Surrounded by middlemen- how multi-sided platforms change the insurance industry

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Abstract—*Multi-sided platforms (MSP) strongly affect markets and play a crucial part within the digital and networked economy. Although empirical evidence indicates their occurrence in many industries, research has not investigated the game-changing impact of MSP on traditional markets to a sufficient extent. More specifically, we have little knowledge of how MSP affect value creation and customer interaction in entire markets, exploiting the potential of digital technologies to offer new value propositions. Our paper addresses this research gap and provides an initial systematic approach to analyze the impact of MSP on the insurance industry. For this purpose, we analyze the state of the art in research and practice in order to develop a reference model of the value network for the insurance industry. On this basis, we conduct a case-study analysis to discover and analyze roles which are occupied or even newly created by MSP. As a final step, we categorize MSP with regard to their relation to traditional insurance companies, resulting in a classification scheme with four MSP standard types: Competition, Coordination, Cooperation, Collaboration.*

1 Introduction

The insurance industry is faced with existential challenges these days: demographic change, persistent low interest rates, and, most notably, ongoing digital transformation (Capgemini and Efma 2018a; Nicoletti 2016). The emergence and development of digital technologies does not only affect the structures and processes of traditional insurance companies (e.g., Allianz, Generali, Ping An, Berkshire Hathaway), but also leads to changing customer needs and behaviors (e.g., Deloitte 2016; Naylor 2017). As a result, digital transformation impacts value creation, value proposition, and customer interaction of insurance companies (Pousttchi 2017; Pousttchi et al. 2019).

Although the insurance industry is historically entangled with information and communications technology to efficiently calculate risks and loss distributions, large companies often struggle to respond adequately to this massive change (e.g., Eling and Lehmann 2018; Scardovi 2017; Naylor 2017). These developments give rise to new players with innovative business models that swiftly adapt and exploit the advantages of new technologies and data sources to address the needs of digital customers – from small insurance start-ups to very large tech companies like Amazon or Google (Capgemini and Efma 2018b; Hook 2018; Moore 2018). In many cases, these players mediate between insurance companies and their customers, facilitate transactions or reduce information asymmetries, and therefore show characteristics of multi-sided platforms (MSP). Despite their growing economic relevance, there is currently little research on insurance-related MSP and their strategic impact on the insurance industry. More generic research on platforms does explore the multiple facets of MSP (e.g., pricing structures, value propositions, user behaviors). However, there is yet little knowledge on how digitally-empowered MSP can transform entire traditional industries (de Reuver et al. 2018) or how the place of traditional insurance companies is redefined in the industry (Eling and Lehmann 2018). The aim of our research is to address this research gap. The insurance industry with its large, solid companies is especially suited for our investigation as it undergoes a massive transformation, which yields many opportunities for new innovative players to step in (e.g., Moore 2018). Practical contributions underpin this impression with empirical findings (e.g., Noack et al. 2017) and suggest that the insurance industry might be highly affected by MSP and the rise of new ecosystems within the next years (e.g., Catlin et al. 2018). This raises the research question how and to what extent MSP might change value creation of the future insurance industry. In response to the research aim, we analyze the state of the art in research and practice in order to develop

a reference model of the value network for the insurance industry. On this basis, we conduct a case-study analysis with a special focus on platforms to discover and analyze roles, which are occupied or even newly created by MSP in the network. As a final step, we categorize MSP with regard to their relation to traditional insurance companies.

The outcome of the paper is threefold: a role-based reference model of the insurance value network, identification and analysis of insurance-related MSP configurations and a taxonomy resulting in the derivation of four MSP standard types in the insurance industry. The rest of the paper is organized as follows: In the next section we provide an overview of the relevant literature and describe our methodology. In the third section we develop the reference model. In the fourth section, we identify and analyze (new) roles for MSP, present an enhanced reference model for the (future) insurance value network, develop a classification scheme and derive the standard types. Finally, we conclude and outline potential implications of MSP in the insurance industry for both research and practice.

2 Background

2.1 Multi-sided Platforms

Although the notion of the phenomenon "platform" is centuries-old (e.g., medieval markets; Hagiu 2006a), they increasingly have obtained extensive coverage in IS, Economics, and Marketing research within the past decade (e.g., Willing et al. 2017; de Reuver et al. 2018; Hagiu and Wright 2011; Sriram et al. 2015). Especially, the progression of digital technologies has upheaved the virtue and power of platforms (Parker et al. 2017). Since Rochet and Tirole have introduced their model of platform competition in two-sided markets (2003), research on (multi-sided) platforms has increased and diversified to a large extent (de Reuver et al. 2018). As two-sided markets and MSP are interrelated (Bakos and Katsamakas 2008), research still lacks a clear but comprehensive definition and understanding of MSP (Hagiu and Wright 2015) as well as sharp distinctions from two-sided platforms or further platform types (Staykova and Damsgaard 2014).

Basically, MSP have two fundamental characteristics: They facilitate direct interaction between two or more distinct sides of market participants with all sides affiliated with the platform (Hagiu and Wright 2015). While direct interaction refers to the control over the trades' key terms (e.g., pricing and delivering of goods or services) by either of the market participants or the platform, affiliation involves consciously made platform-related investments by either participant side to engage in this interaction (Hagiu and Wright 2015). The existing literature on MSP complements this concept by two further characteristics: Homing and switching costs as well as network effects. The former incur for participants due to the platform affiliation (e.g., Armstrong 2006; Evans et al. 2006, 283; Kwon et al. 2017) while the latter appear when the platform's usefulness – and therefore value – is subject to the participant size (Shapiro and Varian 1998; Eisenmann et al. 2006; Song et al. 2018).
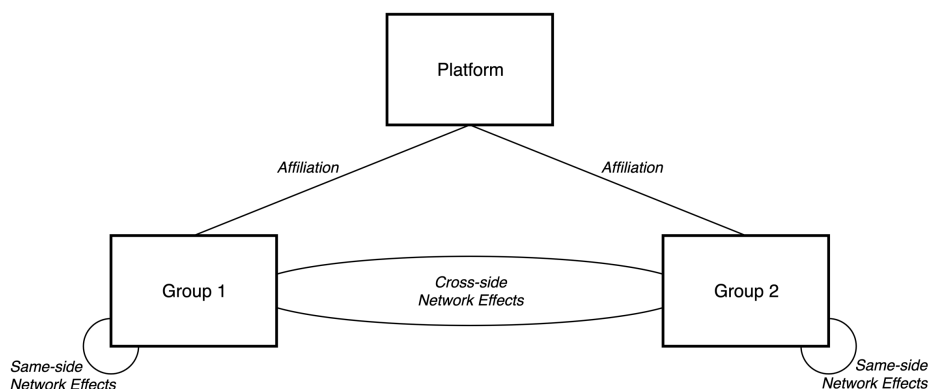

Figure 1: Platform affiliations and network effects (adapted from Staykova and Damsgaard 2015)

Network effects are strongly associated with platforms, which create networks by pairing up different market participants (see Figure 1; Rochet and Tirole 2003; Parker and van Alstyne 2005). Network effects are *direct* if the platform's value depends on the number of same-side participants (de Reuver et al. 2018). In the platform context, this phenomenon is also called *same-side effects* (Eisenmann et al. 2006). A common example are social networks where users benefit from the presence of other users (e.g., Baumöl et al. 2016). On the contrary, network effects are *indirect* if the platform's value depends on the number of cross-side participants (Eisenmann et al. 2006; de Reuver et al. 2018). This phenomenon – also called *cross-side* network effects – occurs, for instance, in software platforms where developers benefit from the presence of end-users and vice versa (e.g., Song et al. 2018).

In IS research, three relevant streams have emerged in the past decade: economics, marketing and sociotechnical issues. These three research streams get gradually entangled, e.g., when shedding light on digital platform competition from an architectural view (Kazan et al. 2018). *IS and Marketing*-related research often relates to platform user attitudes (e.g., Bartikowski and Walsh 2014), behaviors (e.g., Siering et al. 2016) or interactions (e.g., Baumöl et al. 2016) and in what way platforms can encourage commitment (e.g., Benlian et al. 2015). From a more *technical and sociotechnical* point of view, IS related research covers IS capabilities (e.g., Tan et al. 2015), ambiguous user behavior (e.g., Becker and Pousttchi 2013), modeling approaches (e.g., Kaczmarek-Heß and de Kinderen 2017), performance features (O'Reilly and Finnegan 2005) and architectures of platforms (Wagelaar and van der Straeten 2007). Others discuss the rise of digital platforms as artefacts (de Reuver et al. 2018), which, for instance, can support collective interaction within online communities (Spagnoletti et al. 2015).

2.2 Digital Transformation of Insurance

Digital transformation affects many industries as digital technologies increasingly change business in three characteristic dimensions: value creation, value proposition and customer interaction (see Figure 2; Pousttchi 2017; Pousttchi et al. 2019). Furthermore, digitalization has a lasting impact on customer behavior and decisions (Pousttchi and Dehnert 2018; Belk 2013). Traditional insurance companies often still host decade-old legacy systems and therefore require adequate strategies to integrate and exploit digital technologies in order to ensure or enhance competitiveness in global markets (Matt et al. 2015; Pagani 2013). Thus, some of them have addressed digital transformation as part of their strategic alignments (e.g., Allianz 2017a). The combination of new technologies with innovative ways of data processing not only improves and disrupts existing business processes, but also enables completely new business models and markets (Constantiou and Kallinikos 2015; Seddon et al. 2017).

This is particularly the case in networked businesses (Baesens et al. 2016) and therefore also accounts for the insurance industry. Insurance companies are highly dependent from information and communications technologies in order to effectively and efficiently accumulate, store and process huge amounts of data (Yates 2005). On one side, the business implies a "production unit" to produce insurance coverage or amass capital by assessing, quantifying, and pooling individual and collective risks with actuarial methods. On the other side, it involves a "service unit" with (professional) services for customer acquisition, care, and retention through different channels (Farny 2005). Insurance firms are particularly affected by the rise of digital technologies and the changing behaviors of their customers although they are traditionally rather slow in adopting innovative technologies, as available literature indicates (Nicoletti 2016; Crawford 2017).

Customer Interaction Model
(CIM)

Digital Transformation

Value Creation Model
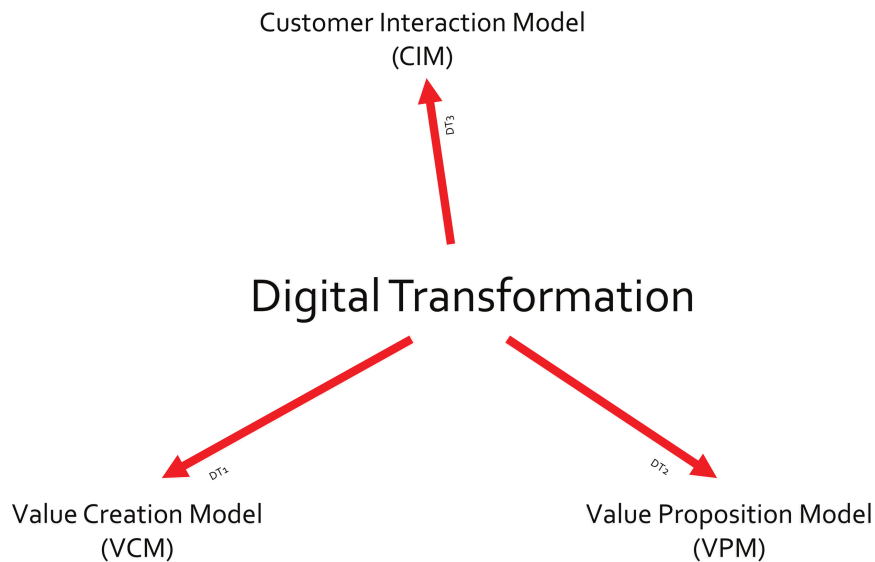(VCM)

Value Proposition Model
(VPM)

Figure 2: Dimensions of Digital Transformation (adapted from Pousttchi 2017)

With regard to *value creation* of insurances, research addresses the impact of digital technologies on strategies (Granados and Gupta 2013; Grover and Kohli 2013; Hess et al. 2016), management decisions (Fearon and Philip 2005), sourcing and implementation (Herz et al. 2012), performance (Hamel et al. 2012), process automation (Braunwarth et al. 2010), process flexibility (Afflerbach et al. 2014), or innovation (Chen et al. 2009). More importantly, the impact on production-related processes has become popular in the last years as the availability of new data sources opens up further possibilities for risk assessment, forecasting and underwriting processes (Boyer et al. 2012). Particularly, the generation and exploitation of telematics data has gained increased attention within the literature (Baecke and Bocca 2017; Vaia et al. 2012).

In terms of *value proposition* of insurances, research focuses on the impact of digital technologies on new products or services like add-on or micro-insurances (Fleisch et al. 2015), insurances against online defamation (Gatzert et al. 2016), insurances for self-driving vehicles (Vellinga 2017), and insurances against general or specific cyber risks like those from cloud computing (Zhao et al. 2013; Haas and Hofmann 2014).

The majority of present research, however, covers the impact of digital technologies on *customer interaction* for marketing, sales and customer relationship management (CRM) in the light of changing customer behaviors. On the one hand, research addresses possible measures from insurance companies to enhance customer interaction by multichannel (Klotzki et al. 2017) and automated communication (van Doorn et al. 2016). Other contributions investigate changes in customer experience and loyalty (Posignon et al. 2015; Dai and Salam 2014), new forms of personalization (Kaptein and Parvinen 2015), the impact of digital nudging (Weinmann et al. 2016), or innovative ways to collect, process and utilize customer data (Saarijärvi et al. 2014). Customer-behavior oriented research addresses customer characteristics, preferences, behavior or engagement (Derikx et al. 2016; Honka and Chintagunta 2016; Bijmolt et al. 2010).

2.3 MSP in the Insurance Industry

MSP are already involved in the insurance industry to a remarkable extent. On the one hand, so-called insurtechs (i.e., technology-driven startup companies in the insurance industry) and other mediating actors like price-comparison websites enter the insurance market with innovative applications, solutions, or business models. They exploit new digital technologies, data sources and analytical techniques to attract the attention and ownership of the customer (e.g., Catlin and Lorenz 2016; Puschmann 2017; Naylor 2017). Common examples in Germany are Clark, Finleap or Check24, but many more new players have already entered the traditional insurance market (e.g., Noack et al. 2017). In many cases, these players mediate between insurance companies and their customers, facilitate transactions or reduce information asymmetries, and therefore show characteristics of multi-sided platforms (MSP). They place themselves between insurance companies and suppliers or customers and thus affect

value creation and customer interaction in many ways (e.g., Rossbach and Hilberg 2016).On the other hand, traditional insurance firms use or develop platforms themselves for reasons of improving their IT infrastructures (e.g., Ergo and IBM (Daniel 2018)), obtaining external know-how, services and other resources (e.g., Generali and Amodo (Peverelli and de Feniks 2018)), distributing or selling products (e.g., Concordia (Scheuermann 2017)), collaborating with other insurance companies (e.g., blockchain platform b3i (Wills 2017)) or cooperating with companies from other industries (e.g., single sign-on platform Verimi (Bialek 2018)). In these cases, they leverage the potential of digital technologies themselves to gain competitive advantage. Despite the practical relevance of platforms in the insurance industry, comparatively few contributions from IS or service research study the strategic impact of platforms on value creation in the insurance market entirely. While some contributions examine the complementary part of insurances within the sharing economy (Weber 2014; Puschmann and Alt 2016; Täuscher et al. 2017), others explore the increasing implications of price-comparison sites on both insurance firms and customers (Robertshaw 2011; Son et al. 2006) or the potential impact of platform technologies like blockchain on the organizational structures of insurance firms (Hans et al. 2017). Only by way of example amongst other industries, some contributions relate platform research with insurances (Dietl 2010; Markus and Loebbecke 2013) and use the example, for instance, to explore the phenomenon of internet-driven re-intermediation in traditional markets (Parker et al. 2017) or the importance of collaboration in business networks to enhance customer relationship (Heinrich et al. 2011).

In summary, it can be stated that the insurance industry is highly affected by the emergence of digital technologies, which especially give rise to new players. Although evidence from practice indicates that MSP impact traditional insurance companies in many ways by leveraging the potential of new technologies (e.g., Catlin et al. 2018), current research does barely add up to their share of the massive transformation traditional markets undergo. What is more, there is yet little understanding of how MSP affect value creation in an entire industry by occupying or creating new roles and how their new value propositions lastingly impact customer access and interaction for traditional players in the market.

2.4 Methods

We first tackled our research question by screening available literature on MSP, following the guidelines from Webster and Watson (2002). This implies a search in relevant scientific databases (i.e., AISel, IEEE Xplore, ACM DL, EBSCO Business Source Premier, ScienceDirect, SpringerLink, Proquest, Google Scholar, Wiley) for the expression *("platform*" OR "MSP*") AND ("insur*")* with a focus on high-quality journals (A+, A or B according to the VHB JOURQUAL3 ranking) and within relevant research strands (i.e., Information Systems, Business Informatics, Economics, Professional Services, and Insurance). During this, only those contributions with a clear relation to MSP in the insurance industry were selected. Subsequently, backward and forward searches are applied and repeated until no further relevant articles could be identified. In order to bring our research question into line with the big picture, we extended our literature review with research on digital transformation of the insurance industry with a concept-oriented approach along the three dimensions of digital transformation. We also synthesized existing literature reviews on MSP within three entangled research strands in IS. On that basis, we applied an exploratory, qualitative empirical approach from a positivist perspective to gain a deeper understanding of the impact of MSP on the insurance industry (Myers 1997; Orlikowski and Baroudi 1991), and combined it with design-oriented modeling. Our research design consists of three main steps. (1) We developed a role-based reference model of the current insurance value network, (2) we applied it for the identification and analysis of MSP configurations therein and (3) finally derived a taxonomy of MSP in the insurance industry resulting in four standard types (see Figure 3).
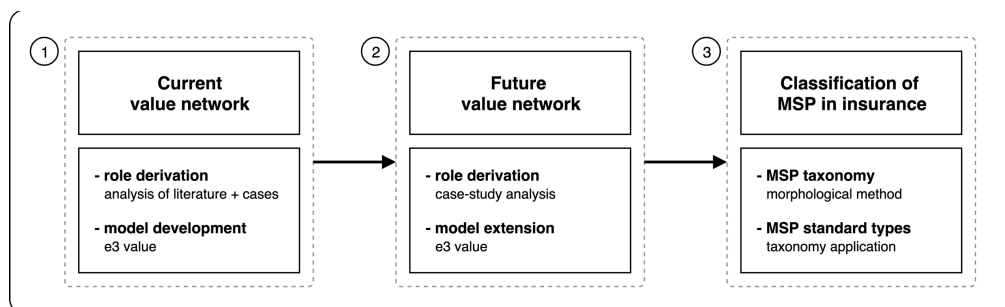

Figure 3: Research design

For the development of the reference model, we applied a design-oriented approach. Design science research allows the development of both theories and artefacts that lend utility to theory. It requires a comprehensible, rigorous design and evaluation of artefacts as an approach to solve important and relevant business problems in a specified environment (Hevner et al. 2004). Basically, these guidelines can be condensed into three activities: systematic artefact construction by practice or theory-based insights, evaluation of the functional performance, and reflection on results (Kuechler and Vaishnavi 2012). Results can be models, methods, constructs, or instances (March and Storey 2008). Following these rules, we first developed value-creating roles as theoretical instances of our reference model. For this purpose, we reviewed existing academic literature on both general and insurance-related value chains and networks to identify value-creating roles. In order to discover further roles, we examined relevant processes of value creation (e.g., sourcing, distribution), value proposition (e.g., products and services), and the (digital) customer journey within traditional insurance companies. This process includes screening of written material or records (e.g., company websites) and direct observation of the market (Yin 2009; Benbasat et al. 1987). Empirical cases help to both substantiate identified roles from literature and explore further relevant roles within the network (Yin 2009). We completed the relevant set of roles for our reference model until theoretical saturation, i.e., adding cases is not expected to reveal new roles anymore (Eisenhardt 1989). We systematically combined these instances to a generic model by developing their interrelationships – i.e., the identified and conceptualized roles were synthesized with the according value flows to a value network for the traditional insurance industry. The value network is essentially based on e3-value, a method to depict value streams among actors in business models (Gordijn et al. 2000). To achieve a higher analytical value, we extended and modified this method by the role concept introduced by Pousttchi 2005 and Pousttchi 2008. This concept distinguishes actors, roles, and activities: The generic model aggregates activities to roles, while roles can be assigned to actors as part of an analysis (Pousttchi and Hufenbach 2014), i.e., a real-world actor can assume one or more roles in the value network by conducting the inherent role activities. Value streams represent the value flow (i.e., commodities or payments) among roles in a network and can also amount to zero. Important core roles in a model can be depicted in greater detail by means of an introspective analysis. This implies the definition of this role's main value-creating activities. The application of an introspective analysis on the core role within the reference model allows to investigate and define how its main value-creating activities interrelate with their inner and outer environment (i.e., activities and roles). As a further step to ensure utility and correctness, we validated the resulting reference model in discussions with practitioners, which led to minor modifications.

In a second step, we extended our model with regard to the influence of MSP. For this purpose, we built on the identified roles and conducted a case-study analysis with a strong focus on MSP. Following the data collection principles from Yin (2009) and Benbasat et al. (1987), we mainly rely on written material about digital transformation, insurtechs, and platforms in the insurance industry, i.e., company websites as well as white papers, overviews, and articles in professional journals, magazines, or newspapers. At this, we collected market actors to examine their MSP characteristics and business models. Thus, we identified roles occupied by MSP in the insurance value network. Our case study findings were classified, synthesized and applied to the previously developed value network to explore and systematize the theoretical and practical implications (Gregor 2006; Ågerfalk 2014). We considered different tie points within the reference model between the core and periphery of insurance companies to illustrate the emerging configurations in the market. In the end, our reference model combines both technology-oriented and management-oriented viewpoints, showing the relevant platforms and value streams in the insurance industry (Hevner et al. 2004). In a third step, we complemented our analysis and addressed the MSP phenomenon from a completely new angle (Poole and van de Ven 1989) for the purpose of demonstrating their linkages to traditional insurance companies. In order to develop an MSP taxonomy and to derive disjoint MSP standard types in the insurance industry from our findings, we applied the morphological method, a highly systematic approach for structuring multi-dimensional problems. It is particularly suitable for the exploration of complex problems that cannot be solved with formal (mathematical) methods, causal modeling, or simulation. The approach involves the identification and definition of the investigated problem's essential characteristics and the assignment of relevant instances to each characteristic. The aggregate of all critical characteristics and instances is represented by a morphological box, which allows for a structured analysis, systematization, and comparison of complex phenomena (Zwicky 1966; Ritchey 2013).

3 Development of the Insurance Value Network

Value creation of insurance companies has commonly been depicted by means of distinct value chains, since insurance business holds many characteristics incomparable to other industries (see Figure 4; Koehne 2006; Altuntas and Uhl 2016; van Rossum et al. 2002). Although the value chain as both a concept and an analysis tool has proved useful for decades to visualize linkages of value creating activities, it becomes increasingly inappropriate when it comes to capture and explain the value streams and other interrelationships within and among companies in contemporary industries (Peppard and Rylander 2006).
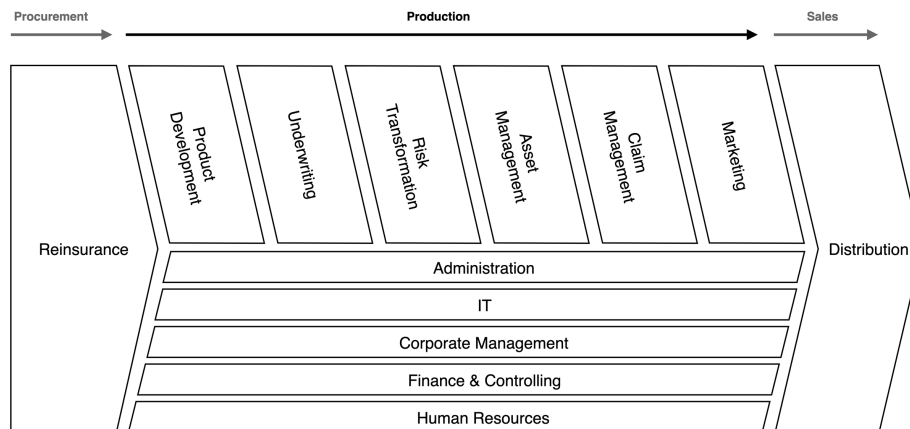

Figure 4: Classic insurance value chain (adapted from Köhne 2006, p. 261)

Especially, increasing dematerialization (Barile et al. 2016), digitalization (El Sawy and Pereira 2013; Markus and Loebbecke 2013), and interconnectedness (Bharadwaj et al. 2013) favor the emergence of platforms and other new business models (Basole and Karla 2011; Zott et al. 2011) as well as new forms of collaboration, cooperation, or competition (e.g., Mantena and Saha 2014; Pant and Yu 2018; Ceccagnoli et al. 2013). Therefore, new ways to visualize these new forms of value creation are required (Amit and Zott 2012). Many researchers have explored respective value networks in specific industries (e.g., Jeansson et al. 2017; Morgan et al. 2013; Pousttchi et al. 2015; Pousttchi and Hufenbach 2011; Razo-Zapata et al. 2013). However, comparatively few have done so with a focus on the insurance industry (Fjelstad and Ketels 2006; Köhne 2006; Laffey and Gandy 2009) although the value chain's appropriateness has already been discussed controversially in the light of digital transformation (cf. Eling and Lehmann 2018; Perissinotto 2003).

Following the guidelines of design science research, we develop an insurance value network that helps us to identify and illustrate the impact of platforms with respect to current and future value creation. This implies the conceptualization of roles from literature and practice. Some value-creation activities and roles are derived from classical literature on insurance value chains (e.g., Altuntas and Uhl 2016; Farny 2005; Nguyen and Romeike 2013) and then validated with practical evidence. Other roles originate from empirical findings of our case study research and go beyond the traditional value configuration. The core of our reference model comprises the role of the *insurance product provider*, which effectively develops insurance products (see Figure 5). It contains definite value-creation activities insurance companies traditionally accomplish. However, traditional insurance companies are not limited to this role. In order to receive a more detailed view in a later stage on how insurance companies are entangled with MSP in the value network, we integrate an introspective analysis that allows for the interdependencies with the core value-creation activities of an insurance product provider. The decomposition of this important role is useful as it demonstrates the basic value-creation activities of this role and how they specifically interrelate with other value-creation activities within the role or with external roles in the insurance product provider's environment.
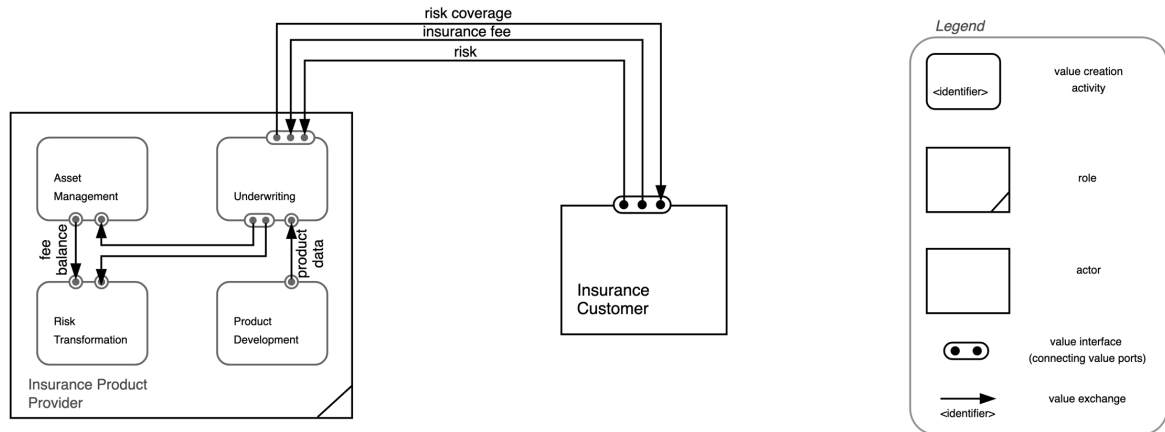
Figure 5: Insurance product provider with insurance customer

These closely intertwined value-creation activities are derived from the classic insurance value chain and are defined as product development, underwriting, risk transformation, and asset management. *Product development* includes market research, concept development and maintenance, premium definition and adjustment, technical statistics and auditing. *Underwriting* includes the calculation and customization of products depending on the customers' individual risk characteristics as well as both standardized and complex application processing, issuing, or provisioning. *Risk transformation* includes taking and balancing individual risks by pooling them over time into collective ones. *Asset management* includes the handling of savings, investment decisions, development of investment products, or strategic and tactical asset allocation.

In a next step, the coherent analysis of typical value exchange activities of insurance companies helps to identify the periphery of the insurance product provider, which comprises further relevant roles and actors providing goods, services, or resources. On the sourcing side, these include R&D operator, IT service provider, reinsurance service provider, capital provider, insurance consultant service provider, and statistical data provider.

The role of an *R&D operator* involves originating and testing new products, services, and processes. This is no traditional value-creation activity of an insurer. Yet, innovation is increasingly important for insurance companies to keep pace with competition and digital transformation as findings from practice and research indicate (Pretty 2017; Ringel and Rosenbaum 2016; van Rossum et al. 2002). Insurers increasingly cooperate with other companies in order to promote research on innovative insurance products (e.g., Generali and Progressive (Vrobel and Donohue 2016)) or cross-industry services where insurance know-how is required or at least beneficial (e.g., Allianz Automotive (Allianz 2017b)). Even more important is the role of an *IT service provider*, which supplies the insurance product provider with vital IT resources (e.g., standardized or customized hardware, applications, databases and data warehouses) for the operation of the IT systems and cross-functional support of all activities. For the purpose of reducing complexity, the IT service provider is connected only and directly with the role of the insurance product provider. Technically speaking, each role (and value-creation activity) would require sufficient IT resources likewise.

The role of the *reinsure product provider* is crucial for the purpose of averting risks and reducing potential losses, especially due to major catastrophic events, which could endanger an insurer's viability. For economic reasons only, reinsurance can also be bought for garnering arbitrage revenues. A *capital provider* is necessary for the provision of financial services or resources, such as loans, bonds, or investments. This becomes increasingly important in the light of the EU Directive Solvency II, which specifies the minimum amounts of capital European insurers must always have available to reduce the risk of insolvency (2009/138/EC, Art. 87 et seqq.). In order to continuously improve the process of producing and maintaining insurance policies, an insurance product provider requires expertise and know-how from *insurance consultant service providers* (e.g., new actuarial methods or changing customer behavior) as well as statistics from *statistical data providers* (e.g., weather data or data about potentially new markets). Usually, these four roles are accomplished by a reinsurer (e.g., Munich Re, Hannover Re). However, expertise might also be delivered by insurance consultancies (e.g., Bain & Company), statistical data by specialized institutes (e.g., destatis).

Our reference model contains further necessary roles to comply with the service delivery aspect of insurance products: the role of a *customer & claim manager* includes taking care for customer inquiries and claims settlement, i.e., standardized and complex loss or damage assessment, compensation payments or actions, claims controlling, fraud detection, and the initiation of further measures like follow-up support, collection of statistical data, or future damage containment. A *customer support service provider* intercepts initial and repetitive customer concerns or incident and loss reports. In the latter case, an insurer often is both reliant upon a *loss assessment service provider* (e.g., experts, assessors) and, when a loss cannot be compensated financially, a loss removal service provider (e.g., physicians, craftsmen, vehicle repair shops). With respect to sales promotion, a *marketing service provider* is responsible for strategic (e.g., brand management and customer retention) and operative (e.g., promotion and advertisement) marketing measures. A *sales manager* informs potential customers about their individual risks and respective insurance products to expedite the contract closing. This role is traditionally accomplished by brokers, agents, direct sales subsidiaries or websites of insurance companies. Finally, insurers collect and process data from their customers for individual fee calculation (ex ante) or usage-based fee adjustments (ex post). For these purposes, the roles of a *customer data aggregator* (collection and storage of raw data) and a *customer data provider* (processing and analysis of raw data) are required. These roles strengthen the actuarial competencies by exploiting new data sources, which becomes increasingly important in the view of big data, smartphone usage, and telematics.
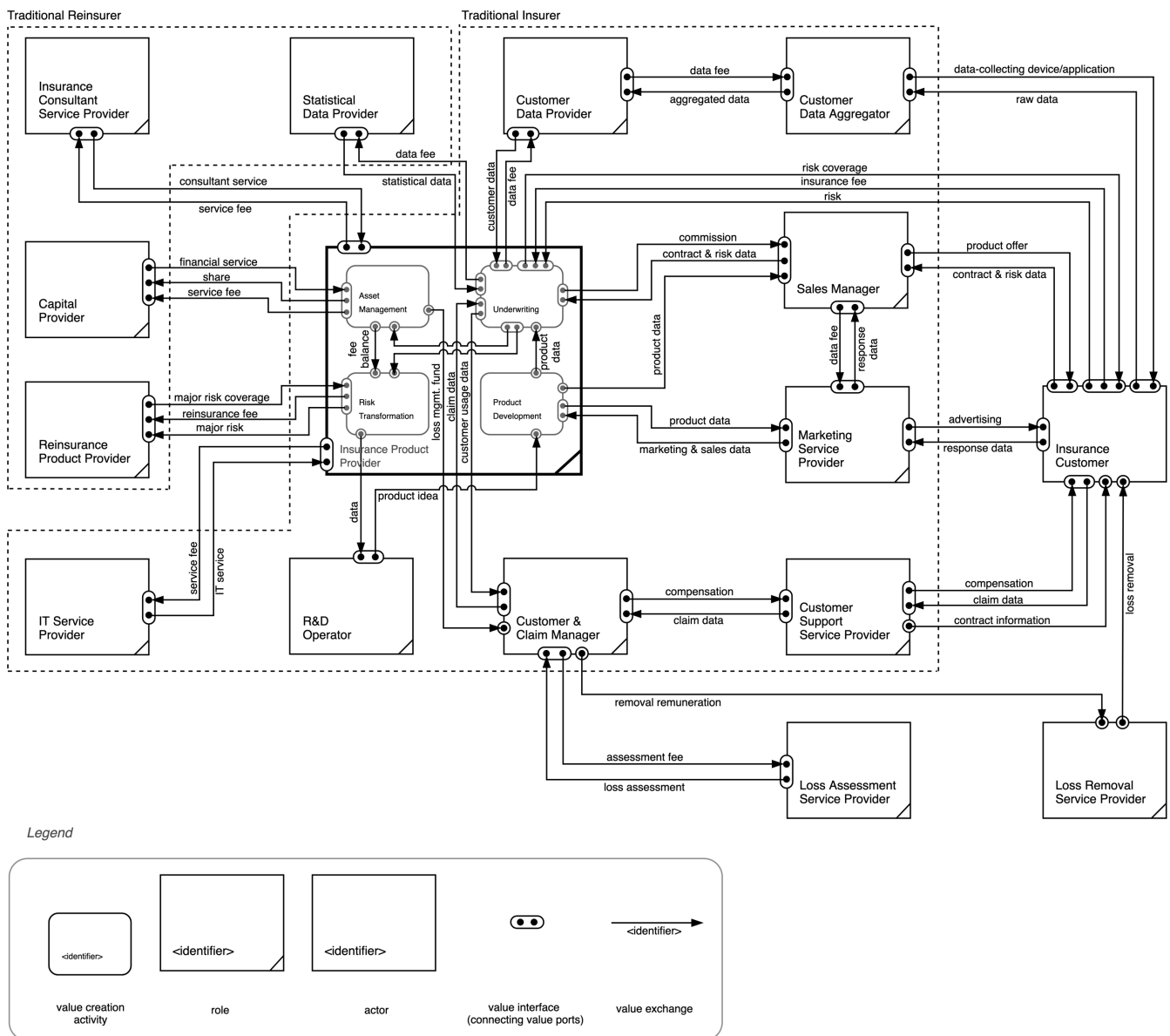

Figure 6: Current insurance value network

Value creation in our reference model starts with the role of the R&D operator, which supplies product development with new ideas or proposals for risk assessment of former products or new risks and damages to be insured and covered. In the light of digitalization and innovation processes, R&D becomes increasingly important for insurance companies and goes beyond the simple support of product development (Miles 2007). Insurance companies try to exploit the potential of new technologies and big data to develop innovative business models or revolutionize their processes in order to keep pace with the competition (Haapio et al. 2018; Naylor 2017; Nicoletti 2016). However, product development plays an important part in value creation by originating insurance products on the basis of different data (e.g., risk, marketing, sales, claims) and supplying the marketing and sales roles with product information (e.g., Johne 1993).

For adequate underwriting, the insurance product provider receives customer contract data from the sales manager in exchange for a commission and closes the contract with the customers by taking their risks in exchange for insurance fees. The customer data provider adds usage and behavior-based data of the customers. Remaining amounts of the customer's insurance fees (less expenses provision, administration, operation) are transferred to asset management while risks are passed to risk transformation. To pool and transform these risks and assets successfully, the insurance product provider receives risk protection, financial resources, statistical data and actuarial assistance from the reinsure product provider, capital provider, statistical data provider, and insurance consultant service provider (e.g., Schmid 2015).

Direct customer interaction is conducted by the marketing service provider (sending advertising messages and collect response data), the sales manager (offering products and collect contract relevant customer data), and the customer support service provider for existing customers (taking and forwarding customer inquiries and claims). These three roles commonly work closely together, draw on similar databases, or are even combined to one actor in the market; e.g., the insurance agent as the customer's single contact person (Johne 1993). Customers' insured damages are examined by the loss assessment service provider and refitted by the loss removal service provider, which both are usually paid by the insurance product provider, coordinated by the customer & claim manager in the back-end and the role of the customer support service provider in the front-end.

Customers' raw data is accumulated by the customer data aggregator, which in turn provides the data-collecting device or application to the customer. An application might be an insurer's mobile app for policy management, digital policy IDs or assistance services (e.g., Meine Allianz, GEICO mobile), a device might be an OBD2 compatible trip computer or gauge (Marabelli et al. 2017). Aggregated data is transmitted to the customer data provider, which provides processed and pseudonymized data to the insurance product provider to enable usage-based pricing. Particularly, in the light of an increasingly data-driven society, insurers road-test new data sources to augment their underwriting activities or to offer telematics-based insurance products. Further data-based services are already tested and implemented in practice, such as social network profiling (e.g., Admiral and VisualDNA (Christl and Spiekermann 2016)). The insurance product provider requires sufficient IT resources from the IT service provider to conduct the tasks appropriately (e.g., Schmid 2015).

All in all, value creation in the insurance industry involves a handful of specific but necessary roles and activities, which are interdependent and hence require coordination to operate successfully. Figure 6 shows the resulting role-based reference model of the insurance value network. Dashed lines indicate those roles traditional insurance respectively reinsurance companies typically occupy: An insurer assumes the roles of the insurance product provider, IT service provider, sales manager, marketing service provider, customer support service provider, customer data aggregator, and customer data provider. A reinsurer commonly takes up the roles of the reinsurance product provider, capital provider, insurance consultant service provider, and statistical data provider.

4 MSP in the Insurance Value Network

4.1 New Players, New Roles

Based on the value network configuration of the previous section, we apply a platform-focused case-study analysis to expand the current insurance value network by new roles emerging from the emergence of new players in the market. Based on their value-creation activities and their value propositions, these new roles can be integrated into the value network. In a subsequent step, their impact on customer interaction can be deduced and illustrated. Hence, this section aims to show in which various ways MSP are exerting influence on the value creation in the insurance industry. Two major effects have to be distinguished in the value network: MSP assuming already existing roles (colored light grey in Figure 7) and MSP creating new roles (dark grey).

In many cases, MSP aim to occupy existing roles from traditional actors. Mostly, they capture the role of the *customer support service provider* to become the customers' (one-and-only) contact point for gathering information about their contracts, for managing contract details, or for reporting damages or losses (e.g., Clark, allesmeins, Motionscloud). As customers, regardless of their age, get more and more familiar with the use of smartphones, they become increasingly receptive for innovative services (i.e., products or applications). Hence, if market players can offer such services in a convenient, entertaining and useful manner, they are able to reach the customers (Davis 1989; Pousttchi and Goeke 2011). As a result, innovative insurtechs are able to collect valuable usage data from the customers' smartphones and might therefore occupy the role of the *customer data aggregator* and – depending on their data-processing capabilities – the role of the *customer data provider*. As successful data processing relies on large datasets and fast, reliable technologies (e.g., database systems, data transfer techniques, computing), these two roles are likely to be assumed by considerably more powerful MSP like mobile operating system providers with proprietary application marketplaces (Apple/iOS, Google/Android). In the special case of car insurance, producers of driving-style analysis systems or devices come into consideration for these two roles while existing actors include car manufacturers (e.g., VW Connect, Toyota G-Book) and telematics system suppliers (e.g., Yellowfox, Amodo, Octo).

In other cases, MSP build upon their technological resources to create completely new roles which mediate between two or more other roles. They consequently further expand and modularize the value. To a great extent, this occurs when MSP mediate between insurance customers and insurance companies. MSP often become the customers' first contact point when comparing products online (e.g., Covomo, Tarifair, Check24) or via a mobile app (e.g., Knip, Clark). In such cases, these actors create the role of the *sales MSP*, which brokers between customers and traditional insurers (in the role of insurance product provider). Possibly, Amazon will soon claim its share in the insurance market by occupying this role (Dumm and Hoyt 2003; Grzadkowska 2018). Other insurtechs cover this role by helping independent insurance brokers to compare insurance products and manage the contracts of their customers (e.g., Bisure, BrokingX). Thus, they barge in between traditional insurance brokers and companies, narrowing the margins without direct customer interaction. Further, non-insurance related, MSP capture this role when insurance protection is beneficial or even necessary for their business, like online marketplaces for rental cars (e.g., DoYouSpain and Zurich) or holiday accommodations (e.g., Airbnb and Lloyd's of London). In either case, integrating online payment gateways might be necessary to facilitate payment transactions and reach the target customers (Lowry et al. 2006) by cooperating with digital payment platforms (Kazan and Damsgaard 2016). This requires the role of the *payment service MSP*, which further modularizes the value network (e.g., PayPal, Klarna).

However, customers benefit from a multitude of access paths to compare and purchase insurance products. Searching online for insurance products is likely to make potential customers more receptive to relevant personalized advertisement (Lambrecht and Tucker 2013; Zhu and Chang 2016). Hence, new players successfully position themselves between potential customers and traditional insurers (in their role of the marketing service provider). By promising to present relevant promotions to users who intend to buy insurance products, these players create the role of the advertisement & marketing MSP (e.g., Google, Facebook, Instagram). Such MSP place themselves between insurers and customers by leveraging their enormous platform capacities, their immediate proximity to their users' daily lives, and consequently, their massive knowledge of (potential) insurance customers (Pousttchi and Hufenbach 2014). Other insurtechs have specialized in assisting insurance customers with the management of losses and take care for the entire communication, coordination and monitoring among insurers, insurants and external services providers for loss assessment and removal in the case of an accident (e.g., Spearhead, Unfallhilfe24). This requires the role of a *loss management MSP*.

New players do also emerge on the sourcing side of traditional insurers and further modularize the value network. Some players mediate between insurers and reinsurers and create the role of the *reinsurance product MSP* (e.g., IRMI). Other players broker – sometimes via simple smartphone applications – between insurers and capital providers (e.g., finanzen.net), which requires the role of a *financial services MSP*. When it comes to collaborating and researching on industry-wide or cross-industry challenges, insurers occasionally co-found R&D platforms like, for instance, the mutual blockchain R&D platform b3i (Wills 2017). Such MSP often are not-for-profit but undertake specific tasks which result in a distinct role in the value network: *R&D collaboration MSP*.

Although many insurtechs or other companies yield new technologies, products, or solutions that might be of considerable interest for insurers (Wilson 2017), MSP are not prominent in the sourcing or provision of IT resources so far. However, the increasing share of cloud-based services (Weidmann et al. 2010; Beimborn et al. 2011) might lead to the emergence of *IT services MSP*, which broker between insurers and IT service suppliers. Similar developments are conceivable with new players that help traditional insurers to explore and exploit new data sources – particularly in the view of big data, which offers numerous opportunities for customer engagement (Bijmolt et al. 2010), personalized marketing (Rust and Huang 2014), supply chain management (Chen et al. 2015), fraud detection (Ngai et al. 2011), ex-post ratemaking (Boucher and Inoussa 2014) or several other insurance services (Lehrer et al. 2018). Players, which are able to provide traditional insurers with a variety of valuable data from various sources, could create the game-changing role of an *external data MSP*. Nowadays, reinsurers and other data service providers assume this role to moderate extent, but the predictive power of big data is yet unexhausted.

In either case, such digitally-empowered players exploit the potential of digital technologies. They benefit from automated, streamlined processes to offer easy-to-purchase online products (either standardized or customized) by leveraging advanced channels for product distribution and customer communication which people can access from any device, at any place and any time. They gain competitive advantage in terms of value creation, value proposition, or customer interaction by positioning themselves between the traditional insurers and other parties, participating in the business, intensifying competition and increasingly modularizing the value network. Figure 7 shows the resulting reference model for the future insurance value network, including the identified existing and potential MSP roles therein.

One success factor of customer-oriented insurtechs is based on their modern, innovative applications, which appeal to digital customers who miss such interaction and communication tools from their (traditional) insurance companies. Such insurtechs typically occupy two or more roles as they provide (online-)consulting, comparison, distribution (sales MSP), customer care and claim receipt (customer support service provider), and assistance in the case of an accident (loss management MSP). Commonly, their business models zero in on both acquisition and portfolio commissions (e.g., Clark, Knip). Other customer-oriented insurtechs concentrate on either sales or customer relation with an emphasis on younger customers (e.g., Virado). This raises the question if traditional insurers might be able to catch up with such innovative products, services, applications and interfaces. Otherwise, the new players in the market might sustainably retain their leads. A special case occurs, when an MSP acquires all three roles of sales, customer support *and* marketing. At this, an MSP gains entire customer ownership, i.e., it is the one-and-only contact point for their affiliated customer segments. The actual insurance product provider only exists in the background and might be even barely visible to the customer. Such strategically important players capturing all customer-oriented roles can become a threat for traditional insurers, which mostly still draw upon their brand awareness. By forfeiting customer ownership, they run risk of being reduced to a plain and replaceable insurance product provider. A popular example is Airbnb that indirectly sells and promotes insurance products as an integral part of its platform service and also takes care of customer claims (i.e., from hosts as well as from guests). Customers are unaware of the actual insurer behind.
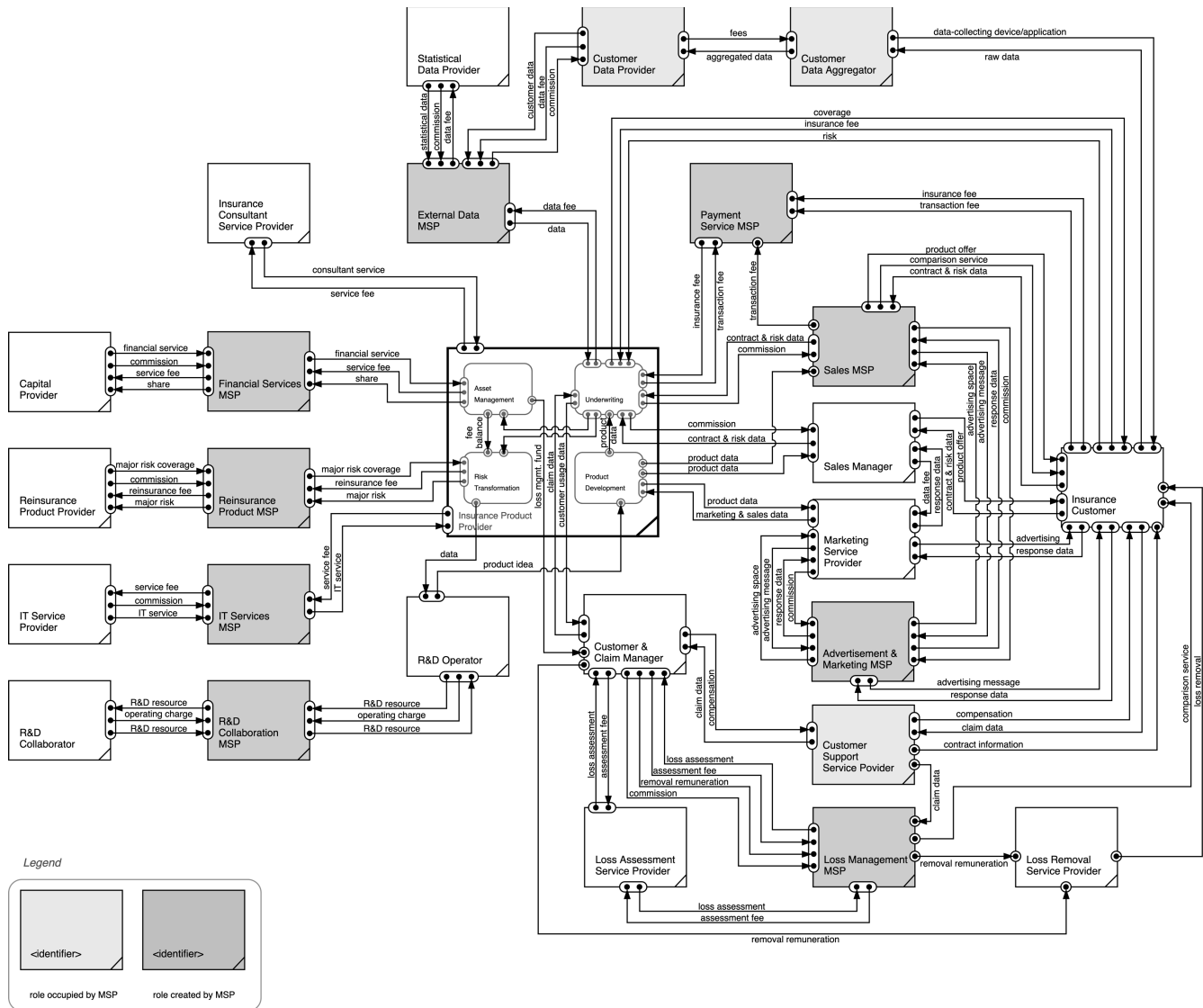
Figure 7: Future insurance value network

Altogether, our findings imply that traditional insurance companies are entirely encircled by innovative, digitally empowered players, which exhibit distinct MSP characteristics and bear considerable impact on both competition and value creation. The advent of these new roles and actors elevates specialization, modularization, and the occurrence of niche suppliers. This raises complexity of the market structure and reveals three main effects:

(1) Customers have a multitude of channels and providers to access information from, to compare or purchase insurance products, and to directly or indirectly contact the traditional insurers. It can be expected that customer behavior and interaction will be impacted lastingly (Cassab and MacLachlan 2009; Polo and Sese 2016). Since in future traditional insurance brokers will not be the only (and most important) distribution channel, insurance companies will have to redesign their customer interaction models. This implies new distribution or communication structures and processes, particularly in terms of multichannel or omnichannel strategies (Jeansson et al. 2017; Klumpes and Schürmann 2011).

(2) Likewise, traditional insurance companies have to reassess their position in the changing market. In the light of a digital, data-driven economy, innovative insurance services and products are required to satisfy the changing customer needs. That means, traditional insurance companies have to redesign their value proposition models (Hedman et al. 2016).

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(3) Traditional insurance companies will have to reassess their part in the value network regarding their core competencies. Digital channels, products and interaction require adequate IT capabilities, data-processing abilities, and organizational structures in the back-end. Hence, traditional insurance companies need to refresh their value creation models and their strategies accordingly (Grover and Kohli 2013; Ross et al. 2016). This implies new structures and processes on the one hand (Loebekke and Picot 2015), as well as appropriate and deliberate sourcing (Mani and Barua 2015), cooperation (Korhonen et al. 2006) and innovation networks (Lyytinen et al. 2016) on the other hand. All in all, value creation in the insurance industry is highly affected due to digital technologies. MSP with their innovative business models are likely to have their stake in this transformation process, maintaining separated relationships to traditional insurance companies and customers.

4.2   Taxonomy of MSP in the insurance industry

As the previous section indicates, MSP affect value creation in the insurance industry in many different ways by occupying or creating roles in different areas within the value network. Often, MSP affect the interaction between insurance companies and customers. Although the MSP seem very similar in their very nature, a comparison among them reveals distinctions. Hence, the aim of this section is to develop a taxonomy of MSP from empirical cases that helps distinguish these players by means of their distinct characteristics.

MSP differ regarding *contact initiation* at customer-oriented activities, i.e., which party takes up communication. For instance, if a customer books a flight and is offered a travel cancellation insurance, the contact is initiated over the platform. Conversely, a potential insurance customer might start his product search on his own at a price comparison MSP (Pousttchi and Dehnert 2018). Depending on the business model, an MSP aims obtain *customer ownership*, i.e., controlling the customer in terms of marketing (e.g., Google), sales (e.g., Check24), CRM (e.g., Haftpflichthelden), two of them, or even all combined (e.g., Clark). Further segments of customer ownership are payment (e.g., Paypal), loss management (e.g., Unfallfuchs), and data (e.g., Apple). For that purpose, corresponding roles need to be *occupied* or newly *created* by MSP in the value network. Moreover, MSP might have different *impact on insurers' profits*. Some MSP can be profit-increasing, for instance, when they co-develop products (e.g., Schutzklick) or enable access to new customer segments (e.g., Airbnb) while other MSP induce an adverse, profit-reducing relation. The latter occurs, when MSP accumulate insurance customers in order to gain group advantages and beat down the insurers' margins (e.g., Crowdheroes). This also implies a differentiation of occurring *network effects*, namely same-side or cross-side. Particularly, peer-to-peer insurance MSP leverage same-side network effects to negotiate more favorable terms (e.g., Friendsurance) while price comparison MSP depend on cross-side network effects, since they have to attract both enough customers and insurers (e.g., financescout24).

Moreover, MSP in the insurance industry have different *revenue sources* and *revenue types*. Depending on the business model, they generate revenues with insurers, brokers or agents, insurance customers, specialized service providers, or other customers or parties. For instance, sales MSP most commonly charge acquisition commissions (e.g., Covomo) whereas MSP in their role of a customer support service provider receive portfolio commissions (e.g., wefox). While the latter is paid periodically, the former constitutes a onetime payment (*revenue frequency*). Such revenues can occur repeatedly whenever a customer decides to purchase a new insurance product. Mainly, such insurance products are *distributed* by MSP through intermediation (e.g., Schutzklick) or as product add-ons (e.g., Kasko). However, direct sales are probable in the future. Especially, if sales MSP additionally begin to develop own licensed insurance products (Schlenk 2017). These developments will also have an effect on MSP' *vertical range of insurance production* and thus on the value network. Finally, MSP expose different kinds of *relationship towards traditional insurers* and consequently change competition and cooperation structures within the insurance market. Depending on the business model, MSP can either toughen competition among insurance companies (e.g., price comparison MSP), foster coordination among different roles in the value network (e.g., between customer and insurer), cooperate with insurers or even help insurers to collaborate with other actors in the market. Table 1 summarizes the above-mentioned MSP characteristics and their respective instances by means of a morphological box (Zwicky 1966).

characteristic	instances									
Contact Initiation	Insurance customer		Insurer		MSP		Broker/Agent		Other	
MSP Customer Ownership	Sales	Marketing	CRM	Loss Mgmt.	Payment		Data	Other		None
Role Occupied	Customer Support Service Provider			Customer Data Aggregator			Customer Data Provider			
Role Created	Loss Mgmt. MSP	Adv. & Marketing MSP	Sales MSP	Payment Service MSP	External Data MSP	Financial Services MSP	Reins. Prod. MSP	IT Services MSP	R&D Collab. MSP	
Impact on Insurer Profit	Profit-increasing			Neutral			Profit-reducing			
Network Effects	Same-side					Cross-side				
Revenue Source	Insurer		Brokers/ Agents		Insurance customers	Specialized service prov.	Other customers		Other parties	
Revenue Type	Insurance fee		Acquisition commission		Portfolio commission	Service fee	Product fee		Other	
Revenue Frequency	Onetime			Repeatedly			Periodically			
Distribution Type	Direct sales		Intermediation		Add-on		None			
Vertical Range of Insurance Production	Sourcing	R&D	Prod. Dev.	Underwriting	Risk Transf.	Asset Mgmt.	IT	Marketing	Sales	CRM	Claim Mgmt.
Relation towards Insurer	Toughening competition		Fostering coordination		Acting in cooperation		Enhancing collaboration			

Table 1: Taxonomy of MSP in the insurance industry

4.3 MSP standard types in the insurance industry

MSP change value creation within the insurance industry by creating and capturing value adding roles, thus expanding and modularizing the insurance value network. However, the nature of MSP can vary hugely. This accounts especially for the characteristic feature of MSP: being a platform and mediating among insurers and different parties in the market. In some cases, MSP mediate between customers, brokers and insurance companies by seizing the roles of sales, marketing or customer relationship (e.g., sales MSP, loss management MSP). Often, these MSP zero in on commissions paid by the insurance companies or – rarely – on fees paid by the respective customer. In other cases, MSP occupy similar roles, but mediate among completely different groups and cooperate with insurance companies to complete their core business (e.g., Airbnb). As our taxonomy indicates, MSP affect insurers fourfold: competition, coordination, cooperation, and collaboration. In order to gain a deeper understanding of these effects, this section aims to examine and segregate the four different ways MSP mediate among insurers and other parties.

In many cases, MSP toughen *competition* by providing price comparison to the insurance customers (e.g., Verivox, Tarifcheck) and occasionally even modify the rules. For instance, if a customer chooses an MSP to search for alternatives, the MSP assumes control over the products being offered, while the customer might be indifferent to the chosen insurance company – conventional selection criteria like brand or service quality might become a less relevant factor in purchasing decisions. In some cases, these new players incline to occupy the one-for-all customer interface (e.g., Clark), pushing the actual insurers into the background. This would not only imply a shift of the insurers' customer orientation, but also a strategic realignment of the insurers' processes, strategies, and endeavors. However, smaller insurance companies might take advantage from being listed by MSP (Farnung 2014). Mostly, such MSP focus on acquisition or portfolio commissions from the insurers.

In some cases, MSP do not mediate between customers and insurers for marketing and distribution purposes, but aim to foster *coordination* among customers, insurers, and external services providers for loss assessment or loss removal (e.g., Unfallfuchs, ÖRAG). In the case of an accident or damage, these MSP assist insurance customers with the loss report, the remedying of damage, the search for specialized service providers (e.g., workshops), and the entire communication process. Usually, such MSP charge their services to the account of the customer or retain a percentage of the loss payment from the insurer.

Occasionally, MSP are only loosely affiliated with the insurance industry, but depend on insurance coverage in order to successfully conduct their actual businesses (e.g., Airbnb). Hence, they act in *cooperation* with insurance companies. Typically, such MSP mediate between two different kinds of users (e.g., sellers and buyers, house hosts and guests, car owners and renters) while the insurer itself keeps in the background, entirely (i.e., white level service provider) or at least largely invisible to these users. Such a cooperation might be fruitful for insurers as they gain access to new customer segments, but they lose grip of customer ownership and – equally important – become replaceable. A prominent example here is Airbnb, which couldn't operate without insurance partners but unobtrusively includes the insurance premiums into the service fees. This is a typical example how even MSP from other industries might implicitly affect the insurance industry. While the former three scenarios mainly earmark traditional insurers in a passive mode, a fourth type of MSP enhances active *collaboration* among insurers and partner companies. Commonly, insurance companies avail themselves of the advantages of MSP to efficiently and synergistically collaborate on mutual R&D projects with competitors or firms from other industries, leveraging the available technological capabilities (e.g., Verimi, b3i (Wills 2017), Allianz and BASF (Heide 2015)).

Altogether, we can differentiate among four different interaction modes among MSP, insurers and other parties in the insurance industry, which finally results in four complete and disjoint *MSP standard types*: competition, coordination, cooperation, and collaboration (see Figure 8). On the one hand, traditional insurance companies might benefit from the occurrence or utilization of MSP as such platforms can facilitate information flow and transactions or offer opportunities to reach new segments or customers through digital channels. Beyond that, completely new insurance-related products or services are conceivable. However, traditional insurance companies might as well suffer disadvantages if they entirely surrender the customer ownership and therefore increasingly forfeit direct customer interaction. In such cases, the brand of an insurance company might fade out in the view of the customer and become arbitrarily interchangeable. Consequently, traditional insurance companies should thoughtfully put their relationships towards MSP into question and define and pursue profound strategies.
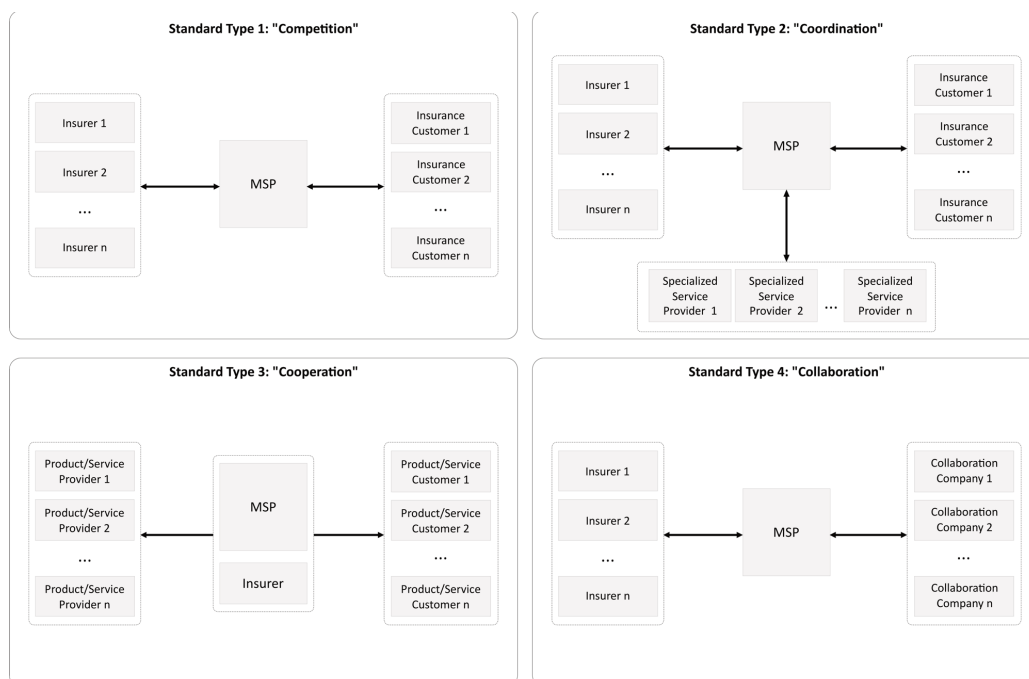

Figure 8: MSP standard types in the insurance industry

5 Conclusion

Digital technologies and changes in customer behavior do not only force traditional insurance companies to redesign their strategies, organization structures, and processes, but also give rise to new business models and value configurations and therefore the advent of new players which exhibit common characteristics of MSP. Against this background, we applied a design-science approach to systematically analyze if and in which way MSP affect value creation in the traditional insurance industry. Our paper has three major outcomes: a role-based reference model of the insurance value network; its application for identification and analysis of insurance-related MSP configurations; and the derivation and classification of four MSP standard types in the insurance industry.

Our findings suggest that MSP affect the value configuration of the insurance industry twofold: First, MSP impact the traditional insurer's value creation in many ways by attaching themselves to several sides around its core activities. They either occupy roles in the value network formerly conducted by the insurers themselves (e.g., customer support) or create entirely new roles (e.g., loss management MSP). Second, there are four MSP standard types in the insurance industry to describe the relationship constellations between MSP and traditional insurers: MSP in the insurance value network do either (1) sharpen competition among traditional insurers, (2) facilitate coordination among insurers, customers, and other players, (3) cooperate with insurers, or (4) enhance collaboration among insurers and other companies.

Taken as a whole, value creation in the insurance industry undergoes a massive transformation due to the emergence of MSP in the insurance industry. This has three main implications for the insurance industry: specialization, modularization, and thus a higher complexity of the value network. It might become increasingly difficult for traditional insurance companies to structure and coordinate their supply chains as well as their distribution and communication activities (e.g., omnichannel). They even might cede important activities of value creation and customer interaction to MSP or other upcoming actors in the market. In the worst case, traditional players might be diminished to plain insurance product providers. In contrast, MSP in the insurance industry are likely to promote the reduction of information asymmetries among traditional insurance companies, customers and other players in the value network. Customers are provided with a multitude of providers and channels to access or assess information, compare or purchase insurance products, and contact their insurance companies. New ways of customer interaction might promote the occurrence of new products or business models. Consequently, shifts in the value network and changing customer behaviors might lead to new constellations of customer ownership.

The major research contribution of this paper is an improved understanding of how MSP affect value creation in traditional service-oriented industries in different ways by occupying and creating roles in the value network. Practitioners might apply different value network constellations to reconsider and modify their value creation, value proposition, and customer interaction activities in the market. Future research might concentrate on how the rise of multiple MSP in the insurance industry will affect the development of alternative business models. For instance, MSP might find ways to make traditional insurers superfluous (e.g., peer-to-peer insurances like Friendsurance) or start creating value themselves instead of just mediating (i.e., developing own insurance products like One with WeFox). Researchers could also adopt a more differentiated view on insurtechs and big players. Particularly, research on the development of Google, Apple, Facebook, or Amazon in this field could be promising as their data-processing abilities break ground for new ways of producing and distributing insurance coverage – or might even be used for predictive analysis to eliminate uncertainty and therefore the need for insurance at all.

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