

Advanced Innovation Management

Best Practice of German and American Corporations in the Mobility Sector

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Many established corporations are currently seeking to adapt their business models and innovation frameworks in order to compete with disruptive businesses. In this context, semi-structured qualitative expert interviews (n=19) have been conducted in Germany and the USA, which examine advanced approaches of innovation management. Results include the need to build up technology driven competencies within the corporation, as well as advanced incentive schemes. Further detected findings refer to the funding of innovation projects, cooperation with external partners, and internal structures. Presented recommendations will help corporations to fine tune their innovation activities by learning from insights into various multinational firms.

INTRODUCTION

During the past few years, a tremendous improvement in information, communication and connectivity technologies has taken place (Baharadwaj, 2012), which is often referred to as digital transformation (Tolboom, 2016). These new digital technologies significantly facilitate firms' business processes, including for instance the communication between employees and electronic systems (Laryea & Iben, 2014) or the customer experience (Hoong, 2013).

However, especially industrial-age manufacturing firms experience major challenges regarding their business activities, as key functionalities of their products are being digitized (Yoo et al., 2015). In this context, it is essential for established corporations to understand and develop the right settings for the required adaptation of their innovation activities and business models (Simsit et al., 2014).

In this context, many established corporations struggle to master a strategic shift in their business models, which at the same time increases the complexity of their innovation activities (Berman, 2012; Gimpel & Röglinger, 2015; Lenet, 2017). Therefore, structured frameworks in general present elements and relationships that provide an essential basis for manager's debate concerning the right course of action for a sustainable success of their business (Adner, 2006). The presented study addresses the need to identify advanced innovation management approaches that target current demands of the market and can be transferred to firms' corporate innovation framework. In connection with this, the following research question has been analyzed:

How Does a Firm Successfully Organize its Corporate Innovation Framework in Order to Respond to Digital Challenges?

Based on an initial systematic literature review in the field of corporate innovation frameworks, several existing approaches have been identified, which are depicted in the following section. In addition, this study relies on a number of expert interviews in order to identify lessons learned and advanced innovation approaches for incumbents to adopt. Thereby, the collected qualitative data represents best practice from German and American corporations. Finally, suggested approaches are presented and summarized by an advanced corporate innovation framework model.

CORPORATE INNOVATION FRAMEWORK

The following passage has the aim to provide a deeper understanding of the presented research topic and the theoretical foundation of corporate innovation frameworks. In order to systematically analyze firms' innovation activities, this study relies on the approach of corporate innovation systems (CIS). First, the terminological and historical context of CIS are depicted, as well as related fields of study. A critical assessment of the system perspective has the aim to point out essential considerations for research conducted in the field of corporate innovation frameworks. Afterwards, the identification of relevant innovation framework dimensions serves as a basis for the empirical analysis of this study.

Definitions and Historical Context

To date, only few authors have explicitly defined the term 'corporate innovation system', as prior research on innovation systems is mainly oriented towards national, regional or sectoral types of innovation systems (Carlsson et al., 2002; Freeman, 1995; Faber & Hoppe, 2013). Granstrand (2000) is considered to be the first author who introduced the field of CIS in the innovation literature. He defines this type of innovation system as "the set of actors, activities, resources and institutions and the causal interrelations that are in some sense important for the innovative performance of a corporation" (Granstrand, 2000, p.14). Furthermore, a CIS is described as "a corporate's organization (or a network of corporations), and rules and strategies governing the invention, development, and adoption of new technologies" (Sigurdson & Cheng, 2011, p.419). It is highlighted that CIS need to be open and encourage creativity, spontaneity and self-organization in order to provide a framework for successful innovation processes (Hauschildt and Salomo, 2011). In connection with this, firms play the most crucial role in the innovation system perspective, as they innovate together with other organizations (Lundvall, 2008). As the concept of a CIS still remains ambiguous, the working definition applied for this study describes this type of innovation system as 'a complex organizational framework that includes the required processes, resources, structures and institutions for corporate innovation activities'.

The CIS approach is based on the Neo-Schumpeterian tradition, as it has its own unique constituents, function, and activities (Lee, 2010). The following system concepts depict the historical embedment of corporate innovation systems and thereby represent their fundamental basis: input/output analysis (Leontief, 1941), development blocks (Dahmén, 1950), innovation system (Lundvall, 1985), national innovation system (Freeman, 1987), Porter's diamond (Porter, 1990), technological innovation systems (Carlsson & Stankiewicz, 1991), local industrial systems (Saxenian, 1994), sectoral innovation systems (Breschi & Malerba, 1997), regional innovation systems (Cooke, 1997), corporate innovation system (Granstrand, 2000), social system of innovation and production (Amable, 2003), organizational innovation system (Wagner-Luptacik et al., 2006). Furthermore, the systematic literature review reveals that the concept of CIS is closely associated with the approaches of organizational innovation and corporate innovation management (e.g. Lee, 2010; Christensen & Raynor, 2003; Hauschildt & Salomo, 2011; Bagnò & Cheng, 2011). Thus, many studies do not clearly make a conceptual distinction between these terms.

Related Fields of Study

Prior studies have elaborated several research orientations in the context of corporate innovation systems. First of all, many authors refer to the resource-based theory when they analyze intra-firm innovation (e.g. Xu et al., 2007; Covin & Miles, 1999; Floyd & Wooldridge, 1999). Accordingly, a firm's strategy for the obtainment of sustainable competitive advantage needs to be targeted on filling its current resource gaps through innovative capacity (Grant, 1991). The resource-based view is described as "a strategic view of the firm's ability to extract rents from bundles of innovations" (Hackett & Dilts, 2004, p.56). Thus, to innovate, a firm requires the ability to flexibly shift its existing resources from one deployment to another with the aim to assemble them into novel combinations (Amit & Schoemaker, 1993; Freeman & Engel, 2007). A balance between exploiting a firm's existing proven resource combinations and exploring new ones, is decisive for long-term success (Ireland & Webb, 2007), which refers to the approach of ambidexterity (Raisch & Birkinshaw, 2008; Mortara & Minshall, 2011).

Furthermore, particular research clusters that have a significant relevance in the context of CIS have been identified. In this context, structural characteristics and sub-systems have been addressed by several authors (e.g. Sigurdson & Cheng, 2001; Bagno & Cheng, 2011; Van Lancker et al., 2016). It is considered essential to take into account the internal organization of a firm in connection with its innovation activities (Coriat & Weinstein, 2002). Thereby, several authors highlight the innovation process as a key component of CIS, as it has an impact on many other dimensions (Lee, 2010; Edquist, 2005). Furthermore, the relevance of strategic innovation management is pointed out in particular (Afuah, 2009; O'Reilly & Tushman, 2013), as well as the importance of the dialectic relation between each sub-system and the actors within and outside the CIS (Fuglsang & Sundbo, 2005). In accordance with the institutional theory of Edquist and Johnson (1997), institutional sub-systems, such as rules, standards or modes of inter-firm relationships represent relevant aspects (Coriat & Weinstein, 2002). In addition, the reward system plays an important role in the context of CIS (Ireland et al., 2009).

Another research cluster incorporates the interface between the CIS and the innovation ecosystem. This aspect is based on the open systems theory by Christensen, which states that organizations are influenced by their environment (Christensen, 1997). In connection with this, firms tend to serve those actors, which provide them with resources. Several authors address that external relationships represent a critical success factor in the introduction of innovations (Gellynck & Vermeire, 2009; Groonum et al., 2012; Ozman, 2009). Furthermore, three levels are suggested: macro level, meso level, micro level (Ortt & Smits, 2006). The micro level refers to an organization (or a network of organizations), the meso level describes an industry and the macro level characterizes a country. Firms' innovation processes are influenced by all three levels and their specific institutions, rules and procedures in a direct or indirect manner. Furthermore, open innovation is highly relevant for corporate innovation management and more radical types of innovations in particular (Baka, 2014; Budde et al., 2012; Enkel et al., 2009).

Besides mentioned research streams, organizational learning and knowledge management also represent considerable research orientations in the context of CIS (Lee, 2010; Pellissier, 2008). This approach is connected to corporate renewal and the internal infrastructure of organizations (Coriat & Weinstein, 2002; Apilo, 2010; Steiber & Alänge, 2015; Stampfl, 2016). Other studies highlight the importance of constant adaptation and low cost experimentation, as well as knowledge diffusion that all have a positive impact on individual and organizational learning (Dess et al., 2003; Baden-Fuller & Stopford, 1994). It is also stressed that there is a strong relation between organizational learning and innovation (Stampfl, 2016). However, prior studies mainly provide findings with respect to product innovation (Foray, 2000) and process innovation (Jang et al., 2002) and did not specifically target radical types of innovations.

Moreover, several studies highlight that sustainable corporate innovativeness requires an organization-wide entrepreneurial spirit that is essential in order to cope with and benefit from rapidly changing marketplace conditions (Jeong & Wenckers, 2008; Rothwell, 1975). Further authors recommend establishing a sustainable environment for intrapreneurship, which is based on certain organizational structures and managerial tools, such as decentralization and decision-making autonomy or allocation of free time for innovation (Kuratko et al., 2005; Hornsby et al., 2002; Scheepers, 2011).

Critical Assessment of the Innovation System Perspective

In order to provide a basis for future studies on corporate innovation frameworks, a critical assessment of the innovation system perspective is recommended. In the following, several arguments that either support or oppose the approach of innovation systems in general are presented.

First of all, several authors address the dynamic approach and multi-dimensional aspects of innovation, which require a holistic, comprehensive view on the topic (Van Lancker et al., 2016; Budde et al., 2012; Tödtling & Tripl, 2005). Furthermore, currently many studies provide valuable insights in this context, which are however scattered in different studies and diverse innovation research fields (Alänge, 2013). Existing findings need to be compiled in order to make them applicable for further research and practice in the field of corporate innovation management. This statement is enhanced by the proposition that micro-level innovation managers require hands-on models for innovation development that are not provided sufficiently by prior studies (Berkhout et al., 2010). In addition, innovation systems help to organize and focus the analysis of innovation projects and to provide a basis for rational action (Lundvall, 2008). The system perspective of innovation is furthermore supported, as it implies the relationship between structures, processes, and people (Servatius & Piller, 2014). Hereby, the combination of “hard” and “soft” factors plays an important role, which is highly relevant for the momentum of such systems. In this context, the ability of innovation system studies to open the “black box” of innovation and to analyze processes are addresses, which are typically overlooked in their linear approach to R&D (Spielmann, 2005).

In contrast, there also exist several constraints that need to be considered in the context of CIS. For instance, too little operational value as well as a lack of substance are assigned to the innovation system perspective (Foray, 2000). It is also highlighted that the innovation system defines a concept rather than a general theory, as it does not specify any general laws of cause and effect (Lundvall, 2008). This statement is supported by demanding a more rigorous, systematic and theory-like concept of innovation systems (Edquist, 2005). Furthermore, the dynamic nature of innovation systems might lead to considerable empirical challenges throughout the research process (Carlsson et al., 2002). In addition, it is recommended to avoid thinking in terms of mechanical models of causality in connection with innovation systems and to develop theory as well as analytical techniques (Lundvall, 2008).

Resulting from the presented discussion, the predominant benefits of the system perspective indicate that the approach is considered suitable for future analyses in the field of corporate innovation frameworks. In particular, the increasing complexity of firms’ innovation activities due to ongoing paradigm shifts in many industries, justify a holistic view on the topic of corporate innovation management. However, it is recommended to consider critical remarks throughout any innovation system study. Thus, the following section incorporates the identification of suitable innovation framework dimensions as a basis for the empirical part of this research.

Identification of Innovation Framework Dimensions

Existing innovation management literature provides numerous approaches and frameworks for innovation best practices (e.g. Hauschildt & Salomo, 2011; Christensen & Raynor, 2003). However, since the environment of firms is rapidly changing due to digital transformation and disruptive business models by new players in the market, little attention has been paid to the challenge of successfully transforming a firm’s established innovation activities in a holistic and systematic manner. With the objective of providing a basis for the empirical analysis of this study, several existing innovation frameworks and approaches have been integrated into the definition of suitable dimensions. In this context, numerous authors mention that the innovation process represents the key factor of a corporate innovation framework, as it influences many of the other suggested elements (Lee, 2010; Edquist, 2005).

As mentioned above, Granstrand (2000) was the first to introduce the approach of CIS and thereby defined the following dimensions: activities, actors, resources, institutions, and causal interrelations. In this context, the dimensions represent different groups of components and indicate important sub-systems, such as the actor system, that are involved in corporate innovation activities. The second analyzed approach refers to the star model framework for organizations’ design choices that provides

managers with the ability to influence employee behavior. Suggested policies are based on the following five dimensions: strategy, structure, processes, rewards and people. While the strategy dimension determines the firm's direction including its goals, objectives, values and mission, the structure dimension relates to the placement of power and authority within the organization. In addition, the process dimension describes the flow of information and the means of responding to information technologies. The rewards dimension has the aim to reconcile the goals of employees with the goals of the organization. Last but not least, the people dimension covers human resource policies, such as recruiting, job rotation, training, and development (Kates & Galbraith, 2007).

An organizational architecture that supports entrepreneurship includes the following dimensions: a firm's structure, culture, reward systems, and resource set (Ireland et al., 2009). In connection with this, a firm's structure refers to its arrangement of authority, communication, and workflow relationships. The culture dimension incorporates for instance employees' emotional commitment. Reward systems have the potential to impact risk taking within the organization. Finally, resources or capabilities are required in order to exploit entrepreneurial opportunities. In addition, a corporate innovation framework requires the following characteristics: organizational ability and strategy, research and development (R&D) structure, arrangements of advanced learning, association with the public sector, human resource management, competitive strategy, access to newly developed knowledge and technology, management of intellectual property right, networking ability and strategy, as well as financing strategy (Sigurdson & Cheng, 2001). Following Bagno & Cheng (2011), "intra-organizational innovation systems" incorporate six different dimensions: strategic adequacy, interpretation of external environment, conception of internal organizational structure, integration of external structure, systematization of organizational basic processes, consideration of human factors and relationships. In addition, various studies are summarized, as they propose four important structural components of a corporate innovation framework: diverse actors, innovation network, innovation process, and institutions (Van Lancker et al., 2016;) Westergren & Holmström, 2012; Chesbrough, 2012).

The innovation management framework suggested by McKinney (2012) incorporates the following four dimensions: strategy, systems, culture, and ecosystem. The strategy dimension for instance refers to the innovation governance, metrics or the impact of intellectual property (IP) risks. Following, the systems dimension includes among others innovation processes, idea management, and information management. The culture dimension is characterized by employee involvement, education and training. Fourth, the ecosystem dimension describes the collaboration with partners, IP management or technology scanning. Furthermore, four dimensions that have an influence on innovation processes can be extracted from basic literature on innovation management: organizational members, organizational culture, organizational structure, and organizational environment (Britzer, 1990; Thom, 1980; Witte, 1988).

Resulting from the analysis of existing innovation framework approaches, Table I depicts the selected seven dimensions that serve as a basis for the empirical data analysis of this study. Accordingly, the seven corporate innovation framework dimensions that are outlined in Table I and applied to this study refer to the following: innovation process, organizational structure, resources, hygiene factors/rewards, people and culture, strategy and external ecosystem. By the conducted synthesis of existing innovation models, so far scattered perspectives have been merged systematically and therefore represent a profound basis for the following empirical analysis. However, as existing dimensions still represent a rather abstract model, this study has the aim to substantiate the framework by conducting the following empirical analysis.

TABLE 1
IDENTIFIED INNOVATION FRAMEWORK DIMENSIONS

Dimension	Existing studies
Innovation Process	Granstrand, 2000; Lee, 2010; Lancker, et. al., 2016; Edquist, 2005; Kates & Galbraith, 2007; Westergren & Holmström, 2012; Chesbrough, 2012; McKinney, 2012; Bagno & Cheng, 2011
Organizational Structure	Sigurdson & Cheng, 2001; Ireland et. al., 2009; Bagno & Cheng, 2011; Kates & Galbraith, 2007; Britzer, 1990; Thom, 1980; Witte, 1988
Resources	Granstrand, 2000; Sigurdson & Cheng, 2001; Bagno & Cheng, 2011; Ireland et. al., 2009
Hygiene Factors / Rewards	Sigurdson & Cheng, 2001; Bagno & Cheng, 2011; Ireland et. al., 2009; Kates & Galbraith, 2007
People and Culture	Granstrand, 2000; Sigurdson & Cheng, 2001; Bagno & Cheng, 2011; Lancker et. al., 2016; Ireland et. al., 2009; Kates & Galbraith, 2007; Westergren & Holmström, 2012; Chesbrough, 2012; McKinney, 2012; Britzer, 1990; Thom, 1980; Witte, 1988
Strategy	Sigurdson & Cheng, 2001; Bagno & Cheng, 2011; Kates & Galbraith, 2007; McKinney, 2012
External Ecosystem	Bagno & Cheng, 2011; Lancker et. al., 2016; Westergren & Holmström, 2012; Chesbrough, 2012; McKinney, 2012; Britzer, 1990; Thom, 1980; Witte, 1988

METHODOLOGY

With the aim of analyzing the above mentioned research question of this study, a qualitative approach has been chosen. Qualitative research is considered particularly suitable in case of explorative studies in new or underexplored research areas (Yin, 2011), which applies to the investigated phenomenon. In the following sections, the research design is described more precisely, as well as the data collection and analysis.

Research Design

The presented study has been conducted by relying on the empirical analysis of qualitative expert interviews (n=19). Experts represent suitable interview partners, who are considered as a source of specialist knowledge regarding the circumstances to be investigated (Gläser & Laudel, 2010). The sample includes innovation managers of multinational corporations from the US and Germany, which all operate in the mobility sector. Due to their position, all involved experts have a holistic overview of their organizations' innovation activities and are thereby able to share lessons learned and best practice based on a broader perspective. Furthermore, the sample incorporates long established, as well as younger firms, which also has the intention of capturing various perspectives on the research topic.

All expert interviews are characterized by an explorative approach with a semi-structured interview guideline including open questions in the field of preliminary identified innovation framework dimensions. Hereby, the main focus has been on innovation activities in the field of radical types of innovations and business model innovations based on digital technologies. Recorded audio files were later transcribed in order to capture the data for further analysis.

Data Collection and Analysis

During the period from March until September 2017, the qualitative data has been collected. In total, 9 German corporations and 10 American corporations have been included in the study. This distribution has the aim to ensure a broad perspective of applied innovation approaches and practices within different worldwide regions. The duration of each expert interview accounted for 47-125 minutes and all experts and firms remain anonymous for this study. Furthermore, the qualitative interviews were conducted in German and English language mostly in person, otherwise by phone. In the context of the mentioned research question, specific approaches and activities for different types of innovation have been addressed, such as the required framework for digital business model innovations in particular.

In order to analyze the collected data, based on Mayring (2010) and Yin (2011), the methodology of qualitative content analysis has been chosen. Thereby, three distinct forms of interpretation are to be considered in order to ensure a profound analysis of the material: summary, explication and structuring (Mayring, 2010). Several iterations during the data analysis ensure a profound coding reliability and accordingly enhance the presented findings. The experts referred to concrete issues and solution approaches derived from their practical experience in the context of the analyzed topic, which have been transferred to the following findings.

FINDINGS

Based on prior defined innovation framework dimensions, each of them has been associated with anchor examples and citations from the experts' practical lessons learned. In total, the qualitative content analysis resulted in 2413 codings of the qualitative data material. One by one, the dimensions are explained in detail in the following sections and sorted according to their relevance, which is derived from the number of codings per dimension. Thereby best practice of advanced innovation management from two regions approaches are identified. Furthermore, the abstract level of existing corporate innovation framework dimensions has been concretized in an explorative manner.

Innovation Process

In alignment with the qualitative material, 460 codings have been detected concerning the innovation process, which supports its high relevance in the context of this study in accordance with Lee (2010) and Edquist (2005). Most firms apply the classical stage-gate innovation process, even for more radical types of innovation projects. However, "of course the number of stages depends on the innovation project" (expert 11). In case of digital business model innovations, expert 6 highlights that the control mechanisms at each gate need to be "more focused in terms of investments – what do you have to invest in which innovation and what's the return". Expert 12 adds that "these stages represent a different form, as you're typically undergoing an internal assessment and the validation is conducted through those presentations and the final decision." Furthermore, many interviewed experts struggled with the definition of their business model innovation process, as they are still experimenting with this type of innovation: "Honestly I'm not able to describe an example of our process" (expert 1). In contrast, one interviewed expert from a firm with an existing digital business model responded that they avoid thinking in terms of processes: "Processes slow you down [...] I always say, Silicon Valley is like a youth science competition. We take what we have, see what's the outcome and then we made it to the first level to see whether we can make it to the second" (expert 13).

Another important aspect refers to the fact that many firms are announcing company-wide innovation challenges in order to support their internal idea generation and the process of business model innovation. Therefore, some firms make use of IT platforms to support this process. "In the sense of challenges that we announce at the central level, but also within the departments themselves" (expert 6). Usually, the best ideas or projects get the chance to participate in one of the internal incubator or accelerator programs that will be further explained in the following section. Expert 9 shares that in order to avoid thinking in silos, "it's all integrated with each other. We just had the case where one campaign was launched by the

commercial department, the challenge was open to employees of the [other] department, and the winning idea is executed at the [corporate incubator], which is operated by the engineering department.”

In this context, several experts mentioned the importance of the application of advanced innovation methods within the innovation process: “methodological tools, like Design Thinking, help” (expert 1). This is also encouraged by partnerships with universities and research institutions, as expert 17 explains: “We have a strong partnership with the D-School at Stanford”.

People and Culture

People and culture represent the dimension with the second highest relevance in accordance with its number of codings (407). In connection with the research question of this study, digital business model innovations require employees with specific roles and qualifications. First of all, “the interface between headquarter and the innovation hub is critical. The leading manager should have a corporate background in order to understand existing politics and processes and make use of an existing internal network” (expert 10). Furthermore, expert 10 adds “new products do not necessarily have to be developed by engineers, but also employees with every possible background. Managers still need to learn and accept this”. Expert 15 supports this view by explaining: “We have so-called central teams, which are employees that are not assigned to one specific project. This is more like a pool of employees – all with a different background” (expert 15). Another significant role refers to the mentors within an organization: “Most internal startups usually have a high-ranking mentor, who makes the final decisions, protects and supports them” (expert 6). Several experts also mention that role models within an organization are essential for business model innovations: “It’s about starting a fire within these people and from that point on it’s voluntary. And you can only generate this voluntariness if you have these energizers within your organization. People who exemplify this culture and spread their passion, who show them how it works. With these role models you can transform an entire firm” (expert 6). The role of innovation managers is seen as a “consulting function that supports idea owners throughout the process without pushing their own ideas or technologies” (expert 9). Last but not least, corporations are starting to implement the role of a Chief Innovation Officer or a Chief Digital Officer in order to guarantee top-management support (expert 9, expert 19).

In addition, it is considered crucial to ensure the right qualification of employees for developing digital business model innovations. In this context, established corporations need to train their personnel in fields such as “user experience, big data, etc.” (expert 1). However, especially for software-related business models, special qualification are required that cannot be obtained through average workshops, as one expert explains: “In software, there are these superstars, who are coming up with these new crazy ideas that demand two or three, maybe four times average salaries, but they produce more than ten times than average. So you need to be willing to pay them that much“ (expert 14).

Altogether, a general change in the mindset of an established organization is required: “I see such a huge gap between the Silicon Valley mindset and the mindset of the traditional OEMs” (expert 11). A thought out communication with a clear explanation of required changes for a business model transformation is considered critical, which “requires a certain social competence of managers” (expert 1). However, several experts point out the challenge of really identifying with a new mindset rather than forcing a certain culture on employees (expert 13). One vehicle for supporting such a cultural change in the mindset of personnel refers to the before mentioned internal idea challenges, that “rather have the focus to change our culture instead of bringing up great ideas. And that change will automatically lead to new business models” (expert 19).

Organizational Structure

Another critical dimension refers to the organizational structure and design of a firm, which is also highly ranked due to 338 identified codings. In connection with the required organizational structure for digital innovations, most firms rely on separate entities, such as incubators, accelerators or venture capital arms for the development of new business models. However, approaches differ with respect to the responsibility of such an entity. “Each division has an incubator where they play a lot with business

model innovations and not with technological innovations, which is rather located in the division of Corporate Technology” (expert 3). Several established firms chose to establish separate legal entities in order to support their digital business model innovation activities: “We came to the conclusion that the advantages of an independent separate legal entity exceed. You need to be attractive for different personnel, you need higher flexibility and different reporting structures. That’s why we chose this path for our corporate incubators that are located within different regions worldwide” (expert 8).

Accelerator programs are often established together with an external partner, as explained by expert 2: “For the topic of new digital business models, we are docked to the [...] Accelerator“. Expert 9 further explains the function of such an accelerator; „We have a “Call for Startups” at this startup accelerator on a regular basis where we try to attract external startups”. Venture capital arms mainly have the function of “scouting for new external ideas” (expert 6) and “investing in startups in order to profit from changes in the market” (expert 3). Expert 16 highlights that such investments usually refer to early stage startups. Besides the mentioned initiatives, many corporations experience increasing innovation activities across their divisions on an individual basis. Hereby, it is crucial to create a balance between “fixed structures that are managed top-down and at the same time you need enough freedom also for small business units to deal with these new types of innovation at their own pace” (expert 1).

However on the other hand, several experts – mostly from younger firms – state that they “don’t have particular departments for innovation” (expert 13) and “no special focus on business model innovations” (expert 18). They refuse to establish departmental thinking, as they believe “we are all innovators. I don’t think it makes sense to have a separate innovation team” (expert 15). These approaches align with the mentioned trend of established corporations to broaden their innovation activities within the organization besides their fixed company-wide initiatives. However, it needs to be considered that it might be a challenge to monitor such a vast innovation spectrum across all divisions: “I would say, we know half of them, a quarter might be relevant for us and the other half is hopefully not as relevant for us” (expert 7).

External Ecosystem

Furthermore, the interaction with the external ecosystem plays an important role for corporate innovation frameworks, which is indicated by 267 codings. In connection with open innovation and the interaction with the external innovation ecosystem, various partners have been named for digital business model innovations: university cooperations (e.g. expert 1), external startups (e.g. expert 10), OEMs (e.g. expert 11), customers (e.g. expert 12), consulting firms (e.g. expert 12), suppliers (e.g. expert 13), and competitors (e.g. expert 15).

New digital players from Silicon Valley seem to prefer larger corporate partners for their innovation projects: “We don’t need technology in most cases. Also startups have limited resources, that’s why we usually work with large international companies. The advantage is that they have a lot of resources, they already have a big network, they know the industry and they have deep knowledge about their products” (expert 15). Another expert from a younger digital player points out some of the challenges they face in the context of external collaboration: “It is often hard to collaborate with external partners, as they struggle with meeting our tight internal deadlines. Therefore, we prefer to do as much as we can internally” (expert 18). In contrast, established corporations often name external startups as essential partners for digital technologies: “Partnerships with startups in innovation ecosystems, like Silicon Valley, Shanghai, Tel Aviv, or Munich, that have technologies that we need” (expert 3). Another expert shares: “We look at the startup scene, as they provide us with good ideas. To some extent they also have skills that we are not able to build up within a short period of time” (expert 2). However, he adds that “I find it just as interesting to look at other established corporations, as startups have great ideas but still need to prove that they are able to survive in the long-run”.

In general, most experts described the type of collaborations for digital business model innovation projects as unique: “This requires different types of collaborations. Nothing is standardized, there are always new collaborations for each project and there has to be a win-win for both sides” (expert 15). Furthermore, one expert describes the role of satellite offices from established corporations in connection with external collaboration: “Here in the Valley we collaborate a lot more than our motherships. I think

they would be scared. (...) We still need to compete so there are areas where we probably would never share, but we collaborate more” (expert 17). In some cases, Silicon Valley-based innovation offices started a project with each other, which was later transferred to their European headquarters that would otherwise never have been initiated between both firms.

Last but not least, several experts referred to the issue of intellectual property (IP) management when it comes to external interactions: “Especially in cooperation with external partners, IP and compliance issues arise” (expert 6). Particularly many corporations struggle with compliance and extensive processes around that topic. Expert 9 adds: “People are often scared. We may not open up to the outside because of IP – this often represents a roadblock”. Outside of Silicon Valley, startups often find themselves exposed to established firms’ bureaucracy connected to IP. However, in Silicon Valley, startups often represent the stronger party and specify legal requirements themselves (expert 10).

Strategy

Following the aspect of external relationships, experts’ citations concerning their firm’s innovation strategy include 256 codings. The strategic dimension of corporations often refers to company-wide initiatives that have the objective to transform the current business: “We now have this company-wide strategy 2025 that strongly seeks to understand changes in society that have an impact on our business model” (expert 1). Another expert adds: “What’s new now is that we are developing a holistic strategy that enables digitalization and innovations not only from our business units but company-wide” (expert 2). In connection with digital business model innovation projects, one expert emphasized that they are always executed “in close cooperation with strategy and corporate research” (expert 4).

In this context, most experts highlight that any innovation still has to have a link to the existing core business: “All innovation projects must be fundamentally important for the core business of the company. [...] We don’t have the time or the energy to focus on topics that don’t improve our core business“ (expert 11). In case of younger firms, this statement might be based on the fact that new players in general first need to establish their business model instead of transforming it as established firms require. However, mentioned examples of established firms’ business model innovations also lie within the range or close to their core business, which might be related to the challenge of convincing sponsors for more radical types of innovation projects within the firm.

Another strategic issue incorporates the selection of suitable innovation projects. Expert 8 addresses this challenge: “With respect to a successful transformation, I think it’s essential to focus on major topics. And in this context you certainly have to count on 10-15 topics that need to be pursued rigorously. You need to focus on these 15 topics and employ your resources accordingly. Still, you need to remain flexible, as 5 of these topics might be a failure and another 5 topics have not been on your radar”.

Resources

In total, 249 codings have been identified concerning a firm’s required resources for innovations. In accordance with the resource-based theory, the interviewed experts highlight that digital business model innovations require a different and more extensive resource-set than traditional R&D-based innovations. Expert 8 explains: “I believe what’s being underestimated is that when you build up a new business model, you are building up a completely new business. And at least during the ramp-up phase, you have a higher demand for resources, especially in terms of people who implement this new business model. (...) So business model innovations are very resource intensive.”

Another expert reveals that “when you look at business model innovations, you need another type of innovation managers, who are able to deal with a broader spectrum of topics and think more like an entrepreneur” (Expert 7). In addition, expert 3 points out that “you need knowledge transfer, you need crowd-sourcing and decentralized networks for this type of innovation.” In connection with this, it is crucial to combine technological capabilities with business model innovation in order to develop more radical types of innovation. Expert 14 states: “So certain things that come out of a business model innovation cannot be realized unless you have a certain technology. And certain technologies enable business model innovation.” Keeping this in mind, it is suggested to enable a close collaboration between

those entities that incorporate such capabilities and thereby strengthen internal technology-driven competencies.

Furthermore, the financial resources that are needed for innovations in the digital field are highlighted. One expert explains: “In general, there are no borders at [...] except for money. So everybody can have ideas and share them, however the potential has to be high enough to get the right amount of funding” (expert 15). Expert 13 reveals how the funding of projects works at his organization: “When you are able to explain your idea on three pages, within six minutes and it makes sense, you will receive the budget for executing that idea”. Expert 14 addresses the need to fund innovation projects quickly in order to succeed in the digital field: “with software you can get something done in 12 weeks. So again, it comes back to that original flexibility, where you need to fund things quickly and see if there is something there and then move on or expand if it makes sense”. Expert 16 who is managing innovation projects at a satellite office in Silicon Valley adds: “...the resource that you need is money, it’s just that we use it differently. Because we are less process heavy than in Europe, so you make savings and we are more efficient in that respect, but we pay people more in Silicon Valley than we do in Europe.” Furthermore, expert 15 shares: “There is one equation... potential / investment. The higher the potential or a new business, the higher the investment in resources. You have to play with that balance”.

In order to provide sufficient financial resources for digital innovations, several corporations implemented special funds that are dedicated to those types of projects, as expert 1 describes: “Our workers council has established two innovation funds that provide retained financial resources from wage agreements”. Expert 2 supports this approach by adding: “We have founded a separate legal entity for digital ventures that has 100 million Euro at hand in order to invest in external new technologies and business models”.

Hygiene Factors/Rewards

Last but not least, 130 codings refer to a firm’s hygiene factors and reward system. One way to encourage employees’ motivation for more radical innovation projects refers to their remuneration. Firms from Silicon Valley state that rewards and incentives are based on financial returns of shareholdings, which is a common approach in this region: “In general, our goal is to actively participate in the equity market. (...) That’s your engine. You have a much higher identification with your company, when you receive shares, as you want the company to grow” (expert 13). Furthermore, he addresses that working hours are much more flexible, which also refers to employees’ time off and sick days. Thus, expert 13 suggests “to increase the salary by 10% for less days off during the first two years. And once you have a family and are married, you can still have the full amount 20 days off”. The demand for a more flexible incentive scheme is also highlighted by expert 8, who works for an established firm: “In these new markets with young IT talents, you need a more flexible approach for the remuneration and incentives of your employees”. However, many experts share the opinion that financial incentives should not represent the sole factor for motivating employees, as for example expert 5 explains: “I’m not a friend of financial incentives, as this can only be a short-term motivation in my opinion”. This aspect reveals a different mindset within several regions.

A large number of experts emphasized the importance of flexible working conditions in the context of digital business model innovations. Especially autonomy and support need to be considered in this context, as expert 12 expresses: “It’s a huge incentive to enable employees to present their own idea to a large number of peers or to top managers, which has been impossible in the past”. Another expert adds that “I think it’s healthy to give all employees an opportunity to participate” (expert 17). Another expert addresses the need to “create an environment where you feel safe enough to have ideas and develop innovations without having someone saying “That’s garbage” – this is essential” (expert 13).

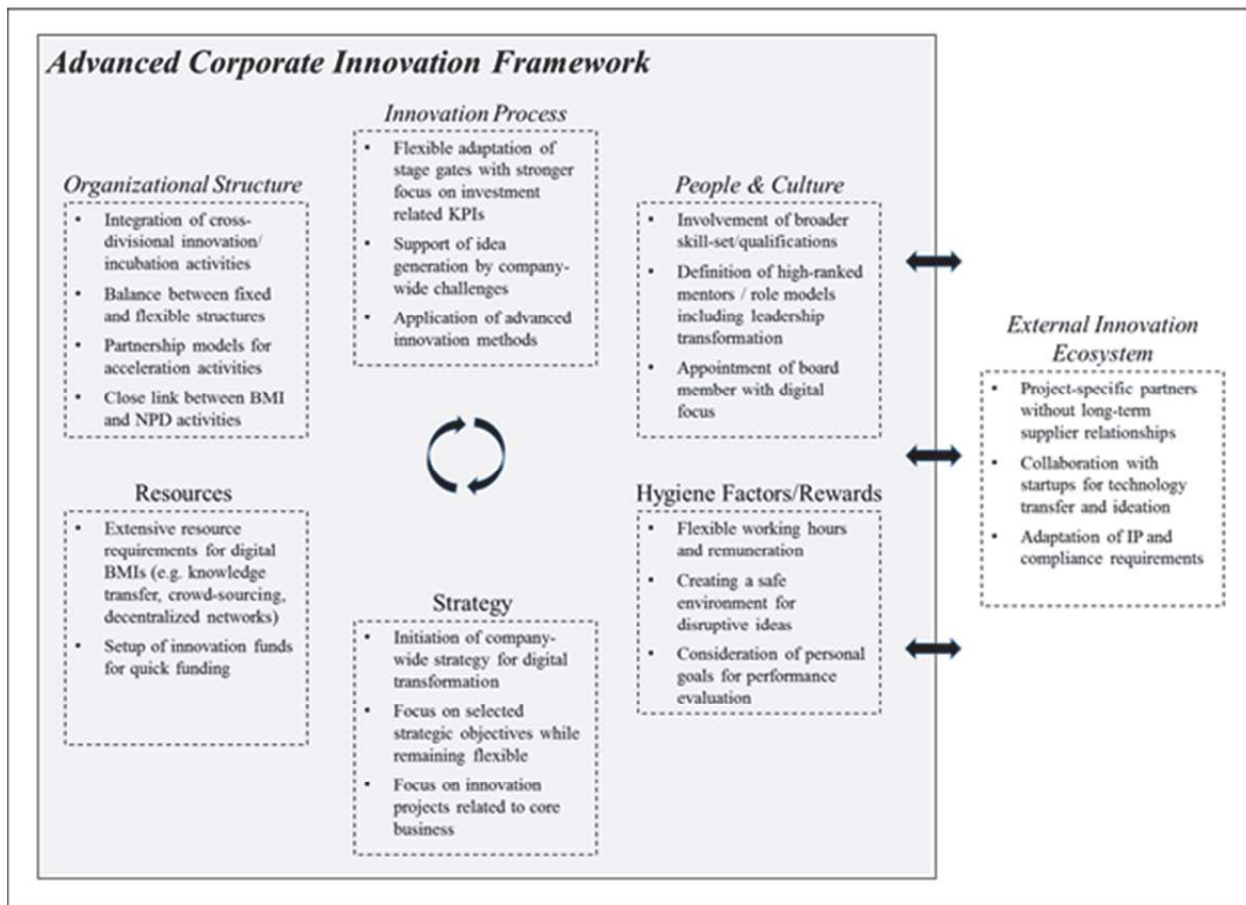
One expert particularly referred to the performance evaluation of employees, which can be adapted on an individual basis in order to increase motivation: “We also have KPIs to measure our performance, but now part of our performance evaluation is whether or not we achieve our personal goals and this is linked to our bonuses. So you have a fixed pay and a variable pay, the bonus. Your performance conditions how much of a bonus you’re going to get. It’s going to be on your job and then there is also a part on things

that you want to work on for yourself, which you define with your manager. For example this quarter I want to learn German or I want to train for running a marathon” (expert 16). A more flexible approach for the performance evaluation is also already applied within the corporation of expert 3: “I have 2-3 objectives that refer to the organization and 2-3 individual objectives”. At the same time, such flexible approaches require an adapted leadership style as well: “We say leadership represents one of the biggest enablers for this transformation” (expert 6).

Advanced Corporate Innovation Framework

Resulting from the identified best practice, the following section proposes an advanced corporate innovation framework that supports managers during the adaptation of established innovation management approaches for the digital transformation of their firm (see Figure 1). The eight dimensions are based on the initial analysis of existing literature, while the dashed boxes contain findings from this study that particularly refer to the requirements of digital transformation and disruptive business model innovations.

**FIGURE 1
ADVANCED CORPORATE INNOVATION FRAMEWORK (OWN ILLUSTRATION)**



CONCLUSION

This study has analyzed the corporate innovation framework of German and American firms in the mobility sector. Based on an initial systematic literature review on existing theoretical approaches, best practice of corporate innovation managers have been identified. Thereby, the presented paper contributes

to closing the current research gap regarding the transformation of established corporate innovation frameworks for a successful shift towards new digital business models.

The empirical part of this analysis incorporated (n=19) qualitative expert interviews with innovation managers in different regions worldwide. Based on the findings, the authors proposed advanced approaches that are suitable for established firms to adopt in order to transform their current business model. Altogether, the findings are divided with regard to the following dimensions: innovation process, organizational structure, resources, hygiene factors/rewards, people and culture, strategy, and external ecosystem. In this study, existing abstract corporate innovation framework dimensions have been substantiated by an explorative approach.

It is crucial to consider that the suggested results are not transferable to any organization one to one, as internal and external environments might differ with respect to the industry or region. An individual firm rather needs to evaluate closely, which of the advanced approaches fits their organizational culture and setting in order to be successful. Another limitation of this study refers to the selection of the interviewed experts, who have been chosen based on their availability and not always possess a comparable position within their respective organization.

A possible approach for future research might refer to an extension of the presented analysis to other regions and industries. Thereby, the proposed dimensions of a corporate innovation framework could be further validated and revised. Furthermore, it might lead to significant findings when each different type of innovations is analyzed more precisely in this context. Altogether, it is suggested that established corporations make use of the presented advanced innovation approaches as they are trying to realign their corporate innovation activities successfully.

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