This decision process involved compiling a long list of potential candidates and then narrowing it down to a shortlist based on suitability. The data analysis was conducted following the general qualitative methods of categorization, constant comparison, and classification.

Data was also collected through observation. Article I focuses on chatbots as the medium between the customer and the service provider. Ten out of 117 identified cases chatbots were selected for further analysis based on the access to the service as well as their maturity. Chosen ten cases were studied and used as vignettes (Reinartz et al., 2011) to illustrate the research phenomenon in addition to apprehend the interaction between context and the phenomenon (Dubois & Gadde, 2002). Article II is based on seven semi-structured interviews with three startup founders and three experts from the payment industry in Finland. Qualitative methods were used to study the institutional logics involved. Each interview was well prepared and lasted over 60 minutes. The focus was on the interviewees' expertise and views, the aim being to explore changes in mobile payments. All the interviews were recorded and then transcribed before being analyzed. Article III is also based on qualitative methods, whereby 10 Finnish FinTech startups were first identified in 2015, and their founders were interviewed at the Slush startup event using a semi-structured method. Two years later these same 10 startup founders were again present at Slush in 2017, and were interviewed for a second time. All the interviews were recorded and transcribed before being analyzed. Finally, Article IV also reports a case study based on qualitative, longitudinal data collection from multiple sources such as interviews, videos, websites, and observation. All the data was first organized by time and then analyzed by theme.

4 THE ARTICLES

This research was started in 2015 during the ascendency of FinTech. However, at that time, little was known about the possible consequences in the FS sector. To narrow this gap in understanding, the logical choice was to start observing the phenomenon from different perspectives, which involved creating a framework comprising four articles and working on them one by one. This chapter summarizes each of the four articles (see Figure 8).
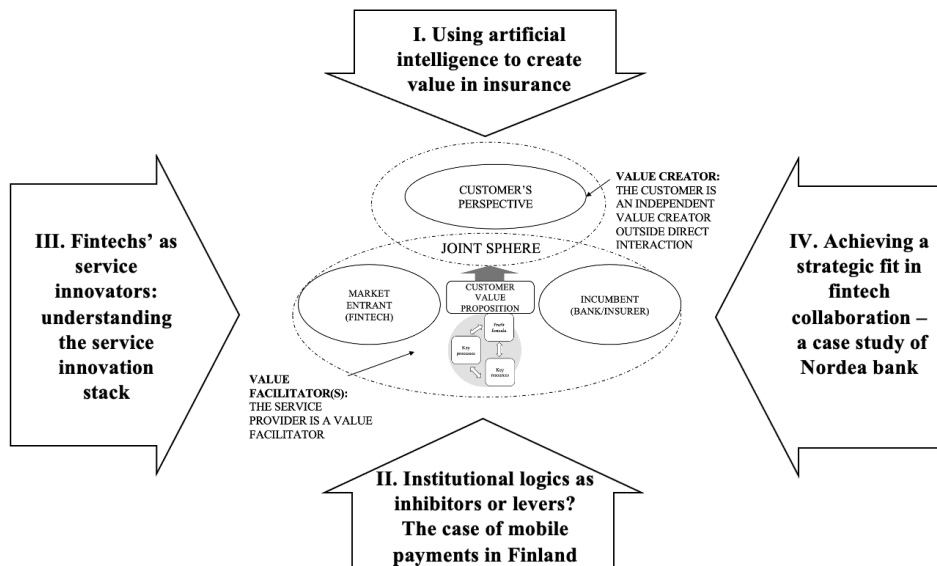
Figure 8. The research framework and the positioning of the articles

The aim in Article I was to explore the use of Artificial Intelligence (AI) technology for value creation in insurance services. To this end, a matrix model was constructed to map the use of AI and its value for the customer. Data was collected from multiple sources such as databases and company websites with a view to building a qualitative case study.

Article II reports on research charting the changes from the market entrant's perspective (the Wolt delivery platform) and from the incumbent's perspective. A case-study protocol was followed through the conducting of interviews using a semi-structured format.

Article III analyzes service innovation from the market entrant's perspective (10 FinTech start-ups) and builds a service innovation stack. A semi-structured interview was used in 2015 and then repeated with the same 10 start-ups in 2017 to ensure validity and to create a longitudinal study.

Finally, Article IV follows how an incumbent (Nordea) reacted to the phenomenon to find a strategic fit. A single-case approach is used, built on longitudinal and multiple source data.

The author of this dissertation is the first author of all four publications. He contributed to all phases of the research process, specifically the research design, building the theoretical framework, collection, and analysis of the data, as well as writing the manuscript.

4.1 Article I

Riikkinen, M., Saarijärvi, H., Sarlin, P., & Lähteenmäki, I. (2018). Using artificial intelligence to create value in insurance.

Published in the International Journal of Bank Marketing, 36 (6), 1145–1168.

   Customer's perspective: Chatbots are becoming more common in insurance companies as part of their customer service and sales channels. There are several ways of applying chatbot technologies, and the focus in the first article is on how Artificial Intelligence (AI) is used for value creation in this context. As insurance companies are seeking to establish their new supporting role in the process of customer value creation (Grönroos and Ravald, 2011), we addressed the following question: *"How can artificial intelligence be used to facilitate value creation in the insurance context?".* Using multiple data sources, we first identified 117 chatbots within the insurance industry. After analyzing them we highlighted 10 illustrative case examples.

   First, we found that chatbots embody a new type of communication through which companies can facilitate customer value creation by providing additional resources. Within this new type of communication, insurance companies can take different roles. Second, we put forward four metaphorical suggestions to characterize the role of insurance chatbots: *Butler*, which has high support of value creation, but low usage of AI, *Info desk,* which has low support of value creation and low usage of AI; *Intellect,* with low support of value creation, but high usage of AI and reverse usage of customer data; and *Life Coach,* with high support of value creation and high usage of AI, and reverse usage of customer data. Hence, the *Life Coach* approach allows for sustainable competitive advantage in that it is very difficult to imitate.

4.2   Article II

Riikkinen, M., Lähteenmäki, I. & Nätti, S. (2018) Institutional logics as inhibitors or levers? The Case of Mobile Payments in Finland.

Published as a book chapter in *Marketing and Mobile Financial Services – A Global Perspective on Digital Banking Consumer Behaviour*

Service Provider's perspective: The world's first mobile payment transaction was carried out in Finland in 1994. Since then, paying by means of a mobile phone has been gaining in popularity and startups have started to embed payments in their mobile apps. Many of the innovative solutions within mobile payments were introduced by startups. Thus, our study focus in the second article is on how institutional factors affect innovation in payments, and how industry-specific cultural, cognitive, and regulatory barriers (Thornton et al., 2012) can impede innovation. The research concentrated on Finland, given its long history of mobile payment.

This article addresses the following question: H*ow do institutional factors affect innovations in new payment services?* First, we identified a food-delivery startup called Wolt. It is a platform that connects the customer, the restaurant, and a courier. In order to make this all function efficiently they have embedded the payment as part of their user flow, leaving traditional providers out of the picture. We interviewed the three persons who founded Wolt, as well as four industry experts from incumbents and the regulator. Focusing on how institutional factors (cultural-cognitive, normative, and regulative) affected innovation in the field of mobile payment services, we found that incumbents tended to see them as barriers, and that the regulative aspects held back their innovation activities. Start-ups, in turn, perceived the same barriers as levers facilitating their own innovations, and built solutions based on market expectations. These barriers also prevented large incumbent firms from copying the innovations of smaller startups. In sum, the findings reported in this article contribute to the discussion about FinTech and enhances current understanding of payment systems.

Article III

Startup's perspective: FinTech startups are seen as innovators in FS, but there is as yet insufficient understanding of how they innovate. Incumbents have not actively sought opportunities beyond provider-pushed innovation (Gallouj & Djellal, 2011), whereas FinTech startups seem to. Hence, our aim in the third article was to find out how FinTech start-ups innovate in practice. First, therefore, we observed the process in service innovation from a linear perspective (Edvardsson & Olsson, 1996), and then adopted the more dynamic ecosystem perspective (Lusch & Nambisan, 2015).

Our research questions were: *"What is FinTech innovation based on in practice? Is it a technological innovation or a new service?"*, which we addressed in a case study of 10 Finnish FinTech start-ups. These companies were first identified as participants of the Helsinki-based startup event Slush in 2015, and the interviews were conducted there. The same startup founders were again interviewed two years later at Slush 2017.

In our analysis of these interviews, we found that, instead of innovating in a linear manner, the FinTech startups constructed what we call a "service innovation stack". This is based on ecosystem thinking and reflects the work of Lusch and Nambisan (2015). The findings reported in this article contribute to the literature on service innovation and help to clarify the differences between market entrants and incumbents.

4.3 Article IV

Riikkinen, M. & Pihlajamaa, M. (2022). Achieving a strategic fit in fintech collaboration – a case study of Nordea Bank

Published in Journal of Business Research (JBR), 152, 461–472.

Incumbent's perspective: Ever since the FinTech phenomenon came to light, banks and insurance companies have been looking for ways of initiating different types of startup collaboration. Although the same need for corporations and startups to form partnerships is acknowledged across industries, their suitability to the industrial context has not been widely studied (Shankar & Shepherd, 2019). The aim in the fourth article is to shed light what this means in FS by means of a case study. Nordea is the largest FS company in the Nordics. Aiming to build up collaboration with startups, it organized three programs in 2015–2018. The first represented the traditional incubator model whereby startups were invited to work at Nordea's premises over a three-month period and to get to know it as a company. The second program was also an incubator model, adjusted to meet more specific requirements when choosing the companies, for example. In the third program Nordea decided to turn the innovation flow inside out, and instead of having external startups it would invite internal teams with ideas.

We addressed the question of *"How to organize collaboration so as to achieve a strategic fit between start-ups and the incumbent?"* in a longitudinal study conducted between 2015 and 2018. Information was collected in several interviews with members of the organization, via onsite observations, and from additional program-related data such as videos and documentation. All this data was then analyzed and organized in process flows. A close study of these flows and their outcomes through the lenses of different *knowledges* revealed that, at first, Nordea identified a lack of *entrepreneurial* and *technological* knowledge. During the second program it would gradually establish such knowledge in its organization, thereby enabling it to switch the direction of the flow in the third program, and to find a strategic fit with innovation coming from within.

4.4 The key findings reported in the articles

The four articles describe and analyze how value creation may be reconfigured from different perspectives. Drawing together all the individual aspects, Table 3 summarizes each article in terms of the key findings and the contributions related to the respective research questions. This builds the foundation on which the discussion and conclusions presented in Chapter 5 are based.

Table 3.	Summary of the key results		
Article	Research question(s)	Key findings	Contribution
I. Using Artificial Intelligence to Create Value in Insurance	*"How can artificial intelligence be used to facilitate value creation in the insurance context?"*	Companies can facilitate the customer's value-creation process by providing additional resources.	Automated chatbots provide convenient access to data leveraged through a discussion-like interface. This study is among the earliest to address their value-creating potential in insurance.
II. Institutional logics as inhibitors or levers? The Case of Mobile Payments in Finland	*How do institutional factors affect the innovation in new payment services?*	Institutional barriers could be used as levers in payment innovations.	This research contributes to the discussion about FinTech as a phenomenon and broadens the general understanding of related change processes.
III. FinTechs' as service innovators: analysing components of innovation	*"What is FinTech innovation based on in practice? Is it a technological innovation or a new service?"*	FinTechs appear to go beyond the linear locus of service innovation (Edvardsson and Olsson 1996) towards a dynamic ecosystem perspective in its innovation themes (Lusch and Nambisan 2015).	FinTechs have changed service innovation within the financial industry and could therefore offer a valuable learning opportunity to larger companies such as banks in their innovation activities.
IV. Achieving a strategic fit in fintech collaboration – a case study of Nordea Bank	*"How to organize collaboration so as to achieve a strategic fit between start-ups and the incumbent?"*	Knowledge flows are essential for finding a strategic fit in startup collaboration and should be adjusted accordingly.	Light is shed on how Nordea achieved a strategic fit by adjusting its collaboration model over time based on the knowledge it had gained.

In sum, the findings imply that ongoing transformation affects innovation and distribution in the case of new services. It further challenges the structures and roles of service providers in FS, and how they create value with their business models.

5 DISCUSSION AND CONCLUSIONS

The purpose of this dissertation was to explore and analyze how value creation is reconfigured in FS. The phenomenon was investigated from four different perspectives as reported in four articles, which in their entirety contribute to the research purpose. The decision to take multiple perspectives, namely of the *customer*, *service providers*, the *startup* and the *incumbent*, facilitated the exploration and analysis of this ongoing phenomenon. Further, the different perspectives eased the search for tools and frameworks from previous literature in the fields of insurance science and marketing, which further facilitated the exploration. The focus of the discussion in this final chapter is on how value creation is reconfigured, what the theoretical contributions of this dissertation are, the managerial implications, and what possible avenues for future research emerge.

Reconfiguration of value creation in FS narrows down to two aspects.

First: *Digitalization and regulation transform the ownership of processes and resources as the foundation of value creation.* Although the customer-facing service provider introduces the customer-value proposition, as discussed also in the Articles I and II, it is most certainly a combination of several *resources* and *processes* (Johnson, 2008) from different sources and several service providers. Hence, the *resources* and *processes* incumbents (as in Article IV) previously claimed to be theirs are now accessible to others using API technology, and occasionally are even required to be accessible by regulation (e.g., account information and payments due to PSD2). Therefore, when given permission by the customer, market entrants have the same opportunity as incumbents (Article III). However, this also gives an incumbent the opportunity to create new services using the resources and processes of its competitors. These new services can entail new value propositions which were not previously possible. Consequently, processes and resources are no longer only an internal part of the business model (see Johnson 2008) but should be seen more broadly, which future research should revisit.

Second: *Digitalization transforms the means by which value creation is facilitated in FS, which also detaches the ownership from the customer.* For instance, service providers are now able to use chatbots (as discussed in Article I) to facilitate the value-creation process of customers, but they cannot claim ownership of it (Grönroos & Voima, 2013). Digitalization has made this joint sphere of value creation between customer and service provider accessible to third-party providers, or so-called FinTech startups (see Article III). As Gomber et al. (2018) point out, FinTechs can use institutional barriers as levers, (as discussed also in Article II) not having the legacy of systems, culture, or employees that incumbents have. Instead, these new service providers concentrate on the joint sphere and innovate within a dynamic ecosystem (Lusch & Nambisan, 2015). This also means that service providers can choose not to facilitate the value creation but just enable partners to do that instead.

These two aspects explicate the foundation of this dissertation, which lies in the reconfiguration of value creation. The way how we observe the ownership of processes and resources as well as the means by which value creation is facilitated, requires a revisit. Hence, use of the term reconfiguration is a deliberate choice. The suggestion put forward here is not that value creation should be fully configured, but that the known building blocks should be reconfigured. This final chapter sums up the theoretical contributions of the dissertation, the managerial implications and the limitations, and gives suggestions for future research.

5.1 Theoretical contributions

The theoretical contributions of this dissertation are threefold. First, the four articles make individual contributions. Article I identifies four metaphors that characterize how insurance chatbots can support customer value creation, which facilitates discussion of the different roles involved. New technologies such as automated chatbots provide the necessary access through a discussion-like interface. This article was among the earliest to address this issue in the insurance sector. Article II contributes to the discussion on institutional barriers and how they influence the transformation of value creation. The created framework helps to illustrate this. Article III contributes to the theoretical discussion by introducing the concept of a service innovation stack to explain the service provider's role in facilitating customer value creation. Finally, Article IV contributes to the discussion on how different modes of collaboration with FinTech startups help incumbents to achieve a strategic fit, but how they should be applied in times of disruption remains unresolved.

Second, this research contributes to the theory of value creation in suggesting an additional role for service providers within value co-creation, namely the *Value Enabler*. As applied in this dissertation, the term helps to describe the newly created role of an incognito service provider, which literally enables the value facilitator to create value propositions that would not otherwise be possible. The term has been used in various ways in previous research and should not be confused here with *enablers of value* as discussed by Lenka et al. (2017) and Wright (2002), for example. It is used in this dissertation specifically with reference to the role of the service provider within the value-co-creation process. In the context of value co-creation, Petri and Jacob (2016) refer to the customer as the enabler of the value in the process. However, the assumption here is that the customer is the *Value Creator*, and that the service provider is the *Value Facilitator* (Grönroos& Voima, 2013). Given the re-configuration of value creation in FS, the additional role of a *Value Enabler* is proposed, which supports the *Value Facilitator* in offering access to its *key resources* and *key processes* (Johnson et al., 2008). This addition will help researchers in the future to understand and explain how FS differs from other industries, and to investigate further possible changes in business models. As Boot et al. (2021) point out, a new development is to use non-financial data in the provision of financial services. Therefore, by introducing the different roles of value creation and observing them through elements of the business model, this dissertation contributes to the literature on

marketing and insurance science. Furthermore, it extends the discussion on FinTech to a broader level, approaching value creation in FS, and across their borders such as in non-FS providers functioning as Value Facilitators.

The reconfigured structure redefines the roles of service providers in FS. In this new setup, altered by digitalization and regulation, the *Value Creator* (the customer) still creates value for themselves (Grönroos & Voima, 2013). On the service provider's side, however, there are the two roles: to *facilitate* and to *enable* value creation. Thus, as Grönroos and Voima (2013) as well as Heinonen and Stradvik (2018) point out, the *Value Facilitator's* role is to ease the *Value Creator's* process in the specific context by offering the required tools and services (Heinonen & Strandvik, 2018). Thus, extending extant research, this dissertation coins a term for a new additional role, the *Value Enabler*. This service provider owns *resources* and/or *processes* (Johnson et. Al, 2008), which enable the *Value Facilitator* to create new tools and services (e.g. Heinonen & Strandvik, 2018) to smoothen the process of the *Value Creator*.
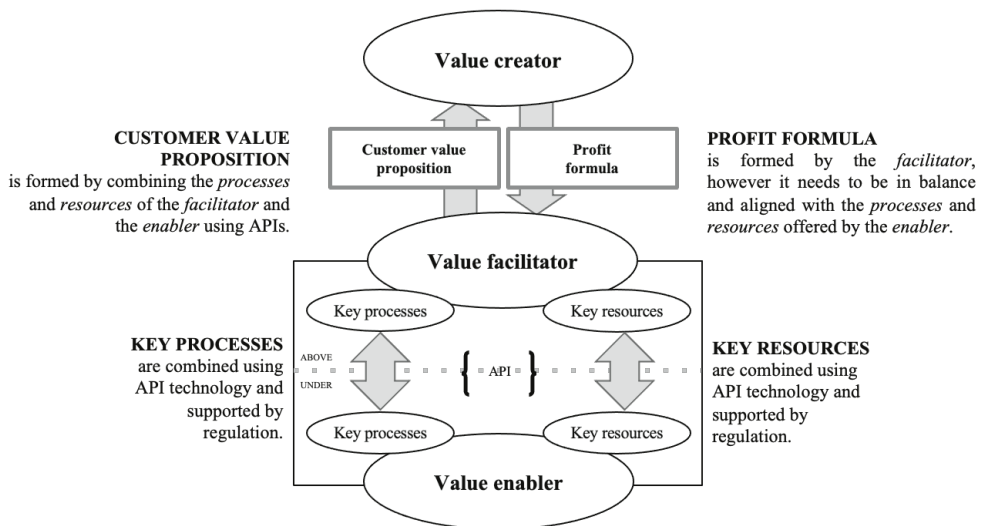
Figure 9. Research findings: the reconfigured framework for value creation in Financial Services

Figure 9 illustrates *how value creation is reconfigured in FS*, depicting the key elements and synthesizing the outcomes of this dissertation. It is suggested that the framework expresses the new reality in FS better than the models of Johnson et al. (2008) and Grönroos and Voima (2013). As previously discussed, innovation depends on how value creation is facilitated. The innovator is the *Value Facilitator*, which could also be an *incumbent* service provider with access to

the *Value Enabler's processes* or *resources,* creating a new *customer value proposition*. Thus, a firm's resources and processes are no longer stable attributes, and instead are assets that are accessible to other service providers. Furthermore, this *reconfiguration* impacts every company, as newly accessible *resources* and *processes* offer them all the opportunity to create new customer-value propositions.

Third, the dissertation contributes to the theoretical discussion on value creation and business models. The eventual purpose of business models is to create and capture value (Grönroos and Ravald, 2011), and value creation requires new conceptual frameworks and constructs enabling scholars to deepen their understanding. Digitalization disrupts every industry and thus needs to be addressed in academic discussion. The combined framework built on well-known business models (Johnson et al, 2008) and value creation (Grönroos & Voima 2013) presented in this dissertation contributes to the theoretical discussion in putting forward a new framework explaining the reconfiguration of value creation in FS.

Whereas Standaert and Muylle (2022) recommends studying open insurance in terms of data, product and ecosystem, it is suggested in this dissertation that all three are already open in the banking sector. Consequently, the framework suggested in Figure 9 could become relevant to the insurance industry as soon as open insurance starts. Furthermore, the data is among the key resources, and access is controlled through regulation. Hence, in the words of Bohnert et. Al. (2019, p.14), "companies need to think more strategically about digitization and acknowledge its transformative effect on their overall business activities, including internal as well as external operations": this transformation will have an impact on business models and innovation in FS industry wide. This dissertation agrees with Bollaert et al. (2021) that there is no undeniable evidence of FinTech replacing traditional finance.

5.2 Managerial implications

This dissertation explored and analyzed the reconfiguration of value creation, and also provides managers in FS with relevant implications. As discussed above, FS will face more and new kinds of competition, and technology decisions will have an impact on business models. Therefore, managerial implications are required to put the findings of research into practice, and metaphors could help to stir the imagination of managers (Cleary & Packard, 1992). The managerial implications are three-fold.

First, the four articles carry various implications. Using the framework suggested in Article I, insurance companies could reflect on the kind of role they wish to play in customers' value-creating processes when using new channels. These roles are especially relevant to service providers who are *value facilitators*. The framework on which Article II is based will help startups to find their levers, and incumbents to identify barriers to change. For managers this transition is from a goods-oriented business model to service- and customer-dominant thinking. Although the framework was created following interviews in startups, managers of incumbents are also better able to understand and innovate services using the service innovation stack discussed in Article III. When they understand the roles, opportunities, and innovations they might wish to explore collaboration. The findings reported in Article IV provide incumbent managers with practical tips on how to organize innovation in cooperation with external service providers.

Second, managers should start by assessing their company's value proposition and compare it to the resources and processes at hand (value facilitators). If certain resources and processes are missing, then suitable partners (value enablers) should be acquired. And vice versa, if the company has a surplus of resources and processes, it should make them accessible through APIs. Depending on their resources and processes, managers should carefully consider what role is most suitable. For instance, when the well-known FinTech start-up (online bank N26) first launched its service in 2013, it relied on white label cards and accounts issued by Wirecard Bank, making Wirecard the *Value Enabler* and N26 the *Value Facilitator*. Within this structure, N26 was able to concentrate fully on facilitating customers' value creation. In the newly reconfigured setup, all managers should be searching for a value proposition that offers a solution to the customer's problem. The managerial discussion in FS should thus start by

building an understanding of the problems of (target) customers and of suitable value propositions. The value proposition is at best, a way of communicating the potential value creation   to the customer (Johnson et al. 2008), and of standing out from the competition.

Third, FS is constantly developing as an industry. Therefore, applying the findings reported in this dissertation will help managers to understand the roles and opportunities as well as to prepare for possible upcoming regulative changes. Discussions about PSD3 as well as 'open insurance' are already ongoing and are expected to further accelerate the transition. Regardless of the size of the company, managers in FS will need to make decisions that will have a long-term impact on their company. Hence, this dissertation provides managers with tools to help them understand how value creation is reconfigured in FS so that they could start working on what that means to their company.

5.3   Limitations and future research

Although I carefully crafted the research design, I considered the most suitable for my exploratory study of the FinTech phenomenon, the study is not without its limitations. Overall, FS are dynamic and rapidly changing, which means that this research is a product of its time. The limitations fall into three categories, namely (1) perspective, (2) geography, and (3) method. With regard to the perspective, although the dissertation builds on the assumption that customers create value for themselves (e.g. Heinonen & Strandvik, 2018), it does not consider customers per se. Instead, the focus is on the means by which service providers facilitate the process. Gathering reliable customer data would have been challenging given the limited understanding of structures on the service provider's side at the time of the data collection. However, now having acquired some understanding of the service provider's perspective, I suggest that studying customers could extend current knowledge of how reconfiguration affects the value-creation process. Hence, observing the phenomenon from a value-chain or platform perspective could add insights into to the discussion in the future. The value-chain perspective could also open up opportunities to study responsibility aspects in this setting, whereby new services are created using resources and processes acquired from different service providers. Understanding the ownership of responsibility would also be of interest to

researchers concentrating on issues related to ESG (environmental, social, governance) reporting.

Second, my prime focus here is on the Finnish and Nordic markets. This related mainly to my background, which gave me extraordinary access to data from sources that would have been harder to penetrate in other markets. Moreover, at that time the phenomenon was so novel everywhere that knowledge to be gathered would have been limited worldwide. Now, however, studying another market with a larger population of FinTech start-ups, such as Germany or the US, and the differences in culture, business model and innovation structure could bring more nuanced results.

Third, given the nature of exploring a new concept, I used qualitative research methods. As understanding of the subject matter deepens, future research should employ confirmatory quantitative methods to expand understanding of the reconfigured structure. It would be possible, for example, to measure the real impact of regulations such as PSD2 by studying the volume of transfer business or even API calls. Quantitative methods could also reveal the significance of the reconfigured model to FS as an industry. There is more to explore, too, such as mental models of how value is perceived in this reconfigured setting, practices for managing the mixed band of internal and external technology partners as part of the value-creation process, and the customer perspective on building trust, for example.

Altogether, FinTech is an outcome, not the cause. Hence, the building blocks of value creation in FS are scattered around and service providers need to decide if they want to pick the ones to *enable* or to *facilitate* customer's value creation.

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Publication I:

Using Artificial Intelligence to Create Value in Insurance

Riikkinen, M., Saarijärvi, H., Sarlin, P., & Lähteenmäki, I. (2018).

ABSTRACT

Purpose: Recent technological and digital developments have opened new avenues for customer data utilization in insurance services. One form of this data transformation is automated chatbots that provide convenient access to data leveraged through a discussion-like interface. The purpose of this paper is to uncover how insurance chatbots support customers' value creation.

Design/methodology/approach: Three complementary theoretical perspectives—artificial intelligence, service logic, and reverse use of customer data—are briefly discussed and integrated into a conceptual framework. The suggested framework is further shown through illustrative case examples that characterize different ways of supporting customers' value creation.

Findings: Chatbots represent a new type of interaction through which companies can influence customers' value creation by providing them with additional resources. Based on the proposed conceptual framework and the illustrative case examples, four metaphors are identified that characterize how insurance chatbots can support customers' value creation.

Research limitations/implications: The study is conceptual in nature, and the case examples are used for illustrative purposes. No representative data from those users who will eventually determine whether chatbots are of value was used.

Practical implications: Using the suggested framework, which is aligned with provider service logic, insurance companies can consider what kind of a role they wish to play in customers' value-creating processes.

Originality/value: Automated chatbots provide convenient access to data leveraged through a discussion-like interface. This study is among the earliest to address their value-creating potential in insurance.

Keywords: Artificial Intelligence, Chatbots, Insurance, Service Logic, Reverse Use of Customer Data

Paper type: Conceptual paper

1. INTRODUCTION

Technological disruption and rapidly increasing competition are reshaping the boundaries of financial services. The fundamental characteristic of contemporary market dynamics is the interplay between traditional financial companies and new startups, which has resulted in financial technology companies known as FinTechs that are able to fully leverage digitalization opportunities without the costs and cultural burdens of the past. Among this group of FinTech companies, there is a sub-group known as InsurTechs (insurance technology companies) that aim to disrupt the insurance industry using innovative technology and business models. In addition, companies from other sectors, such as retail, are actively searching for opportunities for growth and potential areas for leveraging their customer data assets. Thus, financial companies are facing new competition from both inside and outside the industry. In response, banking and insurance businesses are reconfiguring their competitive priorities and raison d'être by investing in emerging technologies.

Insurance technology, such as environmental sensors, connected devices, wearables, [and] geo-awareness, are examples of how insurance services are being affected by an evolving technological ecosystem that both existing providers and new start-ups are trying to leverage for their own benefit.

Another example of this emerging technology is artificial intelligence (AI), which is being increasingly used in insurance technology for a wide range of back-end purposes, including algorithmic trading, financial search engines, blockchain analytics, and fraud detection. AI has also been used to power chatbots—discussion-like interfaces through which companies leverage their data combined with natural-language processing and machine learning to automatically provide customers with different types of information. In chatbots, the system is fed with natural-language data on historical customer interaction, which is processed by an intelligent system that learns to automatically suggest answers back to the customer in text format. Decision trees and conversation scenarios are often used to limit the number of potential answers for finite search spaces. This information is then used to build bots powered by machine learning that can, over time, learn more and provide better answers. The further developments of AI technologies in the last [several] years, especially around natural-language processing, enable the use of chatbots for automation of customer service tasks with significant efficiency gains in various sectors, including insurance.

In parallel with this wave of technological disruption, also new sources of data have emerged. Consequently, the financial industry has accumulated a vast amount of data on markets and customers. However, most banks and insurance companies have been protective of this information, focusing mainly on ways to use their data to benefit their companies. Nevertheless, recent technological and digital

developments—including the emergence of AI and chatbots—have opened new avenues for using customer data to benefit not only firms but also customers' value creation. Chatbots, in particular, provide a convenient way to leverage such data to create new types of benefits, that is, to provide new resources to support customers' value creation, which in turn can provide insurance companies the potential to differentiate themselves.

Research on AI, and indirectly chatbots, dates back to early work by Turing (1950), who developed the Turing test to determine whether a chatbot is distinguishable from a human. Later, Weizenbaum (1966) proposed a more concrete manifestation with Eliza, the first chatbot ever coded. More recently, progress has been seen not only in academic research, but also in industrial applications ranging from IBM Watson and Apple's Siri to Facebook Messenger's bots. The commercial value of chatbots has obviously sparked an even stronger interest in the underlying research, which has changed from scripted chatbots to chatbots built on natural-language processing and machine learning. Prominent examples of latest technology used in AI chatbots include approaches for learning word representations (e.g., Bojanowski et al., 2016) and text classification (e.g. Joulin et al., 2016).

Conclusively, despite the increasing relevance of AI and its use to create customer value, chatbots in particular have remained [relatively unaddressed in literature. Today, chatbots are being increasingly used in various consumer services, including banking and finance (e.g., Behera, 2016). This creates pressure to generate new knowledge on chatbots' potential for value creation (i.e. how chatbots eventually can support customers' various value-creating processes). Consequently, the purpose of this study is to uncover how insurance chatbots support customers' value creation. To address this, three complementary theoretical perspectives are discussed: artificial intelligence, service logic, and the reverse use of customer data. Based on these, the study's conceptual framework for supporting customers' value creation through chatbots is introduced. Next, the framework and chatbots' capability to support customers' value creation is illustrated through case examples of insurance chatbots. The selected chatbots offer important insight into how they are currently being used in insurance industry. Finally, findings are discussed through four identified chatbot "metaphors." The study ends with a conclusion and a discussion of its research limitations, as well as possible future research directions.

2. BUILDING THE CONCEPTUAL FRAMEWORK

The theoretical background of this study relies on three fundamental shifts (see Figure 1). First, chatbots are increasingly used in different service settings and there is emerging demand for in-depth understanding of their value-creating potential. Second, scholarly discussion around value has shifted from value as an outcome to value as a process, increasing the pressure to understand both how customers eventually create value through their own processes and how firms can support these processes (e.g., Grönroos and Ravald, 2011). In the context of this study, these theoretical developments are addressed to explore and uncover the potential of chatbots to support customers' various value-creating processes. This notion has been well represented in contemporary discussions on service logic. Third, increasing attention is being focused on harnessing the power of data for the benefit of customers; hence, the use of customer data is being used less as a resource for firms' value creation and more as a resource to support customers' value creation (e.g., Saarijärvi et al., 2013b; 2014). Chatbots represent a concrete example of this, as they use vast amounts of customer data to provide relevant information for the customer; the reverse use of customer data thus offers a complementary theoretical point of departure for the research phenomenon. Altogether, the three theoretical points of departure, artificial intelligence, service logic, and the reverse use of customer data, together with digitalization, provide the conceptual lens through which the research phenomenon is viewed. Next, they are discussed in more detail.
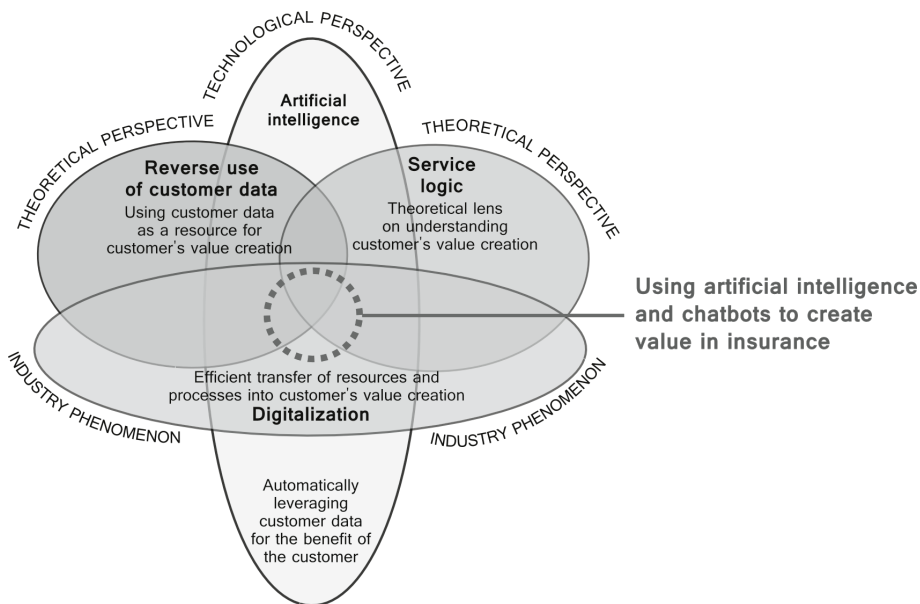
Figure 1. The research framework

2.1. Developments of chatbots and AI

The history of chatbots dates back to the 1950s and 1960s, when computer scientists Alan Turing and Joseph Weizenbaum worked on developing computers that could communicate like humans. This was done through experiments such as the classical Turing test and, later on, the invention of the first chatbot program, Eliza. While these early experiments seemed unfeasible, recent technological developments and consumer behavior have expanded the realm of what is possible with chatbots. Today, consumers spend a great deal of time on social media, especially [on] messaging applications. Furthermore, social media companies such as Facebook and Google that provide communication platforms have expanded their product offerings to include chatbot framework technologies. For example, Facebook acquired Wit.ai in 2015 (TechCrunch, 2015), and Google acquired a service provider called API.AI in 2016. Both services offer development interfaces that allow users without any coding experience to create chatbots. The insurance industry has been one of the early adopters of this new technology, and chatbots have been used by various firms for both external purposes, such as customer support, and internal purposes, such as to support employees to work more efficiently. Although, this automation technology can also be viewed from cost efficiency perspective, our research concentrates on understanding the ones that create value to the end customer.

A chatbot is an artificially intelligent program that can interact with consumers via different messaging apps. That said, despite the extent of AI research in the field, most conventional real-world chatbots lack AI in the true sense. Although no single unifying theory for AI and chatbot research exists, researchers debate the topic on a fundamental level, and their argumentation can be mapped into a few key challenges in the field, of which the following function as examples: (i) the underlying domain of conversations is characterized by the length and the breadth of the context. (ii) while short conversations require only one response per input, longer conversations require keeping track of old discussion information. (iii) a closed domain setting limits the number of potential inputs and outputs, while an open domain setting allows a conversation to evolve into anything. While the AI community has tried to construct generic chatbots, such as Alice and Eliza, a large number of chatbots are tied to use cases and domains, such as cultural heritage (Pilato et al., 2005), blind students (Bigham et al., 2008), and security training (Kowalski et al., 2013). Further discussion on the utility of chatbots in various use cases can be found in the work of Shawar and Atwell (2007).

Generally, and more importantly, the models behind chatbots can be divided into two types: retrieval-based, which use predefined sets of responses, and generative, which rely on machine learning to generate new responses. Many of the retrieval-based chatbots develop their responses using Artificial Intelligence

Markup Language (AIML), a pattern-matching XML parser. To make chatbots more human-like and useful, chatbots should obviously reply with coherent messages, even if only from the point of view of a use case, rather than only memorizing conversations in a database. Behera (2016) also points out that current chatbots often over-rely on AIML. In this vein, later developments with Behera's (2016) Chappie fills the demand for an interface between AIML and chatbots, offering a smarter way to understand chats, filter entities, and generate text in an AIML-readable format. In this approach, AIML serves as the lowest level of the chatbot brain and is used only as an interface for replying in a natural language based on extracted information. This would already enable many of the useful features of generative models. While generative models still face a number of challenges—such as incorporating context; developing a coherent personality; and evaluating models, intentions, and diversity—this field of research has made significant advances. Examples of recent successful work include the use of neural networks to map sequences to sequences (e.g., Sutskever et al., 2014) using Long Short-Term Memory (LSTM) recurrent neural networks (Hochreiter and Schmidhuber, 1997) and neural language modeling for short conversations (e.g., Sordoni et al., 2015) through recurrent neural networks (e.g., Mikolov et al., 2010; Mikolov, 2012). This is also the research that has allowed significant leaps in applied scientific challenges and industrial applications around natural-language processing, especially its use in conjunction with learning systems. And even more importantly, these are also the technologies that are increasing the efficiency, and thus value, of chatbots for automation of customer service tasks in a number of sectors, including obviously also insurance.

2.2. Service logic

In the past decade, the locus of value creation has shifted from the sphere of the company toward the context of the consumer. In parallel with this fundamental shift in attention, a number of contradictory and complementary theoretical perspectives (or lenses) concerning what eventually constitutes service or value have emerged. In current academic literature, 'service' is not conceptualized in a similar way than it was used in traditional service marketing literature, where services [were] often referred to as product-like outputs. On the contrary, whether the customer buys products or services is as such irrelevant: customers buy resources or processes that support their own value creation (Gummesson, 1995; see also Humphreys and Grayson, 2008). During the past fifteen years, a number of complementary service-related theoretical perspectives have emerged that all tap into this shift in attention. Service-dominant logic (e.g., Vargo and Lusch, 2004; 2008; see also 2016), service logic (e.g., Grönroos, 2008; 2011; Grönroos and Ravald, 2011), service science (e.g., Maglio and Spohrer, 2008; Vargo et al., 2008; Maglio et al., 2009), customer-dominant logic (Heinonen et al., 2010; Heinonen and Strandvik, 2015) and many-to-many marketing (Gummesson, 2008) have evolved into their own scholarly identities. Moreover, they

have collectively shifted attention from firms' value creation to customers' value creation (i.e., the various processes, practices, and activities through which customers realize value). However, while these perspectives share similarities, they are also characterized conceptual and ontological differences (see e.g. Saarijärvi et al. 2013a; Grönroos, 2011). Consequently, whereas service science may offer [a] suitable macro perspective for analyzing value co-creation on a systemic level, S-D logic could offer theoretical approach and conceptual tools to address the integration of resources and processes between companies, consumers and society at large (Vargo and Lusch, 2017). Service logic, on the contrary, emphasizes viewing customer's value creation through resource integration (Grönroos, p. 303):

> "As firms provide customers with resources for their use, they can be viewed as creators of a value foundation through a value facilitation process. When customers use these resources (goods or services) and add other resources (goods, services, and information) and skills held by them, the value potential of the resources is developed into value-in-use. Hence, the customers also bring value foundation to the table."

Customers combine resources, processes, and outcomes either individually or by interacting with other actors in a collective process of value creation (Grönroos and Voima, 2013). One type of resource that can support customer's value creation is the information that the company provides to its customers. It is important to note that data is not necessarily information. Information is information only if it is relevant for the customer. As defined by Drucker (1988, p. 4): "Information is data endowed with relevance and purpose". In that respect, only information can be considered as a potential resource for customer's value creation. For example, in [the] food industry, information related to product origins, recipes or food diets can provide major support for customers' value-creating processes related to food consumption. This is referred to as customer service logic, and it is well aligned with the characteristics of this study: chatbots represent an alternative and cost-effective way to provide customers with resources that they find meaningful in their value creation. Customers can use chatbots to request and explore any type of information related to their own value-creating processes. While chatbots provide only such information that customers ask, the information is often found meaningful, and thus it can be considered as an additional resource of value creation.

Second, given the fundamental role of the customer in his or her value creation, firms are increasingly being pressured to facilitate customers' various resource integration processes. This is referred to as provider service logic. In the insurance context, products and services clearly play a secondary and supportive role for the customer in the "job to be done." Insurance is seldom seen as a primary goal or value in itself. Therefore, the value-creating potential of any insurance product or service must be assessed

from the perspective of the customer, taking into consideration how the insurance industry can support customers' value creation through their own resources and processes. In this context, chatbots represent a new type of interaction through which companies can influence customers' value-creating processes by providing them with additional resources. Through these interactions, both companies and customers can affect each other's processes and, therefore, become both subjects of and active participants in the value creation process (Grönroos and Ravald, 2011; see also Nyman, 2013).

2.3. Reverse use of customer data

Due to [the] digital revolution, the amount and type of data has become immense and many industries are facing new opportunities to leverage on data. Companies have traditionally used this data for product and service development or various CRM activities: data has been used by companies primarily for the benefit of themselves. Data has been an input resource for companies' various value-creating processes, such as identifying cross- and up-selling opportunities, allocating resources for the most profitable customers, segmenting customers, and designing customized marketing communication campaigns (e.g., Richards and Jones, 2008; Jayachandran et al., 2005). In that respect, innovation from data (Rindfleish, O'Hern and Sachdev, 2017) has been recently coined as an emerging approach for acquiring, analyzing and acting upon consumer data to enhance innovation in companies.

This is well aligned with reverse use of customer data, i.e. shifting attention from using customer data for the benefit of the firm toward converting customer data into information to support customers' value creation (Saarijärvi et al., 2014). Customer data [thus] becomes an input resource for various customers' value-creating processes, which has major implications for various industries, such as food retailing (e.g. converting point-of-sale and customer loyalty program data into food healthfulness information), energy (e.g. converting energy data into real-time energy consumption information), and financial services (e.g. converting transaction data into information about consumers' finances). Reverse use of customer data therefore shifts the focus from using customer data solely for the benefit of a company to using customer data to support customers' value creation. Thus, the role of customer data is in transition: it is increasingly used not only to identify the most profitable customers, build customer risk profiles, and design personalized marketing communications, but also to facilitate customers' value-creating processes.

This fundamental change in perspective has several major implications not only for customer data usage but also for the ways in which companies utilize their assets to achieve a sustainable strategic advantage. Through the reverse use of customer data, companies can leverage their existing customer data assets to

build new services for their customers. For example, Spotify and Netflix use vast amounts of customer data not only to promote new albums, artists and series, but also to identify early adopters to whom they can suggest new music and movies. Using algorithms, companies are able to learn more about their customers' behaviors and then use this enhanced understanding to benefit the customer. Naturally, this has major implications for building customer loyalty. While products and services can be copied, competitive advantages related to continuously serving customers through customer data are far more difficult to imitate.

In sum, in the context of this study, the reverse use of customer data offers a new point of departure for exploring the potential of customer data for customers' value creation processes. Chatbots represent an efficient way to provide customers with information that is based on artificial intelligent use of existing customer data, i.e. previous customer inquiries, appropriate transaction and asset data, or relevant market data. Consequently, with the help of AI customer data is processed into information and delivered through chatbots to support customer's various value-creating processes related to insurance.

2.4. Synthesizing the theoretical framework

The three theoretical and complementary perspectives described above provide the basis for developing a conceptual framework of how insurance chatbots can support customers' value creation.
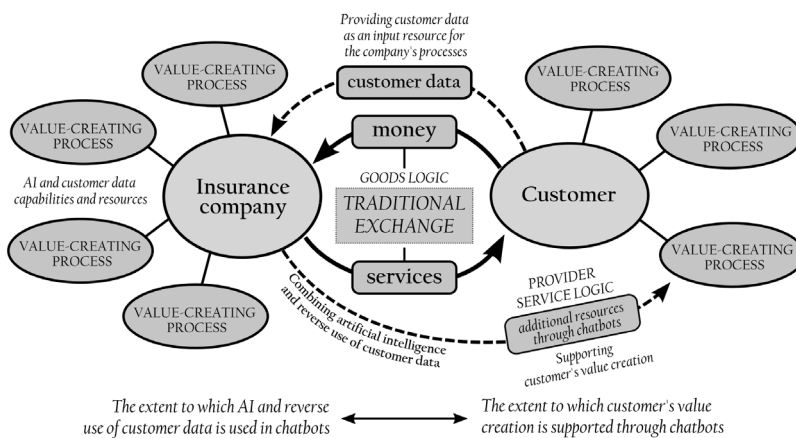
Figure 2. The conceptual framework

As depicted in Figure 2, taken together, AI chatbots, reverse use of customer data and service logic can shift the locus of value creation from goods to services, that is, toward supporting customers' value-creating processes in ways that go beyond traditional insurance products (see also Puustinen et al., 2014). Conclusively, customer data is an input resource for company's value-creating process where AI and chatbots are used to provide customers with additional resources that they can use in their own value-creating processes. As argued by Heinonen and Strandvik (2015), value is created in the ecosystem of the customer and not within the providers' ecosystem. Therefore, in the context of AI chatbots, service providers need to understand both how to support customers' processes effectively and how to achieve this through AI, chatbots and reverse use of customer data. In the following section, the suggested conceptual framework is reflected with the case examples and then further analyzed in Table 2.

3. ILLUSTRATIVE CASE EXAMPLES

Given the purpose of this study, the research focuses on the "[c]onception of new ideas (e.g. new constructs) or creative synthesis of existing ideas (e.g. new relationships between well-accepted constructs)" (Yadav, 2010, p. 2). Thus, the study seeks to discover rather than justify (MacInnis, 2011; Yadav, 2010). With this type of endeavor, the use of illustrative examples is an effective way to uncover the central characteristics of a research phenomenon (see Nordin and Kowalkowski, 2010; Rubalcaba et al., 2012). Consequently, to further develop the proposed conceptual framework, selected case examples (or vignettes; see Reinartz et al., 2011; Saarijärvi et al., 2014) of chatbots' current use in insurance are examined.

The case examples were selected through a three-step process. First, various academic and business sources were used to identify suitable financial industry actors that leverage the potential of AI initiatives. The selected actors included both start-ups and more conservative financial companies. This step resulted in the identification of 155 applications and solutions being used in business today (see Appendix 1). Second, the focus was limited to insurance actors, which decreased the number of potential case examples to 17. Finally, from this group of services, only insurance chatbots were selected for further exploration and furthermore. The final set included 12 chatbots that represent the use of chatbots in the insurance industry today. These chatbots are briefly described in Table 1.

Insurance chatbot / company	Chatbot characteristics
SPIXII (UK) InsurTech start-up that acts as an insurance agent. Founded 2016.	This automated insurance agent finds a suitable insurance product from a database by asking users smart questions. The company wants users to be able to find the insurance that is right for them through just a simple conversation, meaning no more filling out forms or confusing jargon. Therefore, the customer receives a quote for an insurance right away and can buy it without meeting a person.
Magda / Link4 (PL) Chatbot for Link4, Poland's first car insurance policy to be sold online. Founded 2014.	This automated insurance agent supports the company's Internet sales channel by giving users the opportunity to contact a Link4 advisor around the clock. The chatbot is made possible by an extensive knowledge database covering car, property, and travel insurance. Magda can reply to questions related to how to pay premiums, the compensation payout process, how to extend insurance, how to report a car sale, what can be insured when renting a property, and what to look out for when choosing an insurance company. In this case, customer receives answers to his questions without queuing to the customer support.
Mia / Co-operative Banking Group (US) Answers customers' insurance queries for Co-op Banking Group. Founded 2011.	Mia (My Interactive Adviser) is an intelligent, human-like virtual assistant who works alongside real contact center employees. Mia helps contact center staff provide consistently accurate messages to customers and has been proven to reduce repeat calls and wait times by up to 65%. The chatbot instantly provides employees with correct answers to a wide range of banking and insurance questions who then create value for the end customer by answering customer queries faster.
Arbie / RBC Insurance (CA) Supports RBC customers on the RBC website. Founded 2013.	Arbie uses text analysis tools based on a FAQ database and retrieves answers based on the questions consumers type into a search field. Users simply type in a question, such as, "How do I buy insurance?" and click the "Ask" button. Users can also instantly receive a dynamically generated list of the top 10 questions. After clicking "Ask," users receive one right answer to their question, as well as links to more information about how to get an online quote. Value for the customer is created through a discussion interface instead of searching for an answer on the website.

Nienke / NN (NL) Acts as a host on the NN website. Founded 2014.	Nienke is a website "host" that answers questions based on a pre-built FAQ database. The user interface looks more like a search function than a chat interface. Nienke answers all questions about the insurance and service offerings of Nationale Nederlanden. Similar to Arbie, customer value is created with the opportunity to ask instead of searching for the answer.
Marc / Crédit Agricole (FR) Online insurance agent on the CA website. Founded 2015.	Marc uses text analysis tools to answer questions and seek a suitable product for each customer from among Crédit Agricole's offerings. Marc's mission is to present Crédit Agricole's health insurance offerings, to answer questions concerning products/services, and to analyze users' needs in order to provide tailored offers. Therefore, customer value is created by precise product related answers instead of expecting customers to search for the information on the website.
Hanna / Swedish Social Insurance Agency (SE) AI customer service advisor for social insurance-related questions. Founded 2003.	The Swedish Social Insurance Agency's Hanna helps users navigate the SE website, provides information about social insurance and how to apply for benefits, and answers questions concerning e-legitimation. In this case customer value is created similarly as in Arbie and Mia by answering the customer queries faster without waiting times or customers searching for the information from the website.
Insurgram (DE) InsurTech that acts as an insurance agent. Founded 2016.	Insurgram advises users quickly, easily, and comprehensibly about insurance products, allowing them to quickly and easily get information on insurance prices and finalize their purchase processes within the app without ever meeting a sales representative. Since users contact Insurgram via messenger and an insurance expert helps find the best insurance policy for them, customer value is created without being in the need so meet with an agent at all and personal data is transmitted over a secure mobile checkout page.
Brolly (UK) InsurTech that gives advice and compares insurance options. Founded 2016.	Brolly is a free personal insurance concierge available online and on mobile phones that uses insurance products from several insurance companies. Brolly tells users whether they are over- or under-insured, whether they have duplicate or missing coverage, and whether they can get the coverage they need at a better price. Customer value is created through simplicity since users only need to enter their information once, and choosing and purchasing an insurane done directly in the chat interface similar to Insurgram.
Maya / Lemonade (US) InsurTech that automatizes underwriting. Founded 2016.	Lemonade Maya AI chatbot is able to craft the perfect insurance for each customer, make it easy to buy and handle claims within the chat interface. Processing a claim can be done within 3 seconds.
Allie / Allianz (AU) A bot advisor from Allianz that supports product-related questions. Founded 2013.	Allie uses text recognition to generate answers to customers' questions on the company's webpage. Allie can be launched from the company homepage, and she answers questions about a wide range of insurance products, just like a broker. Customer value is created through 24/7 insurance broker that replies immediately with product related questions.
Trōv (US) InsurTech that automates underwriting. Founded 2012.	Trōv allows users to add items that need be insured to a virtual collection and then turn the insurance for these items on or off as needed in real time. This on-demand insurance platform uses automated chatbots to register claims via text. Customer value is created through an overview of all the belongings of the customer as well as customized insurances per item.

Table 1. List of chatbots used in insurance industry.

To gain a deeper understanding of each chatbot's value-creating logict, complementary information was gathered from the companies' webpages, publicly available databases, and practical, real-life tests of the chatbots.

The authors then assessed each chatbot along two fundamental dimensions based on the identified theoretical perspectives: 1) the extent to which AI and the reverse use of customer data are used in each chatbot and 2) the extent to which customers' value creation is supported through each chatbot. These dimensions were used in analyzing the selected case examples. During the analysis process, it was soon

noticed that the chatbots varied in terms of the degree to which they utilized AI and the reverse use of customer data in their back-end processes. As is depicted in Figure 2, the first is dependent on companies' processes, and the latter is dependent on customers' processes, as the customer must eventually determine whether value is created (Grönroos, 2008). For example, while some chatbots utilized only simple decision-tree models with limited customer databases, others harnessed and customized potentially vast amounts of data to benefit the customer. Moreover, the chatbots differed in their ability to support users' value creation processes. Some chatbots delivered only the same informative content available on the companies' websites while others offered highly personalized solutions to customers' problems. Table 2 summarizes these dimensions.

	The extent to which the chatbots use AI and employ reverse use of customer data	The extent to which the chatbots support customers' value creation
Low	AI and data use are limited, and the service is based on a simple decision-tree model.	The service creates limited value and advice, or content that is available elsewhere or is not personalized for the consumer.
Mode-rate	The system is able to utilize AI and data to fulfill customers' needs to a limited level.	Although the outputs of the service are limited, the service is still better than a self-service website.
High	The technology is able to either crunch a massive amount of data or use predictive models to modify outputs based on users' complex needs.	The value created is notable, and the advice the bot provides is personal and nearly comparable to advice from a real-life advisor.

Table 2. Chatbots' potential for supporting customers' value creation.

Altogether, as summarized in Table 2, insurance chatbots are diverse and differ in their ability to be of value to customers. Based on the proposed conceptual framework and the case examples' differing characteristics, four different roles of chatbots can be identified. These are discussed in more detail in the following section.

4. DISCUSSION

The conceptual framework and the case examples illustrate that chatbots can play four distinct roles (or metaphors). These roles differ based on chatbots' ability to combine AI and reverse use of customer data as well as the way in which they eventually support customers' value creation. Most importantly, these roles uncover and capture the value-creating potential a chatbot can have in supporting customers' value creation.
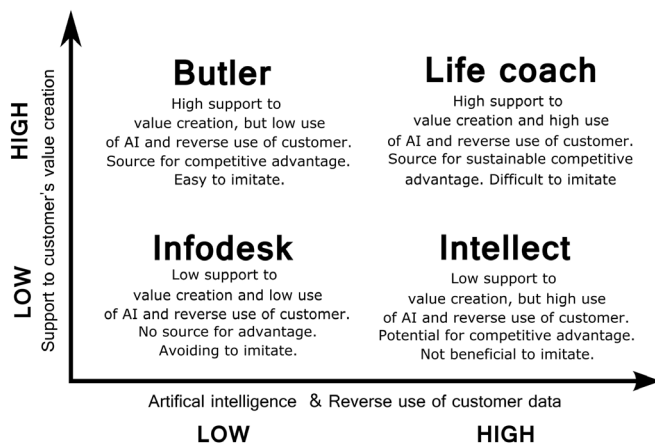
Figure 3. The four metaphors of chatbot usage

First, the "Infodesk" metaphor represents the simplest form of chatbot. Infodesks provide only low levels of support to customer's value creation. For example, they might provide customers the same type and amount of information already available on a company's website. In this respect, these chatbots do not provide additional resources for customers' value creation processes (for a comparison, see Grönroos, 2008), nor do they deliver resources in more efficient way. Similarly, Infodesks use AI and reverse use of customer data only to a limited degree. For example, chatbots such as Arbie, address customers' concerns using only relatively simple text analysis tools based on FAQ databases. Although customers may receive answers to their questions, Infodesk chatbots do not utilize the full potential of AI or the reverse use of customer data.

Second, the "Intelligent" metaphor refers to chatbots that do leverage the potential of AI and the reverse use of customer data to a high degree but that do not ultimately contribute significantly to customers' value creation. Intelligent chatbots are characterized by their ability to analyze vast amounts of data and even build predictive and self-enhancing models to modify their customer interactions. Mia and Hanna are good examples of Intelligent chatbots, and they have major potential to support additional customer value creation.

Third, "Butler" is a metaphor for insurance chatbots that are capable of providing high levels of support for customers' value creation processes through relatively low levels of AI use and the reverse use of customer data. In other words, despite failing to harness the full potential of AI, Butler chatbots are still able to provide additional valuable resources to support customers' processes. Insurgram, for example, advises customers quickly, easily, and comprehensively about various insurance products. In addition, customers can use the Insurgram app to finalize their purchases without ever meeting a sales representative. As mentioned in the conceptual framework, the value-creating potential of any insurance product or service to support customers' value creation must be assessed from the customer's perspective. For the customer, the ability to select between a chatbot and a sales representative might have a high value based on the time required for a representative to integrate various resources.

Finally, of the insurance chatbots investigated, "Life Coach" chatbots leverage AI and the reverse use of customer data to the highest degree and provide the highest level of support for customers' value creation. Life Coach chatbots are able to leverage the potential of AI to support customers' value creation through, for example, effective data analysis or predictive support. Of the investigated chatbots, Maya and Trōv are good examples of Life Coaches, since they provide customers new ways to craft insurance options and register claims. They not only save customers' time and offer existing (familiar to the customer) resources, but also help customers request and explore new resources to integrate into their value-creating processes. Life Coach chatbots have the ability to offer additional resources and, hence, to become active participants in customers' primary process.

As illustrated in by the case examples, both AI in general and chatbots in particular represent significant technological disruptions that open new avenues for value creation in the insurance industry. However, the eventual success or failure of any digital initiative is determined by whether it is ultimately able to reduce inconvenience or to create new benefits for the customer in ways not offered by the existing competition. Furthermore, chatbot development should be approached not as a separate technological exercise or as a rapid response to FinTech, but instead as a well-designed customer-oriented initiative strategically aligned with a company's competitive priorities.

5. CONCLUSION

Digitalization, AI, and other forms of technological disruption are reconfiguring the boundaries and logic of financial services. One manifestation of this revolution is chatbots, which offer the insurance industry new ways to interact with customers and leverage the vast amounts of data accumulating in their corporate silos. Despite their increasing relevance, however, chatbots' roles in and potential for supporting customers' value creation have remained unexplored. This might have been due the limited capabilities of the chatbot and the complicated technology in order to build them. However, the recent achievements in technology have made it more accessible for the larger audience to build AI based chatbots that are also relevant for the customers. For this reason, the present study sought to uncover how insurance chatbots can support customers' value creation. To address this research purpose, a conceptual framework was built, it was examined through illustrative case examples, and four metaphors were identified that illustrate how customers' value creation can be supported through chatbots. In conclusion, this study offers three main contributions.

First, while prior research on chatbots has focused primarily on technological or corporate perspectives, this study is among the earlier to build a customer perspective on chatbots in the context of the insurance industry. Toward that end, we underline the importance of the three complementary theoretical perspectives in understanding the value-creating potential of chatbots: AI as a perspective to efficiently convert data into conversational-like information (with the help of chatbots), service logic as a perspective to support customers' value-creating processes through additional resources (with the help of chatbots), and reverse use of customer data as a perspective to using customer data for the benefit of the customer (with the help of chatbots). In that respect, the study introduces a tentative conceptual framework to uncover both the level of AI used in chatbots and the extent to which chatbots are able to support customers' value creation. Since customers' value is created in their own processes, chatbots can be seen as tool to enter a space that has not been accessible for companies earlier. Furthermore, the use of artificial intelligence and reverse use of data offer an unlimited opportunity to serve the customer within their own process compared to the current state with limited capabilities of humans as agents. Therefore, the created framework will help to categorize and understand the rapidly growing number of new services and position them into perspective.

Second, customers form value by combining external resources (goods or services), information, and skills either individually or with other actors in a collective process (Grönroos, 2008; Grönroos and

Voima, 2013). Using the suggested framework, which is aligned with provider service logic (Grönroos, 2008), insurance companies are encouraged to consider what kind of a role they wish to play in customers' value-creating processes. In this respect, chatbots represent a new type of interaction through which companies can influence customers' value creation by providing them with additional resources. As illustrated by the case examples, though chatbots support provider service logic, they can easily fail to present a clear opportunity for providers to engage in or actively influence customers' value creation processes as a co-creator. However, it is argued that chatbots' ability to support customers' processes varies from low to high support through limited or extensive usage of AI and the reverse use of customer data. Based on this understanding, four metaphors were identified: Infodesk, Intelligent, Butler and Life Coach. Each metaphor represents a different way in which chatbots can engage in customers' processes. However, chatbot initiatives should not be disconnected from companies' competitive priorities. To the contrary, they should be clearly aligned with companies' strategic customer value propositions and raison d'être (see Anderson et al., 2006; Payne et al., 2017). Therefore, the four metaphors can be utilized to position the company's chatbot, align it with company's strategy and possibly work later on the persona of the chatbot to maximize the customer experience.

Third, this study is among the first to systematically identify and assess the chatbots currently being used by insurance actors in the market. In that respect, it provides both scholars and practitioners a wide variety of examples how customers value creation can be supported with the help of chatbots. For example, one of the case companies called Lemonade is able to handle a claim for a stolen item within 3 seconds, in which their AI based chatbot has reviewed the claim, cross referenced it with the company's policy, ran 18 anti-fraud algorithms on it, approved the claim, sent wiring instructions to the bank, and informed the customer that the claim was closed (The Economist, 2017). This process and combination of technologies are not only disruptive for the current way of working within insurance industry but even more so contributing directly to customers' value creation. However, while the list of financial applications and start-ups is exhaustive (Appendix 1), the relative share of insurance chatbots is low. Consequently, room remains for new players capable of developing and adapting suitable value-supporting roles.

In conclusion, the findings suggest that both AI and the reverse use of customer data offer vast potential to benefit customers' value creation through chatbots. However, existing insurance chatbots appear relatively trivial, primarily offering solutions to problems that could be answered by customers themselves (e.g., by exploring company websites). It can be surmised that in future, rapid development of AI will support the development of more mature and complex advisors capable of generating value for

customers. These developments will challenge the traditional customer–service provider interaction and create additional interesting opportunities for future research.

5.1. Limitations and avenues for future research

Several limitations must be taken into account prior to generalizing the findings of this study. First, the study was highly conceptual in nature, and the case examples were presented only for illustrative purposes. The study used no representative data from those users who ultimately determine whether chatbots have value. Instead, this study sought to provide examples of how chatbots are used in the contemporary insurance industry and to explore and evaluate their value-creating potential. However, given the nascent character of this stream of inquiry, exploring the multitude of case examples provides an effective and useful way to examine an emerging research phenomenon and provide a good basis for future research. Second, although specific criteria were used to select the case examples, this study might not include recent launches of new and innovative chatbots. Since AI is rapidly developing, chatbots with improved capabilities to engage in customers' value-creating processes are increasingly being developed.

Given the unique characteristics of AI, customer perceptions of its usefulness may go beyond traditional consumer-oriented technology acceptance models, making AI an inspiring and interesting avenue for future research. From the business model perspective, research should address how chatbots will eventually exert pressure on different elements of insurance business models, such as value propositions, profit formulas, and company resources and processes (see Christensen et al., 2016). Furthermore, there are many interesting opportunities to address chatbots' various consumer behavioral implications. Future studies could link AI levels and chatbot characteristics with key outcome measures, such as satisfaction, word-of-mouth, and loyalty and quantify the framework with more specific measures. They could also place more emphasis on the diverse value dimensions that these new initiatives can produce. Finally, this framework with four metaphors can also work as a baseline for studying the use of personas in chatbot creation which goes deeper into use of phrases and the tone-of-voice of the chatbot.

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Appendix 1: Full list of AI based financial applications (partly adapted from CB Insights)

Name	Description	Category
Active.ai	Active.ai develops intelligent virtual assistants with bots, SMS or voice API's for financial service institutions.	Assistants / Personal Finance
Acuity Trading	Acuity Trading brings big data solutions to retail investment mainly for online brokers and platform providers.	Market Research / Sentiment Analysis
Affirm	Affirm is a consumer finance company that provides shoppers instant point-of-sale financing for online purchases.	Credit Scoring / Direct Lending
Aidyia Limited	Aidyia develops AGI (artificial general intelligence) technology to identify patterns and predict price movements in global financial markets.	Quantitative & Asset Management
AIM	AIM is an artificial intelligence-powered app for automated investment management.	Quantitative & Asset Management
Aire	Aire uses a proprietary artificial intelligence process to allow banks to lend to new, qualified borrowers through online inverviews.	Credit Scoring / Direct Lending

Algoriz	Algoriz allows users to build trading algorithms with out any coding experience.	Quantitative & Asset Management
Alpaca	AlpacaDB, also known as Alpaca or Alpaca.ai, is a Deep-Learning startup that enables companies to use AI technology to automate professional human tasks.	Quantitative & Asset Management
AlphaSense	AlphaSense provides a search engine for knowledge professionals through semantically index the world's investment and market research content.	Market Research / Sentiment Analysis
Alpine Data Labs	Alpine Data Labs offers a code-free solution for Advanced Analytics for Big Data and Hadoop.	Quantitative & Asset Management
Amareos	Amareos uses artificial intelligence to extract market sentiments daily from global news and social media.	General Purpose / Predictive Analytics
Angoss	Angoss Software offers predictive analytics and business intelligence software to businesses looking to improve performance across sales, marketing and risk.	General Purpose / Predictive Analytics
Anodot	Anodot provides real time analytics and automated anomaly detection, discovering outliers in vast amounts of data and turning them into valuable business insights.	General Purpose / Predictive Analytics
Apporchid	AppOrchid utilizes cognitive computing and next generation user experience as a means of providing multi-device apps across the enterprise value chain.	General Purpose / Predictive Analytics
Applied Data Finance	Applied Data Finance's (ADF) product called Personify Financial applies technology and advanced techniques in data science and machine learning to optimally assess the credit risk.	Credit Scoring / Direct Lending
AppZen	AppZen is an artificial intelligence powered SaaS tool for automating T&E expense report audit and the tool integrates with all existing expense reporting tools, such as Oracle.	Business Finance & Expense Reporting
Argon Credit	Argon was created to increase consumer liquidity by offering unsecured online installment loans and offers people a safe easy way to acquire loans at competitive rates.	Credit Scoring / Direct Lending
Avant	Avant is changing the way online banking customers borrow money by utilizing advanced algorithms and machine-learning.	Credit Scoring / Direct Lending
Ayasdi	Ayasdi helps companies to use artificial intelligence and Big Data to make employees more productive.	General Purpose / Predictive Analytics

BehavioSec	BehavioSec is a behavioral biometric company that creates digital fingerprints from an end-users behavior through monitored keystrokes and mouse behavior.	Regulatory, Compliance, & Fraud Detection
Bigstream Solutions	Bigstream has a Big Data/Machine Learning platform that translates user analysis into actionable insights in real-time, allowing enterprises to accurately predict future usage trends and user preferences.	Regulatory, Compliance, & Fraud Detection
Binatix	Binatix provides powerful, brain-like, pattern recognition and machine intelligence technology so users can put data to work in remarkable new ways.	Quantitative & Asset Management
Biz-Q	Biz-Q analyzes commercial register notices and other mandatory publications from German companies to win business information, such as financial ratios and relationships between companies.	General Purpose / Predictive Analytics
BondIT	BondIT supports investment portfolio construction, optimization, re-balancing and monitoring. BondIT's intuitive software-as-a-service platform uses advanced machine-learning algorithms.	General Purpose / Predictive Analytics
Brainspace	Brainspace's product called PureDiscovery, develops a scalable platform that combines machine-learning technology, unstructured data analytics, and interactive data visualizations.	General Purpose / Predictive Analytics
Cape Analytics	Cape Analytics redefines the way information about the built environment is created and consumed using geospatial and aerial imagery structured data.	Insurance

Captricity	Captricity is secure cloud solution that transforms handwritten paper forms into digital data with 99%+ percent accuracy.	Insurance
Change Labs	Change Labs' platform uses machine learning and artificial intelligence to figure out how a user spends their money and identify where they could be making smarter decisions.	Assistants / Personal Finance
Checkrecipient	CheckRecipient is an email security platform that uses machine learning to make sure sensitive or confidential data cannot be sent to the wrong individual.	Regulatory, Compliance, & Fraud Detection
Clarity Money	Clarity Money makes a personal finance app that aims to help users lower their monthly bills and improve their financial health along the way.	Assistants / Personal Finance
Cleo	Cleo AI is an AI-powered chatbot to help users manage their finances, either via the Cleo app or Facebook Messenger or voice based with Amazon's Alexa and Google's Google Home.	Assistants / Personal Finance
Clinc	Clinc has built Finie, an advanced voice-controlled A.I. platform for banking.	Assistants / Personal Finance
Clone Algo	Clone Algo concentrates on researching timing sciences, algorithms and risk management systems based on artificial intelligence.	Quantitative & Asset Management
CognitiveScale	CognitiveScale builds machine intelligence software for healthcare, commerce, and financial services markets.	General Purpose / Predictive Analytics
CollectAI	CollectAI uses big data and machine learning for automated debt collection. CollectAI software offers various strategies to handle and collect unpaid bills.	Debt Collection
ComplyAdvantage	ComplyAdvantage helps firms make intelligent choices when complying with regulations relating to sanctions, money laundering (AML), terrorist financing (CFT), bribery and corruption.	Regulatory, Compliance, & Fraud Detection
Context Relevant	Context Relevant is develops a platform with machine learning, data science tools, statistical methods and an advanced distributed system capabilities.	General Purpose / Predictive Analytics
cortical.io	Cortical.io develops Natural Language Understanding (NLU) solutions based on its proprietary Semantic Folding technology.	Regulatory, Compliance, & Fraud Detection
Creamfinance	Creamfinance makes consumer finance quick-to-access by using the most advanced and representative scoring techniques to minimize consumer's effort and maximizes risk management.	Credit Scoring / Direct Lending
CreditVidya	CreditVidya is a B2B technology platform that uses big data and advanced machine learning techniques to provide credit scores to consumers, banking and financial institutions.	Credit Scoring / Direct Lending

CrossCues	CrossCues is an omni-channel customer engagement platform that uses machine learning to enable users to understand, anticipate, and engage their customers.	General Purpose / Predictive Analytics
CrowdProcess	CrowdProcess has creted James that helps risk officers in banks manage risk better, reduce default rates and improve risk management.	General Purpose / Predictive Analytics
Cybertonica	Cybertonica aims to decrease the number of fraud transactions and charge-backs, and increase site conversion with a cloud risk intelligence hub for merchants, PSPs and financial institutions.	General Purpose / Predictive Analytics
Cyence	Cyence empowers the insurance industry to understand the impact of cyber risk in the context of dollars and probabilities.	Insurance
Dataminr	Dataminr offers both buy-side and sell-side financial firms a data analytics platform that develops technology to unlock hidden value in real-time public social media data.	Market Research / Sentiment Analysis
DataRobot	DataRobot offers an enterprise machine learning platform that empowers users of all skill levels to make better predictions faster through open source.	Regulatory, Compliance, & Fraud Detection
Descartes Labs	Descartes Labs uses machine learning to analyze massive amounts of imagery.	Market Research / Sentiment Analysis
Digit	Digit is like a digital piggybank that connects to a user's checking account, analyzes the user's spending habits and income.	Assistants / Personal Finance
Digital Reasoning Systems	Digital Reasoning specializes in cognitive computing with a software that understands human communication.	Regulatory, Compliance, & Fraud Detection
Dimebox	Dimebox provides a global acquiring solution, offering financial institutions a SaaS-based white-label full-service gateway to take control of all their payments.	Regulatory, Compliance, & Fraud Detection
Domeyard	Domeyard is a hedge fund focused on high frequency trading which leverages advances in high-performance computing and data analysis to implement trading algorithms.	Quantitative & Asset Management
Elafris	Elafris develops a platform allows companies to sell more products at a lower cost, with a messaging system that allows companies to attract and retain the millennial consumer.	Assistants / Personal Finance
Emerge analytics	Emerge Analytics extracts profit from corporate data using machine learning and process analytics.	Market Research / Sentiment Analysis

Enterprise Bot	Enterprise Bot is a multiplatform messenger that provides banks with a powerful AI-powered customer relationship tool to enhance customer experience.	Assistants / Personal Finance
Euklid	Euklid platform uses algorithms to predict market trends leveraging Artificial Intelligence for Big Data analysis and processing as well as for the creation of investment options.	Assistants / Personal Finance
FeedStock	FeedStock is an intelligent information management platform for investment professionals, using machine learning to filter received emails, categorize and prioritize what research is relevant.	Market Research / Sentiment Analysis
FeedZai	FeedZai Fraud Prevention platform uses big data analytics to detect business anomalies and frauds.	Regulatory, Compliance, & Fraud Detection

Filtered	Filtered is commercializing deep learning technology which uncovers insights into emerging technology and trends.	Assistants / Personal Finance
FinChatBot	FinChatBot's chatbot platform, Holly, is an artificial intelligence available on all platforms and it increases insurance companies' conversion rates but also cuts costs.	Assistants / Personal Finance
Fintonic	Fintonic is mobile banking for the products that matter and it leverages big data financial information, using proprietary credit scoring and machine learning algorithms.	Assistants / Personal Finance
Float	Float empowers emerging credit consumers to prove their creditworthiness through personalized underwriting.	Credit Scoring / Direct Lending
Fortia Financial Solutions	Fortia Financial Solutions uses artificial intelligence, machine learning, and business process monitoring to help the fund industry meet compliance requirements.	Regulatory, Compliance, & Fraud Detection
ForwardLane	ForwardLane is a B2B cognitive finance company that builds enterprise-scale strategic AI solutions for private wealth management, asset management and insurance.	Quantitative & Asset Management
Fount	Fount is a robo-advisor company that offers customized financial portfolios Ð tailored to each customer via machine learning technology and asset allocation algorithms.	Quantitative & Asset Management
Fraugster	Fraugster is an anti-fraud company with the goal of eliminating fraud and increasing its customers' profits.	Regulatory, Compliance, & Fraud Detection
Friendly Scor	Friendly Score is a B2B solution for online lenders, providing a consumer credit assessment tool that uses social media data to increase conversion and approval rates.	Credit Scoring / Direct Lending
Fyle Technologies	Fyle's platform can identify expense related data in emails, such as an air ticket receipt and works as a computer vision-enabled expense management platform for enterprises.	Business Finance & Expense Reporting
H2O.ai	H2O offers an open source predictive analytics platform for data scientists and application developers who need scalable and fast machine learning for smart business apps.	General Purpose / Predictive Analytics
Habito	Habito is a digital mortgages startup that aims to help users apply for mortgages and avoid overpaying through its platform.	Credit Scoring / Direct Lending
Homebot	Homebot is an AI powered financial dashboard and planner for Homeowners. It helps homeowners build wealth by optimizing debt, home improvement, and rental potential.	Assistants / Personal Finance
Indico Data Solutions	Indico lets developers integrate machine learning algorithms into their applications with a single line of code.	Market Research / Sentiment Analysis

iSentium	iSentium offers an analytics tool catered to hedge funds, financial institutions and professional traders.	Market Research / Sentiment Analysis
James	James is a one-stop shop for Credit Risk Management, that allows users to easily create, validate, deploy, and monitor regulation-ready, high-performing predictive models.	Credit Scoring / Direct Lending
Jewel Paymentech	Jewel Paymentech develops an intelligent risk solutions for the banking and electronic payments industry.	Regulatory, Compliance, & Fraud Detection
Jumio	Jumio is a an ID credentials authentication company that helps businesses reduce fraud, meet regulations and increase revenue while providing customer experience.	Credit Scoring / Direct Lending
Kasisto	Kasisto's conversational platform offers enterprises to communicate with their customers.	Assistants / Personal Finance
Kensho Technologies	Kensho is pioneering real-time statistical computing systems and scalable analytics architectures.	General Purpose / Predictive Analytics
Lemonade	Lemonade replaces brokers and bureaucracy with bots and machine learning and offers insurances instantly.	Insurance
Lingua custodia	Lingua Custodia is a specialist in artificial intelligence dedicated to the financial translation.	Credit Scoring / Direct Lending
Lucena Research	Lucena Research offers quantitative analysis and statistical Machine Learning solutions to hedge funds, wealth advisers and advanced individual investors.	General Purpose / Predictive Analytics
MoneyLion	MoneyLion enables consumers to take control of their financial lives through smarter spending, saving and credit tracking tools.	Assistants / Personal Finance
Multiply	Multiply is using AI to bring holistic financial advice to millions.	Assistants / Personal Finance
Naborly	Naborly is a Canadian software company specializing in residential tenant screening using artificial intelligence and machine learning.	Credit Scoring / Direct Lending
Narrative Science	Narrative Science specializes in advanced natural language generation (Advanced NLG) for the enterprise and writes like a real person.	General Purpose / Predictive Analytics
Neat	Neat is the world's first AI powered mobile personal financial assistant for millennials.	Assistants / Personal Finance

Nervana Systems	Nervana Systems is bringing scale and simplicity to the application of brain-inspired algorithms.	Business Finance & Expense Reporting
NetChain Squared	NetChain optimizes the financial position of companies by instantly and intelligently moving money, data, and information.	Business Finance & Expense Reporting
Neurensic	Neurensic aims to strengthen and protect the most vital industries by using machine learning technology to help businesses comply with regulatory demands.	Regulatory, Compliance, & Fraud Detection
Numenta	Numenta has developed core technology in machine intelligence based on a theory of the neocortex and offers a cloud-based prediction engine.	General Purpose / Predictive Analytics
Numerai	Numerai created the world's first encrypted data science tournament for stock predictions for wealth managers.	Quantitative & Asset Management
Nutonian	Nutonian's Eureqa applies breakthrough science to enable anyone to deriver answers and understanding from complex data.	Business Finance & Expense Reporting
OnCorps	OnCorps is the Adaptive Decision Analytics company that intelligently engages users and nudges them to make better decisions.	Business Finance & Expense Reporting
Onfido	Onfido delivers next-generation identity verification and background checks, helping businesses verify anyone in the world within seconds.	Regulatory, Compliance, & Fraud Detection
Opera Solutions	Opera Solutions enable its clients to scale analytics across the enterprise and thereby extract more growth and profits with its platform.	General Purpose / Predictive Analytics
Orbital Insight	Orbital Insight works at the intersection of big data and the commercialization of space and is the first mover in large-scale analysis of satellite and UAV imagery.	Market Research / Sentiment Analysis
Paxata	Paxata's Adaptive Data Preparation platform provides an interactive, analyst-centric data prep experience powered by a unified set of technologies.	Regulatory, Compliance, & Fraud Detection
Penny App	Penny App has just launched a personal finance coaching app built with bank-grade security with tools to explain spending and income.	Assistants / Personal Finance
Personetics Technologies	Personetics Technologies offers financial institutions a predictive interaction solution designed specifically for the financial services industry.	Assistants / Personal Finance

Petal	Petal uses the latest methods in machine learning and product design to create consumer financial products.	Business Finance & Expense Reporting
Pit.ai	Pit.ai develops AI agents that learn how to invest by themselves, and that can develop more granular market insights than human experts using massive data sets.	Quantitative & Asset Management
Plex.ai	Plex.ai is an insurance start-up working on using artificial intelligence to re-engineer the way insurance and risk management is done.	Market Research / Sentiment Analysis
Prattle	Prattle uses natural language processing, sentiment analysis, and machine learning and offers it for research analysts, traders, and other finance professionals.	Market Research / Sentiment Analysis
PredicSis	PredicSis' software software allows customers to target prospects for campaign profitability using its own machine learning algorithms that are designed to predict customer intentions.	Regulatory, Compliance, & Fraud Detection
Proportunity	Proportunity explains and forecasts the real estate market using machine learning.	Market Research / Sentiment Analysis
Quotip	Quotip offers a management tool for product idea generation, request for quote and audit/life-cycle management.	Market Research / Sentiment Analysis
RapidCFO	RapidCFO, (FinCheck) is developing a conversational finance & business bot where users can instantly find monthly expenses hidden in their email and get a summary list of all their receipts.	Assistants / Personal Finance
RiskGenius	RiskGenius helps insurance professionals review policies faster with machine learning.	Insurance
SBDA	SBDA Group offers machine learning that allows banks to offer a personalised and automated financial advice service to its customers.	Assistants / Personal Finance
Scalend	Scalend is an analytics platform that helps businesses gather customer insights, optimize user experience through predictive big data and machine learning, using a web app.	Market Research / Sentiment Analysis
Sentient Technologies	Sentient's mission is to transform how businesses tackle their most complex, mission critical problems by empowering them to make the right decisions faster.	Quantitative & Asset Management
Seynse	Seynse built a digital lending platform, Loan Singh, which enables easy loans for credit worthy yet underserved borrowers.	Market Research / Sentiment Analysis

Shift Technology	Shift has offers detecting potential insurance fraud as a service based on algorithms to detect fraudulent behavior.	Insurance
Sift Science	Sift Science provides real-time machine learning fraud prevention solutions for online businesses across the globe.	Regulatory, Compliance, & Fraud Detection
Signal Media	Signal Media's AI lets businesses track changes to their world in real-time from competitors, to regulation, to their own reputation with certainty and clarity.	Market Research / Sentiment Analysis
SigOpt	SigOpt provides an optimal, automatic solution, bringing plug-and-play metrics optimization to small and mid-sized companies that can't afford a full data science team.	Quantitative & Asset Management
Skry	Skry, dba Coinalytics, enables enterprises to derive real-time intelligence and risk assessment from Blockchains and decentralized applications.	Market Research / Sentiment Analysis
Skytree	Skytree - The Machine Learning Company, offers Advanced Analytics market with a Machine Learning platform that gives organizations the power to discover deep analytic insights.	Regulatory, Compliance, & Fraud Detection
Smart Trade	Smart Trade is a quantitative trading platform which helps engineers develop, use and share trading algorithms.	Market Research / Sentiment Analysis
SmartZip Analytics	SmartZip Analytics is a provider in predictive marketing solutions for real estate and related industries.	General Purpose / Predictive Analytics
Socure	Socure's Social Biometrics solution detects fraudulent users on websites and mobile application.x	Regulatory, Compliance, & Fraud Detection
The Logic Value	The Logic Value has created a bot advisor for the valuation of companies listed on indexes internationally.	Market Research / Sentiment Analysis
Tractable	Tractable builds artificial intelligence systems for automation, with a technological focus on deep learning for computer vision.	Insurance
Trifacta	Trifacta enhances the value of an enterprise's Big Data by enabling users to easily transform raw, complex data into clean and structured formats for analysis.	Regulatory, Compliance, & Fraud Detection
Trill Financial	Trill Financial combines machine learning and artificial intelligence techniques to create algorithms that can comprehend and predict financial markets.	Market Research / Sentiment Analysis
Trim	Trim enables two-way communication with its users through text messages or Facebook Messenger.	Assistants / Personal Finance

Troo.ly	Trooly delivers Instant Trust services that verify, screen and predict trustworthy relationships and interactions.	Regulatory, Compliance, & Fraud Detection
TrueAccord	One True Holding, dba TrueAccord, is an automated debt recovery platform that bridges the gap between the creditor and those in debt.	Debt Collection
Trumid	Trumid is a US-based electronic bond trading platform that can effectively increase the liquidity and transparency of corporate bonds.	Quantitative & Asset Management
Turi	Turi offers a platform for building predictive and intelligent applications.	Market Research / Sentiment Analysis
TypeScore	TypeScore provides alternative credit scoring for lenders using natural language processing analysis on language data provided by the borrower as part of the application process.	Market Research / Sentiment Analysis
Understory	Understory, formerly Winstruments, is a weather data and analytics company providing real time, surface level data generated by dense grids of weather stations.	Insurance
Uniphore	Uniphore harnesses the power of voice and data technologies to transform any mobile device, irrespective of its feature set, into an enterprise class service delivery platform.	Market Research / Sentiment Analysis
Upstart	Upstart is a funding platform and mentoring network that matches students with backers who believe in their potential.	Credit Scoring / Direct Lending
Volos	Volos Portfolio Solutions provides pre-trade analysis software for investment managers who seek to supplement their portfolio with nonstandard derivative products.	Market Research / Sentiment Analysis
Walnut Algorithms	Walnut Algorithms uses machine learning techniques combined with financial expertise to create outperforming computational models for asset management.	Quantitative & Asset Management
Wealthfront	Wealthfront provides access to the same high quality financial advice offered by major financial institutions and private wealth managers.	Quantitative & Asset Management
WeCash	WeCash is a China-based big data credit assessment startup. The company helps analyze Chinese customers' credit.	Credit Scoring / Direct Lending
Wint	Wint offers a platform that automates accounting using artificial intelligence.	Business Finance & Expense Reporting

WorkFusion	WorkFusion offers AI-powered products that provide all of the tools an operations team needs to automate business processes.	Regulatory, Compliance, & Fraud Detection
Xeno Flash	Xeno Flash offers AI development for financial analysis and converts information on documents related to financial reports into table data.	Market Research / Sentiment Analysis
YoloData	Yolodata is a Smart DaaS platform for the Millennial driven, collaborative-economy.	Market Research / Sentiment Analysis
Zeitgold	Zeitgold offers an end-to-end solution for managing the financials of cafes, restaurants and SMEs.	Business Finance & Expense Reporting
Zendrive	Zendrive uses data and insights to empower drivers to make better driving-related decisions and to make time spent on the road a fun and rewarding experience.	Insurance
ZestFinance	ZestFinance is a financial services technology startup that uses machine learning and large-scale big data analysis to help lenders make more accurate credit underwriting decisions.	Credit Scoring / Direct Lending
Express Line	Express Lien puts construction industry participants in complete control of their financial risk and payment processes.	Assistants / Personal Finance
Magda	This automated insurance agent supports the company's Internet sales channel by giving users the opportunity to contact a Link4 advisor around the clock. Link4 is made possible by an extensive knowledge database covering motor vehicle, property and travel insurance.	Assistants / Personal Finance
Mia / Co-op Banking Group	Mia (My Interactive Adviser) is an intelligent, human-like virtual assistant who works alongside real contact centre employees, instantly providing them with the correct answers to a wide range of banking and insurance questions.	Assistants / Personal Finance
Arbie / RBC Insurance	Arbie uses text analysis tools based on a FAQ database and retrieves answers based on the questions consumers type into a search field. Users simply type in a question, such as, 'How do I buy insurance?', and click the 'Ask' button	Assistants / Personal Finance
Nienke	Nienke is a website 'host' that answers questions based on a pre-built FAQ database. The user interface looks more like a search function than a chat interface. Nienke answers all questions about the insurance and service offerings of Nationale Nederlanden. Next to the answer, she provides FAQs related to the subject of the customer's interest.	Assistants / Personal Finance

Marc / Credit Agricole	Marc uses text analysis tools to answer questions and try to find a suitable product for each customer from among Credit Agricole's offerings. Marc's mission is to present Credit Agricole's offerings in terms of health insurance, to answer questions concerning products/services and to analyse users' needs in order to provide tailored offers.	Assistants / Personal Finance
Hanna / Swedish Social Insurance Agency (SE)	The Swedish Social Insurance Agency is very familiar with the kinds of questions customers have—all of them, not only the top 10—since it conducts routine follow-ups via customer support telephone calls. All of these questions (and more) are now answered by an Interactive Assistant. Hanna helps users navigate the SE website, provides information about social insurance and how to apply for benefits and answers questions concerning e-legitimation.	Assistants / Personal Finance
Insurgram	Users contact Insurgram via their most-used messenger, and an insurance expert helps them find the best insurance policy for them. Users can ask any question they like during the conversation and then actually purchase a policy at the end of the chat. .app without ever meeting a sales representative.	Assistants / Personal Finance
Brolly	Brolly is a free personal insurance concierge available online and on mobile phones that uses insurance products from several insurance companies. Brolly tells users whether they are over- or under-insured,…	Assistants / Personal Finance
Allie/ Allianz	Allie uses text recognition to generate answers to customers' questions on the company's webpage. Allie can be launched from the company homepage, and she answers questions about a wide range of insurance products, just like a broker. Unlike a broker, however, Allie operates 24/7.	Assistants / Personal Finance
Trov	Trov allows users to add items that need be insured to a virtual collection and then turn the insurance for these items on/off (when needed) in real time. This on-demand insurance platform uses automated chatbots to register claims via text.	Assistants / Personal Finance

Publication II:

Institutional logics as inhibitors or levers? The Case of Mobile Payments in Finland

Riikkinen, M., Lähteenmäki, I., & Nätti, S. (2018)

ABSTRACT

Purpose: This paper aims to explore what kind of institutional barriers companies must overcome in order to innovate a new mobile payment service.

Design/methodology/approach: A qualitative case study of mobile payment development in Finnish financial sector is applied to explore institutional factors affecting innovation in payment services.

Findings: Institutional factors (cultural-cognitive, normative, and regulative) affect innovation of mobile payment services in highly institutionalized setting. In addition to defining those barriers, in this study we find that startups can use institutional barriers of traditional incumbents as levers for their own innovations.

Research limitations/implications: The study deepens our current understanding of the cultural-cognitive, normative and regulative factors affecting of new practices and service innovations in the highly institutionalized setting.

Practical implications: Results of this research will help startups to find their levers as well as incumbents to identify the barriers for change. The change also means a transition from goods-oriented business model to service- and customer-dominant thinking.

Originality/value: This research contributes to the discussion about FinTech as a phenomenon and broadens the general understanding of related change processes.

Keywords: Digitization, Innovation, Mobile service, Institutionalization, Change, Case study

Paper type: Book chapter

1. INTRODUCTION

Across the world, digital communication technologies are changing how people communicate. This disruptive technology-driven change has been shown to affect the business environment, where interaction increasingly involves computer-mediated networks: machine to machine, human to machine, and human to human (Oviatt and Cohen, 2015). Along with this ongoing change in communication practices, digitalization is revolutionizing how value is created in customer interactions. While much human-to-human interaction already occurs through digitalized channels, new and emerging technologies (e.g., 5G, Internet of things, blockchain) further radically amplify the information intensity of products and processes and increase the connectivity of actors and processes in customer interactions with service providers.

Westerlund et al. (2014) argued that, if utilized proficiently, these new tools would facilitate new approaches to value creation and service interaction in all knowledge-intensive industries. Indeed, enhancing interaction and value creation with customers is claimed to be among the keys to success in the digital age (Haas et al., 2012; Vargo et al., 2014). The digital revolution demands greater attention to customers' idiosyncratic needs, along with the reorganization and reinvention of operations to improve customer-perceived value in unique and customer-specific interaction situations (e.g., Matthyssens and Vandenbempt, 2008). As information is increasingly gathered by technological means, customer interaction must focus on making sense of what is of value to the beneficiaries of service users (Vargo et al., 2014). In addressing these changes, companies have yet to understand how and when digital tools and channels can effectively be used for customer interaction while remaining focused on value creation.

Digital interaction is no longer just one of a business's activities; it is the central means by which companies systematically relate and combine their activities, knowledge, and resources with other actors (Håkansson et al., 2009; Ulaga and Eggert, 2006; Blocker et al., 2012; Haas et al., 2012). However, the institutional environment in service-intensive industries means that technology utilization poses certain challenges. While organizations must continue to perform well in their technical domain, managers must also ensure that their organization adapts to provide services in a viable and sustainable manner, maintaining value creation and intensive interaction with customers.

The challenge is formidable; in many traditional industries, companies must undergo radical change to incorporate increasingly connected, customer-centered, and service-based modes of operation (Gebauer and Kowalkowski, 2012). This transformation means redirecting attention from the firm's

resources and production processes to support customer value creation (cf. Grönroos and Ravald, 2011; Ballantyne and Varey, 2006; Grönroos, 2006). In other words, both sales and service production activities must be adapted to support a customer-centric approach (see for example Heinonen et al., 2015), and service providers must learn new ways of enhancing value creation. Organizations need to be increasingly sensitive and responsive to emergent opportunities and must be able to react flexibly to emergent situations (Borg and Johnston, 2013).

The digitalization of customer interaction is a matter of strategic concern at organizational level, requiring change in the broader, taken-for-granted assumptions, values, beliefs, and culture shared by the organization's actors (Scott, 2014). In this context, it is important to comprehend how value creation is guided and constrained by institutions embodied in the customer and in organizations involved, and how organizational practices and established management models are deployed (Spohrer and Maglio, 2010; Lusch and Vargo, 2014; see also DiMaggio and Powell, 1983).

As noted above, many factors within and between companies and their customers can impede development toward the new business logic of digital services. In addition, industry-specific cultural, cognitive, and regulative issues can hamper comprehension or implementation of this new logic. These issues are not yet well understood, not least because of the novelty of this phenomenon in many businesses. To shed light on this strategic challenge, the present study addresses the following question:

How do institutional factors affect the innovations of new payment services?

Empirically, the study examines the kinds of institutional barrier that a newly established enterprise, for example,must overcome in developing digitalized customer interaction. In so doing, the present study deepens current understanding of new digital service innovation adoption in the financial sector, encompassing consumers, participating companies, and retail banks.

Because there is still scarce understanding of this phenomenon, a qualitative case study of mobile payment development in Finnish financial sector was conducted (e.g., Kovács & Spens 2005). This kind of an explorative approach provides an extremely informative starting point for the study.

Payment services is a context in which institutional logics play out, but the theoretical mechanism must be understood at the higher industry level. Our approach is further informed by the fact that practices and beliefs concerning payments have been strongly institutionalized within the Finnish banking sector and among consumers. To find out these barriers to innovation in payment services,

we interviewed business experts and start-up representatives. They all have the experience of payment service development, some of them from several decades. In addition, multiple sources of secondary data were used.

In terms of both theory development and empirical analysis, we focus here on institutional logic, which has been defined as the socially constructed sets of material practices, assumptions, values, and beliefs that shape cognition and behavior (Thornton et al., 2012). To understand institutional development in the present case, we address the adoption of digital communication technologies and practices in the interaction between firms and consumers in terms of three aspects: 1) cultural-cognitive, 2) normative, and 3) regulative. Analysis of these three aspects helps in understanding institutional logic and change.

The paper is organized as follows. First, the core analytical framework is described, addressing institutional factors and their logic in service provider-customer interactions. The aim of this theoretical section is to identify relevant concepts for the analysis of institutional factors that create barriers to payment digitalization. After outlining the research design and methodology, the study findings are presented. The final section discusses theoretical and managerial implications, limitations of the study, and directions for future research.

2. THEORETICAL FOUNDATION; INSTITUTIONAL LOGIC

Institutional logic has been defined as the socially constructed set of material practices, assumptions, values, and beliefs that shape cognition and behavior (Thornton et al., 2012). At the individual level, this includes norms and values; at the organizational level, institutional logic includes culture, politics, regulation, and industry-side norms (Oliver, 1996). A shared understanding of acceptable norms of activity creates institutions (Suddaby et al., 2010) organized by a dominant logic, and institutional change is understood as a transition from one dominant logic to another (Helfat et al., 2009). Institutional logic can be observed in many domains (Friedland and Alford, 1991), including markets, industries, organizations, and networks of organizations.

Organizations are tightly embedded in their social and political environment, and their actions and constructions reflect the rules, values, beliefs, and practices determined by that environment (e.g., Powell, 2007). Actors are not isolated but interact constantly, which is why actors' institutional behavior is not explained by solely rational or market economy factors (e.g., Marsh and Stoker, 2002). In the broader sense, institutions can be defined not only as visible organizations and constructions but in terms of routines, manners, and established models of action (including rules, laws, and agreements). For this reason, the concept of established is central to understanding and defining institutions (e.g., Hodgson, 2006). Because institutions reflect and describe their surrounding society, they must be established and stable, and they affect the behavior of actors either by restraining or changing it (Peters, 1999).

In the present study of institutional barriers to innovation in payment services, the institutions that influence the development are not only formal, organizational, and visible but may be also informal, non-organizational, and invisible. For example, co-operation among established Finnish banks is an informal and even invisible institution that is highly influential in the development of local payment services in Finland. Customer behaviors and their established assumptions about how to pay (or about accepted payment methods) can also form an institution that affect payment procedure development.

To understand the institutional barriers that can hamper change (and also, in this case, the potential accelerators of change when tackled), the adoption of new digital service and practices between firms and consumers is examined in terms of the following aspects: 1) cultural-cognitive, 2) normative, and 3) regulative.

Cultural-cognitive aspects refer to the shared conceptions that constitute the given social reality and the frames used to construct meaning (Thornton et al., 2012). From an institutionalist perspective (Scott, 2008), institutions embody common and self-evident beliefs and meanings that are both subjective and objective (that is, external to the actor). Cultural-cognitive meanings vary among different actors, depending on the level of embeddedness in routines and patterns, which can make them difficult to understand (Scott, 2008). It is often the case that rules are obeyed because they are based on a "taken-for-granted" mental model, and contradictory behavior is not seen as an option. In the present context, how consumers habitually pay, or believe they must pay, may be determined by cultural-cognitive factors, for example.

Normative aspects refer to rules prescribing rights and privileges, as well as responsibilities and duties, grounded in the institution's experience (Jackall, 1988; Ocasio, 1999). Norms are based on rules describing how things should be done in order to achieve goals. Normative institutions are values that internalize desirable behavior (Meyer & Rowan, 1977; Zucker, 1983). A normative system specifies both the goals of each action and the ways of reaching them (Scott, 2008). Norms depend on the actor's role in the institution; only some values and norms are common to all actors (Scott, 2008). In the context of payments, while established players may share common norms for goals and execution, new players may have different values and norms challenging status quo.

Regulative aspects refer to institutions' ability to constrain and regularize behavior, encompassing legal systems (laws) and policies and rules within the organization or industry (e.g. Barnett & Carroll, 1993). These are often formal rules such as laws, but they may also be informal, as in the case of general norms of behavior (Meyer & Scott, 1983). In banking and payment services, government supervision has traditionally been strong, and for this reason, regulative aspects and related influences are of particular interest here.

Organizations tend to legitimize their operations in their extended social environment, leading typically to institutional isomorphism—that is, they become more homogenous in their cultural-cognitive, normative, and regulative aspects (Meyer & Rowan. (1977). While competition and open markets should lead to differentiation of organizations in the same market, strong institutionalism may serve as a counterforce. If regulation plays a strong role in a given business area, business legitimation and continuity may be even stronger drivers than economic outcomes (DiMaggio and Powell, 1983; Hall and Taylor, 1996), and consolidating the company's existence becomes more important than

profits (see Meyer and Rowan, 1977). This is seen in the current offering of financial products by the Finnish banks, whichis limited, especially within the areas of payments, lending and wealth services.

Despite the many sources of friction mentioned above, institutions are, in one way or another, in continuous flux. Change is determined both by rule makers and by rule takers—that is, by those who form institutions and those for whom institutions are made. Institutions may change by chance or for no discernible reason. Change may also be a natural process of evolution, arising from competition or social development. When change is goal-oriented, it may also be driven by a few powerful actors (Goodin, 1996). Formal institutions are more easily influenced than informal ones (North, 1990), and regulative changes seem to influence institutions more rapidly than cultural customs. Certainly, legal obligation can be forceful; in the payments area, for example, the second Payment Services Directive (PSD2) seems likely to change business models and services at a more rapid pace than any other current institutional driver.[1]

While informal institutions may change without the conscious action of actors, formal institutions need to commit resources to implement change, and earlier decisions may lock development on a certain path. In other words, path dependency is caused by historical actions, and by an attitude of "this is the way we have always done it." Because many institutionalized habits and traditions are strongly embedded, they steer decision making (Thoenig, 2003), and even irrational behavior or business decisions may be explained by this institutional path dependency. Conversely, institutional entrepreneurs modify old institutions and create new ones, as do new entrants, creating a competing institutional logic. Institutional entrepreneurs have the resources to change existing institutions or to exploit the status quo of institutional position (Lawrence and Phillips, 2004). Shi et al. (2008) have used institutional theory to analyze the adoption of internet banking. According to them, both normative and coercive forces have significant influence on attitude and intention to use new digital banking services.

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[1] PSD2 is intended to create a more integrated and efficient European payments market, encouraging innovation and protecting consumers by making payments safer and more secure. It seeks to open payment markets to new entrants, leading to more competition, greater choice, and better prices for consumers. The directive was approved by the European Parliament and the European Council in late 2015 and came into force on 13 January, 2016. Market participants will have to comply with most of the requirements set out in the legislation from 13 January, 2018.

3. METHODOLOGICAL ASPECTS

The single case study method facilitates the collection of rich data in respect of a target phenomenon that is not yet well understood (Eisenhardt and Graebner, 2007; Yin, 2009). In adopting this approach, we employed abductive logic (e.g., Dubois and Gadde, 2002), which is appropriate given the nature of the target phenomenon and the objective of developing theory based on the case study (Locke, 2010). The single case setting of mobile payment development in Finland enabled us to develop an in-depth understanding of a complex phenomenon in question (Gummesson, 2000; Yin, 2003; Patton, 1989).

Since it was clear from early on that our study will be qualitative, interviews were an obvious choice of method. Data collection included interviews, relevant documents, and participant observations. The interviewing process started in March 2015 with the start-up company interviews and ended in January 2016 with the industry experts.

The aim for the start-up firm interviews was to collect data of it's founders´ entrepreneurial activity through which they strive to alter how value is created in this context. Furthermore, we wanted to understand how new entrant form competitive edge against an established bank. In particular, we focused on their introduction of a novel practice for mobile payments. This was extremely informative part of the data, for institutional barriers really become explicit during the launch process.

The chosen industry expert interviews were conducted with banking industry representatives from three different organizations that represents large established banks in the Finnish market. These interviewees were selected on the basis of their first-hand experience of institutional barriers when digitalizing payments and of related institutional factors that affect the adoption of new practices for customer interaction with service providers. Interviews with industry experts indeed augmented the view of payments development in Finland over a long period of time and clarified why payment services have encountered certain institutional barriers that newly established firms have been able to overcome. The saturation point of data collection was reached in quite early stage of data collection, and it seemed that informants hold quite homogenous understanding of the phenomenon under scrutiny.

All the interviews were recorded and transcribed. Thematic analysis were conducted to categorize the data according to chosen theoretical perspectives and preunderstanding of institutional logic. The interviews were conducted using a narrative method where the interviewee was given the context of

mobile payments and then asked to reflect from their perspective. This lead to a discussion which mostly started from the background of the interviewee and continued further to the fundamentals of payments. After the first round of interviews we analysed the collected data and found out that there are few key themes that repeat over and over again in all the interviews and therefore the saturation of data collection was reached.

Date	Interviewee	Company	Role	Duration
04.04.2015	Miki Kuusi	Wolt	CEO	55 min
04.04.2015	Oskari Petas	Wolt	Payment technology	50 min
01.05.2015	Elias Pietilä	Wolt	CTO	40 min
21.10.2015	Miki Kuusi	Wolt	CEO	45 min
17.01.2016	Erkki Poutiainen	Nordea	Head of transaction banking	60 min
18.01.2016	Hannu Kuokka	Danske Bank	Head of cards	55 min
19.01.2016	Päivi Heikkinen	Bank of Finland	Head of cash department	60 min

Table 1: List of interviewees, interview times, interviewee roles and duration of interview.

Although the interviewees have given the permission to publish their names, we have decided to use their quotes anonymously. This is due to the means of research and putting the stress on the content.

We also collected secondary data to support the interviews. In these 30 events in Finland and in Germany, themed around FinTech and payments, we spoke with dozens of FinTech entrepreneurs, bankers, and other industry experts. Although these talks were not recorded, we assembled the key findings and presentations to gain a fuller understanding of the relevant institutional barriers. Furthermore, these discussions supported our preliminary findings of the key themes detected in the interviews.

27.01.2015	Berlin	FinTech Meetup
12.02.2015	Berlin	Berlin Tech meetup
27.02.2015	Berlin	Startup Weekend Future of shopping

10.03.2015	Helsinki	Kasvu Open
25.03.2015	Berlin	Startup Night - Pitches, Traction & Funding
26.03.2015	Berlin	Valley in Berlin - You Is Now
07.04.2015	Berlin	Startup Confessions by BSC Accelerators Edition
15.04.2015	Berlin	Fundraising workshop
05.05.2015	Berlin	Startup Next Berlin
11.05.2015	Berlin	Seedcamp Berlin
12.05.2015	Berlin	interact.io & myContacts launch
20.05.2015	Berlin	FinTech & Payment Stammtisch
10.06.2015	Berlin	2nd hu:braum Portfolio Days
11.06.2015	Berlin	Axel Springer Plug n play pitching
17.06.2015	Berlin	FinTech Berlin Meetup
06.08.2015	Berlin	Inbot Sales Conversion Workshop & Penthouse Party
02.09.2015	Helsinki	Exit Only event by Frontier
03.09.2015	Helsinki	AVP Talk - "Get Ideas Out of Your Head and Into the World"
08.09.2015	Helsinki	Nordea Startup Accelerator info session
06.10.2015	Berlin	Silicon Allee Breakfast Meet Up
06.10.2015	Berlin	Itembeer Happy Hour @ "Making Customers Happy MeetUp"
22.10.2015	Berlin	Explore the latest FInTech trends on Top of Berlin
11.11.2015	Helsinki	Slush 11.11-12.11.
11.11.2015	Helsinki	Startup Sauna Fall '15 Demo Day
17.11.2015	Berlin	FinTech Stammtisch
19.11.2015	Frankfurt	FinTech Forum
25.11.2015	Helsinki	OP Hoksaamo - day
01.12.2015	Helsinki	Fintech Finland Community Launch
03.12.2015	Berlin	Rockstart Answers Berlin #2
08.12.2015	Berlin	FinTech Berlin December Meetup

Table 2. Secondary data

Thus, in the following empirical section, we consider the barriers from the differing perspectives of he industry experts and the institutional entrepreneurs. Analysis of these two complementary views provides a fuller understanding of the actual institutional barriers encountered to the existing payments space. In analyzing these barriers, we also aim to illuminate the associated change of institutional logic and how cognitive, normative, and regulative logics may both constrain and support the process of change (Scott, 1995). Before that, a short description of payment service development as an empirical

setting of the study and how our company example Wolt (from which start-up interviews are collected) relates to this entity.

Empirical setting; Mobile payment service development in Finland
The radical changes in technology have created opportunities for Financial technology (FinTech) start-ups to enter the market with alternative payment offerings. While the estimated proportion varies according to the source, payment startups are generally considered to be the largest FinTech sector. CB Insights is an online database for venture capital and based on their company data, they suggest dividing payment startups into eight sub-categories.

Category	Purpose	Examples
Online payment services	To help businesses to move their payment processing online, making it more accessible, secure, and inexpensive	Stripe, WePay
Billing automation and streamlining	To streamline invoicing and automate financial processes and billing	Zuora, Paymentus
Point-of-sale payments	To offer point-of-sale products and services, including card readers, stands, and digital storefronts	iZettle, Revel Systems
Personal payment services	To provide consumers with more convenient payment platforms	MobiKwik, Affirm
Bitcoin payments	To use digital currency to make payments faster and more secure	Coinbase, BitPay
E-commerce payments	To provide payment solutions for the e-commerce market that are geared to the challenges facing online merchants	Klarna
Connected card payments	To offer all-in-one connected credit cards as a key link in the payments value chain	Coin, Stratos
Money transfer services	To provide digital solutions for sending money quickly and cheaply across borders	Transferwise, Remitly

Table 3: Categories of payment startups (Adapted from CB Insight 2015)

Although the categories in Table 1 are not confirmed through academic researchers, it illustrates the complexity of payments as a whole. The largest category is online payments, which has grown rapidly since offering payment processing. Because of the high costs of sending and following up on invoices, some of the new market entrants have concentrated on using technology to automate invoicing. Point-of-sale systems (POS) were formerly provided by large hardware suppliers, but the latest developments

in hardware technology has made it possible to offer cheaper integrated solutions e.g. to attach to a smartphone or pad. Personal payment services make transactions stress-free while also reducing the time spent on banking platforms. Using Bitcoin for payments has become more common, and numerous startups are building supporting services for that market. Furthermore, there are several e-commerce payment providers concentrate on making payments easy for merchants. As the number of plastic cards in our wallets increases, a number of startups have created "all-in-one" cards that combine these. Finally, money transfer services offer international payment transactions at a fraction of the service fee charged by traditional providers.

In order to understand the phenomenon in Finland, we reviewed payment related companies in the Finnish market. Most of the companies are working solutions that are not in direct customer contact but instead work around areas such as webshop payments and offer it as a solution. However, there was one exception: Wolt, which is a Helsinki-based high tech startup founded in October 2014. Wolt has developed a "simple to use" mobile application that allows consumers to order and prepay for products from nearby restaurants, cafeterias and bars. The major value-add of this application is that it enables customers to pick up orders quickly and avoid queueing. During data collection for this study (in summer 2015), Wolt expanded their service offering to home delivery. At that time, the company was less than a year old but had expanded the number of restaurants covered by their service to more than 200, including well-known Finnish brands such as Kotipizza.

In Wolt's case, simplicity is the key for both consumer and merchant; the process needs to be logical for both parties, and payment should not be the main focus. Ownership of the purchased good is transferred while the process is ongoing, and all documentation (such as receipts) is delivered automatically in digital format. The service comprises two separate apps: one for the consumer and one for the merchant. The consumer app enables complicated orders to be placed in a matter of seconds. Being a Wolt user is free of charge, and their loyalty as well new user acquisition for Wolt is rewarded in the form of credits. On the merchant side, one major enabler of Wolt´s early success was the ability to integrate into any existing point-of-sale system without additional technology. As Wolt´s revenue is generated by a small transaction fee, there is no signup cost for new merchants. Wolt's business model is facilitated by direct contracts with banks and card issuers, which makes it possible to offer the service with a competitive price.

Looking at the categories of payment services in Table 3 above, it is challenging to locate Wolt within this framework. This is because, rather than being just a standalone payment option, Wolt has built its

business model around the core consumer process of ordering food or beverages. The salient category, then, is "Personal payment services," as customers provide their payment card information when signing up with Wolt and subsequently use their Wolt account when paying for orders. From data collection point of view, Wolt representative interviews were valuable, for institutional barriers really become explicit during the launch process of this new kind of payment service.

4. INSTITUTIONAL LOGIC AS A BARRIER TO DIGITALIZING PAYMENTS

Cultural-cognitive aspects

Cultural-cognitive aspects refer to the shared conceptions that constitute a given social reality and the frames through which meaning is created (Thornton et al., 2012). In a payments context, for example, how consumers usually pay, or how they believe they must pay, is closely linked to their cultural-cognitive background. In the present case, this influence could be seen among both service providers and consumers. One typical explanation for the stagnation of payment service development or consumer expectations was "this is how we are used to paying." Our research identified two central cultural-cognitive barriers to digitalization of payments in Finland: Consumer behavior and bank dominance.

Consumer behavior

Consumers are used to concrete payments; when you pay, you use some established means or device. For centuries, cash has been the standard means. More recently, credit and debit cards preceded mobile phone payments, using the same chip as in cards. Payment integration and embedding in the primary consumer action lies beyond traditional payment institutions. In the case of Wolt, for instance, the consumer makes a contract with the service provider for future payments by giving permission to complete the payment automatically at the moment of purchase. Based on that permission, the service provider then takes care of the payment process.

> Old local infrastructure and (consumer) habits have blocked out new players like PayPal and Klarna. (Payments Expert A)

Consumers are so deeply into card schemes. Since the 1970s, they have been used to withdrawing money from ATMs to pay for everything they buy, and now to make person-to-person payments as well. ---- There was the old infrastructure, and the old habits. (Payments Expert C)

Bank dominance

Traditionally in Finland banks have dominated the relationship with consumers, who seem to have accepted that position. Banks have had authority over their customers because what they brought to the market determined the standard for payment services. In general, the institutional position of banking and banks c.f. customers is the historic reason why banks have dominated the relationship.

Banks have not been service firms as such, but legitimated institutions under strict regulation without real competitive threat until new entrants and FinTech firms entrance since 1990's. In Finland, payments development and the use of digital means have been modern compared to many other markets. Customers have been pleased to digital services e.g. for the removal of checks already in the 1980's. However, it does not diminish the influence of bank dominance, which might be due to cultural drivers.

> Customers have been steered toward using payment methods favored by the bank. (Payments Expert A)

> Card payment services have been dominated by US schemas; Visa, MasterCard, Amex. (Wolt founder C)

> Banks have huge sales organisations; they can always sell more their own products. (Wolt foinder A)

> Banks directed customers to withdraw money from ATMs rather than at a branch. (Payments Expert C)

Normative aspects

Normative aspects refer to the rules prescribing rights and privileges, as well as responsibilities and duties, based on the institution's experience (Jackall, 1988; Ocasio, 1999). In the payments area, for example, established players may share common norms for goals and their execution while new players may have different values and norms (Scott, 2008). In the present study, we identified the following normative barriers to payments development: Security lack of co-operation inside the banking industry, lack of competencies, technological lock-in and path-dependency of payment-action-related choices.

Security

All market parties, including regulators, banks, and consumers, emphasize the importance of security as a feature of payments. This implicitly suggests that new payment methods are not necessarily perceived as secure. Banks are considered to be reliable and therefore customers are confident to use payments offered by incumbent banks. In Finland, the share of digital payments is already vast, and therefor services like PayPal or Apple Pay offered outside of the traditional sector have not reached notable market share. However, to an average consumer, it is challenging to evaluate the risk level of services, regardless if they are offered by an incumbent or a new market entrant, for example a FinTech startup.

> Customers see online payments insecure. They do let their cards to be taken at the back-office in kebab-pizzeria out of their sight but are not willing to give their card information when shopping on-line. (Wolt founder D)

> It is not possible for consumers to estimate the risks of payment security. --- Security is perhaps the most significant barrier to payments development. (Payments Expert A)

> If the service provider is known for reliability, that refers also to the trustworthiness of the service. (Payments Expert C)

Co-operation inside the banking industry

Until 1994, the Finnish banking system was very closed, with no real competition outside the local market. The 1994 EEA agreement opened the market, but entry by foreign banks remained slow (Lähteenmäki, 2006). Local banks have been used to close cooperation through the banking association. Our data indicates that this has led to normative, mutually reinforcing thinking among industry experts.

> You need a kind of consortium or value chain to offer [a payment service]; you can't operate alone. (Payments Expert B).

> The payment system was highly structured and defined by the cooperation between banks in the banking association ---- The bank card scheme was a cooperative effort to reduce the amount of cash in the payment system. (Payments Expert A)

Clearly, earlier payment service development was based on the needs of the banking sector rather than the needs of consumers. The choices made created a strong path dependency for development in a relatively stagnant environment. Innovations in payments were rather incremental than disruptive for the banking industry. Cost efficiency was more important driver than for example competition and service differentiation. An interesting question is how financial technology can change the current status quo of consortium or value chain need (the need of scale) rather than service differentiation (scope)? Furthermore, the role of Finnish Banking Association as a vocal union is unclear since FinTech firms are questioning the traditional role of cooperative effort.

Lack of competencies

From a normative perspective, one of the issues was the lack of business development competencies in established banks. Our qualitative analysis shows that this formerly regulated and protected business area did not need the same level of competencies before as it does in the current more open and competitive environment. Because of the protected position, established banks did not need to concentrate on differentiating service offering. Partly this might have been due to the lack of suitable competences. Markets opening, changes in regulation, new market entrants, and FinTech phenomenon in general have changed the competitive environment. Therefore, new employee competencies needed, such as innovativeness, flexibility, customer centricity and open-mindedness have caught the attention of incumbents.

> Banks have not been very flexible because of the lack of competition --- It was not critical to consider other development options. (Payments Expert B)

Technological lock-in

Banks have often been early adopters of new technology. However, early innovations have led too easily to lock-in to a certain technology, restricting further development in this regard. In particular, early investment in mobile technology at the end of 1990s in Finland was seen as a strong barrier to benefiting from next-generation technologies now.

> Strong investment in electronic purses, mobile payments, and WAP (wireless application protocol) at the beginning of the Millennium may have locked us into that legacy of first-wave electronic payments. (Payments Expert B)

> It's as if things are concreted in—you can't touch them, and our world goes no further. (Payments Expert C)

Path-dependency of payment action -related choices

In a long history, the digitalization of first payments transactions began in the 1960s, and transactions have since been automated by established banks in many ways. However, the actual payment action has been locked into cash or cards, and the consumer always uses some means or device.

> Consumers got used to cards—first with ATMs, then to pay for their groceries shopping, and later for online purchases. (Payments Expert A)

> NFC [near field communication] technology for paying without a PIN code for both in cards and smartphone payments, was seen as a great innovation. However, you still need to use some kind of device to pay. (Payments Expert C)

Regulative aspects

> Payment regulation causes huge amount of costs in the form of compliance. (Wolt founder A)

The first meaningful regulative event in this payments context was the Single European Payments Area (SEPA) initiative to improve cross-border payments efficiency for the Euro. The aim was to increase competition between banks inside the Eurozone. However, our data indicate that the effect of SEPA for consumers was more negative than positive. Earlier (pre-SEPA) Finland, along with several other European countries, had their proprietary, internal payment systems offering fast and cheap money transfers inside their respected country. SEPA harmonized payments in euros under the same basic conditions, rights, and obligations, but also steered payment transfers to circle outside of the home country. Our experts did not see this being only beneficial for consumers.

> SEPA did not improve the user experience. On the contrary, consumers who make payments mostly within their own home country have more to do when making a wire transfer. (Payments Expert B)

PSD2 is expected to impact on the payments industry, as banks will be required to open APIs to third party providers. This means that startups can exploit institutional barriers to offer their services to consumers using the same bank payment API.

> PSD2 will open access to customer bank accounts [data] for third party players. (Payments Expert B)

The issues outlined above serve to clarify the formation and difficulty of renewing institutional logic in the payments context, offering distinct reasons for the legitimation of institutions. According to Powell (2007), it is important to understand which factors are most important in strengthening or weakening the current social order. Our research confirms that Finnish banks, authorities, banking associations, banking employees, and customers have together formed an institutionalized community with common and shared values and meanings, increasing the sense of security and trust for actors inside that community as compared to those outside (cf. Wooten and Hoffman, 2008). This institutionalization may lower transaction costs by virtue of higher reliability and internal communication between actors (North, 1990). On the other hand, institutions may also increase transaction costs (Goodin, 1996); For example, payment services card schemes and technologies originally designed for ATM withdrawal became the status quo for all kinds of payment, preventing the emergence of more cost-effective methods.

New entrants versus institutionalized beliefs

The above analysis describes the barriers limiting or preventing new forms of payment service emerging. However, the payments experts (representing the established banking industry) also mentioned several respects how new entrants could compete against the traditional banks, using existing barriers as levers for their own capabilities and new approaches. Based on our analysis of the interviews with established bank experts, we were able to identify four perspectives that help to understand the advantages for new entrants: consumer, payment, bank, and technology.

From consumer perspective, the experts referred repeatedly to millennials and to younger consumers' using smartphones for everyday purposes. Being a digital native has given them greater control but also higher expectations towards the service providers.

> This generation of mobile phone users always carry their mobile phones; the user experience is already in place. (Payments Expert C)

> Consumers have noticed that they can tender payments services (Payments Expert B).

> I believe that payments will be abstracted in long term. (Wolt founder C)

From payment perspective, the role of the payment practice itself is diminishing, which means that location and time are no longer relevant. It has also become easier for consumers to compare different services and to find the most convenient solution without thinking about the payment per se.

> Payment is never the primary origin [of the process]; modern technology allows payment integration into the basic thing: what you want to do. (Payments Expert B)

> To some extent, these new services make location and time of day irrelevant. At the same time, consumers have realized that they can compare different services. (Payments Expert C)

> Convenience [of the payment process] is more important for consumers. It can even be a little more expensive if it is easier to use. (Payments Expert A)

From a bank perspective, the barriers are obvious. Banks used to lead technological development, however lost that position because of their existing technical and cultural set up. Banks are not familiar with rapid changes in the market. This means that their responses take time and this creates window of opportunity to the new market entrants.

Banks were early adopters of technology and the Internet. However, the situation has been stagnant for the last fifteen years --- Banks are not used to competition. Traditional banks are not flexible environments [for new innovation]. --- Banks are tied to massive payment systems [Swift, card schemes]. (Payments Expert B)

Banking business is so shielded by regulation. (Wolt founder C)

We have that "can't touch that one" attitude; we are cemented in, and this world goes no further. (Payments Expert C)

Visa has announced that when regulation (referring to PSD2) forces into competition, it weakens innovation, makes things more expensive, and complicates customer service. (Wolt founder B)

From technology perspective, the experts saw increasing possibilities, and FinTech startups were not seen as a negative factor. Instead, moving toward more flexible platforms and structures is seen as an opportunity also for banks to innovate. PSD2 will enhance this development, and FinTech may be the long-awaited catalyst for financial industry.

PSD2 opens up access to customers' account information and payment processes --- In a way, you can open a bank without being a bank ---- When we start to use account transfers for our purchases, and for person-to-person payments as well, it introduces new possibilities and maybe also brings banks back to better payments innovation --- There is increasing "Intel Inside" kind of thinking (Payments Expert B).

Electronic wallets, mobile payments, WAP… locked us into that legacy --- FinTech is a great opportunity to break the old legacy infrastructure (Payments Expert C).

Overall, although the established banks have enabled the opportunity for new entrants and FinTech firms, several institutional factors were identified as barriers to development for all payment service providers. These include consumer behavior, lack of competencies within established banks, technological lock-in, path dependency, and issues of regulation. The findings indicate that all three

institutional aspects (cultural-cognitive, normative, and regulative) contribute to the success of new payment methods offered by new entrants. In addition, our analysis identified entry factors related solely to the competencies of new entrants and FinTech firms.

New entrant's competitive edge

What can be new entrants´competitive edge against the incumbents in this new situation? Our analysis highlights especially four differentiating competencies, which are customer centricity, simplicity, innovativeness, and technological edge.

> Banks prefer to focus all their efforts on satisfying institutional investors or shareholders, and no bank seems to specialize in user experience design (Wolt founder A).

> User interfaces do not seem to be specialty of any bank (Wolt founder C).

This view concurs with banking industry experts that originally development of payment services was driven by internal needs of banks rather than consumer needs.

Simplicity combined with customer centricity was also brought up. This further highlights the focus to customer experience.

> We have everything as little as possible. Customer does not use any payments mean, and the shop-keeper does not handle money or money transfer. Shop-keeper uses his/her old point-of-sales devices. Customer gets electronic receipt and no paper is needed. (Wolt founder C)

> Our focus is on user experience. There are two user experiences in our case: the customer and the sales-person in the restaurant. (Wolt founder A)

Simplicity is important for merchant as well as customer's processes. Hence, payment is understood being in a supportive role not as core service per se. Furthermore, payment is not the primary process for either of the parties, and the less they have to manage it, the better is the user experience.

Finally, innovativeness seems to be a significant feature.

> Banks have concentrated on payments processes for decades. However, we noticed that there is nothing wrong with existing processes, but the main challenge is payment transactions as such (the actual payment execution at the point-of-sale). (Wolt founder D)

> On-boarding is very complicated process of traditional banking service. We used Facebook application programming interfaces (APIs) to on-board the customer with SMS message confirmation.

Wolt's founders suggested that a bank with an API-based strategy could prove to be very successful, since many startups seek for a partner to build in-app payments. In addition, Wolt's founders envisage that the institution of payment will increasingly be integrated in the core service process, and actually many recent services have moved in this direction. As an example the Wolt's founders mentioned Uber, where the consumer does not even notice the payment, as it is integrated in the process. Wolt's founders also believe that the future of grocery stores will involve home delivery rather than going to the supermarket. They anticipate that smaller merchants will join the service first, with larger corporations following once the critical mass of users is reached. Branded apps such as Starbucks they do not consider as a threat because:

"---In the long term, consumers would prefer to use one app for several shops and restaurants (Wolt founder A)

5. DISCUSSION AND CONCLUSIONS

This study sought to identify the main institutional barriers in developing digitalized customer interaction and through one case example understand what kind of challenegs a newly established enterprise has to overcome when launching a mobile payments service. In particular, our empirical data clearly show that institutional factors (cultural-cognitive, normative, and regulative) affect adoption of new digital service innovations in the highly institutionalized payments setting. Our study confirms that while status quo institutions create many barriers that can block innovation, those barriers can also serve as catalysts for the creation of new services by institutional entrepreneurs. Hence, services that are relevant for the consumers can be created by the new market entrant although the institutional barriers have been keeping the incumbents from doing them. In other words, incumbents and also consumers have been locked-in the old institutional way of thinking, while new entrants are free of the same barriers. In line with Greenwood and Hinings (1996), our research supports the view that institutional logic offers an appropriate framework for understanding the factors that influence adoption of such innovations in highly institutionalized settings.

The current study identifies consumer behavior and bank dominance as cultural-cognitive factors influencing payment service innovation, likewise security, cooperation within the banking industry, lack of competencies, technological lock-in, and path dependency of payment-related choices as being influential normative factors. Regulative aspects are characteristically EU-level rules as strong regulative factors that hinder development of the new business logic of digital services. However, while institutional logic limits the need for established actors to change within their traditional context, it also creates opportunities for new players. Our study reinforces the view of Battilana (2006) and DiMaggio (1988) that institutional entrepreneurs can create entirely new procedures without the burden of the past, enabling them to challenge the institutions.

According to DiMaggio (1988), institutional entrepreneurs modify old institutions and create new ones by accessing resources that support their own interests. To understand how startup firms have been able to break the institutional barriers, we have to understand how those resources enable innovation. As all those resources were also within the reach of established banks, startups' main resource was their ability to think outside the box, which we characterize here as the startup mental model. For

example, Wolt's founders believe that the user experience of paying will change and the payment element of the process will disappear; when smoothly integrated into the process, the consumer does not even notice the payment. The following figure encapsulates our key findings regarding the differences between an incumbent and a startup in terms of institutional barriers.
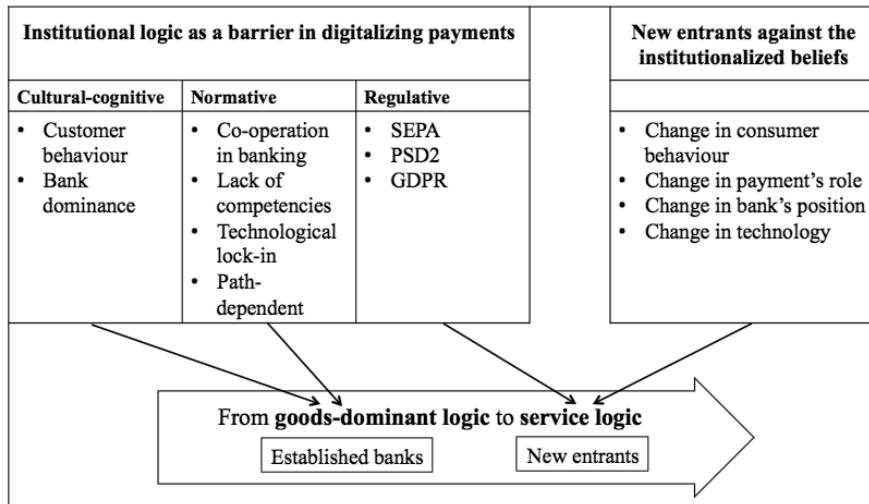

Figure 1. Institutional logic as barrier and enabler of new innovation

Figure 1. shows how cultural-cognitive and normative reasons have hindered the innovation of customer-centric new services in payments area, which explains also why established banks can be described as goods-dominant by their business logic. Furthermore, regulation has been protecting the traditional banking sector, thus strengthening the goods-dominant logic. During our research, we observed how recent changes in regulation have enhanced the move from goods-dominant to service logic by opening the competition for new entrants.

The present study demonstrates strong managerial implication that innovation can be created with relatively few resources and within a limited timeframe. Corporate executives should explore different ways of cooperating with promising startups and should fully assess the cost of creating new services in-house. Examples that our Wolt example has demonstrated to create better customer experience in payments area are such as easier and faster on-boarding process of the service, integration and

abstraction of secondary service (i.e. payment) into primary service (food ordering), real-time follow-up of the service process, reverse use of customer data, automatic registration of transaction (no use of concrete payment device or receipt), integration of new service into existing legacy (no need for new point-of-sale device), and the use of social media (group "Wolt&Friends" was created before the launch operating as a platform for early adopters). Wolt 's core team of just six people was able to turn their concept into a functioning and scalable business model in less than six months. This confirms that, with the right thinking and allocation of resources, big companies could in principle develop several Wolt-like ideas for serving existing customers or acquiring new ones. However, big organizations need to find some effective means of generating new ideas, as many are invented outside the organizational context. In general, Wolt's idea is not groundbreaking, and it can be assumed that some bigger corporation has already had a similar idea; what matters is that the capability to execute ideas.

Furthermore, this research paves the way for future research. While this paper looked at one market and one informative company, it is important to acknowledge that this is only one case study within a particular market (Finland), with its own special characteristics. The study could usefully be repeated in other markets to compare results and develop a better understanding of this phenomenon. As there are several other companies building their service around a similar kind of "hiding-the-payment" approach, a multi-case study could be done within the same industry. Additionally, a cross-industry study would provide a broader view of these issues.

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Organizing for Open Innovation with Fintech Startups -
Case study of Nordea Bank

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ABSTRACT

Driven by digitalization, emergence of startups and regulatory changes, the banking industry is ongoing a "fintech revolution" where numerous new entrants are challenging incumbents by developing new financial services. Banks are experimenting with various ways of collaborating with fintech startups, ranging from corporate venture capital to acceleration and incubation programs. There is, however, lack of empirical research of startup collaboration in the banking industry. We address this gap by conducting a longitudinal case study of how Nordea, the largest retail bank in the Nordics, organized for collaboration with fintech startups. We investigate three accelerator/incubator programs that were ran between 2015 and 2018 and analyse how the programs enabled the combination of key knowledge resources (entrepreneurial, technological, market, organizational) required for developing new business. We propose that different outside-in and inside-out modes of open innovation vary in how they promote knowledge combination and identify the integration of startups into the bank's existing business and technological systems as a key barrier to open innovation. We further suggest that during major changes in an industry, startup collaboration can be a way for an incumbent to accumulate technological and market knowledge even if concrete business outcomes remain modest.

1. INTRODUCTION

The financial industry has traditionally been considered as conservative and risk averse (Vermeulen, 2004; World fintech report, 2019), mainly because of legal and compliance constraints (Schueffel and Vadana, 2015). In the past years, it has gone through a turbulence from digitalization to financial crisis and later to an invasion of new market entrants called "FinTechs" (financial technology) startups. The pressure to innovate is currently high due to three main drivers: digital transformation, the emergence of fintech startups, and regulatory changes. First, digital transformation of traditional banking services, such as payments, identification and risk modelling have required significant investments from incumbent banks. At the same time, they face competition from big players such as Facebook, Alibaba and Google who have entered the industry with their own payment services (Bughin & van Zeebroeck, 2017).

Second, numerous fintech startups have emerged that challenge incumbent banks by providing unique, niche, and personalized services (Lee & Shin, 2018) disrupting the incumbent banks' business models (Gomber et al., 2018). It has been predicted that traditional financial service providers may lose over 650

billion dollars in revenue to new fintech companies in the areas of payments, crowdfunding, wealth management, and lending (Terry et al., 2015).

Third, a driver that applies to banks operating in the European Union, a PSD2 (Revised Payment Service Directive) regulation is implemented that demands banks to open their Application Programming Interfaces (APIs). This means that for banks to meet the requirements of the directive, they need to build the technical possibility for third party providers (when given permission) to access account information, make transactions and check for the balance of the account. This allows new service providers to innovative on top of the banking data.

To respond to the increasing pace of change, incumbent banks have started to engage in open innovation, with fintech startups in particular. According to the resource-based view, the logic of open innovation is that "firm's critical resources should extend beyond its boundaries and enable resource flows (knowledge flows) with external firms" (Vanhaverbeke et al., 2008, p.9). As the fintech startups are likely to possess relatively scarce and valuable resources, combining them with a bank's existing resources may be valuable for developing new financial innovations. Despite of the topicality of fintech, there are practically no empirical studies of how incumbent banks should organize for collaboration with fintech startups, which is what we set out to explore.

2. OPEN INNOVATION WITH FINTECH STARTUPS

Traditionally, banks have mainly focused on closed innovation (Schueffel & Vadana, 2015). Banks' internal teams have innovated independently or with the help of a consultant. Collaboration with other players in the markets has not been that common. At times, banks have joined their forces to create industry standards, such as identification and payment related protocols, but when it comes to developing more specific services, every bank has worked for themselves.

A shift from closed to open innovation is, however, taking place (Fasnacht, 2009) and both of the two main modes of open innovation, the outside-in (inbound) and the inside-out (outbound), have been observed (Gianiodis et al., 2014). Users and lead customers have acknowledged as key sources of new banking services, reflecting the outside-in mode (Oliveira & von Hippel, 2011; Athanassopoulou & Johne, 2004). The inside-out is observed when a bank markets its internal funds to other firms to offer to their clients (Fasnacht, 2009). BBVA, a Spanish bank, has for example, experimented with new business models by partnering with travel firms, such as Hotels.com (Gianiodis et al., 2014).

In principle, startups and large banks are a match made in heaven: combining the innovativeness of startups with the resources and capabilities of incumbents may bring together the best of both worlds and ensures the novelty of ideas and the ability to implement them. Startups are limited in their financial resources, labor, management skills and know-how of regulatory requirements (Klus et al., 2019; Zaremba et al., 2017) but they tend to have higher innovation potential than incumbent banks (Gozman et al., 2018). Large companies, on the other hand, tend to suffer from organizational inertia that forces them to continue on a predetermined trajectory, restricting their ability to innovate radically and adapt to the needs of the digital age (Klus et al., 2019; Hill & Rothaermel, 2003). The size difference is however often associated with differences in culture, processes, and priorities which makes collaboration difficult (Smith et al., 2001; Pihlajamaa et al., 2017).

An important underlining question is how banks should work with fintech startups. According to Arnold (2018), banks are reacting to fintech startups in five different ways. First, "digital attackers" build their own digital rivals against the market entrants such as Goldman Sachs' online lender, Marcus. The second way to respond is to acquire startups, which for example BBVA did with the Finnish payment service provider Holvi. Third, banks may partner with big technology groups. Standard Charter, for example, teamed up with AliPay in Asia. Fourth, banks may diversify to new markets what for example Royal Bank

of Canada did through offering a platform for new services such as creating a startup and renting out on Airbnb. Finally, there is the "if you can't beat them, join them" strategy. As an example, Santander launched its own blockchain-based overseas transaction service to compete with new entrants.

2.1 Outside-in: Corporate venture capital and corporate accelerator programs

In the startup context, two main forms of outside-in open innovation are corporate venture capital (CVC) and corporate accelerator programs (Weiblen & Chesbrough, 2015), both of which are widely adopted by incumbent banks (Lee & Shin, 2018). CVC refers the purchase of minority equity stakes in privately held companies (Benson et al., 2009). While investments in startups may generate returns like any other form of investment, corporate investors are often also motivated by accessing new resources via the partly owned companies (Chesbrough, 2002). It has been suggested that corporate venture capital allows companies to access broader and more diffuse collection of knowledge resources than what internal R&D labs may contain (Chesbrough & Tucci, 2002). Hence, CVC can help in organizational learning and knowledge creation (Wadhwa & Kotha, 2006). Further, it may help managers direct their attention: by engaging in CVC companies can be more aware of emerging technologies and business

opportunities their environment (Maula et al., 2013). CVC may also help startups succeed by providing access to a large company's technical and market resources (Weiblen & Chesbrough, 2015). A potential downside, however, is that strong ties with a particular investor may constrain startups from accessing other resources, for example from the investor's competitors (Park & Steensma, 2012). Corporate accelerator programs are defined as "company-supported programs of limited duration that support cohorts of startups during the new venture process via mentoring, education, and company-specific resources" (Kohler, 2016 p. 348). Almost all top banks have launched accelerator programs to engage in collaboration with Fintech startups (Mohan, 2016). Accelerators typically scout of startup ideas that are directly related to the organizer's business activities and internal problems (Moschner et al., 2019). They are hence seen as a method to tap into startups' knowledge resources and innovativeness. Accelerators are also an effective way to resolve uncertainty around a company (Yu, 2019). Formal arrangements may include the incumbent licensing of the startup's new technology or co-developing new products (Weiblen & Chesbrough, 2015). In the latter case, the created intellectual property may be shared with both parties. Accelerators also provide opportunities for spin-ins, i.e. acquisitions of the startups (Becker & Gasman, 2006).

Accelerators may take various forms (Moschner et al., 2019). Traditionally, they are organized in-house and tightly connected with the organizer's business units and their challenges. More recently, hybrid accelerators have emerged that include internal teams alongside with external startups. The operations of an accelerator may also be outsourced to an external service provider or shared with a consortium of multiple corporations. Moschner et al., (2019) argue that the strength of in-house accelerators lies in their ability to provide startups a committed customer with and actual need for their product, but that independent accelerator programs often provide better knowledge for professionalizing startups, for example by providing workshops for setting up business plans.

2.2 Inside-out: Corporate incubation programs

The inside-out form of open innovation with fintech startups is observable in corporate incubation programs, where internal business ideas are developed with the aim to spin them out as new ventures (Weiblen & Chesbrough, 2015). Sometimes, employees may independently decide to leave the organization and start their own company or parts of an organization may be detached as part of a strategic restructuring, but increasingly spin-out are actively supported as a way for incumbent companies to exploit opportunities in unfamiliar markets or technologies (Bruneel et al., 2012). Incumbent companies with abundant technology and knowledge bases generate opportunities beyond what they are

willing to exploit. Internal innovation activities tend to have barriers such as a focus on short-term business logic and the not-invented-here syndrome that make it difficult for them to exploit novel ideas internally (Keil et al., 2008; Pihlajamaa, 2018). Spinning them out may enable experimentation without the rigidities of a large corporation.

The main purpose of spinouts is to promote the birth and success of companies that have capabilities and resources that are complementary to those of the originating organization. Incubators may help organizations leverage their tacit corporate knowledge in the creation of new business (Becker & Gassman, 2006). Sometimes new applications may be sought for internal core technologies, but perhaps more often non-core technologies, such as unused patents, are developed into spinouts (Becker & Gassman, 2006). Linkages to the spinouts are maintained through partial ownership, license agreements, and/or strategic partnerships (Parhankangas & Arenius, 2003; Helm & Mauroner 2011).

2.3 Research gap

The relative advantages of different collaboration modes with startups have received limited attention in general (Selig et al., 2018) and particularly in the banking sector. Hogenhuis et al., (2018, p. 39) argue that "large firms frequently pursue collaborations with young ventures without a clear action plan, neglecting the challenges that such asymmetric partnerships may bring". So far, a couple of

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studies have addressed this issue. Weiblen & Chesbrough (2015) note that equity investments tend to require significant transaction costs from searching and selecting the most promising startups, negotiating with founders and further investors, and monitoring and governing their operations. Equity investments are always present in CVC, typically in corporate incubation programs, and sometimes in accelerator programs. Further, the authors argue that accelerators are typically suitable for problems that are close to the organizer's core business and the collaboration is driven by achieving short-term benefits. In contrast, incubation programs and especially CVC tend to have weaker links to the core business and imply a longer time horizon. From a resource-based view, the most promising approach for analyzing collaboration modes with startups is presented by Becker & Gassman (2006). They argue that beyond financing and infrastructure, knowledge is the most important strategic resource that incumbents may provide startups. They further identify four categories of knowledge that various kinds of corporate incubators and accelerators may offer:

- entrepreneurial knowledge on how to establish a company and build needed business plans, skills and capacity,
- technological knowledge on which new technologies are valuable and how they can be exploited,

- market knowledge on how to meet customers' demands and how to segment the market into different technological value propositions, and

- organizational knowledge on the incumbent company's organization and its operations for establishing strong ties with relevant departments that can support the collaboration in the future.

The authors find that corporate incubators and accelerators are typically specialized in one of these 'knowledge modes'. Internal corporate incubator programs, for example, focus on leveraging entrepreneurial knowledge for fast exploitation of internal non-core technologies. Depending on the open innovation mode, the startups may already have sufficient knowledge of some of the categories and the role of the incumbent is to provide the missing knowledge. The availability of various knowledge resources to the incumbent also determines how feasible each approach is.

While the fintech startups have an increasingly important role in the transformation of the banking industry, there is little understanding of how incumbent banks determine the collaboration mode with the startups for reaching desired outcomes. Adopting the categorization of the four knowledge categories as an analytical tool, we set out to investigate:

How a large bank organizes for collaboration with fintech startups?

3. RESEARCH DESIGN

Due to the lack of extant research on the topic, we chose a qualitative single case study as the method (Eisenhardt & Graebner, 2007). For the purposes of the study, we sought an incumbent bank that engages in open innovation with fintech startups. We chose Nordea which is the largest bank in the Nordics with operating income of ca. 9 billion euros, 30 000 employees and close to 10 million private and corporate customers (year 2018). The data collection began in 2015 when Nordea first started collaborating with startups by launching Nordea Startup Accelerator. We followed Nordea closely until 2018. During this time, three accelerator or incubator programs were implemented, each different from the preceding. We compare and contrast the programs and the context of which they were implemented to establish an understanding of the logics of different modes of open innovation with fintech startups. The longitudinal perspective on Nordea further allows us to provide a view of how the open innovation modes evolved with accumulated experiences and industry maturity.

The main data collection method was expert interviews. 13 interviews were conducted, mainly with Nordea's management responsible of planning and running the programs (Table 1). The interviews also included two startup

participants and a representative of an external service provider that Nordea used for organizing the accelerators. The interviewees were chosen based on their key roles in the programs. Snowball sampling was further used to include persons with relevant insights.

A semi-structured interview guide was used to ensure that key themes such as service innovation, organization and business models were addressed in the interviews. Complementary data was collected by observation during the startup pitching events, videos of presentations of the program and hundreds of PowerPoint slides explaining the content of each program. This data provided contextual information and helped provide a comprehensive view of each program and their differences.

The analysis process started by organizing all the collected data on a timeline and writing a chronological case narrative. Afterwards, the three programs were compared according to selected categories to create an understanding of each case and their similarities and differences (Miles et al., 2013). The categories included various general characteristics such as numeric figures of applications, participants and pilots, strengths and weaknesses of the programs, and descriptions of the processes and organization of the programs. In addition, the four knowledge categories by Becker & Gassman (2006) were applied.

Interviewee	Date
Executive Vice President, Nordea	20.10.2015
Head of the Accelerator Program, Nordea	17.12.2015
Head of Experimentation and Learning, Nordea	17.12.2015
Startup Participant - RealSource	17.12.2015
Startup Participant - GetJenny	17.12.2015
Management Partner, Nordea	19.12.2015
Group interview: Management Partner, Nordea & Head of the Accelerator Program, Nordea	19.12.2015
Managing Partner, Nestholma	11.01.2016
Head of Open Banking Development, Nordea	21.11.2017
Group Digital Consultant, Nordea	08.01.2018
Co-head of Product & Concept Development, Nordea	12.01.2018
Head of the Accelerator Program, Nordea	22.03.2018
Head of the Accelerator Program, Nordea	13.06.2018

Table 1: Interviewee list

4. CASE: NORDEA

4.1. Background

The case company, Nordea, is the largest retail bank in the Nordics and the second largest in the Finnish market. In the early 2000s, it was known as a forerunner in e-banking (Echikson, 2001) but since then innovation has not been a high strategic priority (Ritakallio, 2016). In 2015, when this research project started, Nordea had just recently received a new CEO Casper von Koskull and their innovation activities were primarily conducted in-house. However, the market leader in Finland, OP Financial Group, had already established an innovation lab, OP Lab, to develop financial services together with startups resulting in successful applications such as the Pivo mobile wallet. The third-largest player, Danske Bank, had also introduced a mobile payment platform, MobilePay, to enter the Fintech market.

In the Fall of 2015, Nordea followed the others by establishing an accelerator program "Nordea Startup Accelerator". The background of the program was in a previous "Nordea Innovation Challenge" where Nordea invited students and entrepreneurs for a hackathon to work over a weekend with data and tools given by Nordea. After this event, an external accelerator provider, Nestholma,

contacted the Vice President of Commercial Banking of that time, who became interested in the idea and managed to get acquire internal approval for it. The first accelerator program was followed by a second batch under the same name in 2016 and as "Nordea Runway" in 2018. Next, the three programs are summarized in Table 2 and next discussed in more detail to describe how Nordea's collaboration with fintech startups evolved in time.

	Nordea Startup Accelerator (2015)	Nordea Startup Accelerator (2016)	Nordea Runaway (2018)
Time	November 2015 – February.2016	September – December 2016	March – July 2018
Description	The accelerator program was organized together with Nestholma. 12 startups were invited to Nordea's premises.	The accelerator program organized together with Nestholma where. 14 startups were invited to Nordea's premises	The incubation program was organizer internally. 3 teams were sent to external accelerators
Processes	Limited knowledge of suitable processes. Facilitation was mainly in the hands of an external provider.	Processes are more in place. External provider is used but it does not have as big role as before.	Good understanding of suitable processes. A change from outside-in to inside-out processes.
Organizatio n	Small team, many challenges with a siloed organization and lack of commitment.	Core team, 60 business champions. Strong support from the top management. Bigger budget.	Strong top management involvement.
Culture	Strong not-invented-here syndrome	Slowly more open to integrating new ideas.	Highly supportive atmosphere.
Outcome	Applications: 170 Shortlisted: 50 Participants: 12 (17 invited) Pilots: 5	Applications: 320 Shortlisted: 35 Participants: 14 Pilots: 5	Applications: 134 Shortlisted: 10 Participants: 6 Pilots: 3
Ownership	No direct ownership by Nordea.	No direct ownership by Nordea.	Startups mostly owned by Nordea.

Table 2: Summary of Nordea's three accelerator programs

4.2 Nordea Startup Accelerator 2015

In the Fall of 2015, Nordea organized its first accelerator program. The participants of the program were decided mainly under three broad themes: "reaching your goals through saving", "value-added services in payments" and "digital touchpoints in the future". The original thought was to be stricter with the decisions and search for startups that could work under the Nordea brand, but during the process, the scope was expanded to a couple of startups that were not working directly within the industry.

Nordea Startup Accelerator program (Figure 1) was facilitated in Finland, but it was a Nordic wide concept. The program was a test for Nordea to get more understanding for further development. The budget for the program was relatively low and according to an interviewee the main goal was "to get a proof-of-concept and gain evidence of how Nordea should work in this manner". From the very start, the goal was to "do this next year 5-times bigger". Furthermore, the accelerator program was seen as a tool to "enhance the brand, get new customers and speed up the internal learning processes".

The long-term dream of the core team was to expand the accelerator program to Nordic level and learn what the right model that works for them is. The program lasted for 12 weeks and it was facilitated by Nestholma.
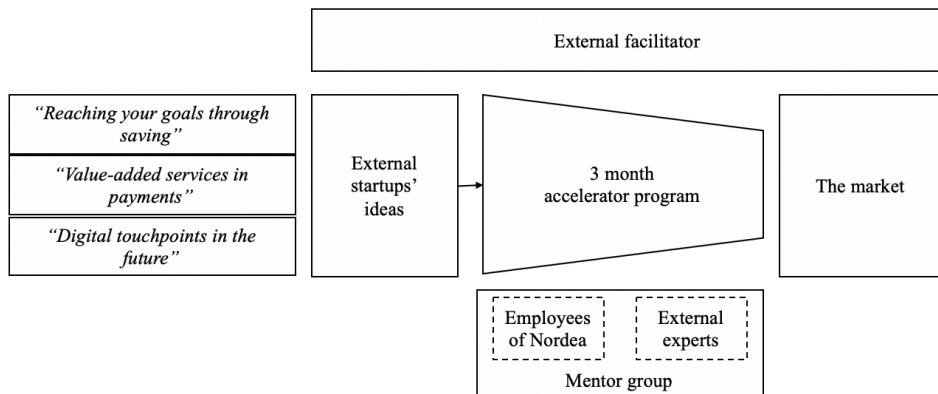
Figure 1: Nordea Startup Accelerator (2015) process.

Startup	Description
Palkkaus.fi	Palkkaus.fi digitalizes employment and makes salary payment easy for households, entrepreneurs, SMEs, 3rd party services and helps employees to find work.
RealSource	RealSource is a transaction portal for Commercial Real Estate.
Wone	Wone is a mobile service that makes sending money to your friends and family as easy as texting them.
GetJenny	Conversational AI for customer service. Jenny takes the monotonous task of answering the most common customer questions - automatically, in any language you already support.
Polycoin	Polycoin provides risk management and compliance solution for financially regulated organizations such as banks and insurance companies, who wish to start managing digital identities and process virtual currencies
PayPeanuts	PayPeanuts lets you use your unredeemed loyalty points to pay for online content, giving you the experience of "free" and no mental transaction cost while content creators still get paid for content.
NurtUp	NurtUp licenses games to cafes, so that people - strangers - interact at a deeper level, and create communities.
Nordledger	Nordledger brings a fully automated smart-contract based global marketplace for B2B e-invoice factoring.

Nordigen	Nordigen helps lenders automate income verification by processing bank statement documents and extracting insights from transactions.
FeelingStream	We build a simple CX analytics platform to detect customer feelings.
B2BPay	Exporting to Europe? Collect payment in 34 European countries for free from anywhere in the world!
AutoBuy	AutoBuy guides you through the process of buying a car, while automating irritating and time-consuming paperwork.

Table 3: Participants of the 2015 program.

The accelerator got altogether 170 applications which led to 50 shortlisted startups. In addition, 60 Nordea employees were nominated as mentors. The mentors were from all market areas and from all over the organization. All of the mentors had to apply for the program. Some of the mentors were also assigned "on-site" to give the startups direct guidance during the process. A group of Nordea mentors voted for the best ones (see Table 3) that were invited to pitch to a pitching event. The participants of the program received sparring. This included several visits by different experts as well as workshops around business model development and 1-on-1 sessions with a named mentor.

The program was highly explorative in that diverse teams working on topics such as real estate and gaming were included. Consequently, strong ties to Nordea's existing business were lacking. The internal atmosphere was also considered a challenge. According to the interviewees, "not-invented-here syndrome" was strong in Nordea's culture. Another reason for the wide involvement of mentors

was they would facilitate the integration of the startups in the organization. Overall, out of the 12 participants, four continued to work together with Nordea. These were Palkkaus.fi (nowadays Salaxy), GetJenny, Nordigen and Feelingstream. At the time of the program, these companies were at a very early stage, but have later on been successful in raising more funding.

4.3 Nordea Startup Accelerator 2016

In 2016, Nordea organized the second patch of the startup accelerator. This time it expanded to be a "truly Nordic wide"- program and the pitching event took place in Oslo where the chosen startups could decide if they would want to be located at Nordea's Helsinki or Stockholm premises. The application period was also longer than before, and more resources were spent to promoting the program internally as well as externally. Furthermore, the themes were more specific: "Emerging technologies", "Digital life and pension", "Banks' role in sharing economy", "Enabling rapid transactions in collaboration economy" and "Compliance and changes in regulation".

According to the interviewees, the startups in the 2016 program were more carefully chosen than in 2015. This meant that more time was spent on pre-screening the applicants and in order to be chosen for the program, someone from Nordea had to buy the idea and "express their interest to be a champion"

for that exact startup. Furthermore, all the 14 startups were this time working with topics related to financial technology and therefore were easier to match with the internal business units.

Due to the longer application period and intensive promotion, the program received over 300 applications of which 35 teams were invited to a pitching day in Oslo. The number of accepted teams was also increased from 12 to 14 and they were evenly divided between two locations: Stockholm and Helsinki. The chosen startups were under the five themes and they had an internal buy-in already before joining the program. According to an interviewee, this was considered key learning from last year:

"The startups do not get further in the funnel without an internal sponsor and that the responsible business unit sees a clear benefit and drives the process further."

In contrast to the previous year, the mentors were called business champions and they were more committed to working with their startup. Further, the general attitudes towards the program had improved and the acceleration processes and their requirements were understood better. The program followed a similar three-month schedule as before and the final pitching was organized in December 2016 (see Figure 2).
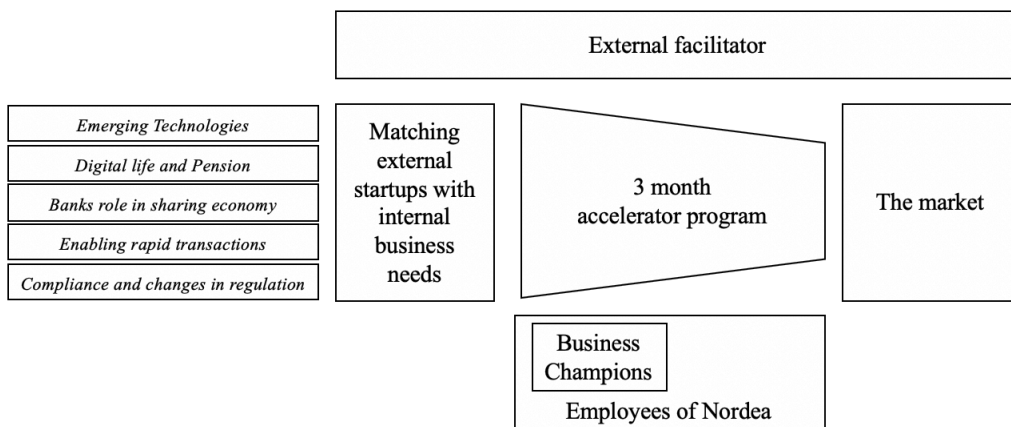
Figure 2: Nordea Startup Accelerator (2016) process.

Startup	Description
D-Vision	We motivate drivers to improve their driving habits and road safety in a rewarding and fun way.
MinaTjänster	People lack control over their economy when it comes to subscriptions and recurring costs. We provide a powerful digital tool where we summarize all active subscriptions for the user
Tikkr	TikkR is a disruptive digital insurance platform people on the go!
Asteria	Helping small and medium sized businesses mitigate the risk for overdue invoices.
SmartCalling	Connect to your customers via phone call with a branded, dynamic, and interactive call screen to change their call experience and help save connection costs.
YeyNey	YeyNey helps you save money by reducing your spontaneous shopping.
Taviq	TAVIQ helps investment advisers remove hassle and add-value on investor profiling.
Collectly	We help banks and businesses minimize losses on bad debts while keeping the customers loyal.

Fjuul	Fjuul is a fitness app that turns everyday activities into exercise and rewards you with discounts, for instance for insurance premiums.
Voxo	Voxo digitizes regulatory compliance in the financial advisory process.
Zash	Zash helps retailers' lower operational costs and increase sales revenues, by digitizing the interactions and transactions with their customers!
Trayce	Trayce is your digital assistant that helps you create and submit error free expenses in a matter of seconds.
Kuan	Kuan Inc. is a cross border payment platform backed by blockchain technology for businesses receiving recurring and large overseas payment within 2 working days.
Bankiton	We provide consumers a smart way to compare and switch retail banking services, by simply chatting in social media apps.

Table 4: Participants of the 2016 program.

Five startups – MinaTjänster, Asteria, Smartcalling, Collectly and Fjuul – continued working with Nordea. Integration with Nordea's business units was more successful than before, and the three months' time in the accelerator could be used productively. However, the program revealed new technological challenges. All the startups relied on tapping into Nordea's IT systems, but APIs for doing that did not exist or were at very early stages as the PSD2 regulation had not yet been enforced in 2016. The fit with Nordea's business lines was achieved rather well but implementing the startups' concepts would have required higher technological readiness from Nordea. Technological integration of the third-party services became the biggest barrier to benefiting from the 2016

accelerator program: every single partnership or pilot project would have required some kind of technology development, which were not taken in to account in the IT development budget.

4.4 Nordea Runway 2018

The goal of the accelerator programs organized in 2015 and 2016 was to "gain new ideas, ways to work and solutions and then integrate them to Nordea's solutions". However, over the course Nordea found both business integration and technological integration to be challenging in practice. Identifying startups that support Nordea's business interests and are technologically feasible proved to be a difficult task. However, according to an interviewee, the programs had generated a wider interest in startups and fintech within the company: "During our accelerator programs, we received questions if also internal teams could participate but we decided to leave them out."

At this point, the understanding of the new financial technologies and markets within Nordea had increased to a level that creating ideas internally was considered feasible. Based on these learnings, Nordea decided to change its accelerator program into "Nordea Runway, which is a way to find ideas and great people internally". In contrast to the previous programs, the goal of Nordea Runway was to identify ideas and teams within the organization and accelerate them to become independent companies.
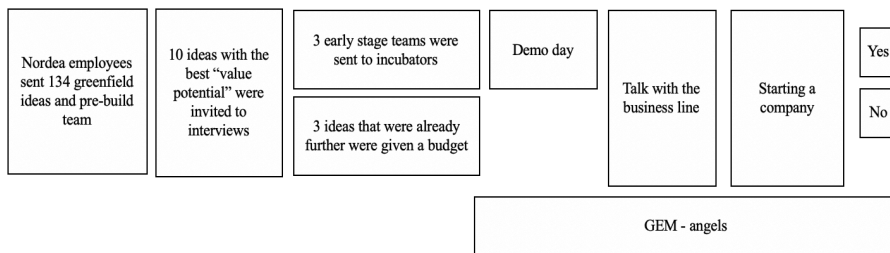
Figure 3: Nordea Runway process.

A total of 134 ideas were submitted via an internal questionnaire in Nordea's intranet. Employees were asked to pitch greenfield ideas – that go beyond existing business – and build up a team of at least three people around it. After this, suitable teams were chosen and around 20 of them were interviewed by an internal jury. The focus was strongly on radically new propositions, as described by an interviewee: "We got also ideas that incremental ideas that would enhance our internal processes but those were left out". After the 10 finalists were decided, a final pitching competition was organized in Stockholm and streamed internally to the whole organization. The teams were pitching their ideas directly to Nordea's top management team, GEM (Group Executive Management), which functioned as the jury and the final decision-maker.

Finally, a group of three teams was chosen. One of the teams used artificial intelligence to automate internal processes, the second was a service platform helping entrepreneurs starting their company and the third was a service planned

around teaching children how to spend their money right. In addition, another group of three already founded companies received support on the side of this program. According to the interviews, key strength for the teams in the Runway program was their in-depth knowledge of the core banking system, its limitations and the opportunities it provides. Despite the fact that Nordea had accumulated knowledge of the acceleration process from the previous programs, the teams were sent to an external accelerator to ensure detachment from Nordea's core business: "The three-months program is organized by an external partner and the goal is that the teams are away from "Nordea-context" as much as possible". The team members continued receiving their normal salary during the program and they had the possibility to return to their original job afterward. The goal of this was to lower the barriers to entry and give the employees a risk-free opportunity to try their ideas. During the program, the teams received coaching and support to develop their ideas into well-formulated hypotheses that could be tested. An interviewee described that "the goal for the teams during the program is to create a hypothesis and customer validation". Nordea Runway's core team worked as "business angels" with a small budget at their disposal, which meant that occurring costs such as travelling or external technology help could be purchased if needed. Furthermore, "every startup had a GEM-angel to support and guide them" which helped to get an internal mandate to go forward with the ideas.

The Runway program resulted in three minimum viable products. One of them was launched as a spin-out and the two others were integrated to existing services. Based on the learnings from previous programs, Nordea put effort in involving the whole organization in the process, which was a key obstacle in the first program. In preparation for PSD2, Nordea had also developed its IT systems, which made it easier to design and implement APIs that the teams required, overcoming the main difficulty of the second program.

5. KNOWLEDGE RESOURCES IN THE THREE PROGRAMS

Collaboration with startups aims to support the emergence of new ventures that have a solid technology base, understanding of market needs, the ability to operate and scale a new business, and which have synergies with the incumbent company. Incubators and accelerators vary in how they are able to ensure that startups have access to key knowledge types (entrepreneurial, technological, market, organizational) that are needed for developing successful business (Becker & Gassman, 2006). Comparing Nordea's' three consecutive programs shows how the access to knowledge evolved from 2015 to 2018. These changes may be explained by differences in the programs and changes in Nordea's knowledge base.

	Nordea Startup Accelerator (2015)	Nordea Startup Accelerator (2016)	Nordea Runway (2018)
Open innovation mode	Outside-in	Outside-in	Inside-out
Entrepreneurial knowledge	Corporate employees did not have entrepreneurial knowledge. To help startups develop their business, the accelerator program was organized in collaboration with and external service provider.	Nordea had some entrepreneurial knowledge – an external service provider was still used.	Nordea had some entrepreneurial knowledge – an external service provider was still used. In contrast to the previous programs, entrepreneurial knowledge was provided to internal teams.
Technological knowledge	External startups used emerging technologies (APIs, blockchain, etc) of which Nordea had little existing knowledge.	During the first program, Nordea created an understanding of the technologies outside of its organization and its limitations to using them. Therefore, the second program was more focused and technological expectations were figured out before the start of the program.	Nordea had increased its technological knowledge significantly and was be more aware of where to find the right solutions and how to implement them.

Market knowledge	In 2015, fintech was a very fresh phenomenon and knowledge of the new market within Nordea was limited. Nordea had extensive knowledge of the traditional banking market.	By the second program, Nordea's market knowledge had increased due to activities in the startup scene and therefore it was easier for them to carve out internal themes that would match different startups offering as well.	By 2018, Nordea concluded that the market knowledge within the organization is sufficiently high to generate ideas internally.
Organizational knowledge	Startups were not aware of Nordea's limitations. This was initially considered an asset for the first program, but the implementation of the ideas proved challenging due to lack of fit with Nordea's existing business.	The second program was more focused on Nordea's strategic goals and expectations. Chosen startups were matched with a business line before joining the program. Startups were not aware of Nordea's technological systems which made the implementation of the ideas difficult.	Internal teams understood Nordea's business interests and technological systems well which made the implementation of the ideas easy.

Table 5: Open innovation modes per program

5.1 Entrepreneurial knowledge

Before 2015, Nordea had little to do with startups, their ability to provide entrepreneurial knowledge was limited. Hence, they sought external help for organizing the accelerator program from Nestholma – a service provider

specialized in open innovation in the fintech sector. Training on the best practices for running a startup was based on Nestholma's entrepreneurial knowledge, while Nordea was able to share its organizational knowledge and learn from the startups' ideas and ways of working. While Nordea also acquired entrepreneurial knowledge during the programs, an external accelerator was used also in the Runway program in 2018.

5.2 Technological knowledge

In 2015, collaboration with startups was seen as a way to access new technological knowledge, for example of blockchain. Running the accelerator programs gradually increased Nordea's understanding of the new technology space and enabled the identification of the most promising and relevant new technologies and their properties. In practice, collaboration was hindered by problems in the technological integration of the startups' services in Nordea's systems: the lack of APIs made startups unable to tap into Nordea's processes. While the needed APIs were eventually set up, in 2018 Nordea this issue was also circumvented by changing from external to internal teams, which knew Nordea's technical systems in detail. This was possible as the organization had accumulated knowledge of the new technologies and was no more dependent on external technical expertise.

5.3 Market knowledge

A similar evolution took place with respect to market knowledge. The emergence of fintech startups in the banking industry created significant uncertainty on how the market would change and where the most promising new business opportunities are. As Nordea's understanding of the market increased, supported by its collaboration with the startups, it became easier to make decisions on which emerging opportunities to focus on. In 2018, Nordea was ready to rely on its own knowledge base and start incubating internal instead of external teams.

5.4 Organizational knowledge

A key goal for Nordea was to share its organizational knowledge with the startups and establish strong ties with its relevant departments. Synergies with Nordea's existing business was also the main thing that Nordea itself could offer the startups. Entrepreneurial knowledge was mostly provided by an external service provider and while Nordea had technological and market knowledge related to the traditional banking industry, the startups were seen more as knowledge sources than recipients in these categories. However, integration proved more difficult than expected. Despite the identification of startups with high potential, they did not receive much enthusiasm from Nordea's business units that were rejective towards external ideas that did not directly support their existing

operations. In the second phase, a lot of effort was put into overcoming this challenge: the startups were more carefully chosen to fit the business units' targets and internal mentors were assigned to ensure successful integration. Still, the difficulties persisted to a large extent, strengthened by problems in technological integration as well. Transition to an inside-out mode of open innovation solved this question as strong ties to the internal team members were already established.

6. DISCUSSION

6.1 Startup collaboration during the fintech revolution

The emergence of startups in the financial sector has been described as "fintech revolution" due to the fast pace of changes they bring about in the industry (Gomber al., 2018). The new entrants disrupt the incumbent banks' business models by unbundling financial services, leveraging new technologies and focusing on new market niches that have been previously ignored (Lee & Shin, 2017). In this new situation, we are seeing incumbents engaging in collaboration with startups as a method for renewal (Fasnacht, 2009; Gianiodis et al., 2014).

This article reports how Nordea uses startup collaboration to learn about new technologies and markets in response to disruptive innovation. In the beginning, there were high uncertainties over which technologies and markets are feasible and should be invested in. Consequently, Nordea engaged in a broad exploration of new opportunities with only a general sense of the direction of search. This was reflected in the difficulties of finding synergies with Nordea's existing businesses. The exploration, however, gradually increased Nordea's knowledge of the new technology and market spaces (Bessant et al., 2014) enabling it to narrow the focus of its search in the upcoming years. Afterwards, when

technological and market knowledge had accumulated sufficiently, the "locus of innovation" (Lifshitz-Assaf, 2018) moved towards Nordea's internal activities. The case illustrates a strategy to manage the uncertainties faced during an era of ferment where dominant designs are yet to emerge (Kaplan & Tripsas, 2008). Collaboration with startups enables an incumbent to engage in a faster and more thorough exploration of new opportunities than what it could achieve if it relied only on its own knowledge resources (Vanhaverbeke et al., 2008; Weiblen & Chesbrough, 2015; Yu, 2019).

6.2 The choice of the open innovation mode

The relative advantages of different collaboration modes with startups that have rarely been addressed in the literature (Selig et al., 2018). The findings provide clarity for managers that pursue collaboration with startups without a clear action plan (Hogenhuis et al., 2018). In the first two accelerator programs, Nordea used the outside-in mode: external startups were attracted to join an accelerator with the promise of mentoring and company-specific resources (cf. Kohler, 2016). This open innovation mode has recently become widely used in the financial industry (Mohan, 2016). Typically, accelerators seek external companies that can be directly linked with the organizer's identified business problems (Moschner et al., 2019). While this approach may work under stable industrial conditions, Nordea's case suggests that outside-in mode may be used for more exploratory

purposes at times when there is uncertainty of what the most relevant business problems actually are. Nevertheless, tensions may arise because of difficulties in integrating startups with the incumbents existing business. These tensions resemble well-known challenges of ambidextrous management that aims to concurrently implement both incremental and revolutionary change (e.g. Tushman & O'Reilly, 1996). Finding a home for novel initiatives in existing business units is difficult as they may threaten existing operations and pose a significant financial burden for the units (McDermott & O'Connor, 2002).

Furthermore, the results suggest that by switching between inside-out and outside-in modes companies may adjust their position in the exploration-exploitation continuum (Simsek et al., 2009). In 2018, Nordea switched from outside-in to inside-out mode by replacing external teams with internal teams sometimes referred to as "corp ups". In doing so, they took a step from a highly explorative search of new opportunities towards exploitation. At this point, Nordea had accumulated sufficient technological and market knowledge to identify relevant business opportunities to develop with internal teams. Our findings contrast Weiblen & Chesbrough (2015) who suggest that outside-in startup programs have typically higher integration with incumbents' core business than inside-out incubators. This is explained by the differences between exploitative problem-solving and exploratory learning orientations that can be associated with the outside-in mode. The latter helped Nordea increase

understanding of the industrial changes in general but was not very successful in creating new business.

From a managerial perspective, we encourage managers to define their goals: whether they wish to pilot highly explorative out-of-the-box ideas or just extensions to their current business. Communicating the goal with clarity helps find suitable ideas and ensure organizational support. Further, our study illustrates that it is important to pay attention to that startups have access to key knowledge resources. How startup collaboration is organized determines the available knowledge. Managers should find ways to combine their organization's internal knowledge base with the startup teams' knowledge and complement the mix with external service providers when needed.

7. CONCLUSIONS

In conclusion, this study is among the first to investigate how banks organize for collaboration with fintech startups. We contribute to the literature on open innovation and financial innovation by evaluating the relative strengths of different collaboration modes between an incumbent bank and startups in terms of providing key knowledge resources for developing new business. We propose that different outside-in and inside-out modes of open innovation vary in how they promote knowledge combination. We further suggest that during major changes in an industry, startup collaboration can be a way for an incumbent to accumulate technological and market knowledge even if concrete business outcomes remain modest.

The study is based on a single case study which limits its generalizability. It should also be noted that especially in Europe the PSD2 regulation drives fast industry evolution, and the so-called open banking initiative is gaining traction globally. Incumbent banks are constantly developing their APIs which eliminates some barriers related to technological integration and enables and forces them to collaborate with fintech startups. Our study describes the period of preparation for PSD2. The implementation of the regulation is lagging and it is not yet clear

how it is changing innovation dynamics and collaboration between banks and startups. Exploring how the industry state influences startup collaboration provides a fruitful avenue for future research.

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