Dr. Manfred Bischoff Institute for Innovation Management of Airbus Group

Research Report 2014/2015
Dear readers of this research report,

It is my pleasure to inform you about our research and managerial activities in 2013 and 2014. We aim at presenting you this information in a rather non-typical scientific way in order to foster discussion and interaction with you. Therefore, my team and I summarized the most important research results and projects undertaken into short articles which should serve as impulse for your daily innovation practice as well as to rethink and deepen your knowledge about innovation management.

With this report we would like to thank our engaged research partners who helped us tremendously conducting our research and advancing the field of innovation management. Within joined projects, responses to our surveys and cooperation in teaching we aim to work very close at the needs of practice with our scientific knowledge and tools. Please stay in contact with us and help us to identify future needs and research topics!

Again, thank you for your time and effort and please do not hesitate to contact us!

Best regards
Ellen Enkel

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the institute in a nutshell
The innovation study of 2014 is one of the major highlights of our year. This study, which is conducted since 2010, collects data about innovation activities of companies in Germany, Austria and Switzerland. We use this research in order to verify new upcoming topics as well as changing behaviour and best practices. In 2014, more than 200 companies participated in the study. Four of these were selected as Best Open Innovators in our yearly conference and are illustrating why their innovation management is very successful. Please follow up for more information about the study and about the best open innovation companies in chapter 1.

Especially the connection between strategy and culture seems to determine innovation success. Several qualitative and quantitative research results of the institute indicate that strategy gives the direction how much of open and closed innovation activities is effective and efficient while the culture is supportive or hindering the strategy fulfillment. Furthermore, as open innovation is already seen as the dominant design in innovation management, research results are primarily collected in developing countries. But open innovation is a phenomenon not exclusively used in Europe or the US but even more sophisticated used in developing continents like Africa. Our collaboration with WIPO (World Intellectual Property Organization) enabled us to study several ecosystem projects in the developing world. Additionally, based on a master thesis, we analyse the influence of gamification on business model development and its effect in motivating.

Besides, appropriate communication about the complex topic of innovation is increasingly important. Financial analysts as well as customers evaluate innovative companies higher than companies not known for their innovation efforts. Currently, research and practice are lacking clear indicators to prove innovativeness.

In this topic, the institute is very much profiting from its junior professor Marco Hubert who focuses his research also on this topic. In a joined research project with the chair of marketing of the Heinrich Heine University Düsseldorf (Prof. Kenning) and the chair of applied social psychology and consumer research lab of the University of Vienna (Prof. Florack), the institute undertook several empirical studies to find out when consumers identify a brand as innovative as well as if these relates to financial data of the company. Additionally, Jun.-Prof. Hubert tries to identify indicators to motive contributors of crowd sourcing. Please follow up on this research area in the open innovation section.

In cross-industry innovation, already existing solutions from other industries are creatively imitated and retranslated to meet the needs of the company’s current market or products. Such solutions can be technologies, patents, specific knowledge, capabilities, business processes, general principles, or whole business models. Innovations systematically created in a cross-industry context are a new phenomenon for theory and practice in respect of an open innovation approach. While the cognitive distance between the acquired knowledge and the problem to be solved was regarded as a counterproductive factor in older research, recent theory regards it as positively related to innovation performance. Within our FVA project, we identified social integration mechanisms as crucial for a systematic approach in cross-industry innovation. Based on more than 50 cases we are able to identify building blocks as well as methods and processes to systematize the success of cross-industry innovation especially in machinery industry (see chapter cross-industry innovation).

One important result of the last year’s research projects was the increasing importance of business models, both digital and analog as well as hybrid forms. Practice believes that market growth will be dependent on adapting established or inventing new business models, which better reflect changing customer behaviour, new strategic direction and potentials of new technology. Therefore, we doubled our effort to learn more about service-based business models, academic incubators as well as ecosystems and cannibalisation effects. How successful our research efforts have been can be seen by the number of new articles that were created, the increasing number of students learning about innovation on bachelor, master and executive master level as well as by the huge attention we received on international conferences.
The team of the institute
Behind: Sebastian Heil, Annika Dingler, Jun.-Prof. Dr. Marco Hubert, Felix Cramer von Clausbruch
In front: Simon Engels, Sabine Marx, Prof. Dr. Ellen Enkel, Monika Hengstler, Karoline Bader
Katja-Maria Prexl as well as Pia Hösl are missing
Innovation at the institute in figures 2014

4 Best Open Innovator Awards

About 200 companies participating in open innovation survey 2014

Participation in 5 international scientific conferences and workshops

6 Presentations at Management Conferences and Symposia

Research projects done with
E&Y | Zeppelin Rental | BASF Chemicals | Osram | Henkel
SAP | Airbus Group | Sodexo | AUDI | Bosch | Schaeffler
KSB | Wittenstein | ZF | SKF

International research cooperations with
INSEAD Business School Paris, Universität Wien,
Johannes Kepler Universität Linz, Cambridge University,
University of San Francisco, University of Tilburg,
Universität Stuttgart, Heinrich-Heine-Universität Düsseldorf,
Universität St. Gallen, TU Berlin, TU München,
Westfälische Wilhelmsuniversität Münster, LUT Lappeenranta
41 academic and managerial articles written
9 international conference submissions
8 scientific articles under review
13 published or accepted scientific articles
11 published managerial contributions

22 supervised student theses
2 graduate theses
2 bachelor theses
18 master theses

more than 1,000 participants at lectures of the institute

350 students learning about innovation in fall/spring-semester

| 110 Bachelor students at the courses Introduction to Innovation & Technology Management; Foresight, Innovation & Design; Business Model Innovation as well as Open Innovation |

| 126 Master students at the courses Advanced Open Innovation, R&D Metrics & Creativity, Knowledge Management, Decision Neuroscience as well as Advanced Marketing Research |

| 114 Executive Master students participated in each of the courses Business Models, Trend Identification, Ecosystem Business Models, Introduction in Innovation Management, Introduction in Business Model Innovation, Innovation Management in Retail |
excellence in open innovation
Why is it hard to measure excellence in open and closed innovation?

Opening up the innovation process in order to allow external knowledge to enrich internal knowledge and capabilities has already been established as dominant design in Europe. As we identified with previous innovation studies, external knowledge or resources help companies with both, increasing their effectiveness and their efficiency in innovation. But we already know that the balance between internal (closed) and external (open) innovation is determined by industry speed, corporate strategy as well as by the existing culture of the company.

Whereas high industry speed, like in information and communication industry or fast moving consumer goods industry, forces companies to enrich their own knowledge base and resources with external ones to gain development speed, slower industries like energy, textiles or raw material producers collaborate only in selected projects (e.g., when new technologies are required or new customer demands need to be met).

Recent studies of our institute show that corporate strategy determines how much open or closed innovation is necessary to create corporate performance impact in terms of radical and incremental innovation. Additionally, we know by now which activities companies should undertake in order to best support their strategic decision. As companies with a market defender strategy should focus mainly on internal resources for their innovation, enriched by frequent customer and supplier integration activities to increase market orientation and optimize their resource management, companies with a prospector strategy should heavily focus on external knowledge and resources in order to gain technology leadership. Those companies should possess a large portfolio of different collaborative activities to identify the next technology change and the best partners to develop products and services based on new technologies. Especially large corporations with several business units acting under the one or the other corporate strategy, called analyzer companies, should decide for open and closed innovation activities on business unit level instead on corporate level.

In order to excel in open innovation, corporate culture plays a significant role. Culture can be supportive or disturbing following an open innovation approach. Yet, research doesn’t know if strategy follows culture or the other way around. However, opening up the innovation process is requiring a whole set of new or adapted processes and skills on nearly every level of the company. Therefore, our recent research tries to explore which capabilities technology managers need, dependent on technology strategy, to successfully identify, adapt and integrate external knowledge and resources. One other aspect very new in our research agenda is how management and researchers need to communicate innovation in order to create awareness of being an innovative partner for other companies. Appropriate communication of innovativeness has an impact on consumers, potential and existing partners as well as on financial analysts. Therefore, we aim to identify ways of appropriate communication and persons within the company to do so.

Besides the individual level, research as well as practice lacks in good performance indicators in order to compare and adapt open innovation activities. While the maturity framework measures the excellence of open innovation processes, the clear link between corporate strategy and open or closed innovation activities shows if the right processes are selected and supported. Therefore, we measured excellence and, by doing so, identified the best open innovation companies by their alignment between corporate strategy and activities. In order to classify if their processes and activities are excellent and best in class, experts from practice (the best open innovators of the previous year) needed to visit the companies and look into their activities. Yet, no existing measurement system could support us. The same is true for the internal monitoring of open innovation activities. Most related key performance indicators measure the number of, e.g., external partners, collaborative patents, or open innovation projects successfully finished, instead of the impact or reach of activities (e.g., membership in the most important networks, quality of the partner in the own network, or impact of open versus closed innovation projects on corporate performance). Our on-going research in the field of innovation metrics might help to shed light on this topic as well.

The following chapter is giving an overview about our recent research results in the area collaborative innovation, derived from the 2014 innovation study. Thanks to all participating companies we are able to enrich knowledge about when collaborative innovation is mandatory and beneficial and what to do.

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How can open innovation help firms to systematically enhance their innovation performance? Which open innovation activities might be more beneficial than others? Are there specific drivers for open innovation and antecedents of business model innovation? In this regard, the innovation study 2014 was to support firms in benchmarking against others and help to answer such questions.

The innovation study dealt with three key topics: open innovation, cross-industry innovation and business model innovation. In this context, our institute predominantly focused on organizational capabilities including cultural, strategic and structural aspects which might foster or hinder specific innovation formats and approaches in the corporate landscape. To gather the required information for a benchmarking analysis, we collected the quantitative data via a web-based online survey between April and August 2014. Thus, we used a four-way mailing tactic and addressed top executives of large as well as small and medium-sized enterprises (SMEs) with different industry affiliations via a personalized cover letter.

In total, we addressed about 1,800 firms and received more than 200 responses. Since some questionnaires were not fully completed, we had to cope with missing values regarding specific questions. Furthermore, some response times were too long to be valid for our analysis. This led to a reduction in sample size. Apart from these issues, some firms did not reach a critical firm size or were categorized as start-up firms which again led to a reduction. Finally, we were able to utilize an adjusted sample of 169 observations for the benchmarking analysis.

Strategy as driver for firm openness

Based on theoretically derived strategy profiles (DeSarbo et al., 2005, Fiss, 2011, Olson et al., 2005), we were able to separate the corporate landscape into different proactive strategy archetypes. In our survey, firms were asked to categorize themselves according to defined strategy profiles. With regard to innovation orientation, our benchmark analysis focused on the three proactive strategy archetypes known as prospector, analyzer and defender.

The prospector’s profile describes an innovation seeker, since these firms frequently want to be pioneers with new product or service concepts in their markets. Such firms proactively enter new market segments where they have perceived opportunities and new trends. Furthermore, prospectors concentrate on offering products or services that overcome and push performance boundaries. They are used to offer the most innovative products or services, whether based on performance improvement or cost reduction.

The analyzer’s profile describes a firm to rarely be “first-in” with new products or services. By carefully monitoring their competitors’ actions and customers’ responses, however, analyzers are characterized as “fast followers” with a better targeting strategy, an increased customer benefit, or lower total costs. Depending on the product or service category, analyzers consciously decide in favour of two differing strategies: In some categories, they act as cost leaders and thus, attempt to enhance market shares in existing markets. In other categories, they aim for a differentiation strategy in order to stand out by offering the most innovative products or services.

The defender’s profile exhibits that these firms try to maintain a relatively stable domain by proactively protecting their product-market position. Defenders are rarely at the forefront of product or service development. Instead, they often follow one out of two possible sub-strategies:

(1) On the one hand, they might focus on producing goods or services as efficiently as possible. They frequently emphasize an increase of existing market shares and provide products or services at best price. This archetype is known as the cost-leading defender.

(2) On the other hand, they might focus on providing superior levels of service or product quality. Then, their product or service prices are typically higher than the industry average. This archetype is known as the differentiated defender.

According to the different business strategies, the degree of firm openness and the use of specific open innovation activities can be deduced (Bader and Enkel, 2014). Firms which follow a prospector strategy are usually more open than firms which follow a defender strategy. As the analyzers are positioned in the middle, prospectors are said to...
have the highest degree of firm openness, followed by the analyzers, and followed by the defenders (Bader et al., 2014).

Based on the archetypes’ market and innovation orientation, internal structures and processes and objectives regarding resource allocation, this assessment makes sense. To get a better overview with respect to the archetypes’ utilization of open innovation activities, we calculated the mean of activity utilization for each strategic archetype.

Comparing the three strategy archetypes concerning openness

In line with the exploratory study by Bader and Enkel (2014), we reveal that prospectors and analyzers achieve the highest overall value. In this regard, prospectors and analyzers especially excel at using outside-in and coupled open innovation activities. Concerning the outside-in activities, the integration of customer knowledge, ideas and competences achieves the highest value across all three strategic archetypes (see figure 1). Similar results are provided for the integration of suppliers into the firms’ innovation processes. From a defender’s perspective, this makes sense with regard to its tendency toward efficiency and process optimization. From a prospector’s and analyzer’s perspective, these activities count as state-of-the-art in open innovation and thus achieve the highest values. In contrast, the use of ideas generation and/or solution platforms is relatively low across all strategy archetypes. Regarding analyzers, we exhibit that they frequently integrate lead users and share knowledge across business units that operate across industries. Moreover, analyzers often appear to concentrate on cross-industry innovation activities which matches their market and innovation orientation (see Bader and Enkel, 2014 for details).

Figure 1: Outside-in open innovation activities
Compared to the average sample, top innovators more often share knowledge between business units within their own company and active in different industries. Top-innovators are further in leading position regarding the usage of creativity workshops and online idea generation.

Figure 2: Outside-in open innovation activities: top innovators

Figure 3 highlights that inside-out activities are less present across all strategic archetypes. One reason for this might be the fact that outside-in open innovation is still more common for firms nowadays. For prospectors, the provision of contract research for external staff is the most important inside-out activity. Nevertheless, the degree of utilization is still comparatively low. Analyzers rely most on off-licensing of products and services to foreign geographical markets.

Figure 3: Inside-out open innovation activities
Concerning the coupled open innovation activities, prospectors obviously use long-term collaborations with external partners to gain broad access to different opportunities and trends (see figure 4). Similar to selective customer integration, the joint development projects with customers is the most important activity for all strategic archetypes, followed by joint projects with suppliers. In this vein, prospectors and analyzers again achieve higher values than the defenders do. While joint development projects with universities and research institutes of the same knowledge areas reach the third highest value, cooperation with universities and research institutes of foreign knowledge areas is among the weakest coupled activities. As several firms are not yet prepared to accept a high cognitive distance, referring to the knowledge heterogeneity between collaborating firms, between themselves and their partners, they still rather tend to innovate with partners of similar knowledge areas.

The top innovators in our sample achieved higher scores across all coupled activities. They especially excel with the joint development between business units within the own company and active in different industries; as well as projects with universities and research institutes of the same and foreign knowledge areas.
As said before the defenders are less open with regard to the integration of external knowledge and predominantly focus on their internal know-how. Since defenders strive for either cost leadership or best quality (see cost-leading versus differentiated defenders), these firms do not have to open up as much as prospectors do and can still be equally successful. This is true, as firms sometimes lose focus and over-search or rely too heavily on external resources (Dahlander and Gann, 2010). As a result, one cannot argue that firms with a higher degree of firm openness are more successful. If they do adapt their innovation strategies – including the application of open innovation activities – to their strategic direction and innovation culture, these firms are more successful in their markets (Bader et al., 2014, Drechsler and Natter, 2012, Gianiodis et al., 2010).

Establishing a culture for open innovation

An innovation-oriented culture plays a significant role for firms to increase their product, service and business model innovations. The resource-based view states that firms can gain a competitive advantage if their corporate culture has certain characteristics. Therefore, culture should be a precious organizational resource that incites the firm to perform actions with a succeeding economic value, be unique and difficult for competitors to imitate (Barney, 1986, Kleinschmidt et al., 2007).

Corporate culture further plays a significant role in the successful implementation of open innovation, as it lays the foundation for the acceptance of external ideas and innovations within the company. Especially firms that intensively utilize open innovation have a culture where willingness to focus on future markets and willingness to take risks are strong. Those traits are important as the external sourcing of technology is accompanied by higher uncertainty and risk (Bader et al., 2014, Herzog and Leker, 2010). The multi-layered model of organizational cultures by Schein (1992) can be used to analyze and differentiate between different cultural levels. This framework uses different layers namely cultural values, norms and artefacts. Because values and norms are intangible, they must be transformed into artefacts to finally affect a firm’s innovativeness (Hogan and Coote, 2014, Stock et al., 2012). Prospectors score highest for all attributes of cultural values, whereas defenders score lowest. Further all three values supporting innovation are similarly strong pronounced.

Cultural norms for innovation (e.g. principles, goals and philosophies which shape expected innovation related behaviour) are also strongest for prospectors, followed by analyzers and defenders. Especially the openness for new ideas and concepts seems to be a central cultural norm considering the firms’ open innovation strategies (Herzog and Leker, 2010).

The below figure illustrates in what way firms intend to make cultural values and norms more tangible and visible in their organisation. As the prospector sees itself as an opportunity seeker and open innovator, it tends to circulate stories of exemplary innovation-oriented executive actions. Furthermore, firms of this archetype communicate about their employees who have strongly encouraged the implementation of disruptive practices and processes. Both prospectors and analyzers explicitly reward their employees for disruptive approaches and actions and offer creative meeting and discussion areas. Based on the defenders’ goals, this archetype rather focuses on practices and actions concerning efficiency, process optimization and incremental innovation.

Figure 6: Cultural values, norms and artefacts for innovation
„The Open Innovation Study of the Zeppelin University / Germany does provide extremely interesting insights. Especially the participation does result in looking at Open Innovation from different unusual perspectives, which creates very valuable stimulations to the own innovation process. I can highly recommend the participation“  
(Prof. Dr. Wiltrud Treffenfeldt, Dow Europe GmbH)
Business model innovation

The results of this study reveal that the sample firms are already notably engaged in business model innovation (see figure 7). "A business model depicts the strategic configuration of firm resources (in terms of physical, human and organisational assets, capabilities, and relationships) required to create and deliver a distinct value proposition in order to profitably exploit an entrepreneurial opportunity." A business model innovation therefore "represents an adaption of the strategic configuration of firm resources to create and deliver a distinct value proposition." (Mezger, 2013). However, the top business model innovators (top 10%) are significantly ahead of the sample average in all categories of business model innovation. They excel not only in terms of pursuing more business initiatives than competitors, but they also systematically reassess their current business models, competitive positioning and value chain networks as part of their strategy. In addition, they develop and establish new business models in a systematic way, e.g. by providing a manual to intrapreneurs, organisational formats to develop ideas and concepts as well as a budget to keep. Those activities might contribute to the success of the top innovators’ business models.

![Figure 7: Business model innovation and transformation](image-url)

By means of business model innovation, firms aim to sustain value creation and capture for their stakeholders and themselves (Amit and Zott, 2001, Sosna et al., 2010). In case of a transformation, a firm does not introduce a modified or new business model to complement its prevailing business model(s), but to replace it (Mezger and Bader, 2014).

Our study shows that business model transformation is of considerable relevance to our sample firms (see figure 7). The majority of participating firms has already gained experience in the transformation of business models and has transformed at least one of its business models within the last five years. Yet the top business model transformers (top 10%) differ from the sample average insofar as that they do not only focus on the transformation of any of their business models. Instead, they have also gathered experience in the substitution of their prevailing business models. Thereby, they significantly outperform the average firms. The prevailing business models of the top transformers might have become obsolete or less profitable due to external influences such as new customer needs, regulatory or technological changes. Thus, the top transformers might have improved their knowledge about business model transformation and are likely to be more successful at transformation than the sample average.
Cultural influence on business model transformation

When transforming a business model, companies introduce a new competing business model which usually cannibalizes the current one (Mezger and Bader, 2014). Drawing on cannibalization research (Danneels, 2008, Nijssen et al., 2005), this study also addresses willingness to cannibalize as a relevant factor for business model transformation. It reflects a firm’s attitude to rethink and possibly give up profitable resources in favour of innovations (Chandy and Tellis, 1998). Willingness to cannibalize can comprise the dimensions of investments, sales and capabilities.

Willingness to cannibalize on previous investments refers to a firm’s preparedness to diminish its investments in established resources and assets in order to enhance business model transformation (Chandy and Tellis, 1998, Danneels, 2008).

In our study, we found that all participating firms are only partially willing to cannibalize on investments (see figure 8). Neither the sample average, nor the top business model transformers are willing to completely give up their previous investments. This is the case, as firms spend a lot of tangible and intangible resources on investments which could still be used in the future. The top business model transformers outperform the sample average in all categories concerning a firm’s willingness to cannibalize on investments.

![Figure 8: Willingness to cannibalize on previous investments](image)

Willingness to cannibalize on sales refers to a firm’s preparedness to accept a reduction in sales of current products and services when introducing a new business model (Nijssen et al., 2005).

Our study reveals that the top business model transformers are more willing to cannibalize on sales than the average firms (see figure 9). The top transformers seem to acknowledge that the cannibalization of current sales in favour of a new business model results in a competitive advantage. These firms might also have more experience with the modification of business models and suffer less from organizational inertia than the sample average.
Willingness to cannibalize on capabilities can be defined as the extent to which firms agree to let go of current organizational competences and routines in favour of a new business model (Nijssen et al., 2005).

In this study, the sample average only moderately cannibalizes on capabilities concerning a new business model where a notable change in organizational schemes, abilities, structures and processes would take place (see figure 10) (Leonard-Barton, 1992). The top business model transformers, however, display a considerably higher level of willingness to cannibalize on capabilities. Thus, they may transform their business models in a more successful way by having the right and not primarily obsolete capabilities in place.

To sum up, both the sample average and the top business model transformers are rather willing to cannibalize on sales and investments than on capabilities. This might be due to the fact that capabilities represent valuable resources that have been established in the firms over a considerable period of time. In contrast to investments and sales, the value of capabilities can hardly be measured. Hence, it might be more difficult for firms to find out whether cannibalization of capabilities is indeed worthwhile.
The innovation award winning companies in 2014

At the Innovation 2014, one of the most renowned innovation conferences in Europe, the Dr. Manfred Bischoff Institute for Innovation Management of Airbus Group (former EADS) elected this year’s innovation champions. The awards were granted to The Dow Chemical Company (Best Open Innovator), Audi AG Production (Best Cross-Industry Innovator) and BMW AG (Best Business Model Innovator). And thanks to outstanding innovation performance in all three categories, SAP SE received an overall “Best Innovator” award.

Outline of the innovation study 2014

This year, more than 200 companies from the DACH region (Germany, Austria and Switzerland) participated in our innovation study from May to October 2014. According to current topics in innovation science and the latest issues addressed by the industry, this year’s questionnaire focuses on open innovation, cross-industry innovation and business model innovation.

The most promising companies were selected from all participating companies for individual case studies. Based on the company’s strategic orientation, prospector, analyser or defender (describing the degree of progressiveness), it was possible to theoretically derive optimal open innovation activity and compare it with the company’s real practice. Additionally, the degree of radicalness or disruptiveness of innovation reached with open innovation was regarded. In business modelling, the company’s willingness to cannibalize investments or capabilities was focused on as well as its innovative cross-industry activities, asking for long cognitive distance partnerships and best practices. Cultural antecedents were considered as the foundation for all those activities and can make a difference between success and failure of an initiative in open innovation.
Based on our company interviews with leading innovation experts, concrete examples clarified the company’s activities. Besides, additional sources and information about the company delivered a comprehensive view on its open innovation activities comprised in a case study. Those case studies were the basis for the jury’s last evaluation round.

The expert jury was formed by Dr. Hans-Joachim Weintz (J.W. Ostendorf GmbH & Co. KG), Ulf Timmann (Henkel KGaA) and Dr. Reiner Fageth (CEWE COLOR Stiftung & Co. KGaA). They were the representatives of last year’s best innovators. They were accompanied by Otto Gies and Caroline Legler from Airbus Group and from the scientific side, Prof. Ellen Enkel, head of the institute for innovation management, and her team.

From left to right: Susanne Klinger (Management Circle AG), Karoline Bader (Zeppelin Universität), Matthias S. Brodrück (Management Circle AG), Caroline Legler (Airbus Group), Claus von Riegen (SAP SE), Dr. Reiner Fageth (CEWE COLOR Stiftung), Michel Sérié (SAP SE), Dr. Matthias Meyer (BMW AG), Prof. Dr. Wiltrud Treffenfeldt (The Dow Chemical Company), Kai Petrick (BMW AG), Alois Brandt (Audi AG), Felix Schwabe (Audi AG), Prof. Dr. Ellen Enkel (Zeppelin Universität), Dr. Hans-Joachim Weintz (J.W. Ostendorf GmbH & Co. KG)
Based on the jury’s rating, six of them were chosen for extended company visits in order to dive deeper into the companies’ open innovation approach and excellence. The visits took place between September and October 2014. In these workshops, the six selected companies provided a deep understanding of why they are at the top of Europe’s innovating companies with applied open innovation. After the last visit, the jury, comprised of last year’s winners, agreed on four winning companies in the categories: open innovation, cross-industry innovation, business model innovation and best overall innovator. In order to illustrate the basis of the jury’s decision, we have included a short overview of their prize winning activities below.

The Dow Chemical Company
(Best Open Innovation Award)

Dow combines the power of science and technology to passionately innovate what is essential to human progress. Founded in 1897, the Company employs approximately 53,000 people worldwide delivering solutions to customers in 180 countries in high growth sectors such as packaging, electronics, water, coatings and agriculture. In 2013, Dow had annual sales of more than 57 billion US-Dollars. The company’s more than 6,000 products are manufactured at 201 sites in 36 countries across the globe. The jury was invited to the central innovation hub of Europe, Middle East, Africa led by Prof. Dr. Treffenfeldt. Dow is located in the B2B business; therefore, innovation communication is important from both an internal and external point of view.

One third of Dow’s revenue is generated from products that have been on the market less than five years. The majority of Research and Development is located in the business units, complemented by a Core R&D organization which is dedicated to fundamental research. Application Development is a focus in Europe. To facilitate the interaction with external partners, the “Customer Innovation Center” was recently established in Horgen, Switzerland. This center helps to integrate the external perspective and needs of customers, suppliers, equipment manufacturers and other external partners like universities. In the “Packaging Studio” for instance, a lot of industrial scale packaging equipment is available to test new materials and co-develop with external partners along the process and value chain such as converters, packaging companies and food companies.

Via the „Strategic University Network“ Dow is conducting joint research projects with top science institutions in many disciplines to develop new technology platforms and introduce the latest scientific developments into their own portfolio. For example, Dow collaborates with several Fraunhofer Institutes, NGOs like the “Clinton Global Initiative”, or the “Bioökonomierat”. The „Innovation Playbook“ is an internal tool to manage internal and external innovation projects across business units and geographies. Increasingly, other tool such as „Innocentive“ and „Idea Central“, where ideas and projects can be proposed and developed by anyone in the company, are gaining importance and creating an open innovation space. “Sustainability Challenges” run at Universities and Dow’s engagement for the Olympic Games is also a driver for new innovation with the purpose to address global challenges, like clean water supply, food safety and energy conservation for example. A special effort in Europe is being made to collaborate along the value and supply chain to integrate stakeholders in an open innovation approach. Successful examples are the collaborations with Evonik Industries or last year’s award winning Henkel KGaA as innovation partners. These projects can cover R&D projects, Joint-Ventures or even licensing IPR (Intellectual Property Rights).

Audi AG Production
(Best Cross-Industry Innovation Award)

The Audi Group delivered approximately 1,575,500 cars of the Audi brand to customers in 2013 and produced more than 1.9 million engines. The production is located in Ingolstadt und Neckarsulm, as well as in nine international production facilities, following the dictum „one name, one standard, everywhere“. Each team has to fulfill highest demands concerning quality, efficiency, environmental safety and innovation. Audi itself, which is part of Volkswagen AG, generated 49.9 Billion Euro of revenue in 2013. The company currently employs more than 70,000 people worldwide, thereof more than 53,400 in Germany.

Audi’s strategy 2020 consist of several operating items, one of the most important ones is the goal to become „innovation leader“. They want to become the first in design and technology as well as the first in providing complex mobility solutions for tomorrow’s needs. Therefore they have to find a fit between customer expectations and high end technology. For special achievements in cross-industry innovation, Audi Production is awarded the 2014 price in this category.

Cross-industry-innovation, which means to innovate and collaborate across industry boundaries, is interesting at Audi Production in several ways. On the one hand, they cross the boundaries of the department and use the knowledge of R&D or sales for example. On the other hand, being part of the Volkswagen Automotive Corporation, they can cross...
company boundaries within the same industry without dealing with the open-innovation paradigm. And not least, they inbound knowledge from different industries to learn and improve their innovation management. External knowledge is accumulated by using open innovation activities like scientific collaboration and calls for proposals. They offer test drives and do lead user analysis, also looking into the future with this methods. Several competition awards like the famous „Audi Production Award“ (production of the future), the „Tool Trophy“ (focusing on equipment), the „Audi Urban Future Award“ (for architects and planners) and “Urban Production Conference” are addressing a broad field of topics. The last one is a different approach to cross-innovation. Because the common topic is outside the context, but it deals with a superior urgency and brings together different stakeholders like a mayor, a retailer company, citizens, production, climate counselors and others. Moreover Audi Production uses intermediaries like “Nine Sigma” or “Deutscher Technologieidienst” to get subject-specific but cross-industry input. Internally, Audi Production established an innovation league with rankings and prices for best cross-industry innovation, which underlines the priority of activities as described.

Furthermore, employees are encouraged to visit conventions or exhibitions outside their industry and to talk to external experts who might be interesting due to their different industry background. A „know-how wheel“ is concentrating information, clustering the input and supporting the staff in finding right sparing partners. To foster these approaches, informal knowledge sharing is supported by innovation events as Audi “Production Labs or Innovationscampus” as pre-development and technology days or the “Innovations-Liga”, where potential multiplicators and experts from potential partners out of different industries are invited. For example, to support out-of-industry thinking, the dinner speech at the internal innovation event was hold by a nun in order to provide a completely new view on innovation for Audi Production. This leads to some business model innovation in the last years for example the “Audi Werkzeugbau”, conceptualizing and developing tools for industry solutions. With small creative concept teams, Audi Production is looking for new innovative business model innovation to push the innovation output.

**BMW AG**
(Best Business Model Innovation Award)

BMW AG was founded in 1916 and is located in Munich, Bavaria. BMW is a motorcycle and automobile OEM generating 76 billion euros revenue a year and employing 110,000 people worldwide. As a manufacturer of premium cars, innovation is required not only for products, processes or production, but increasingly in the field of new services and business models. This is why the jury awarded BMW the best Business Model Innovation Award in 2014. Open Innovation at BMW is deeply integrated in the overall organization. BMW conducts crowd-sourced idea and design contests on external as well as internal platforms (e.g. BMW “Co-Creation Lab”, “MINI SPACE”) to team up with the community to innovate the future mobility. The “Virtual Innovation Agency” started in 2001 as a direct interface from customers and external innovators to the BMW R&D department. BMW uses systematically cross industry innovation approaches and intensified lead-user and customer development innovation by setting up the “Innovationswerk”, an internal innovation consulting.

Remarkably, BMW is leading in the field of business transformation. It’s still about cars, but the focus shifts from building and selling towards providing intelligent mobility solutions. In former years automotive OEMs have enriched their business offer from production and sales of cars to offering financial services, after sales services or integrating new technology to individualize the product. With the help of methods like lead user integration, hackathons, design thinking or public contest, they integrate an external perspective. For example, the call for proposals “BMW Urban Driving Experience Challenge” brought radical ideas like lightning for pedestrians or duplicating the traffic sign information in the car. Today, younger customers do less focus on the possession of a car but on spontaneous and hassle-free mobility and services around it. First, it is about the shift from traditional to electric cars, where BMW completely thought differently to develop the BMW i3 for example. It is much more than “just” an electric driven car, but a holistic mobility concept also including various services around mobility. Second, using their BMW i-venture company as an investment vehicle, they started to orchestrate an ecosystem of start-up companies, offering solutions around mobility.

BMW divided their business model innovation in categories. The first one like “ConnectedDrive” offers car enabled services, the second one is car related, like the car sharing platform “DriveNow” or the parking solution “ParkNow”. The third one deals with car-independent mobility services like “Life360”, a locator for family members, a messaging tool and communication app all in one. Future complementary business models might use all kinds of data from the car, driver or even the weather forecast to provide a new value proposition for the customer.
SAP SE
(Best Innovator)

SAP SE, located in Walldorf, is the world’s biggest software company outside the US, generating close to 17 billion euros in revenue in 2013. More than 68,000 employees are working on business process management and provide enterprise solutions for various industries and lines of business such as financials, HR, procurement, logistics, or sales. The jury rewards SAP SE as Best Innovator in all three categories (open innovation, cross-industry innovation and business model innovation).

Initially, SAP started its business offering standard software solutions and providing the necessary services for customers to install and run the software on their premises. Meanwhile, the company also provides cloud-based solutions, emphasizing that SAP has shifted from a traditional product supplier to a Software as a Service (SaaS) provider. Besides, SAP also develops and offers business network solutions. Within these networks, they support information exchange and business transactions among network participants. The latest developments are business model innovations dealing with Information as a Service.

With respect to open innovation, idea generation together with the customers is very important for SAP (outside-in process), especially during the early stage of the innovation process. These ideas are then refined in design thinking workshops and translated into the internal SAP innovation process. Besides, SAP works on the commercialization of their intellectual property, e.g. by providing start-ups early and easy access to the HANA technology platform (inside-out process).

Since SAP provides software solutions for a wide range of different industries, cross-industry innovation is an important basis for new products and services. SAP uses its own current software solutions to recognize the demands of their stakeholders. They collect the information, organize it industry-sector-specifically and share it in the “Industry Cloud”. Every employee has access to this information system describing approximately 25 industry sectors. Regular meetings of the different sector teams improve the internal exchange across sector boundaries.

Concerning business model innovation, SAP developed cloud-based solutions like the SAP Connected Vehicles or SAP Ganges. SAP connected vehicles offers various services to automotive partners to help them find their way in new connected vehicle markets. It is a modular system that is completely customizable and extendable. SAP Smart Parking service, for example, allows connected car drivers to find a reserved parking spot conveniently before they arrive. Or drivers of electric vehicles can use the Charge Spot Aggregation service to get location and real-time status information about charging points nearby.

For handling new kinds of point of interest transactions such as parking, fuelling or access to local attractions, SAP’s convergent charging solution fully integrates with SAP Connected Vehicles. Besides, the partners can create individual charging mechanisms per transaction or individually. To sum up, the idea behind Connected Vehicles is to use the car as a sales channel by transforming the point of interest (poi) into a point of profit (pop).

SAP Ganges is a business network for the many small Indian retailers. It connects the consumer product companies with their distributors and retailers and gives them real-time information to improve their supply chain efficiency. SAP started this business network in India, the country with the most retail shops in the world, but the aim is to translate it to other retail-rich emerging economies globally.

In spring 2015, we are going to relaunch the “Best Innovator Study 2015” and we are looking forward to your participation.

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„Open innovation is the osmosis and reverse osmosis of knowledge across the porous interface between an organization and its environment“

(CDIP/6/6 rev)
insights in collaborative innovation
Although there is a confirmed connection between strategy and innovation (Gianiodis et al., 2010), the impact of strategic direction on a firm’s degree of openness needs further investigation. An exploration of this linkage seems fundamental, as the quality of this relationship is likely to affect a firm’s innovativeness and its financial success. A healthy degree of openness is regarded to deliver a diversity of knowledge that fosters innovation in firms. When associated with a firm’s strategic direction and its readiness to open up, such efforts empower firms to accomplish a competitive advantage over rivals (Bader and Enkel, 2014, Drechsler and Natter, 2012). Although research is not clear about how firms come off best with their balance between open and closed innovation initiatives, a conceivable rule of thumb via strategic direction and innovation culture as determining factors can be presented (Bader et al., 2014).

Why firms should open up

While firms like Procter & Gamble have successfully established an open innovation strategy, there are also other firms which have already experienced difficulties with an increased degree of firm openness (Dodgson et al., 2006). Before pursuing and promoting an open innovation approach, firms ought to consider both benefits and drawbacks of openness or purely internal development.

If firms decide to strongly open up their innovation processes toward the external environment, they suddenly have to deal with an augmented complexity and higher costs of coordination and search. Inexperienced and ill-equipped firms might even reveal confidential knowledge by accident and thus, a loss of competences and know-how cannot always be prevented. Additionally, firms cannot always be sure to find the right external partner when conducting open innovation, and they might not be able to cope with a potential disequilibrium between open innovation and their day-to-day business. Such undesirable consequences can negatively influence a firm’s innovation performance and its long-term innovation success (Enkel et al., 2009).

However, if firms overemphasize a closed innovation model, they are likely to also suffer from drawbacks. If there is too little exchange with the external environment, they might miss a variety of lucrative options and not use every accessible instrument to create new product, service or business model innovations more quickly than their rivals do. Apart from that, these firms cannot share development costs and risks with an external partner and frequently require far more time to introduce and position new innovations in the market (Dahlander and Gann, 2010, Enkel et al., 2009).

As a result, one might raise the question why some firms are more open than others and why some firms benefit more from opening up than others do. Considering a firm’s desired innovation performance, e.g. measured via the turnover from radical versus incremental innovations, Laursen and Salter (2006) illustrated an optimal number of external sources used and exhibited optimal collaboration intensity. In this vein, they showed that a broad and intensive external search is curvilinearly associated with innovation performance. Thus, too much openness would not boost, but reduce a firm’s innovation performance (inverted U-shape). With regard to existing organizational capabilities, however, there is no rule of thumb which can determine a firm’s decision about open or closed innovation. However, specific strategic and cultural characteristics seem to impact a firm’s individual degree of openness (Bader et al., 2014).

Linking strategic direction and firm openness

Most firms follow a proactive strategy and match their organizational structures and processes accordingly in order to successfully perform new product and service development. These firms ought to purposefully coordinate both their strategic direction and their degree of openness with one another (Bader and Enkel, 2014), since the argument that more openness leads to a better innovation performance is not essentially true (Laursen and Salter, 2006). In cases where a firm’s innovation management is perfectly aligned with its strategic direction, a desired innovation performance can be realized (Fiss, 2011, Olson et al., 2005). As firms vary regarding their strategic direction, they are likely to balance their open and closed innovation initiatives differently (Enkel and Bader, 2014).
Based on the original Miles and Snow (1978) strategy typology, three proactive strategies and one non-proactive strategy can be used to analyze the link between strategic direction and open innovation. The non-proactive strategy is known as the reactor and the proactive strategies are called prospector, analyzer and defender. Firms which follow one of the three proactive strategies, succeed in their market domains and achieve a solid financial performance when adapting their processes, methods and activities accordingly (Fiss, 2011). The reactor as non-proactive strategy, however, simply reacts to competitive actions and does not provide a constant strategy-structure connection. This strategic direction is regarded as market failure and would neither lead firms to innovation nor financial success. Based on previous empirical studies (e.g., DeSarbo et al., 2005, Fiss, 2011, Olson et al., 2005, Slater and Mohr, 2006), Bader and Enkel (2014) revisited the three proactive strategic directions via a comprehensive quantitative and qualitative data collection between 2010 and 2012 with regard to innovation orientation. In their exploratory study, they derived the opportunity-seeking prospector, the dual-oriented analyzer and the market-segment securing defender.

<table>
<thead>
<tr>
<th>Defenders</th>
<th>Analyzers</th>
<th>Prospectors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal structures and processes</strong></td>
<td><strong>Degree of centralization and formalization might be high or low</strong></td>
<td><strong>Informal structures and flexible processes</strong></td>
</tr>
<tr>
<td>- Formalized processes and legitimized management principles</td>
<td>- Control over processes and operations</td>
<td>- Less adherence to predefined practices and operations so as to quickly adapt to external changes</td>
</tr>
<tr>
<td><strong>Market and Innovation orientation</strong></td>
<td><strong>Due technological core (hybrid strategy)</strong></td>
<td><strong>Broad product-market domain</strong></td>
</tr>
<tr>
<td>- Tight product-market domain</td>
<td>- Differentiation or cost leadership depending on product category</td>
<td>- Continuous quest for opportunities beyond own sector</td>
</tr>
<tr>
<td>- Little quest for opportunities beyond own sector</td>
<td>- Increase of novelty and reduction of R&amp;D risk as two objectives</td>
<td>- Trigger for change and novelty in dynamic environment</td>
</tr>
<tr>
<td>- Focus on internal process optimization and cost-efficient core technology</td>
<td>- Both incremental and radical innovations</td>
<td>- Willingness to take risks</td>
</tr>
<tr>
<td>- Market segment leader</td>
<td>- Differentiation strategy</td>
<td>- Technology leader</td>
</tr>
<tr>
<td>- Cost leadership or focus on niches</td>
<td>- Tendency towards radical innovations</td>
<td>- Market-segment securing defender</td>
</tr>
<tr>
<td>- Tendency towards incremental innovations</td>
<td></td>
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</tbody>
</table>

Figure 1: Revisited strategy typology of innovation management

**The opportunity-seeking prospector**

The opportunity-seeking prospector can be portrayed as open innovator or opportunity hunter, as it intensely exchanges know-how with external partners and continuously looks for novel market opportunities and trends. Since the opportunity-seeking prospector can respond to new and possibly unexpected movements in the markets more quickly than other archetypes, it is often considered as originator of change. The opportunity-seeking prospector tends to strive for a differentiation strategy and technology leadership, but not necessarily for market segment leadership (Fiss, 2007, Slater and Mohr, 2006).

Scouting activities and early trend identification are crucial for the opportunity-seeking prospector. This archetype tends toward an open innovation model and uses a wide-ranging pool of open innovation activities (Bader and Enkel, 2014, Olson et al., 2005). In this regard, the opportunity-seeking prospector searches for novel ideas, technological solutions and even business model concepts across industry boundaries and is used to transfer interesting solutions into its own field of activity (Enkel and Gassmann, 2010).

Nevertheless, the opportunity-seeking prospector can only be successful in the market if its cultural and strategic backgrounds match the archetype’s innovation model (Bader et al., 2014). Based on this archetype’s widespread opportunity search and its propensity toward open innovation, the negligence of cost-effectiveness might be the most serious issue which the opportunity-seeking prospector is confronted with (Miles and Snow, 1978).
The dual-oriented analyzer

The dual-oriented analyzer follows a hybrid strategy and is positioned between the opportunity-seeking prospector and the market segment securing defender. Depending on the product or service category, the dual-oriented analyzer operates in stable and dynamic markets and takes conscious decisions about its market and innovation orientation. In some categories, this archetype acts as cost leader and strives for market segment leadership, whereas in others, it emphasizes a differentiation strategy and is prone to technology leadership (Bader and Enkel, 2014, Fiss, 2011). Consequently, the dual-oriented analyzer acts like an opportunity-seeking prospector in some markets, whereas in other markets it employs an archetypal defender strategy. With respect to the dual-oriented analyzer’s twofold strategic core, it joins differentiation and cost leadership within its market orientation. In comparison to the opportunity-seeking prospector, the dual-oriented analyzer frequently aims for an improved target strategy by concurrently striving for two objectives: an augmentation in both efficiency and innovation novelty (DeSarbo et al., 2005, Olson et al., 2005).

Based on the dual-oriented analyzer’s two-sided orientation, it attempts to perfectly balance exploitation and exploration (Enkel and Bader, 2014). On the one hand, it frequently exploits internal knowledge and capabilities across business units and divisions to boost incremental innovation. On the other hand, it explores external know-how and technological solutions in miscellaneous markets to enhance the creation of radical innovations (Jansen et al., 2006). In this vein, the dual-oriented analyzer selectively screens present concepts and technological solutions in its own and in foreign industries and transfers the most attractive ones into its own field of activity (Bader, 2013). To balance exploratory and exploitative innovation approaches well, the dual-oriented analyzer needs to manage its resource allocation cautiously (Miles and Snow, 1978). Consequently, this archetype does not open up as broadly as the opportunity-seeking prospector, but focuses on fewer intense open innovation initiatives with nominated external partners (Bader and Enkel, 2014).

The market segment securing defender

The market segment securing defender describes the third proactive strategic archetype focusing on a narrow product-market domain. Due to the fact that the market segment securing defender penetrates and cuts off a fragment of the entire market, it is capable of achieving control over a limited product-market area (DeSarbo et al., 2005).

By striving for a cost leadership or focus strategy, the market segment securing defender tends to strengthen market segment leadership in its tight product-market domains. Firms can distinguish between two possible sub-directions when following a defender strategy. Some firms are likely to follow a cost leadership strategy and internally optimize their processes, structures as well as their resource efficiency. This archetype might be labelled as cost-leading market segment securing defender. Other firms in the category of the market segment securing defender aspire a focus strategy and protect a niche by providing a greater product or service value at a more expensive price compared to the industry average. These firms consciously differentiate from others via an enhanced quality or through their brand, and might be described as differentiated market segment securing defenders (Bader et al., 2014, Olson et al., 2005).

Based on its characteristics and strategic orientation, the market segment securing defender emphasizes a stronger in-house development in comparison to the other two strategic archetypes. Accordingly, the market segment securing defender rather tends toward a closed innovation model and only applies open innovation in a very selective and controlled way. Considering efficiency reasons, close and intense relationships with customers and suppliers play a major role for the market segment securing defender, whereas other external sources are rarely used (Bader and Enkel, 2014, Enkel and Bader, 2014).
Relevance of an innovation-oriented culture

An innovation-oriented culture is a linchpin to product, service and even business model innovation in firms. The resource-based view indicates that firms can achieve a competitive advantage over rivals if their corporate culture shows certain peculiarities. Firstly, a firm’s culture is a precious organizational resource that should incite the firm to perform actions with a succeeding economic value. Secondly, a firm’s culture ought to be unique and thirdly, the cultural characteristics should be difficult to imitate for competitors (Barney, 1986, Kleinschmidt et al., 2007).

Corporate culture counts as intangible phenomenon which is challenging to conceptualize, measure and even manage (Dobni, 2008). However, if a firm allows for a certain innovation orientation and is able to successfully influence and possibly change specific cultural characteristics, it is able to take the role of a game-changing innovator and can achieve growth opportunities offered through emerging markets (Lafley and Charan, 2008). Beside game-changing innovators such as Apple, 3M or General Electric, there are also some firms which needed to experience first-hand that numerous failures in the area of innovation are frequently cultural failures.

There are three different dimensions of an innovation-oriented culture: (1) shared values, e.g. collective beliefs, (2) behavioral norms, e.g. clearly expressed values within a firm’s strategy formulation, and (3) visible practices or artefacts which support innovation within a firm, e.g. success stories, rituals or events (Homburg and Pflesser, 2000, Stock et al., 2012). A solid innovation-oriented culture promotes a corporate setting where a firm’s employees highlight the necessity of novel products, services and business models. In order to actually be successful in the markets, a firm’s employees need to be receptive and responsive to new and creative ideas, concepts and innovations. Moreover, they should be empowered and even rewarded to take a certain level of risk, encouraged to involve in new product development and entrepreneurship, and authorized to explore new resources and approaches (Herzog and Leker, 2010, Kleinschmidt et al., 2007).

So far, research has rarely dealt with the topic of innovation-oriented culture, when considering a firm’s open innovation paradigm and its degree of openness. Despite cultural characteristics, such as the necessity to cope with the not-invented-here syndrome, there are hardly any empirical studies which investigate cultural antecedents of open innovation. One reason is the fact that it is still challenging to capture and measure the dimensions of an innovation-oriented culture (Bader et al., 2014, Herzog and Leker, 2010).

Linking innovation culture, strategic direction and firm openness

In the past, firms have experienced that their corporate culture ought to match their strategic setting and their competitive environment to successfully sustain their positions in the market (Barney, 1986). Accordingly, a firm’s strategic orientation should be adjusted to the underlying cultural antecedents meaning that a firm’s innovation-oriented culture should suit its strategic direction and innovation model which follow (Herzog and Leker, 2010). This is true, since the degree of openness seems to depend on both a firm’s strategic direction and specific cultural antecedents (Bader et al., 2014, Drechsler and Natter, 2012).

Since the opportunity-seeking prospectors tend toward an open innovation model (Bader and Enkel, 2014), these firms’ employees should be highly adaptive and open-minded regarding external ideas and knowledge. Opportunity-seeking prospectors need a strong future market orientation, should not be afraid of taking risks and perhaps fail, need to be prepared to cannibalize existing investments, and should invest in prospective opportunities. With respect to the market segment securing defender, these cultural characteristics are less dominant. This is the case, since the market segment securing defender applies open innovation activities very selectively, and tends toward a lower degree of openness. Instead, skills and tools regarding how to enhance efficiency and routinization as well as how to optimize structures and processes are more central for this archetype’s innovation-oriented culture (Bader et al., 2014).

During recent years, numerous firms have started to shift their innovation model, thereby enhancing their degree of openness. In doing so, a shift in the underlying culture and strategic direction is inevitable to stay competitive and successful in the market. If a firm enhances its degree of openness and changes its innovation model from closed to open, it might not be able to easily resolve prevailing cultural and strategic path dependencies. These issues are likely to occur, as the original closed innovation model probably suited the firm’s strategic direction and cultural background. Consequently, an increase in openness and a succeeding shift of a firm’s innovation model from closed to open would require both, a modification in the firm’s cultural backbone and in its strategic direction (Bader and Enkel, 2014, Barney, 1986, Herzog and Leker, 2010).
Conclusion

Both culture and strategy seem to be essential determinants with respect to the design of a firm’s innovation model. Both factors are likely to influence the firm’s innovativeness and its financial performance, allowing for a differentiation from competitors. Several firms have realized that culture and strategy play an important role when it comes to the creation of novel, innovative solutions and technologies. Culture corresponds to a multifaceted element which is fundamental for a firm’s subsequent strategic direction and its organizational behavior and actions (De Brentani and Kleinschmidt, 2004, Herzog and Leker, 2010, Stock et al., 2012).

Firms ought to internalize that both an innovation-oriented culture and a firm’s strategic direction correspond to intangible resources that cannot be acquired, but that have to be developed and shaped over time. Firms should possess the capabilities to make their cultural attitudes visible and more tangible for all employees, and to cleverly connect them with existing strategic, structural and process-related skills. Additionally, firms need the capability to quickly adjust to existing conditions in order to achieve an optimal fit between all influencing factors.

For further reading:


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Open innovation in developing countries

Although academic as well as practitioners’ papers are mostly based on open innovation examples from the developed world such as Procter and Gamble, Philips, or IBM, this reports from a collaboration with WIPO (World Intellectual Property Organization) illustrates with seven examples that open innovation is already very advanced in the developing world. All projects use multiple collaborations and a wide range of different and flexible agreements to expand their scarce resources. All projects have built an ecosystem of supporting partners around them to expand their sphere of influence and reach social goals they could never reach as a single organization.

Introduction

Originally, open innovation was considered the purposeful outflow and inflow of knowledge into the innovation process (Chesbrough 2003). This includes the search for new technologies outside a firm’s R&D department, the integration of customers’ ideas, the co-development with suppliers and the spin-off of new businesses not fitting to the core strategy.

Open innovation is the osmosis and reverse osmosis of knowledge across the porous interface between an organization and its environment (CDIP/6/6 rev).

Open innovation is here a strategic decision of the company to increase and accelerate innovation and efficiency using external resources. This approach is widespread in Europe and can be seen as a dominant design in innovation management, although the degree of openness varies in companies of different strategic approaches and sizes (Bader and Enkel, 2014). Open innovation 1.0 is based on transferring knowledge, expertise and even resources from one company or research institution to another. Open innovation is not the cure for every problem and there are still good reasons to balance it with other approaches (confidentiality, lack of expertise outside the company, weak collaboration culture within the company or within an industry, more focus on incremental innovation).

Successful small, medium-sized, and big enterprises have developed a network of bilateral and multilateral relationships to the external environment to gain the knowledge or skills needed or to learn from their partners. Multiple partners in innovation can be found along and outside the value chain, as well as on different horizontal levels and from other industries (Laursen and Salter, 2006). Those relationships form a network of knowledge flows the company is embedded in and needs to manage successfully to increase benefit.

Additionally, as the concept of open innovation (1.0) developed from focusing on a single organization and its relationships towards a more ecosystem-based view (open innovation 2.0), influencing many stakeholders, partners, goods, consumers, users and governments, we can see an evolution of the concept. Rightly, Dahlander, Gann, and George (2011) pointed out in their taxonomy on open collaborative projects, there are different forms of openness, in inflows as well as outflows and different means of appropriability (see table 1).

<table>
<thead>
<tr>
<th>Table 1: Different types of openness</th>
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</thead>
<tbody>
<tr>
<td><strong>Inbound innovation</strong></td>
</tr>
<tr>
<td><strong>Pecuniary</strong></td>
</tr>
<tr>
<td>Acquiring</td>
</tr>
<tr>
<td>Acquiring inventions and input to the innovative process through informal and formal relationships […]</td>
</tr>
<tr>
<td><strong>Non-pecuniary</strong></td>
</tr>
<tr>
<td>Sourcing</td>
</tr>
<tr>
<td>Sourcing external ideas and knowledge from suppliers, customers, competitors, consultants, universities, public research organizations, etc. […]</td>
</tr>
<tr>
<td><strong>Outbound innovation</strong></td>
</tr>
<tr>
<td><strong>Selling/Licensing</strong></td>
</tr>
<tr>
<td>Out-licensing or selling products in the marketplace […]</td>
</tr>
<tr>
<td><strong>Revealing</strong></td>
</tr>
<tr>
<td>Revealing internal resources to the external environment […]</td>
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Although knowledge is not reduced by sharing, it cannot be made unusable to others. This could demotivate collaborative innovation. “An appropriability regime affects an innovator’s ability to generate rents from innovation and therefore influences the incentive to innovate” (Dahlander, Gann and George, 2011, p. 6). Whereas formal appropriability or intellectual property rights are patents, trademarks, or copyrights, informal forms are complementary assets, first-mover advantages, or secrecy.

“With weak appropriability regimes, the profit margin will be driven to zero […], and in the absence of appropriability, firms have to rely on speed to market, timing and pure luck […]. Strong appropriability regimes provide incentives to invest in innovative activities, but can endanger the cumulative advance by limiting the use of the underlying knowledge. Weak appropriability regimes, in contrast, often result in knowledge becoming widely distributed, and this can create disincentives to innovate” (Dahlander, Gann and George, 2011, p. 6).

As a key insight, the above mentioned authors conclude that, the relative inefficiency of one mean of appropriability is typically compensated by a greater reliance on another (Dahlander, Gann and George, 2011, p. 8). Therefore, organizations consider various means of appropriability by working with different partners and different knowledge goods in a dense network of relationships. While open innovation 1.0 refers to the perspective of one organization, open innovation 2.0 takes into account this broader perspective.

Open Innovation 2.0 means on the one hand side that a specific innovation cannot be seen as an isolated activity without considering its consequences for its entire economic and social environment. On the other hand close collaboration, interaction and exchange among all stakeholders in an innovation ecosystem addressing business and social opportunities or challenges can lead to higher impact of innovations (European Commission, 2014, p. 5).

For instance, the invention and extended use of smartphones have significantly changed customers’ behavior, created and fostered new opportunities for further innovation in this and other markets, including mobile payment, online shopping or information search. This new perspective towards open innovation 2.0 incorporates the development of new products, services, and business models to address relevant socioeconomic issues, such as green growth, health care, nutrition, sustainable energy, and the digital economy. As the majority of literature on open innovation is based on cases in developed countries (see e.g. Enkel et al. 2009; Dahlander and Gann 2010; Lichtenthaler 2011; Huizingh 2011, Schroll and Mild 2012) the wider perspective of open innovation 2.0 might offer crucial potential for developing countries. It yields more opportunities to target bigger challenges in health, food, and poverty because it enables organizations to link up with companies, communities, and support and build an ecosystem of exchanging and creating knowledge and resources.

Ecosystems as the “fifth generation of network innovation” (Ritala et al., 2013) provide a framework for the description of networks of collaboration and competition that goes beyond the firm as focal actor. It allows one to consider the entirety of commercial and noncommercial actors directly or indirectly involved with an innovation (Palo & Tähtinen, 2013).

Stakeholders and participants in such an ecosystem can include business entities, universities, intermediate public and private research organizations, but also governmental organizations and agencies as well as citizens, societal interest groups, and financial entities. Within such an ecosystem, relevant participants engage with each other through multiple channels, even by pooling their internal resources: equipment, knowledge, technology, finance, people, markets, and data.

Organizations use a broad variety of different open innovation activities to build up their network for innovation. As already demonstrated in Silicon Valley’s gaming industry, collaborative innovation activities have a broader sphere of influence than only partners and customers. And as we have said before, there is little research about collaborative project-setting in the developing world. Therefore, we will address whether innovation ecosystems in developing countries can be explained using the theories developed mainly for European companies.

Developing countries already use a broad variety of open innovation activities and networks. In order to understand how they collaborate we identified via web search 35 open innovation 2.0 projects in developing countries (mainly Africa) which we ask for collaboration in our study. Seven projects agreed to send us further information and give us the opportunity to dive deeper in their ecosystems.

As illustrated in the following cases, innovation ecosystems in developing countries require different forms of appropriability. The cases were selected as already existing for more than three years, long
enough to build up and maintain an ecosystem. Each had formal agreements with partners from developing and developed countries. Finally, they target social problems.

We analyzed 7 ecosystems in developing countries by means of semi-structured interviews with key informants, mostly the CEO, founder and/or financial officer of the project, in all projects; additional internal and publicly available data from reports and presentations; and a survey filled out by key informants. We analyze the challenges and threats of each case with special regard to the management of collaboration in their ecosystems and compare the findings of each case with the others in a cross-case analysis. By analyzing the projects Ushahidi, iHub, Eclipse, the Human Genome Project, Desertec, Cambia, and Algeria’s Cyberpark based on a well-researched taxonomy, we were able to derive three main success factors of all projects.

**Comparative Study of IP Models**

As many of the interviewees of the above projects stated, the knowledge and information asymmetry between partners is a major impediment to innovation, especially between developing and developed countries. These projects apply different collaborative agreements to overcome knowledge and information asymmetry, at least within their ecosystems. Thus, they use their innovations responsibly to break ground for new market access and new forms of collaboration fostering innovation.

A common goal of the projects in this study is an open knowledge exchange to create solutions to bigger social problems. Ushahidi creates open-source software to collect, visualize, and interactively map information to make life safer, iHub and the Cyberpark are part open-community workspace, part incubator and vector for investors and venture capitalists for young technology entrepreneurs. The Human Genome Project created an open-source database to map the genome, Desertec, with its solar power plants in North Africa, produces renewable energy for Europe. The Lens tries to make all patent information public, searchable, and understandable.

All the projects use open-source software to decrease knowledge asymmetries in their ecosystem, so innovations can thrive. A subset of projects includes focal actors in their respective ecosystem, which strive to strengthen the capabilities of other actors and intend to accelerate learning processes for different start-up firms. Rather uncommon for projects in the developing world seems to be the mission to create a marketplace for knowledge, as they currently rely heavily on open source.

Based on the taxonomy of openness developed by Dahlander and Gann (2010), the main form of openness for projects in developing countries is sourcing followed by revealing. The analysis was done by mapping each partner agreement within each case in the above taxonomy to find out the degree of openness of the ecosystem. Every agreement in the ecosystem was therefore classified in the taxonomy by the interviews, which resulted in two dominant approaches for every project. Despite the differences in the importance of the project’s goals, the ecosystems all follow an inbound innovation strategy by sourcing external ideas and knowledge from their partners and an outbound innovation strategy by revealing internal resources to the environment, which might be characteristic of projects in the developing world targeting social innovation.

The two forms of openness less used, acquiring inventions and innovational input and out-licensing or selling products in the marketplace, require a closed software approach and are limited to already existing patents or money to acquire companies, resources, or products. These more commercial approaches collect and reveal knowledge as a public good and try to balance knowledge asymmetry between partners in and out of the ecosystem. Social innovation especially seems to require a more open approach, as partners in developing countries have more knowledge and competency to market than patents, money, or products. Some of the cases also use the acquiring and selling/licensing approaches with commercial partners from developed countries to finance their sourcing and revealing approaches with partners from the developing world as start-ups, nonprofits or small companies.

**What Makes an Open Innovation Initiative Successful**

Although most of the open innovation literature is based on examples from developed countries, this report illustrates examples of sophisticated open innovation 2.0 projects from developing countries. As many collaborations in developed countries are still struggling with IP agreements and a holistic view of all partners and their influence on the environment, these projects are well aware of their environment and use open innovation to achieve bigger social goals. Each has opted wisely for a degree of openness that allows it best to reach its goals with limited resources and a high degree of flexibility. Three main success factors can be derived comparing all projects:
Use of open-source software

Many open innovation projects in developing countries use an open-source approach for their collaborations, as our examples do. One reason why they choose this is that it allows for quicker diffusion of their products. Additionally, it minimizes barriers for potential users, who might not be able to pay for it. The Ushahidi project uses the open-source approach in all of their projects, including their FOSS Technology, which allows it to extend and deepen the ecosystem of its technology and spread it in areas of humanitarian work and crisis management. About its Ushahidi platform, it stated that “critical success [...] hinges on the integrity of this data, and the open-source framework helps to ensure this integrity via transparency and via lowering barriers to all, so the collective voice can be heard.”

ScarCity of resources to enforce IP

Another set of reasons is deeply rooted in the context of developing countries. Enforcement of intellectual property rights is lacking in some areas of the developing world. In such cases, the innovators have less incentive to spend resources on formal means of appropriation because it is uncertain if they will be able to successfully enforce their rights should someone infringe their IP. Scarce resources and a lack of access and understanding of the patent system further drive the use of open-source agreements instead of patents and other formal means of appropriation.

Variety of formal agreements and approaches to openness

Some projects use a variety of forms of appropriation in the different cooperation formats which they facilitate. The iHub project relinquishes any formal agreement with regard to start-up projects. But when dealing with partners from the developed world, iHub uses contractual agreements. While in Desertec and the Human Genome Project all agreements are pretty standardized, Ushahidi and Cyberpark use a variety of formal agreements and approaches fitting to needs of startup companies, social organizations, and commercial partners from developed countries.

Conclusions and Recommendations

As the widespread use of open source in collaborative projects indicates, the joint use of innovations is of high priority in developing countries. Especially for collaborative projects, this is due to the high interdependency within ecosystems. To ensure that innovations are properly protected, different forms of shared patent protection, like patent licensing, could be further promoted. To enable the projects to craft fair licensing terms, could improve the legal protection of their innovations, while also allowing widespread use of their technology by different actors. But to properly use licensing agreements and guarantee the protection of the interests of the organization would require assistance from third parties. One approach would be to teach members of a focal firm of an ecosystem, who then could mentor or assist staff members of other organizations within the ecosystem. Licensing agreements would not only allow for more collaborative innovation between projects in developing countries, but also allow them to use intellectual property from firms in developed countries. Partners could license patents still relevant for organizations in developing countries that may be dormant and without use in their original context.

WIPO promoted recently the use of open innovation and collaborative development models for research. At the recent WIPO Conference on Open Innovation: Collaborative Projects and the Future of Knowledge (WIPO, 2014), January 22-23, 2014, in Geneva, it was especially gratifying to see expressed the virtually unanimous view that open innovation is not only consistent with intellectual property, but that most forms of open innovation in the era of Big Data depend on robust IP regimes for the protection and diffusion of innovations that are produced through global collaborations and community-based efforts. Based on the findings from this study on the potential of open innovation 2.0 and the unique empirical evidence suggesting increasing open innovation maturity in the developing world, a final recommendation for WIPO would be to design and implement tailored capacity building for the strategic management of open innovation and collaborations in the developing world.

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The decision-making process of consumers for a specific product is often characterized by a high degree of complexity. For companies it is therefore very important to generate signals that are able to simplify the buying decision by reducing the level of complexity.

Studies have shown that a consumer’s perception of a firm as being innovative has an evident impact on the success of a firm in new markets (Keller and Aaker, 1997, Shankar et al., 1998), the credibility and perceived expertise of the firm (Golder and Tellis, 1993), the perceived quality and buying intention for its products (Keller and Aaker, 1997) and the stability of a buyer-seller relationship (Falkenreck, Wagner, 2011).

Since firms have various possibilities to innovate and create new products or product extensions (Beverland, Napoli, Farrelly, 2010) the interdisciplinary combination of marketing, innovation research and consumer psychology could shed light on the importance of (perceived) innovativeness of a company. This interdisciplinary approach could also help to investigate how the perceived innovativeness of a firm depends on specific flagship products and how the innovativeness of flagship products and the (perceived) overall innovativeness of a firm interact.

**Theoretical Background**

 Particularly for multi-product and high-involvement markets the development of innovative products and product extensions which satisfy consumers’ needs could be such a signal that helps the consumer to make his decision. The whole brand could be perceived as innovative because of the development of innovative products, and the firm may be able to realize a competitive advantage. Moreover, studies investigating processes and forms of brand extensions have shown that there are positive but also negative main, moderating and interaction effects (Keller, 2002), i.e. fit of characteristics (Aaker and Keller, 1990), similarity and dissimilarity effects, context effects (Wänke et al., 1998) or effects of prototype and exemplar fit (Mao and Shanker Krishnan, 2006) regarding the evaluation of a brand extension and its parent brand. Within this research, especially the existence of a flagship product as distinguishing mark could generate a highly interacting impact on the perception of a specific brand (firm) and may also be able to simplify consumer decision-making.

Against this background, the questions arise, a) whether the perception of innovativeness has a positive influence on different economic values (i.e. intention to buy, willingness to pay), b) whether the existence and the knowledge of a flagship-product, its innovativeness perception and perceived fit has an impact on the perceived innovativeness of a firm.

**Method and Analysis**

We conducted three empirical studies - one pilot study and two main studies – to investigate the relationship between the perceived innovativeness of a firm and the existence of a flagship product. In the pilot study we investigated the effect of the perceived innovativeness of a firm on the intention to buy a related product and the willingness to pay an extra charge for a product of the given firm to validate the relevance of the innovativeness perception. In the first main study we used real and known brands (electronics, cars, and pharmaceutics) to investigate the interaction effects of knowing and naming a specific flagship product with product perception and product fit on the innovativeness perception of the firm. In the second main study we investigated the effects of product perception and product fit on the innovativeness perception of the firm within an experimental setup using a fictitious pharmacy firm called “Schleswig” (with medicines/drugs for cancer treatment) to control for confounding effects of brand knowledge and firm history (compared to main study 1). Furthermore, it has to be mentioned that both main studies had no direct focus on the investigation of the concrete influence of consumer innovativeness and perceived expertise on the innovativeness perception because of their experimental setup and the concentration on flagship products and their impact. Nevertheless, to account for existing results of the effect of consumer innovativeness and expertise within different contexts of innovation and marketing research both versions were integrated as control variables (see Figure 1).
Results

Pilot study With regard to the influence of the innovativeness perception of a firm (H1a/H1b), we found a significant correlation between the perceived innovativeness of the firm and the intention to buy ($r(746) = .638$, $p < .001$) and the willingness to pay ($r(746) = .604$, $p < .001$).

Main study 1 To investigate the effects of the perceived innovativeness of the flagship product and the perceived fit (H2/H3), we used a moderated regression analysis (Hayes et al., 2012) with values of the perceived innovativeness of the flag as independent variable, the perceived fit as moderator, and the industry (electronics, cars, and pharmaceutics), the consumer innovativeness and perceived expertise as control variables (covariates). We found a significant positive main effect for the perceived innovativeness of the flagship product and the perceived fit, but no interaction effect of perceived innovativeness of the product and perceived fit.

Main study 2 To investigate the effects of the perceived innovativeness of the flagship product and the perceived fit, we used a moderated regression analysis (Hayes et al., 2012) with values of the perceived innovativeness of the flag as dependent variable, the perceived innovativeness of the flagship product as independent variable, the price condition for the flagship product and the product price range as moderators as well as the consumer innovativeness and perceived expertise as control variables (covariates). The product fit between flagship product and firm was indicated by the interaction between the price condition of the flagship product and the general product price range. We found a significant positive main effect for the perceived innovativeness of the flagship product and an interaction effect between perceived innovativeness of the flagship product and the product fit.

Conclusion

Overall, we showed that the investigation of perceived innovativeness and the value of flagship products is necessary and important for business research because of a significant impact regarding relevant customer decision values like willingness to pay and buying intentions as well as a significant decrease in complexity of consumers' decision-making due to the flagship product. Management practice seeking to achieve increases in the customers' perceived firm's innovativeness in complex markets will benefit from our study since it enables them 1) to identify and estimate the influence of a flagship product on the customers' perception and 2) to better understand determinants of the customers' perception of a firm's innovativeness and how to influence them. Altogether our theoretical and empirical findings from three studies contribute to a better understanding of the role of flagship products for innovation perception and, thus, innovation management and economic performance across industries.

For further reading:

To ensure long-term competitiveness, companies often employ an open innovation (Chesbrough, 2006) community (Piller & Walcher, 2006) for employees and stakeholders to cooperatively disclose their latent ideas in idea competitions, thereby establishing a continuous stream of innovation ideas. The front end of the innovation process, where ideas are generated and identified, has been recognized as vital for the market success of innovation (Reichwald & Piller, 2006; Zhang & Doll, 2001). Therefore, the management’s prevailing interest in the development of key performance indicators on idea-generation activities led to the rather generic question of how innovators’ diverse structural configurations within the community network can indicate their potential to succeed in idea competitions.

From a theoretical point of view, knowledge is becoming a central strategic issue and source for competitive advantage (Teece, Pisano, & Shuen, 1997). Whereas ideas originate from individuals, knowledge is created as a consequence of interacting individuals within a specific social context (Orstavik, 2008; Spender, 1996). As “innovation processes are exercises in heterogeneous network building” (Orstavik, 2008, p. 129), social relations are worthwhile studying when trying to investigate the interrelationship between the distribution of heterogeneous knowledge among innovators and their innovation potential (Rodan & Galunic, 2004). The advantages of innovators’ embedded positions within their network can be expressed in terms of social capital (Borgatti & Foster, 2003).

Nonetheless, considering the popularity of virtual open innovation (OI) communities, there needs to be more understanding on how different social structures within informal innovation networks (such as OI communities) influence knowledge creation in an interactive ideation process (Teichert, Rost, & Wartburg, 2004). Previous research work applied social network analysis (SNA) to analyze social structures regarding network connectivity and innovation idea quality within the context of OI communities. Nevertheless, no paper has investigated the network positional advantages of innovator groups yet. Björk & Magnusson have called for further research on the topic of group heterogeneity within a virtual OI community (2009). Assuming that social capital increases intellectual capital and vice versa (Björk, Di Vincenzo, Magnusson, & Mascia, 2011), this research-in-progress will investigate the following research question:

How does social capital heterogeneity affect? How will small world effects influence a group’s innovation potential?

Against this background, the following two hypotheses were analyzed:

H1: The smaller the distance of a group of innovators to other members in the network, the greater their innovation potential.

H2: The less clustered a group is within the network, the higher its innovation potential.

The aim of this empirical case study analysis is to examine and identify diverse network positional advantages (i.e., social capital) with regard to innovation potential.

Case Selection

The case research took place within the support structure of a leading European high-technology company. The multinational co-operation currently employs over fifty thousand employees around the world and has a focus on the business-to-business market. To incorporate and connect expert knowledge on a company-wide basis, an internal innovation management tool was implemented in the form of an OI community.

Since the launch of the website, the OI community has attracted over 5,550 members generating more than 1,800 ideas. On this virtual platform, employees and stakeholders can individually or collaboratively work on solution ideas across silos, i.e., departments. By registering on the platform, members can openly contribute to other ideas by leaving comments. The system’s community stage-gate allows for a democratic bottom-up evaluation of an idea: through a combination of Comments, Likes and Views, an idea can progress in five steps from Idea Submitted to Handover. Moreover, ideas can be directed towards a specific Campaign, i.e., an idea competition. Regardless of the stage-gates, the final point score given by a group of experts at the end of an idea contest determines the innovation potential. The company can initiate competitions, specify a time frame and direct the purpose of the competition around areas of strategic interest.

1: The members of the jury will vary, depending on the idea contest.
Discussion and Implications

At first glance, the qualitative and quantitative analyses provide evidence for small world network structures within the sample set of the case competition and its effects on a group's innovation potential. As small world networks accommodate both the relational and the structural research streams of social capital, it is possible to derive implications on the significance of group heterogeneity. The empirical results corroborate the notion that successful idea groups tend to have shorter GDs and thus have more direct connections to socially distant knowledge resources in the case competition. This social nearness could reduce the cognitive distance, presuming that knowledge sets of people become more alike the closer they are positioned in the social structure (Björk et al., 2011). For this reason, the extent of valuable knowledge a contributor is able to communicate on a group's solution idea will ultimately depend on his understanding or absorptive capacity (Cohen & Levinthal, 1990; Nooteboom et al., 2007). Note that there is no optimal social or cognitive distance within networks, which is why the above argument can only be accepted as a general notion. Nonetheless, social nearness can increase an idea group's direct access to a greater pool of diverse knowledge, from which it can (re-)combine these different sets of information to create a unique incomparable solution (Carayannis, 2008). Information heterogeneity through shorter GDs thus may have a positive influence on the novelty of ideas and enrich network variety. To continue, the question arose whether frequent interpersonal interaction may lead to groupthink (Janis, 1972) and impede idea quality. The empirical results imply that a group with lower LCC not only tends to be more successful but also holds fewer redundant ties to its neighbouring member of the idea contest, whereby cognitive homogeneity can be prevented (Fleming & Marx, 2006). With respect to collective intelligence (see chapter 2.3.3), Leimeister also argued that opinion diversity is conditional for success within idea contests (2010). Unfortunately, it is not possible to derive implications from the empirical results, which would suggest the existence of opinion diversity.
within the case competition. The only indicative independent variable in this regard would have been Burt’s Euclidian Distance (ED), which in the hypothesis test proved insignificant.

In terms of managerial implications that can be derived from the case study research, the case company should first of all be aware of the small world mechanisms which elucidate the significance of cross-collaborative ideation activities. Without the case community as IT infrastructure, ideation groups would be isolated “caves” (Fleming & Marx, 2006, p. 4) in the company, and the heterogeneity of knowledge resources would be considerably limited. In addition, on the micro level, idea groups can receive valuable codified tacit knowledge through contributors. Notwithstanding, the empirical results reveal that groups with highly clustered contacts are less likely to be successful in the case competition. Based on this finding, management should question the praised importance of highly engaged community members in contributing to ideas. More importantly, it seems, there are non-redundant ties of a group’s neighbouring contacts in the network.

Excerpt of bachelor thesis by Maximilian Hansen (Spring2013), supervised by Jun.-Prof. Dr. Marco Hubert

For further reading
cross-industry innovation
Cross-industry innovation entails distinctive innovation opportunities and challenges according to the knowledge heterogeneity between the collaborating firms, their organizational-level cognitive distance. While recent theory suggests cognitive distance is positively related to radical innovation, too much diversity hinders efficient knowledge absorption and results in a reduced effect on novelty value. To deal with this and profit from cross-industry innovation in terms of radical innovation, we provide insight on how firms can find collaboration partners that are at an optimal cognitive distance and improve their ability to understand, evaluate, and use distant knowledge for technological innovation. Moreover, convergent developments between industries with impetus from technological and market change represent major driving forces behind service-oriented business model innovation in ‘traditional’ industries. Many firms find themselves moving toward business models based on integrated solutions, but need innovative ways to interact and leverage complementary competences and resources with other firms from beyond established industry boundaries.

Cross-industry innovation potential

Substantial literature has stressed that a firm’s ability to move beyond contextually localized searching is an important source of innovation (Datta and Jessup, 2013; Li and Vanhaverbeke, 2009). Opportunities for Schumpeterian novel recombinations of complementary internal and external knowledge have yielded the most common explanation for the exploration of distant contexts, offering extremely valuable insights into innovation. Numerous further studies provide empirical evidence that innovating across industry boundaries is highly attractive for a firm, as the approach is likely to result in radical innovation (Enkel and Gassmann 2010, Kalogerakis et al. 2010). Whether a partner in cross-industry innovation gains incremental or radical results depends on the knowledge heterogeneity between the collaborating firms, referred to as the organizational-level cognitive distance. Nooteboom (2000) proposes an inverted U-shaped relation between differences in cognitive distance and innovation performance. Subsequently, he and others find out that the innovation potential increases with the increase of cognitive distance (Nooteboom et al., 2007). However, when cognitive distance reaches a certain degree, the effect on novelty value declines as too much diversity hinders efficient absorption (Cohen and Levinthal, 1990). The crucial implication of these opposite effects is that firms pursuing distant collaboration have to perform the dual task of developing access to heterogeneous sources of knowledge and ensuring at the same time that distant knowledge, once accessed, can be adequately absorbed. Consequently, a highly developed absorptive capacity – that is, “the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends” (Cohen and Levinthal, 1990, p. 128) – allows a firm to increase its cognitive distance to external partners in cross-industry innovation (see Figure 1).
The raised issues suggest that much more remains to be understood about how organizational-level cognitive distance between cross-industry partners can be assessed, utilized, and managed in order to generate radical rather than incremental innovation (see Figure 2). Thus, the research field of excellence in cross-industry innovation addresses the overarching research question of how to systematically and purposefully engage in cross-industry innovation. The following sections outline different research sub-fields to conceptualize a firm's systematic engagement in cross-industry innovation.

**Figure 2:**
Collaboration patterns among industries based on a network analysis of 215 cross-industry collaborations. The graph represents the network as a series of nodes which denote industries connected by lines indicating the presence and strength of a relationship. Furthermore, the network structure indicates that the nodes automotive and mechanical engineering, for example, have similar ties to other industries (cognitive proximity: their knowledge overlaps). By contrast, there is a strong tendency for the automotive industry to have ties to industries that the pharmaceutical industry does not have, and vice versa (cognitive distance: their knowledge does not overlap).
Preparing for cross-industry innovation

This research field focuses on the question of how to establish potential absorptive capacity for distant collaboration beyond established industry boundaries to gain radical rather than incremental results. Potential absorptive capacity makes firms receptive to understanding and evaluating external knowledge. It prevents them from becoming locked up in a specific field, running the risk of failing to seek out alternative technologies, by providing them with the strategic flexibility to adapt in various industry contexts. In the context of cross-industry innovation, potential absorptive capacity comprises the process stages of recognizing potentially valuable external knowledge from other industries, assimilating valuable new knowledge, and maintaining it over time to set the stage for future knowledge transfer to occur (Zahra and George, 2002; Lane et al.; 2006). Zahra and George (2002) thereby propose a positive relationship between a firm's exposure to various and complementary external areas of expertise and its potential absorptive capacity. Consequently, a highly developed potential absorptive capacity allows a firm to increase its cognitive distance to external partners in cross-industry innovation. To address our research question, we examined coordination antecedents to potential absorptive capacity for cross-industry innovation with partners at moderate and high distance applying case study analysis. Our study revealed three alternative approaches to coordination antecedents that drive a firm's potential absorptive capacity for distant collaboration:

- The 'innovation flexibility' approach implies an increase in the variability of distant knowledge that can result in both more exploratory innovation and increased failure. For example, at Procter & Gamble (P&G) a team of over 70 specialists who know about and are involved in the technological needs of one or more business units, makes regular use of advanced data mining tools to systematically monitor and scan patent applications across industries and search for new solutions P&G is in need of. They also search web pages and scientific literature as sources of information on technological developments in fields which appear unrelated at first sight. These seemingly unrelated fields are often chosen with the help of modeling and simulation (M&S) tools that help to generalize specific problem statements. Furthermore, these specialists attend conferences, seminars, and fairs outside the respective fields of expertise and pass on new knowledge to the firm. They also regularly and informally interact with outside organizations from distant industries and areas of expertise to learn about new sources of alternative technologies and future technological trends.

- When firms adopt the 'resource efficiency' approach, the costs for searching and integrating distant knowledge decrease. However, there is a limit to the number of new insights that can be found by applying a narrow search scope. For example, Binder+Co shows a smaller number of mechanisms for recognizing and assimilating distant knowledge and uses a narrow search scope in response to certain technology needs. Representatives of senior management and the R&D department periodically approach a certain research institution to identify alternative domains of technological knowledge on specific issues. The appointments with the research institution are an effective way of eliciting knowledge that resides in individual experts who have a broader perspective of similar issues in different industries. Thus, at Binder+Co, only a few qualified specialists who are familiar with the firm's prevailing technology needs investigate potentially valuable, distant knowledge.

- The 'combinatorial approach' allows for a proper balance between the costs of searching and the benefits of acquiring variability of distant knowledge. For example, Dräger, a leading international company in the field of medical and safety technology, makes regular use of the prevalent scouting and screening mechanisms similar to those of P&G, but performs its activities on domains predefined according to the most advanced technology needs. Dräger carries out widespread analyses of technological developments in certain key industries with high cognitive distance, such as consumer electronics. This industry is expected to induce technological change which will influence the development of medical devices. However, Dräger employs disparate teams with experts of different industry backgrounds to enhance the heterogeneity of the team's knowledge base, thus making sure not to miss opportunities for innovation due to a too narrow definition of the search scope. Dräger has hired new employees from the computer entertainment industry, for example, since they have the potential to more effectively absorb and contribute distant knowledge relevant for future innovation. In doing so, Dräger gains a combinatorial advantage by applying a targeted identification and assimilation of distant knowledge while simultaneously complementing its external search efforts by putting together expert teams from different industries. This leverages the scope of the resources available in recognizing and assimilating distant knowledge without necessitating significant investment in infrastructure or people.
In conclusion, all approaches have yielded promising results, enabling different types of innovative firms to prepare for distant collaboration in cross-industry networks. Although small and medium-sized firms might utilize fewer activities of sourcing technology owing to resource constraints, they can still achieve a comparable quality of distant knowledge by adopting the combinatorial approach. The identification of synergetic effects across the process stages of potential absorptive capacity helps technology managers to enrich their understanding of how certain mechanisms can complement directed search efforts.

**Exercising opportunities for cross-industry innovation**

This research field focuses on the question of how to support absorptive capacity in distant knowledge processing. We examine how determinants of absorptive capacity foster processing of distant knowledge from other industries. Basically, on the one hand, members of a firm can acquire other industries' knowledge to develop possible solutions on their own (internal way) and, on the other hand, experts of a foreign industry can make vital contributions to knowledge development and integration (external way).

Using survey data of 125 firms across industrial sectors, structural equation modeling indicates that the relationship between a firm's potential absorptive capacity and its cross-industry innovation outcomes and performance is fostered by collaborative learning activities and deliberate integration mechanisms. More specifically, we empirically examined the role of inbound cross-industry innovation and deliberate integration mechanisms for distant knowledge processing. Deliberate integration mechanisms are thereby intended to modify underlying knowledge processing routines in such a way that existing cognitive schemas are redirected and, hence, focus attention on emerging opportunities for cross-industry innovation. Potential absorptive capacity has a stronger positive effect on cross-industry innovation outcome and performance via inbound cross-industry innovation than via realized absorptive capacity which both assist with the application of distant knowledge. In turn, inbound cross-industry innovation and realized absorptive capacity are positively influenced by absorptive capacity-enhancing integration mechanisms that also assist with the processing of distant knowledge. There is also a direct negative effect of potential absorptive capacity on cross-industry innovation outcomes. This reveals that although firms may have high levels of potential absorptive capacity, they may fail to exercise opportunities for cross-industry innovation. Figure 3 shows our conceptual framework and highlights internal (i.e. by way of realized absorptive capacity) and external (i.e. by way of inbound cross-industry innovation) routes of building and exploiting absorptive capacity. In addition to showing inbound cross-industry innovation as a complement to a firm’s internal knowledge processing capabilities, Figure 3 illustrates how deliberate integration mechanisms facilitate linking previously unconnected knowledge sources in distant knowledge processing by using absorptive capacity-enhancing structures and processes.

Figure 3 (Heil & Enkel, 2015)
These findings suggest that an external emphasis on distant knowledge processing is a more effective approach than to internally establish realized AC. The externally oriented approach includes source selection (potential AC) and development and integration of ideas for novel solution principles in a mutual manner with external partners (inbound cross-industry innovation) to translate distant knowledge into enhanced cross-industry innovation outcome and performance. In other words, rather than engaging in extensive internal efforts to recombine and implement distant knowledge, employees can turn to external R&D partners to learn how to apply the relevant knowledge and shepherd new solution approaches through internal decision-making procedures. As solution principles have already been applied in the distant industry, the risks for further developing and integrating the selected ideas are lower in mutual learning than pure internal adaptation of the external technology. Thus, firms need to install an innovation process model in which both internal and external knowledge processing capabilities are well-aligned with each other. As a complement to these activities, integration mechanisms are instrumental in establishing new ways of interpreting concepts and technologies and new habits of internalizing them as being integral to successful cross-industry innovation. A systematic problem-solving process, heterogeneity of a team’s knowledge base, and an incentive system to foster exploration of distant knowledge have been identified as useful in this respect. These mechanisms may help to sharpen managers’ awareness of how to foster the development of cross-industry innovation based on wide-ranging integration of distant knowledge.

In conclusion, as innovation practices spread beyond established industry boundaries and require more absorptive capacity, the activities of inbound cross-industry innovation and deliberate integration mechanisms could be a valuable means to help firms overcome issues related to distant knowledge processing.

Managing technological distance in cross-industry innovation

This research field focuses on the question of how socially enabling mechanisms and structures enhance complementarities between internal and external absorptive capacity routines to deal with technological distance in cross-industry innovation. These routines are expressed within and beyond organizational boundaries associated with the recognition, assimilation, and maintenance of externally generated knowledge (Todorova and Durisin, 2007), which, in turn, may be located within or outside an organization’s industry boundaries. Amongst others, the external metaroutines include specific routines for identifying external knowledge (e.g. mining patent and scientific literature and informal interactions with outside organizations) and learning from external partners (e.g. networking with outside firms, universities, and research institutions). The internal metaroutines relate to routines that enable the generation of new ideas (e.g. working sessions to bring together people with different knowledge) and sharing knowledge across the organization (e.g. an integrated knowledge management system and central provision of information on new knowledge) (Lewin et al., 2011). Drawing on Todorova and Durisin (2007) and Lewin et al. (2011), we argue that social integration mechanisms transcend internal and external absorptive capacity routines and are fostered by firm organization structures to initiate change from within as well as identify and assimilate ideas from the external environment. To study how firms support and realize cross-industry innovation and how they overcome cognitive distance in collaborative innovation, we aim to understand what successful cross-industry innovation activities consist of in terms of socially enabling mechanisms and structures in cooperation with the research association for drive technology (FVA) in Germany. See the following article in this section for a detailed description of this joint research project.

In conclusion, developing superior absorptive capacity to deal with technological distance in cross-industry innovation implies that these firms are more likely to learn how to achieve interdependencies and complementarities between internal and external absorptive capacity routines. We propose an umbrella concept for absorptive capacity that in our view will advance cross-industry innovation by operationalizing socially enabling mechanisms and structures that reinforce absorptive capacity routines within and between firms.

Exploring focal network roles at times of industry convergence

This research field focuses on the question of how focal firms take on distinct network roles and systematically identify new business opportunities to create value from their networks in converging industry contexts. Industry convergence is a phenomenon observed in many ‘traditional’ industries such as food, publishing, and telecommunications (Hacklin et al., 2013). Many firms find themselves moving toward business models based on integrated solutions, but need innovative ways to interact and leverage complementary competences and resources together with other firms. In e-business,
network architectures as a form of collaboration are thereby increasingly arranged around business platforms (Gawer and Cusumano, 2014), with value offered to customers through innovation with complementary actors. This study translates the platform concept to the context of traditional industries.

The multiple case study analysis includes 15 firms and shows how focal firms create value from their networks by presenting a classification of three types of focal network roles – solution integrator, service broker, and solution orchestrator – and their underlying types of business platforms that firms use to enable and support service-oriented business innovation in converging industry contexts. Specifically, a profound understanding of technology- or market-driven industry convergence enables focal firms to purposefully direct network-based, service-oriented business model innovation in the right direction of vertical and/or horizontal value creation. In this regard, each network role is built up on a certain type of platform. Assessment of a focal firm’s future network role and business model thereby depends on the characteristics of the firm’s core competences and resources – its abstract platform elements in terms of brand strength, technological know-how, installed base, and customer insight. Figure 4 illustrates types of focal network roles and business platforms depending on the emphasis on integration versus coordination:
‘Solution integrators’ control focal parts of the service system and provide platform-complementor integration to increase the value of their business models achieving optimization benefits for the whole service system. As in both cases converging market needs in modern private and business life entail the integration of vertically disaggregated industry structures, the focal firms anticipate and then shape verticalization of the industry structure.

‘Service brokers’ deploy services to make them available to external complementors in a more efficient manner. They build a new value-adding layer and high volumes of business based on a multi-sided platform and horizontally extend know-how advantages across additional market sides. The merging of previously distinct market needs or technological basis allows for structural tendencies in horizontal direction to dominate the provision of new business models.

‘Solution orchestrators’ concentrate on small parts of the value chain in-house while incentivizing and coordinating third-party firms in vertical and horizontal direction to build on a multi-sided industry platform. They simultaneously increase the value of the platform through the use of different forms of coordination and by integrating complementary technologies or applications. There are disruptive technology-driven reasons behind the industry convergence that require these firms to expand the breadth of their business models.

In conclusion, firms need to place a clear strategic focus on their own and surrounding industry environments to identify new technological possibilities and market needs. They need to accurately evaluate whether the industry they are active in is affected by trends of industry convergence based on the effective monitoring of their business environment beyond established industry boundaries. Further, they need to address the question of how they can draw on and adapt their existing core competences and resources to form appropriate business platforms. In doing so, managers need to adopt new ways of ‘business ecosystem thinking’ and set up elements with platform potential to take a certain network role and realize new value potentials in horizontal and/or vertical direction.

For further reading


Heil, S., Dingler, A. & Enkel, E., Managing technological distance in internal and external collaboration: Absorptive capacity routines and social integration for innovation (in progress).


Managing technological distance in cross-industry innovation

Absorbing knowledge of higher cognitive distance is extremely difficult. Not only due to the higher difference of knowledge and technology itself, does the difference in organizational culture of the collaborating partners pose an additional challenge (Nooteboom et al., 2007). Hence, a firm or organization should foster activities, mechanisms and routines that are beneficial to knowledge transfer across industry boundaries (Zahra and George, 2002, Lewin et al., 2011). And when managing distant knowledge beyond established industry boundaries, mechanisms of social integration and interaction come into effect (Cohen and Levinthal, 1990, Volberda et al., 2010). Social integration mechanisms thereby refer to the shared values, norms, and other social mechanisms that build the necessary connectedness between people of an organization for them to develop knowledge together or share and integrate knowledge coming from different parts of the organization or from the external environment (Jansen et al., 2005). To study how firms support and realize cross-industry innovation and how they overcome cognitive distance in collaborative innovation, we aim to understand what successful cross-industry innovation activities consist of in terms of social integration mechanisms to absorb and incorporate external knowledge.

Course of the Project

To address our research question, we use a multiple case study to extensively analyze cross-industry projects of firms in the research association for drive technology (FVA) in Germany. We aim to understand what successful cross-industry innovation activities consist of in terms of communication and social interaction to absorb and incorporate external knowledge. In this research project we work with AUDI AG, KSB AG, Robert Bosch GmbH, Schaeffler AG, SKF GmbH, Wittenstein AG and ZF Friedrichshafen AG, which are all members of the FVA and participating in the study. Accordingly, we are able to reduce industry-specific factors and concentrate on the aspect of social integration mechanisms as well as general routines and structures within these cases. We want to find out whether and how they are of effect in the cross-industry innovation activities.

Supported by the industry association aiming at joint research in the field of driveline technology and power transmission engineering, we identified the above-mentioned firms and applied our research design. Most of the members are manufacturing companies operating in the driveline technology and power transmission industry and therefore face similar challenges: driveline industry is in convergence with information and communication technology, with electric and electronic components playing an increasing role (Frankenberger et al., 2014). Furthermore, additional raw materials (e.g. fibre-reinforced plastics) to be considered differ from the traditional working material of the focal industry. At the same time, this development bears great potential for new products, solutions or services. Firms might be able to find new solutions by combining technologies of the converging industries and also might expose potential for disrupting innovation that is able to substitute existing paradigms (Hacklin et al., 2009).

We start with a short questionnaire that not just helps us to identify cross-industry innovation activities in the participating companies, but also gives us a short overview on each cross-industry innovation project. We decompose internal and external absorptive capacity routines to identify social integration mechanisms and organizational structures combining these two routines. In doing so, we employ a set-theoretic approach based on fuzzy-set QCA, that allows us to perform an initial analysis of which causal conditions contribute to the success of cross-industry innovation projects and to strip away attributes that are unrelated to the outcome in question. Regarding core conditions, the analysis indicates that proximity in product technology and/ or distance in process technology are two sides of the same coin sufficient for achieving cross-industry innovation success – a profile that particularly fits outside-in projects. We continue with semi-standardized expert interviews with involved employees who know most about each case to gain insights and understand the routines and mechanisms underlying these activities in detail. We also consider archival data and presentations of the firms to gain rich description and deeper understanding of all cross-industry innovation activities throughout the focal firms. Therefore, we first study each case individually before continuing with a cross-case analysis in order to identify similarities and differences across all cases of all firms.
Preliminary Results

The search for new technologies, external knowledge and profitable collaborations cannot be generalized as there is no such thing as a typical process in order to innovate across industry boundaries. Every firm has specific structures, corporate culture, problems and ways to cope with them and additionally every single case within a firm meets with different preconditions, resources, and people who work on the cases. But the variety of cases executed in our focal firms allows us to identify not only beneficial but also crucial routines, social integration mechanisms as well as structures that enable firms to innovate across industry boundaries. We furthermore find that the combination of systematically implementing routines and, at the same time, fostering coincidence by structures that take social integration mechanism into account is what supports firms successfully in their cross-industry innovation activities.

- **Internal and external routines:** Rules, habits or procedures that are operationalized at different levels of the organization’s activities and processes are routines that firms employ (Lewin et al., 2011). In this context, such processes are knowledge creation, learning, transferring knowledge or the selection of innovation projects. In turn, internal routines are only processes that take place within and across the business units of a firm but always within the boundaries of the firm (Cohen and Levinthal, 1990). Internal routines for knowledge creation as we found them in our focal firms are for example: idea creation workshops, internal technology forums, central provision of information of specific new practices, cross-functional project teams, learning programs or a systematic search for innovation potential through technology. External routines on the other hand refer to processes and activities involving the external environment. For example, we found external routines like: knowledge creation by visiting conferences, mining patent literature, collaborating with lead customers or lead suppliers, etc. The data we examine reveals that all firms are using internal and external routines in order to innovate across industry boundaries. At the same time, projects or activities that cannot be successfully executed reveal that in those particular cases complementarities to the routines, such as social integration mechanisms, are a crucial factor.

- **Social integration mechanisms:** Social integration mechanisms influence social interaction and therefore knowledge processes that take place between individuals and organizations (Todorova and Durisin, 2007). Besides, internalized social integration mechanisms inspire seeking behaviours (Borgatti and Cross, 2003). Between collaborating partners (internal and external partners), formal social integration mechanisms facilitate the way information is distributed, interpretations are formed and trends are identified. For example, the use of coordinators can facilitate the distribution of information and, in this vein, ensure a free information flow. Informal social integration mechanisms are especially useful for exchanging ideas, e.g. through social networks (Zahra and George, 2002). Additionally, mechanisms based on social integration enable the formation of sociocultural values and norms within firms, groups or between partners (Lewin et al., 2011), referring to shared values and connectedness (Tsai and Ghoshal, 1998, Jansen et al., 2005). Social integration mechanisms are not easily observable and irritable, but play an important role in enabling firms to successfully make use of their internal and external routines in order to achieve better innovation and adaption performance (Lewin et al., 2011). As cases in our sample show, the information that is shared and the way it is shared play a central role in whether the cross-industry innovation project is executed successfully or not. A firm that easily practices the routine of internal idea creation workshops is not able to enforce promising cross-industry innovation ideas. They fail due to the lack of personal connection with internal partners they would need to work with, as well as the absence of a channel, platform or system to communicate the ideas to any other potential stakeholder. Hence, structures to support formal or informal social integration mechanisms additionally contribute to managing the distance between internal and external partners.

- **Structures:** Depending on whether a firm is intending to find a new market or customer for an existing technological solution or trying to solve an existing problem, there are different structures it can implement and make use of (Lewin et al., 2011). There are structures that are beneficial to operate in a marked-oriented manner, such as an independent business unit that is allowed to individually execute start-up projects or internal competence networks. In contrast, the implementation of innovation nights that create room for informal interaction and knowledge transfer with a focus on predefined problems or technologies, is a more solution-oriented way to find new ideas. As the same applies to events like internal techdays or pre-themed business expert meetings. To create and put this type of structures into practice is an important option for a firm to directly and systematically influence collaborative innovation.
Conclusion

With these conditions in mind, our case study findings then show patterns of socially enabling mechanisms and structures that enhance complementarities between seemingly independent bundles of internal and external absorptive capacity routines to increase technological proximity and/or reduce technological distance in cross-industry innovation. In other words, successful cross-industry innovation not only requires certain configurations of absorptive capacity routines, but also distinct configurations of socially enabling mechanisms and structures that facilitate the integration of internal and external absorptive capacity routines to benefit from complementarities among these routines (see Figure 1).

In other words, successful cross-industry innovation not only requires certain configurations of absorptive capacity routines, but also distinct configurations of socially enabling mechanisms and structures that facilitate the integration of internal and external absorptive capacity routines to benefit from complementarities among these routines (see Figure 1).

To successfully innovate across an industry and manage the distance between the collaborating partners is a challenge for all focal firms. However, the ones that are able to identify and make use of beneficial internal and external routines in the cross-industry innovation process and additionally provide structures that facilitate social interaction and support communication, most successfully manage the distance between internal and external partners and are therefore able to successfully perform cross-industry innovation.

For further reading

During recent years, business model innovation has gained in significance (Schneider and Spieth, 2013), since it is critical for firms to create and form new markets and to achieve a competitive advantage over rivals (Mitchell and Coles, 2003). Most academic papers about business model innovation focus on value creation and capture (e.g., Amit and Zott, 2001, George and Bock, 2011), whereas the relevance of certain organizational capabilities, internal structures and processes and the necessity of strategic fit have barely been studied. Thus, we investigated germane organizational capabilities and internal settings fostering business model innovation within product-centric firms. Since several product-centric firms have started to enhance their service orientation, we particularly focused on capabilities and resources enabling the creation of novel service-based business models.

Theoretical concept

Schneider and Spieth (2013) highlighted that there are mainly three research streams concerning business model innovation. These refer to prerequisites, processes and elements, as well as effects of business model innovation. Considering the first research stream about prerequisites, existing research (e.g., Kindström et al., 2013, Teece, 2007) has already tried to tackle this topic through the lens of dynamic capability theory. Since technological and market conditions in corporate environments continuously change, previously appreciated capabilities and resources might suddenly become obsolete. Thus, particularly product-centric firms which strive for a stronger service orientation are often required to assimilate, reconfigure or even substitute their capabilities and resource base according to environmental shifts (Mezger and Bader, 2014, Teece et al., 1997).

The dynamic capabilities perspective helps to combine various characteristics of business model innovation in one theoretical model. In this context, Teece (2007) and Kindström et al. (2013) suggested a process-oriented setting with three stages in which they highlight sensing, seizing and reconfiguring capacities. Sensing as first stage describes the perception of opportunities and environmental risks. Seizing as second stage defines the designing and framing of potential business models through internal structures and mechanisms. Reconfiguring as final stage explains the implementation of a potential business model via organizational orchestration and reconfiguration.

The objective of this research is to prove that specific capabilities and internal settings enable product-centric firms to develop and implement novel service-based business models which are frequently not only new-to-the-firm, but even new-to-the-world business models. We particularly focused on cultural characteristics and internal structures and mechanisms within the process-oriented setting considering sensing, seizing and reconfiguring capabilities (Kindström et al., 2013, Mezger, 2014). As product-centric firms are unlikely to possess the capabilities and resource base to create service-based business models, they habitually need to adapt, reconfigure or even change their existing resource base and gain specific capabilities towards a stronger service orientation. Through our research, we emphasized the most fundamental capabilities and resources across a variety of firms operating in distinct industries.

Methodology

In order to identify product-centric firms which have successfully implemented one or more new-to-the-world service-based business models during the last five years, we analyzed quantitative data of our innovation survey in 2012 (N=183) as orientation for the case selection. We addressed the most successful and best-positioned product-centric firms for a multiple case study analysis in 2013. In total, we were able to gather data of 12 product-centric firms according to specifically selected criteria (Eisenhardt, 1989, Eisenhardt and Graebner, 2007). To enhance validity and assess our empirical findings, the data collection was based on semi-structured interviews which were triangulated with workshop data, company-internal documents, additional questionnaire data and financial reports (Yin, 2003).

Results

Our multiple case study analysis revealed certain capabilities and resources which are fundamental for the creation of novel service-based business models. Although all of our case firms have
already launched new service-based business models during recent years, they are at different stages with regard to systematization. Thus, we can provide both insights of product-centric firms which are still in the process of systemizing their approach, and insights of product-centric firms which are more experienced. Despite this discrepancy, there are certain parameters and characteristics which all examined product-centric firms highlighted regarding successful service-based business modelling.

With regard to sensing, most of our case firms pointed out that the identification of novel service gaps is central, and that a recognized gap should suit the firm’s overall strategic direction. To identify relevant service gaps, foresight and systematic trend monitoring across industry boundaries are frequently applied. In this regard, several product-centric firms employ dedicated departments for this kind of job. After having sensed a promising service gap, certain internal structures, processes and mechanisms should support the employees in establishing an appropriate business model to serve a recognized service gap.

With regard to seizing, our case firms emphasized the relevance of a structured business model development process which has been adapted to service innovations in numerous cases. Furthermore, most product-centric firms have founded a central unit for business model innovation which frequently initiates pilot projects for new service-based business models. These pilot projects are often financed through company-internal venture capital funds. In addition, our findings show that product-centric firms which lack relevant service skills for a new business model, frequently apply M&A as strategy for a quick acquisition of capabilities and resources.

Considering reconfiguring, our case firms accentuated the necessity of developing a service-oriented cultural mindset (e.g. via storytelling and interdisciplinary teams) and of orchestrating the service development (e.g. via organizational restructuring). In this context, our case firms stressed the importance of a firm’s willingness to cannibalize which is essential for both setting up a novel service-based business model as well as for transforming an existing one (see Mezger and Bader, 2014 for details). Several firms also offer dedicated training courses for their employees to build up required service capabilities. Moreover, our case firms frequently provide visible incentives for their employees and offer sufficient manpower and time for the establishment of novel service-based business models.

**Discussion and conclusions**

We consider our empirical findings to be relevant for both theory and practice. First, our empirical study extends existing research on dynamic capabilities by investigating their presence in product-centric firms which intend to enhance the level of service orientation. By operationalizing the process-oriented capability model by Teece (2007) and Kindstöm et al. (2013) with regard to service-based business modelling, we are able to reveal which competences and shifts in resources are essential for product-centric firms to boost service orientation. According to the applied theoretical model, particularly modifications and adjustments in the seizing and reconfiguring stages are critical for the successful adoption of new service-based business models.
guring stages seem to be indispensible. Our empirical study describes actions and mechanisms which foster the development of essential skills and competences. Second, we are able to extend theory by revealing differences in capabilities and resources regarding (complementary) business model innovation and business model transformation(s). In this regard, innovation cultural characteristics such as a firm’s willingness to cannibalize investments, capabilities or sales appear to play a central role (Mezger and Bader, 2014).

Managers can learn from our analysis that product-centric firms need to acquire specific capabilities and resources to develop novel service-based business models or to transform existing ones towards a stronger service orientation. If product-centric firms do not possess these service capabilities and resources, they are recommended to establish them internally, acquire them via M&A, or cooperate with external partners who possess the required skill set. According to our results, the acquisition via M&A appears to be typical for product-centric firms to quickly attain relevant service skills, reach a certain level of service orientation and accelerate the orchestration of a service-oriented mental model. Furthermore, our findings offer practical insights into the characteristics to be focused on by managers of product-centric firms when seeking to augment the service orientation via new business models. Such insights are fundamental, as product-centric firms need to cleverly balance their product and service innovation-related capabilities and assets.

For further reading:


Your contact person for innovation strategy and innovation culture

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Many countries in the European Union register negative or zero growth in GDP. This is due to two economic crises in the last decade. First, the risk capital industry is operating under weak conditions because of the Dotcom bubble in 2000 (Söderblom, 2012, S. 7). Second, there is a lack of seed money in early stages because of the financial crisis (Botazzi, Secchi & Tamagni, 2014, S. 100).

Young and innovative companies can help to solve this problem and push economic growth (Markova & Petkovska-Mirčevska, 2010, S. 217). However, finance is a critical success factor when it comes to supporting startups and growth. On the one hand, the institution itself must have the operating cash-flows (Aernoudt, 2004, S. 127), on the other hand there must be enough money for several fundings in different stages and to provide the best resource allocation (Manigart & Wright, 2013, S. 480).

This lack of capital is often called “Valley of Death” or “Equity Gap” (Rasmussen und Sørheim, 2012). Therefore, supporting instruments should focus on bridging the gap and could perhaps be provided by new institutional players (Canton, Grilo, Monteagudo & Zwan, 2013, S. 701).

Academic incubators could play an important role in nursing entrepreneurial projects, not only from the scientific community (Hackett & Dilts, 2004, S. 41). Based on their know-how, resources and stakeholders, they can provide or orchestrate all support required (Bøllingtoft, 2012). Public institutions support them and foster their commitment concerning the integration of an investment vehicle in early stage fundings (Bergek & Normann, 2008, S. 20). Although some publications focus on the resource allocation provided by academic incubators, none of them carries out research in the field of entrepreneurial finance (Barbero et al., 2012, S. 901).

Therefore, the research question was: “Which influencing or success factors operate on the existence and design of an investment vehicle at academic incubators in German-speaking countries”? The underlying study was based on semi-structured and guided telephone interviews with the managers in charge of academic incubators. Owing to differences in culture, finance, legal aspects and language, the study focused on the German-speaking countries. There was no register of all incubators, so all universities with any activity in technology transfer or startup support were listed and addressed. From these 220 academic institutions, the researcher talked to 23 experts who provided deep insights into their strategic planning and incubator’s work especially in the case of finance. Because of their special knowledge, the study results in a concept of what the system of academic incubator’s financing looks like:

![Figure 2: Influencing factors on academic incubation investment vehicles](Cramer von Clausbruch, 2014, p. 76)
There are reasons and influencing factors which shape the academic incubator. The existence of an academic incubator, the reasons and influencing factors behind it, shape the investment vehicle of an academic incubator. As a consequence, managers of academic incubators have to consider these aspects and find the right mixture of funding opportunities to support incubation projects. Vice versa, as an entrepreneur, one has to regard the options provided by the academic incubator and whether they help to bridge the equity gap.

The model illustrated below shows the organizational aspects and antecedents for the structure of such an investment vehicle in academic incubators. It deals with the degree of openness and the (cognitive) distance of the academic incubator. To point out the findings, the example of Zeppelin University’s “Pionier Port” illustrates the outcomes of the study. One reason for establishing the academic incubator is that a lot of entrepreneurial students are looking for support with their business ideas. Limited resources at a young university are an influencing factor which shapes the form of the incubator as a staff function. In addition, there are reasons for financial support on the one hand like the “proof of equity” and influencing factors like the “equity gap” on the other hand. This results in the investment vehicle called ZUME (ZU Micro Equity GmbH) to bring up venture capital.

Figure 2: Model of open academic incubation
based on Katzy, 2012, S. 21 (Cramer von Clausbruch, 2014, p. 82)
The stakeholders’ perspective: On the academic side, the university and students deal with educational aspects in the field of entrepreneurship. On the other side, the industry corporations and startups are concerned about doing business (x-axis). In the first triangle, industry, students and the academic institution are cooperating in the field of knowledge transfer. In the second triangle, the university, students and startups are dealing with job and internship creation.

The function perspective: The y-axis illustrates the difference between technology transfer and startup support in general. An incubator can have different organizational forms. A staff function, faculty, foundation or association are rather linked to the academic side, whereas a service-providing institute, a limited liability company or any for-profit company are rather located on the business side.

The major decision to be made from the academic incubator perspective is whether the incubator should be located more internally (left y-axis side: “non-profit”) or externally (right y-axis side: “for-profit”) to fulfill its tasks. The results of this empirical study show that the optimum might be somewhere in the middle because of reasons like governance, legal requirements, span of control, operating flexibility and the investment vehicle.

The theoretical implication is that there is a clear difference between technology transfer and startup nursery. In addition, there are two perspectives and ways for corporate venturing.

One major managerial implication is that there are several successful organizational forms to support and implement business model innovations in corporate (incubators). Antecedents, triggers and drivers require which structure is the most effective. In the view of the focal firm (in this case the corporate firm), there are internal options to structure the organization of business model innovation like a staff department or a task force supported by the board of management as well as external ways to handle business model innovation with the help of hubs, accelerators or incubators.

Thus, the next step is to focus on corporate incubators for learning and comparing their approaches. In NaKoGi 2.0, the Dr. Manfred Bischoff Institute of Innovation Management of Airbus Group at Zeppelin University is going to discuss the topic of organizational anchorage with corporate experts.

Your contact person for business model innovation - structure and organisation

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Ecosystems as the “fifth generation of network innovation” (Ritala et al., 2013) provide a framework for the description of networks of collaboration and competition that goes beyond the firm as focal actor. It allows one to consider the entirety of commercial and noncommercial actors directly or indirectly involved with an innovation (Palo & Tähtinen, 2013).
SAP Ganges –
A business model innovation that involves all protagonists of the business ecosystem

A typical business morning in Bangalore, India. While opening his small shop, Anand Babu is concerned: What will I purchase today? Will my supplies last? Will the bank approve the credit I need? Anand Babu is one of 9.3 million retailers in India most of which are mom-and-pop shops with only one or two employees. Small retail business owners in India such as Babu are often isolated and not controlled by large supermarkets or chain stores. Because of a lack of information within the retail sector they are often unable to do their business just-in-time, which means supplying their customers with what they want when they need it. Besides, thin margins and limited growth potential are common pain points among the 9.3 million retailers.

India is the country that has the most retail shops in the world. Approximately 40% of the world's retailers are located in India. They get their goods via an ecosystem (Iansiti and Levien, 2004; Moore, 1996) of 20,000 distributors, 80,000 wholesalers, and 12 main fast moving consumer goods (FMCG) companies.

The unsatisfactory state of the Indian retail business was the starting point for the software company SAP to work on a solution for this problem.

The core of the solution:
Thinking in the business ecosystem

As a first step, the project team spent almost one year with design thinking. Then, the team visited over 200 retailers and more than 50 distributors, wholesalers and FMCG companies in order to understand their business processes and get to know their daily problems. During the whole development period, the project team encouraged the players of the ecosystem to think as entrepreneurs. Finally after two years, the solution was presented: SAP Ganges.

Named after the famous Indian river, SAP Ganges is a network for Indian retail. SAP Ganges requires accompanying changes in the networked companies. These changes embed SAP within an ecosystem of interdependent companies (Adner, 2006; Adner and Kapoor, 2010). From SAP perspective, the players in this ecosystem can be divided into customers and partners. Customers are the FMCG companies, wholesalers, distributors and retailers. Banks, telecommunication companies, OEMs and value-added service partners are considered as partners in this ecosystem.

Part of SAP Ganges is a point-of-sale (POS) device which is offered to the retailers for $100 to $200. The device was developed in association with established OEMs of such devices from India in order to meet the requirements of the retailers. By scanning each sold article with the device, the data is transmitted to the SAP HANA cloud platform. The FMCG companies, their distributors and the banks can subscribe to these insights. While the FMCG companies, distributors and banks work with individual cloud solutions, the retailers only require the POS device in terms of technology. Since a majority of retailers are semi-literate, the device is icon-based.

All players in the ecosystem are to benefit from the network:

| Retailers using the POS device are connected to the business network. They can place real-time orders preventing frequent stockouts. Besides, they will get access to more working capital through bank credits since the banks can assess eligibility of the retailer based on the data. |
| Distributors can take orders, track inventory at retailers' stores and receive payments digitally. |
| Wholesalers will benefit from increased buying power from the retailers and their operational efficiency. |
| FMCG companies get real-time, last-mile information. Based on the data, they get to know which products are moving and where. They can also use SAP Ganges as a direct marketing channel to reach retail stores, e.g. by sending promotions. |
SAP Ganges emphasizes that a business ecosystem of networked firms provides a promising environment for the development and implementation of new service-oriented business models (Chesbrough, 2011). Furthermore, the Innovation Study 2012 showed that top business model innovations excel in terms of thinking in comprehensive, solution-oriented business models and consider the business ecosystems as important input to identify relevant value propositions for the future. The development team of SAP Ganges has done exactly that. Most of the work was performed by crowdsourcing. The team consisted of multinational members in order to translate the model to other retail-rich emerging economies, such as Brazil, South Africa, China and Indonesia.

Your contact person for business ecosystem thinking

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We invite you to participate

Are you working in the field of business development, business model innovation and implementation?

Find out how to effectively learn from other industry leaders and what the latest issues in business model innovation are

- Organisation and structure of business model innovations
- Measurability and comparability in the sense of business model controlling
- Necessity of an entrepreneurial and team culture to implement new business models
- Communication as part of business model innovation and sustainability in business model innovations

The National Competence Center for Business Model Innovation (NaKoGi) was established in 2013. After a successful first round, we relaunch the possibility to learn and develop business models with scientific guidance. Do not hesitate to contact Felix Cramer von Clausbruch (felix.cramervonclausbruch@zu.de) in case of any questions.

Thank you in advance for your interest.
Enhancing business model transformation through willingness to cannibalize on capabilities: An exploratory research

In an increasingly competitive environment, it is vital for firms to constantly rethink how they do business and thus their existing business model(s) (Zott and Amit, 2013). While business model innovation has been widely studied in academic literature (Zott et al., 2011), scholars have hardly investigated the transformation of established business models. Therefore, we analyze the way in which firms transform their current business models. Since recent research has emphasized the importance of a firm’s willingness to cannibalize with regard to disruptive innovations, we scrutinize business model transformation from this distinctive angle.

Theoretical concept

When it comes to business model transformation, a prevailing business model is not merely complemented, but replaced by an adapted or new business model (Mezger and Bader, 2014). In such a case, a firm’s current business model is cannibalized. Although cannibalization has traditionally been seen as an activity to avoid (Mason and Milne, 1994, Moorthy and Png, 1992), it can help firms to overcome organizational inertia which often restrains them from successful transformation (Sosna et al., 2010). Recently, scholars have further investigated the positive side of cannibalization (e.g., Chandy and Tellis, 1998, Nijssen et al., 2005). Willingness to cannibalize describes a firm’s preparedness to reassess and possibly give up profitable resources to bring about a new set of innovations. It is an attitude anchored in a firm’s culture that is conducive to the exploration of new business opportunities (Danneels and Sethi, 2011). In this vein, Nijssen et al. (2005) even distinguished between the dimensions of willingness to cannibalize on previous investments, sales and capabilities.

Although cannibalization on investments and sales certainly contributes to successful business model transformation, we focus on the dimension of a firm’s willingness to cannibalize on capabilities for several reasons. First, business model transformation mainly relates to the reconfiguration of a firm’s existing resources and capabilities. It is therefore of particular interest to reveal the manner in which firms cannibalize on those capabilities and routines in order to foster business model transformation (Nijssen et al., 2005). Second, capabilities cannot be quantified as easily as investments or sales and are therefore often neglected in research. Thus, we explore the crucial role of capabilities with regard to reconfiguring an existing business model. Third, capabilities reflect a firm’s most valuable resource: its people.

Consequently, the goal of this research is twofold: On the one hand, we elaborate on distinctive organizational capabilities that firms need to successfully transform their business models. On the other hand, we investigate “how” and “why” willingness to cannibalize on capabilities can enhance business model transformation.

Methodology

We based the case selection for this research on data gathered via our innovation survey in 2014, which included questions about business model transformation. According to specific criteria (e.g. experience with at least one business model transformation in the past five years, leading positioning as technology or market leaders in the firm’s key segments, incumbent firms), we selected 14 case firms for our investigation. The primary data was collected by means of semi-structured interviews with top executives from the selected firms. This helped to gain valuable insights into the general relevance and recent examples of business model transformation as well as into the firms’ willingness to cannibalize. By triangulating interview data with further primary and secondary data such as annual reports, in-house presentations and information from company websites, it was possible to increase the validity of the data (Yin, 2009, Eisenhardt and Graebner, 2007).

Results

Our results reveal that business model transformation has become increasingly important for firms in recent years. Many firms no longer consider themselves to be mere producers and sellers of goods, but providers of comprehensive solutions. By means of business model transformation, several firms aim
to react to external developments such as changing customer needs, new regulations and rising technologies. Some case firms, however, highlighted that they did not transform their business model based on external triggers, but because of ambitious internal goals. Hence, these firms succeeded in being one step ahead of their competition and became leading market players that shape their ecosystem. Some of these firms even consider the process of transformation as vital part of their corporate DNA. Moreover, the ability to adapt organizational structures and processes was crucial for most firms while transforming their business model. Several firms created new departments or even new ventures outside the established organization to accommodate transformation. This step frequently allowed for quicker decision-making, flexible reactions to external changes and for an earlier introduction of the transformed business model than expected. Furthermore, some firms succeeded in extending their current industry focus which additionally accelerated the business model transformation.

Almost all firms made new investments to achieve transformation. These new investments did not immediately make old ones obsolete, though. Instead, the previous level of investments often had to be maintained at the beginning of the transformation process to finance the new business model. Similarly, many firms were not willing to cannibalize on sales of current business models in favor of a new one. As long as existing business models are still profitable, most firms seek to sustain these revenues as long as possible. Some of our case firms admitted that they would cannibalize on sales in the future if the newly introduced business model became successful enough. With regard to the cannibalization of capabilities, some case firms are rather reluctant, as they find it hard to decide which capabilities to give up. Other case firms, however, consider it vital to replace old capabilities. Most of our case firms cooperate with external partners to quickly acquire new capabilities or establish key capabilities internally by relying on trial-and-error processes.

Discussion and conclusions

Based on this exploratory study, we have been able to derive several theoretical and managerial implications. By analyzing how and why firms transform existing business models, we gained new theoretical insights into the field of business model transformation. Since we revealed capabilities that are required for the reconfiguration of a firm’s resource base, we contributed to research on business model transformation. This helped to further distinguish business model transformation from the broader concept of business model innovation. Moreover, we identified reasons why some firms cannibalize on capabilities and why others do not deepen the theoretical concept of a firm’s willingness to cannibalize on capabilities.

Beside theoretical implications, we also provide useful insights for managers. First, firms are required to have certain capabilities in place to successfully transform existing business models. To acquire those capabilities, firms should not only rely on external cooperation but also adopt internal structures and processes to establish their own capabilities. This can be achieved by setting up interdisciplinary teams, creating new ventures within the firm and by constantly rethinking the firm’s status quo. Second, firms often face the challenge of hiring the right people who have the desired competences when replacing obsolete capabilities. Firms should thoroughly plan the transformation process in advance to successfully deal with this challenge. In doing so, it is not only important to calculate required investments and future sales, but to determine when and how to acquire new capabilities and which capabilities have become irrelevant. Moreover, willingness to cannibalize supports firms in better coping with change inside and outside the firm, as change is inherent to cannibalization.

Excerpt of master thesis by Silvia Köhler (Fall 2014), supervised by Prof. Dr. Ellen Enkel and Karoline Bader

For further reading


While the definition of the term ‘gamification’ is subject of controversy, it is normally understood as using game mechanisms in a non-game context (Luminea, 2013; Simões et al., 2013; Deterding et al., 2011). There are many possible examples like the popular ‘Nike Plus’ platform. The user achieves points and medals for his sportive activities and also for purchasing Nike Sportswear. Nike achieves a win-win situation this way. The user stays intrinsically motivated by earning points and will also acquire more Nike Products to gain more points and get better. The company use game mechanisms like medals, leaderboards and achievements to improve the user’s motivation.

‘Gamification’ is based on basics from the gaming industry (Post and Kaefer, 2013; Deterding et al., 2011) like von Neumann and Morgenstern’s ‘Theory of Games and Economic Behavior’ (2004). But a very important discussion is still missing in present academic research. Does ‘gamification’ lead a business to success? Does it contribute to revenue streams and sales? And which new business models could be created based on gamified elements? One of the few academic researches by Gartner Inc. (2012) sums up that in 2014. 80% of the ‘Gamification’ implementations will not lead to their anticipated business benefits, because of poor concepts and realisations. This outlines clearly how important it is to illustrate how companies can benefit from ‘gamification.’

‘Gamification’ – Opportunities and challenges of the fun way to engage

Along with the emergence of phenomena such as value co-creation, firm networks, and open innovation, open business models have achieved growing attention in research. With ‘open business model innovation’ and the imitation of business models, Chesbrough (2003) as well as Enkel et al. (2009) extended the discussion over the borders of a company. The adjustment and innovation of business models along with customization gets more and more important (Amit and Zott, 2012). Companies unwilling to open up and innovate their business models from time to time will get stuck and may lose their unique selling proposition.

Methods like gamification are valid for such innovation. If gamification and the individual business model are aligned, the company can reinforce the intrinsic motivation of a customer and guide them in a desired direction or influence their buying behaviour. The analysed advertising business model awarded the customer for watching TV spots with a second screen application. Depending on the companies they wanted to promote, they controlled the user by adding more points or special rewards. But it is not only about influencing the customer. Gamification can also promote the value proposition and create additional revenues by adding or improving services.

Nevertheless, the use of gamification in business models does have some confines. Companies may deal with the so-called overjustification effect: a customer might only use a service as long as he gets rewarded. If a customer uses a service or buys a product because he wants to solve a certain problem, he is intrinsically motivated. If he gets a reward for buying or using that product, he might become extrinsically motivated. He then only uses the services because he gets rewarded to do so.

Research Methodology and Data Sample

The use of gamification was evaluated for six different companies, industries, and business models, with data from guided interviews, presentations, websites, or other archival data based on elements derived from academic research. The investigated business models were coming from companies based in the banking-, health care-, pharmacy- and social dating-sector, as well as enterprise software and software-related services.

The research was done in two steps. First each case was analysed individually, in order to elaborate the uniqueness and characteristics for each industry. Secondly the findings were compared to each other in cross-case analyses as to find similarities or major differences.

Findings

Comparing all investigated business models, the main advantages can be found in the ‘value proposition’, ‘customer relationships’, and ‘customer segments’. A competitive advantage, along with a potential ‘lock-in’ effect, underlines the added value for business models and companies by adding gamification. The lock-in effect means that customers are influenced in their decision-making process because of increasing returns to scale. If a customer will lose his gamification achievements when he changes the product, he might feel forced to
stay with the company. These potentials are examined and described through the measurability of the unique selling proposition, as well as their conceptual approaches and borders. For example, the analysed pharmacy company helped the patients improve their life, by controlling their illness through a gamified application. By doing that, the customer gets a higher quality of life, a clear value-add. The patients also showed a better adherence to therapy, which meant more sales for the company.

Moreover, the paper showed that game mechanisms cooperate best with ‘multisided’ or ‘freemium’ business models. Both patterns depend on a large range of active users, and in a lot of cases on dynamic user-generated content. Both these features can be achieved by judicious gamification. This way the companies can also use gathered data to implement new business models, because they will get a better understanding of how and why the customer uses the service. For example, the analysed social dating platform was struggling because of its few profile and user pictures. Because of that, they decided to add a game called ‘hot or not’ and monthly awarded the user with the best profile picture. This helped them to increase the total number of pictures and users.

As an additional effect, the companies get ideas about where and how to build new business models using game mechanisms. The origin business model of Nike was to sell Sportswear, but with the Nike+ platform they were able to build up an additional gamified business model and products, which also supports the classic business.

Finally, companies have to have a clear roadmap and ‘tell a story’ with their gamified business models. Simple rewards like badges or medals are not good enough to bind the customer or create additional value. Business model and ‘gamification’ need a good fit, a gameful design. The analysed software company, for example, has implemented a consistent gamification approach over all applications. The more the employee works, the more points he or she gets. Additional features and bonuses can be unlocked as achievements. That is a great added value for companies and employees. Figure 1 shows the impact, analysed sorted by industries and companies:

![Figure 1](image-url)
Conclusion

The gamification hype might abate, but companies will keep dealing with humans as customers. As long as companies know how to support intrinsic motivation, gamification is a good source for innovation. It can also help companies learn about their users and expand their product spectrum with new revenue streams, new channels, and better customer relationships.

Excerpt of master thesis by Damian Lüttig (Spring 2014), supervised by Prof. Dr. Ellen Enkel and Jun.-Prof. Dr. Marco Hubert
further information
The Dr. Manfred Bischoff Institute of Innovation Management of Airbus Group is named after its founder and the former EADS “architect” Dr. Manfred Bischoff. It is headed by Prof. Dr. phil. Ellen Enkel and consists of two chairs (a full professorship and a junior professorship), as well as PhD candidates and student assistants.

**Fields of research**

The institute researches within the area of technology and innovation management. By combining theory and practice we examine influencing factors, actors and processes for successful product, service and business model innovations.

Our fields of research encompass open innovation and cross-industry innovation, cooperative innovation processes in networks, business model innovation as well as innovation metrics, communication and culture. Theoretical focal points are resource-based business theories as well as dynamic capabilities and absorptive capacity theory.

The chair preferably works practice- and application-oriented. We try to gain insights from practice and to develop, implement and optimise new concepts on a theoretical basis by cooperating closely with companies. Our publication formats range from practical journals up to internationally recognised scientific journals.

**Teaching methodology**

Our teaching focuses on innovation and technology management in bachelor, master and executive master programs. We include the latest findings from research in the courses. Since the best way to learn and understand a theory is to apply it to illustrative cases, the teaching concept of the Chair of Innovation Management is based on a close link between theory and practice. Hence, we often collaborate with one or more companies to achieve knowledge transfers between theory and practice.

A seminar will be structured as follows: the students develop the theoretical foundations of the subject. As part of practical cooperation, the students then work on tasks and challenges of the real world business practice, which need to be solved with the help of the prepared theoretical foundations and, of course, the students’ creativity and expertise.

**Courses**

The Chair for Innovation Management offers a wide range of courses for bachelor, master and executive master students (eMA DIP):

- Introduction to Innovation & Technology Management (BA, CME)
- Open Innovation (BA, CME)
- Business Model Innovation (BA, CME)
- Advanced Open Innovation (MA, CME)
- Knowledge Management (MA, CME)
- R&D Metrics & Creativity (MA, CME)
- Digital Business Models (eMA DIP)
- Trend Identification (eMA DIP)
- Ecosystem Business Models (eMA DIP)
- Introduction in Innovation Management (eMA DIP)
- Introduction in Business Model Innovation (eMA DIP)
- Innovation Management in Retail (eMA R)

**Course example: R&D Metrics & Creativity**

As part of the master module „Creativity, Knowledge and Innovation“, this course covers the measurement of R&D input and output as well as the increase in the innovative capacity of companies. During the theoretical part of the course, students discuss the topics of portfolio management, R&D metrics, R&D controlling, innovation culture and different creativity techniques. The subsequent practical phase allows them to collaborate with companies and work in intensive workshops in order to define improvement levers for them. In Spring 2014 we had the chance to collaborate with Beiersdorf AG in order to investigate and optimise their technology scouting regarding processes, skills, communication and metrics. Both with a thorough analysis of Beiersdorf’s current activities as well as by analysing best practices of other companies we were able to develop improvements for the technology scouting of Beiersdorf AG. Specific tasks were jointly defined, processed by students working in small groups and, at the end of the course, the results were presented to high-level representatives of the collaboration partners. The results were not only scientifically sound analyses and concepts, but also approaches relevant to corporate practice.
The institute goes international

FVA conference in Würzburg, Germany

Summer School in Cambridge, UK

EURAM in Valencia, Spain
RADMA in Stuttgart, Germany

ISPIM in Dublin, Ireland

WIPO Conference on Open Innovation, Geneva
Further publications of the institute 2013-2014

Double Blind Refereed Journal Articles:


Managerial Press and Book Chapters:


**Refereed Conference Publications:**


Hubert, M., Nazarian, B., Oullier, O., & Plassmann, H. (2014): Dissociating the Neural Correlates of Prediction Errors, Predicted Values and Outcome Values, Society for Neuroeconomics, September, Miami.


**Future research**

Bader, K. & Enkel, E.: How can firms enhance their radical innovation outcome? Connecting strategy, openness and radical innovation.


Bader, K. & Enkel, E.: Why are firms open for open innovation? Exploring the impact of innovation culture and strategic direction.


Enkel, E. & Heil, S.: Technology manager’s absorptive capacity of external knowledge: Approaches to exploratory and/or exploitative innovation.


Heil, S., Dingler, A. & Enkel, E.: Managing technological distance in internal and external collaboration: Absorptive capacity routines and social integration for innovation.

Hubert & al.: How Group Heterogeneity Affects Idea Quality – An Empirical Case Study Analysis on Diverse Network Positional Advantages within the Open Innovation Community of a High-Technology Cooperation.

Hubert & al.: The other side of the coin - Investigating expectations and experiences of support systems for startups and young ventures – A focus on accelerator and incubator programs.

Hubert & al.: How to make a difference - Neurophysiological differences of pattern and opportunity recognition between entrepreneurs and non-entrepreneurs.

Hubert & al.: Less control or stronger impulses? - Self-regulation, self-control and impulsive behavior – neurophysiological insights.

Hubert & al.: What’s on their mind? - Using behavioral and neuroscientific methods, results and theories on learning, memory and decision making to investigate and explain the individual perspective within the concept of absorptive capacity.

Mezger, F., Bader, K. & Enkel, E.: Chance favors the prepared mind: The role of cultural antecedents for business model innovation.

Cooperation with practice

Ever since the founding of the Chair of Innovation Management we have closely worked and researched together with the practical world, either on site at a company, in the context of creativity workshops or practical tasks for the students in seminars at Zeppelin University.

Opportunities for collaboration

| Bilateral projects for conceptual design and implementation of current and relevant individual issues in your company |
| Partners in one of our consortia projects (working groups, benchmarking, work-shops) |
| In-house seminars on Innovation, Technology and Knowledge Management and Entrepreneurship |
| Practical lectures in workshops with business partners or in courses |
| Involvement in courses (e.g. examination of your company’s knowledge management) and development of recommendations for improvements through a supervised group of students |
| Company-specific processing of bachelor and master topics by our students as well as placement of committed interns |

Past and current projects

| FVA, identification of routines as well as socially enabling mechanisms and structures to successfully manage technological distance in cross-industry innovation. |
| Beiersdorf, optimising technology scouting with regard to future tasks. |
| Airbus Space, coaching and further development of entrepreneurs for future businesses inside Airbus Space. |
| Astrium, joint ESA project in order to evaluate and adapt space technologies for terrestrial use. |
| EU project Always travel, to develop and validate an European passenger transport information and booking system across several means of transport modes. |
| NaKoGi, competence center of service-based business models with 10 corporate partners. |

Last row: Claus von Riegen (SAP AG), Ales Krubner (BASF SE), Andreas Krüer (Osram GmbH), Otto Gies (Airbus Group), Christoph Afheldt (Zeppelin Rental GmbH & Co KG), Christian Huber (BASF SE)
Third row: Prof. Dr. Stephan A. Jansen (Zeppelin Universität), Caroline Legler (Airbus Group), Lutz Mehlhorn (MehlhornConcepts)
Second row: Susanne Wosch (Ernst & Young GmbH), Clemens Mast (Zeppelin Universität),
Front row: Felix Cramer von Clausbruch (Zeppelin Universität), Lars Rössler (Osram GmbH), Prof. Dr. Ellen Enkel (Zeppelin Universität), Axel Freund (Sodexo Services GmbH) Karoline Bader (Zeppelin Universität), Sebastian Heil (Zeppelin Universität)
Ellen Enkel is professor for innovation management and head of the Dr. Manfred Bischoff Institute of Innovation Management of Airbus Group at the Zeppelin University in Friedrichshafen. Since 2008 she holds the Chair for Innovation Management at Zeppelin University. Prior to that, she carried out research projects for more than 10 years in different roles at the University of St. Gallen, Switzerland. There, she managed the Competence Center Open Innovation at the Institute of Technology Management as well as the Competence Center Knowledge Source at the Institute of Information Management and at the Institute of Management. Since 2012 she has been Editor-in-Chief of the internationally renowned R&D Management Journal. Her research focus comprehends the topics of open innovation and cross-industry innovation, business model innovation, intra- and inter-company innovation networks, innovation metric systems and strategic communication of innovativeness as well as entrepreneurial culture. Prof. Enkel disposes of broad experience by the collaboration with enterprises such as BMW, Unilever, IBM, BASF, Alcan and Henkel. Until now, she has published four books and numerous articles in academic and practical journals regarding technology and innovation management.

Marco Hubert is junior professor for innovation and entrepreneurship at the Dr. Manfred Bischoff Institute of Innovation Management of Airbus Group at the Zeppelin University in Friedrichshafen. Prior to that, he performed research and worked as a Ph.D. candidate at the Chair of Marketing (Zeppelin University, Friedrichshafen). His interdisciplinary focus connects topics from innovation research, marketing, psychology and neuroscience. Currently, his research comprises questions regarding the communication of innovation, the perception of innovativeness, innovation metric systems, e-commerce, consumer behavior and foresight. Jun.-Prof. Hubert has worked in cooperation projects with enterprises such as MARS or IP Germany. He has already published numerous articles in highly ranked academic journals.

Karoline Bader is a research associate and PhD candidate at the Chair of Innovation Management. Her research focuses on the relationships between innovation culture, innovation strategy, and the innovation behavior of firms. Additionally, she conducts research in the area of business model innovation focusing on cultural and strategic antecedents and relevant organisational capabilities. In addition to her research, she has previously worked in numerous cooperative projects with well-known firms across the industries and is one of the co-founders and managing directors of ‘Parkplatz-gesucht’.

Felix Cramer von Clausbruch works as a research associate and PhD candidate at the Chair of Innovation Management. He worked as a food retail salesman for several years and as a consultant in several innovation projects. He received his Bachelor in Public Management and Governance from the Zeppelin University Friedrichshafen and studies his Master in Entrepreneurial Finance at the University of Liechtenstein. His research focusses on triggers and barriers for business model innovations and the logic of structure and organisation to ideate, evaluate and implement them successfully. Therefore, his work is based on the theories of (cognitive) distance and ambidexterity.

Annika Dingler is a PhD candidate at the chair of Innovation Management. After receiving her graduate diploma in business administration she worked in corporate communications as well as innovation management at ZF Friedrichshafen AG for more than seven years. Currently her research focuses on the role of social integration mechanisms, that for example facilitate the way information is distributed, interpretations are formed or ideas are exchanged in collaborative innovation. In particular, she investigates the role of social integration and communication mechanisms in distant collaboration across established industry boundaries (cross-industry innovation).
Sebastian Heil is a research associate and PhD candidate at the Chair of Innovation Management. He holds a Diploma Degree in Business Administration from the University of Mannheim and Copenhagen Business School. His research focusses on the antecedents and consequences of collaborative innovation beyond established industry boundaries. He has been in charge of several research projects with well-known firms and institutions across a myriad of industries and areas of expertise to gain new insights from practice and develop new theoretical and methodological approaches to the management of technological and business model innovation.

Monika Hengstler works as a research associate and PhD candidate at the Chair of Innovation Management. She studied mechanical engineering at the Technical University in Munich and received her bachelor’s degree in “Mechanical Engineering and Management” and her master’s degree in “Mechanical Engineering”. Prior to that, she studied business administration with main focus on business taxation at the Duale Hochschule in Villingen-Schwenningen and finished her diploma with distinction. After completing her studies in 2012, she worked for a medical technology company for more than two years. In her position in the strategic product management department of Gebrüder Martin, a company of the KLS Martin Group, she worked on new implant solutions and biomaterials.

Sabine Marx is manager of the Dr. Manfred Bischoff Institute of Innovation Management of Airbus Group at the Zeppelin University in Friedrichshafen. After an employment of 25 years in facilities for the handicapped, she passed a triennial training for management. Since September 2008, Sabine Marx has been working at Zeppelin University and 2010 she joined the institute as administrative head. Now, as manager, she supports the research team in research projects and is responsible for the representation, organisation and coordination as well as public relations and marketing of the institute.

Simon Engels is a Master student who supports the institute in a variety of research-related activities. He received his bachelor’s degree in „Business Administration and Economics“ at the University of Hohenheim in 2013. There he specialised in innovation management, with a focus on intellectual properties, as well as international management. Currently he studies “Corporate Management and Economics“ at the Zeppelin University. In his studies he investigates how radical innovations (e.g. self-driving cars) affect society and markets as well as how firms can manage innovation ecosystems to profit from these business opportunities. At the institute he supports a project investigating cross-industry innovation in the sector of drive technology, a study about open-collaborative projects in developing countries and the Open Innovation Study 2014.

Pia Hösl is a student of the master’s degree in „Corporate Management and Economics“ at the Zeppelin University in her second to last semester. Since the beginning of 2014, Pia Hösl has been part of our team, in which she mainly contributes to a Cross-Industry-Innovation project. During her last internships she has already gained significant insights into different industries in the areas of business development, sales and marketing.
We look forward to exploring these and further issues with you in 2015!

Please visit our homepage in order to be informed about current news and further information on our research:
zu.de/innovation
References


