Dr. Manfred Bischoff Institute for
Innovation Management of
EADS

Research Report 2012/2013
Dear readers of the research report,

It is my pleasure to inform you about our research and managerial activities in 2012 and 2013. 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 don’t hesitate to contact us!

Best regards,

Ellen Enkel

---

Prof. Dr. Ellen Enkel  
Head of the Institute  
phone: +49 7541 6009-1281  
email: ellen.enkel@zu.de
Contents

The Institute in a Nutshell
8 Highlights and our major topics of the year
10 Innovation at the institute in numbers 2012

Insights in Collaborative Innovation
Chapter 1: Excellence in Open Innovation
14 Why is it hard to measure excellence in open innovation?
16 Innovation Study 2012 – Benchmarking
28 The three best open innovation companies 2012
32 Technology manager’s absorptive capacity of external knowledge

Chapter 2: Innovation Strategy
36 Balancing open and closed innovation: Business strategy as determinant
39 Search strategies for cross-industry innovation:
   Development of a multi-job multi-method matrix with BMW

Chapter 3: Cross-Industry Innovation
41 “We borrow with pride“:
   Cultural and structural capabilities for systematic cross-industry innovation
47 Radical innovation from beyond established industry boundaries:
   How to prepare for distant collaboration
51 When distant partners become your closest friends:
   Ambidexterity through cross-industry collaboration projects
54 Cross-industry innovation: Why should a marine biologist cooperate with
   a chemical company in an innovation project?
57 Guidelines on where to search appropriate partners
Chapter 4: Business Model Innovation

59 Increasing digitalization enables and demands new digital business models
63 Designing radical business models by looking across industry boundaries
66 Flying high or low:
   Capabilities for business model innovation in the highly competitive airline industry
68 How to systematize business creation? The case of Europe’s largest aerospace company
72 How to “fight” Amazon and Google:
   Business model innovation in the specialized publishing industry

Chapter 5: Perception and Communication of Innovation

74 Research Brand Equity
78 Brand Creators

Further Information

83 Research and teaching at the institute
84 Further publications of the institute
87 Cooperation in practice
88 Team
90 The institute goes international
92 References
The Institute
in a Nutshell
The innovation study of 2012 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, Austrian and Switzerland. We use this research in order to verify new upcoming topics as well as changing behaviour and best practices. In 2012, more than 200 companies participated in the study. Three 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, culture and the right innovation activities seems to determine innovation success. Several qualitative and quantitative research results of the institute indicate that strategy give the direction how much of open and closed innovation activities is effective and efficient while the culture is supportive or hindering the strategy fulfilment. Furthermore, as open innovation is already seen as the dominant design in innovation management, skills of employees need to adapt accordingly. Inspired by a project with BMW we analysed which capabilities a technology manager needs to successfully identify, evaluate and integrate knowledge from the outside world. In an on-going large scale survey we aim to link those capabilities with the company’s technology strategy in order to develop archetypes of capability sets for each strategy. For more information to these points please see Chapter 1 and 2.

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 triggers for changing business models, identify capabilities to create new businesses (in cooperation with the Copenhagen Business School), to create digital business models (in our executive master program digital pioneering) as well as to learn how to develop disruptive business models by imitation from other industries. 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.

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. Therefore, we tried to develop a new tool how to measure cognitive distance of industries before selecting a collaboration partner. Additionally, as existing research point out that especially high distance collaboration lead to disruptive results, we studied the capabilities needed to successfully manage those collaborations (see Chapter 3).
In cooperation with Wharton University in the US, we further examined how companies can reach ambidexterity, aiming for both exploratory (disruptive) and exploitative (incremental) innovation, by pursuing cross-industry innovation collaboration. Our case study analysis led to the identification of major success factors like individual learning potentials differ for the collaboration partners, acting as a function of the initial knowledge distance, project objective and subsequent process architecture. Please see Chapter 4 for more information.

Last but not least, 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 but research and practice are lacking clear indicators to prove innovativeness.

The institute is very much profiting from its new junior professor Marco Hubert who focuses his research on this topic. In a joined research project with the chair of marketing of the Zeppelin University (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, Prof. Hubert tries to identify indicators to measure innovativeness of companies. Please follow up on this research area in Chapter 5.
Innovation at the institute in numbers 2012

About 200 companies participating in open innovation survey 2012

Participation in 7 international conferences and workshops

1090 participantes at lectures of the institute

263 students learning about innovation in fall/spring semester

263 students learning about innovation in fall/spring semester

| 152 bachelor students at the courses Introduction to Scientific Working, Introduction to Innovation & Technology Management and Open Innovation |
| 77 Master students at the courses Advanced Open Innovation, R&D Metrics & Creativity, Knowledge Management as well as Marketing Management |
| 34 Executive Master students participated in each of the modules Innovation & Technology Management, Digital Business Modeling, Networks, as well as New Markets & Technologies in Digitalization |
13 presentations on management conferences and symposia

Research projects in practice done with
BMW | Astrium | Henkel | EADS | Friesland Campina

3 best open innovator awards

International research cooperations with
Copenhagen Business School, WU Wien, Universität Mannheim,
Universität St.Gallen (HSG), Université Paris-Sud,
University of Cambridge, Leuven University, Wharton USA

41 peer reviewed academic articles
submission        >>        under review        >>        in press or printed

20 journal and conference submissions
11 scientific articles under review
10 academic articles
10 managerial contributions
Why is it hard to measure excellence in open 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 meet).

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 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 2012 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. The figures displayed show different comparisons between, e.g., different strategy types as well as between the best in class and the average companies. The further readings indicate more information about the summarized topics in each chapter.
Innovation Study 2012 – Benchmarking

Introduction

In what way can open innovation formats help firms to systematically enhance their innovation performance? Which open innovation activities might be more beneficial than others? Are there specific antecedents with respect to differing open innovation formats and business model initiatives? Our Innovation Study 2012 shall support companies to benchmark against others and shall help to answer such questions.

The study dealt with three key topics: the relationship between innovation strategy and openness, business model innovation and cross-industry innovation. In this context, the Chair for Innovation Management 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.

In order to gather the necessary information for the benchmarking analysis, the data were collected via a web-based online survey between March and November 2012. In so doing, companies of different sizes and industry affiliations were addressed via personalized cover letters and systematic email waves.

In total, we addressed over 2,500 companies and finally received 183 filled questionnaires. Due to the fact that some questionnaires were not fully completed, we had to cope with missing values regarding specific questions. This led to a reduced number of observations. Apart from the missing data problem, some companies did not reach a critical firm size or were categorized as start-up companies which again led to a reduction in sample size. Finally, we could utilize an adjusted sample of 169 observations for the benchmarking analysis.

Figure 1: Industry affiliation of surveyed companies (N = 169) in Innovation Study 2012
73.4% of the surveyed companies belong to the category of big corporations (more than 500 employees), whereas 26.6% are small and medium-sized enterprises (SMEs).

With respect to the industry affiliation, 78.6% of the companies can be categorized as manufacturing firms, whereas 21.4% are service providers (= non-manufacturing). Since the topics open, cross-industry as well as business model innovation are still more frequently discussed in manufacturing firms, this unequal distribution might be explained. Nevertheless, these topics have also become more important for non-manufacturing firms during the last years. Overall, we observe an increased interest with respect to required organizational capabilities and employed innovation activities to increase a company’s innovation performance.

**Strategy as determining factor for openness**

Based on theoretically derived strategy profiles (DeSarbo et al. 2005; Olson et al. 2005) we were able to separate the corporate landscape into different proactive strategy archetypes. The companies were asked to categorize themselves according to defined strategy profiles. Within the benchmarking analysis, we only regard the three proactive strategic archetypes (N=160) and neglect the interrogated non-proactive strategic archetype, as the latter type is less successful in the market. This is true, since innovation obviously does not play a key role for this company type.

The Prospector’s profile describes a company to frequently be the first-to-market with new product or service concepts. This company type aggressively enters new market segments where it perceives an opportunity or new trend. Furthermore, Prospectors concentrate on offering products or services that overcome and push performance boundaries. They offer the most innovative products or services, whether based on performance improvement or cost reduction.

The Analyzer's profile describes a company to rarely be “first-in” with new products or services and enter emerging market segments. However, by carefully monitoring their competitors’ actions and the customers’ responses, Analyzers can be 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 favor 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 this company type tries to maintain a relatively stable domain by aggressively protecting its 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 by providing products or services at the best prices. This type 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 type is known as the differentiated Defender.

Based on the different business strategies, innovation strategies and the degree of firm openness can be assumed. Companies that follow a Prospector strategy are usually more open than companies which follow a Defender strategy (see also Enkel and Bader, 2012). Due to the fact that Analyzers are positioned in the middle, we expect Prospectors to have the highest degree of firm openness, followed by the Analyzers, and finally followed by the Defenders.
This assessment makes sense, when regarding the archetypes’ market orientations, internal structures and processes as well as their objectives regarding resource allocation. To get a better overview with respect to the archetypes’ utilization of open innovation activities, we conducted an analysis and calculated the mean of activity utilization for each strategic archetype.

Figure 2 shows that the Prospectors achieve the highest utilization mean for all investigated open innovation activities. This implies that Prospectors strive for a higher degree of firm openness. Since these companies regularly integrate external knowledge in their innovation processes, they often set new trends and are able to discover a variety of opportunities.

In comparison to the Prospectors, the Defenders are less open with regard to the integration of external knowledge and predominantly focus on their internal know-how. Since the Defenders either strive for cost leadership or quality leadership (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 (see also article by Karoline Bader about balancing open and closed innovation). This is true, as companies sometimes lose focus and over-search, or they might rely too heavily on external resources (Dahlander and Gann, 2010).
As a result, one cannot argue that companies with a higher degree of firm openness are more successful. If companies do not adapt their innovation strategies – including the application of open innovation formats – to their strategic goals and vision, these companies are likely to be less successful in the markets (Gianiodis et al., 2010; Laursen and Salter, 2006).

Due to the fact that the Analyzers follow a hybrid strategy adopting both characteristics of Prospectors and Defenders, they might occasionally be less open regarding single open innovation activities (e.g. spin-offs or knowledge acquisition via M&A) and instead focus on others. However, from a general point of view, the Analyzers achieve a greater degree of firm openness than the Defenders do.

To sum up, we can show that the degree of firm openness can be derived from strategy and that it differs with respect to a company’s strategic focus. Furthermore, we demonstrate that this tendency is also true for single open innovation formats.

Finally, we are able to reveal which open innovation activities are the most important ones across all three proactive strategic archetypes. Taking for instance the integration of lead user knowledge or the knowledge exchange in networks within the own industry (see Figure 3), we see that these open innovation formats were intensively applied. In contrast, the integration of external knowledge via M&A seems to play an inferior role.

*Figure 3: Comparison of single open innovation utilization with respect to the strategic focus (N = 160)*
This evaluation might support companies to benchmark their degree of openness as well as their utilization of single open innovation activities with others. Nevertheless, one should always consider a company’s strategic focus and orientation when benchmarking against others.

**Business model innovation**

In our sample, we see the increasing relevance of developing new or reconfigured business models, beyond established product, process, and service innovations.

This can be partly attributed to a moderately dynamic environment regarding technological development and changes in the market structure (see Figure 4). The latter one refers to frequently changing customer needs, new competitors, while technological development captures the speed in which new technologies enter the market (see also Jaworski & Kohli, 1993).

Participants in the study consider especially technological developments as dynamic. As outlined in academic research, the emergence of new technologies often leads to the development of new business models, which adequately leverage the potential of this technology (e.g., Chesbrough and Rosenbloom, 2002; Rosenbloom and Christensen, 1994). Thus, working in this moderately dynamic environment requires a firm to consider business model innovation as complementary activity within its innovation strategy.

With a potentially increasing volatility and dynamism in global markets, such a systematic consideration of reshaping business models might become even more important. Therefore, CEOs, managing directors, and innovation managers are likely to ask how to approach and organize this topic within their companies.

---

**Figure 4: Environmental turbulence regarding technological and market development (N=152)**
Responsibility for business model innovation

The organizational responsibility for business model innovations plays a crucial role, as it is not quite clear yet, who is responsible for these innovation activities (Chesbrough, 2010).

The results of our study show that business model innovation is organized centrally (see Figure 5). These activities are driven by corporate management, i.e. CEOs, Chief Innovation Officers, strategy heads, and/or other board-level managers. This again emphasizes the strategic relevance of the topic.

Typical functions that hold operating responsibility are Corporate R&D, Corporate Development, or even a specific incubator unit. Incubator units are independent organizational units that provide a home for start-ups within a company. These incubators often offer technical infrastructure, consulting or other services to internal new businesses for example. In so doing, new ventures that develop new business models can benefit from the deep know-how and other resources of the core company (Roseno et al., 2013).

<table>
<thead>
<tr>
<th>Responsibility for business model innovation</th>
<th>Sample Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>At board/ management level</td>
<td>3</td>
</tr>
<tr>
<td>Within joint ventures held together with partners</td>
<td>2</td>
</tr>
<tr>
<td>Within independent subsidiaries</td>
<td>2</td>
</tr>
<tr>
<td>Within central corporate or business development</td>
<td>3</td>
</tr>
<tr>
<td>Within central R&amp;D</td>
<td>2</td>
</tr>
<tr>
<td>Within an incubator</td>
<td>1</td>
</tr>
<tr>
<td>Within a separated venture capital unit</td>
<td>1</td>
</tr>
<tr>
<td>Within business units</td>
<td>0</td>
</tr>
</tbody>
</table>

*Figure 5: Where does the managerial responsibility for initiatives regarding business model innovation reside? (N=147)*
Capabilities for business model innovation (BMI)

Based on dynamic capabilities theory (e.g., Teece, 2007), companies need capabilities to adapt their resources in order to address or even induce change. As innovations in business models are often radical or disruptive changes, companies need certain capabilities especially focusing on sensing opportunities or threats in the environment as well as designing and implementing new business models.

To allow for benchmarking, we identified top business model innovators within our sample. These companies share certain characteristics, as they:

- Systematically consider BMI a core part of their innovation strategy and innovation activities.
- Regularly challenge and evaluate existing business models.
- Take more initiatives towards changing the current form of “how to do business”.
- Establish new business model successfully on the market.

Therefore, these companies systematically and purposefully pursue BMI in order to create competitive advantages, foster growth, and address new markets.

What are the differences between top business model innovators and the average sample regarding specific capabilities? Our sample shows that the top business model innovators have strong competencies in sensing and seizing business opportunities and threats.

Sensing comprises capabilities such as:

- **Business model thinking**: Companies need to think beyond their traditional product/service boundaries and consider the business model (within an ecosystem or regarding partners) as subject to innovation. Hence, they should evaluate whether their current business model serves customer needs and leverages technological possibilities adequately.

- **Market and customer orientation**: Current business models serve current customer needs. However, these needs do change and today’s buyers might become non-buyers in the future and vice versa. A strong market and customer orientation for the evaluation of current product/service bundles is relevant to ensure that a business model fits to evolving customer needs.

- **Thinking in business ecosystems**: Customers do not think in terms of single products or services; customers require that companies deliver comprehensive solutions to their problems. Hence, new business models more and more deliver such solutions instead of providing single products. As a consequence, the integration of complementary (or substitutable) products is key for recognizing opportunities and threats.

Within our sample, we found out that companies are already very well positioned regarding market and customer orientation (see Figure 6). However, top business model innovators are significantly ahead of the average company. They excel in terms of thinking in comprehensive, solution-oriented business models and considering the business ecosystems as important input to identify relevant value propositions for the future.
Seizing relates to the subsequent step of approaching business model opportunities and threats that have been identified before. This dynamic capability comprises four aspects:

| Business model design: To tackle opportunities, business model innovators propose entirely new business models, not only new products or services. This differentiates them from other companies. For example, Daimler introduced the car sharing platform car2go to address the segment of young, urban adults. They did not introduce a new car, but introduced an entirely new business model to satisfy this market segment’s needs. |

| Partnering and open innovation: New business models require the companies to integrate partners with complementary competencies. Hence, open innovation and partnering are essential capabilities for business model innovators. This includes a clear definition which competencies are that critical that they should be developed in-house. |

| Reconfiguration of resources: The resource base of a company is valuable for a specific time and within a specific market configuration only. Technological changes and market developments require a company to acquire or build new resources such as technological know-how or customer knowledge. New business models essentially base on these new resource configurations. |

| Decision making: To pursue BMI successfully, a company’s decision-making processes should fulfill certain characteristics, for example being close to the market, allowing for a high autonomy or systematically focusing on business models. |

Our sample shows that all participating companies are rather advanced regarding their partnering and open innovation approach (see Figure 7). However, top business model innovators outperform others in other capabilities such as business model design or resource reconfiguration. Overall, this benchmarking analysis provides insights for companies how to further strengthen their abilities to successfully pursue business model innovation.
Capabilities for cross-industry innovation

Drawing on absorptive capacity theory (Cohen & Levinthal, 1990), the study addressed distinctive capabilities for cross-industry innovation, allowing companies to locate and capture specific knowledge or technologies of partners from beyond established industry boundaries. While the distance between the acquired knowledge and the problem to be solved is positively related to exploratory innovation, too much diversity hinders efficient knowledge absorption and results in a reduced effect on novelty value (Nooteboom et al., 2007).

Therefore, building potential absorptive capacity makes a firm receptive to understanding and evaluating distant knowledge. Further, realized absorptive capacity reflects a firm’s ability to derive new insights from the combination of existing and newly acquired knowledge (Zahra and George, 2002). More specifically, according to the process view of absorptive capacity (Lane et al., 2006) and applied to the context of cross-industry innovation, potential absorptive capacity comprises the process stages of recognizing, assimilating, and maintaining distant knowledge from other industries to set the stage for future knowledge transfer to occur.

On this basis, realized absorptive capacity includes the process stages of recombining new external knowledge of other industries with existing organizational knowledge and implementing it in new products, services, or processes (see also article by Sebastian Heil about distant collaboration).

To allow for a benchmarking analysis, we identified top cross-industry innovators within our sample. These companies share certain characteristics, as they:

---

**Figure 7: Seizing capabilities for business model innovation (N=152)**

<table>
<thead>
<tr>
<th>Business Model Design</th>
<th>Partnering and Open Innovation</th>
<th>Reconfiguration of Resources</th>
<th>Decision Making</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systematic exploitation of commercial opportunities</td>
<td>Integration of partners with complementary capabilities</td>
<td>Optimal use of core competencies</td>
<td>High autonomy of individual business units</td>
</tr>
<tr>
<td>Derivation of new business models beyond products and services</td>
<td>Configuration of internal resources and capabilities</td>
<td>BMI based on customer and/or competitor perspective</td>
<td>Systematic (re-) combination of knowledge</td>
</tr>
<tr>
<td>Definition of new business models to address changes</td>
<td>(Re-) Configuration of business structure</td>
<td>Configuration of internal resources and capabilities</td>
<td>Replacement of relevant abilities</td>
</tr>
<tr>
<td>Opportunities are addressed with new business models</td>
<td>Integration of partners with complementary capabilities</td>
<td>Configuration of internal resources and capabilities</td>
<td></td>
</tr>
</tbody>
</table>
Pursue cross-industry innovation more intensively and perform more activities towards the integration of distant knowledge.

Implement cross-industry innovation as a core part of their innovation activities.

Successfully conducted a multitude of cross-industry innovation projects during the past three years.

Hence, these companies have established cross-industry innovation as a method to systematically accomplish exploratory innovation. What are the differences between top cross-industry innovators and the average sample regarding specific capabilities? Our sample shows that the top cross-industry innovators have stronger antecedents to potential and realized absorptive capacity (see the following sections).

Antecedents to potential absorptive capacity

Our sample shows that all participating companies spend only some effort in recognizing, assimilating, and maintaining potentially valuable external knowledge from other industries (see Figure 8). As yet, there seems to be no systematic exploration of distant knowledge. This may be due to the fact that analogical knowledge from other domains is frequently looked for without the aid of formal methods, which help to abstract from the original problem and to identify appropriate industries or partners. While this approach is rather efficient, the tendency to only partially access knowledge from other industries may constrain the possibility for creative recombination and increase the risk of failing to seek out valuable alternative technologies. Top cross industry innovators outperform others in all antecedents to potential absorptive capacity. In particular, they have in place clearer incentives to
encourage distant knowledge absorption, observe technological developments in certain industries more frequently and approach external partners on a regular base. However, on average, even top cross-industry innovators lack behind an exhaustive approach to adapt to their external technological environment. These findings suggest that it may be an effective way to promote distant search on an individual level and venture broad observations about technological developments only in certain key industries.

**Antecedents to realized absorptive capacity**

Within our average sample, we found that companies are ill-positioned regarding recombining assimilated knowledge from other industries and implementing this knowledge in new products, services or processes (see Figure 9). Top cross-industry innovators are significantly ahead of the average sample on all antecedents to realized absorptive capacity; therefore, they may achieve superior performance by using acquired knowledge in the innovation process. These interfirm differences are likely influenced by the aforementioned differences in the firms’ level of prior related knowledge, determined by the effort that firms undertake to build up their potential absorptive capacity. When combining new and existing knowledge, potential absorptive capacity helps firms to determine the usefulness of new technological knowledge from other industries and convert it into new products, services, or processes. Thus, the realized absorptive capacity is likely to be limited by the level of potential absorptive capacity. In sum, these benchmarking results show where and how companies should further strengthen their capabilities for cross-industry innovation to learn new insights via knowledge from distant industries.
Performance effects from cross-industry innovation

Finally, we see in our sample that top cross-industry innovators outperform the sample mean in all performance measures (see Figure 10). These findings underline the importance of building potential and realized absorptive capacity for cross-industry innovation. The top firms are particularly ahead regarding the reduction of development time and project duration, but also benefit from cross-industry innovation more often in terms of increased product innovativeness. Overall, performance effects from cross-industry innovation activities remain rather modest, especially with regard to the inside-out perspective in terms of licensing revenues and profits out of the commercialization of own technologies.

For both, the sample average and top cross-industry innovators, there is great potential for future development of their cross-industry innovation performance by preparing for distant collaboration in an even more systematic manner. First of all, companies should develop sufficient resources in recognizing, assimilating, and maintaining external knowledge beyond established industry boundaries to assure a sufficient level of potential absorptive capacity. Thereby, an excessive focus on only one process stage will not be sufficient.
At the Innovation 2012, one of Europe’s leading innovation conferences, the Dr. Manfred Bischoff Institute for Innovation Management of EADS together with a renowned practitioner consortium elected Henkel, J.W. Ostendorf, and Ravensburger for excellence in open innovation.

The expert jury was formed by Andreas Clausen and Dr. Stefan Biel (Beiersdorf AG), Dr. Grit Enkelmann and Olivier Schneller (Otto Group), Reinhold Huber (Binder + Co AG), and Dr. Heinrich Schäperkötter and Dr. Bruno Scherb (Schaeffler Technologies GmbH & Co. KG). From the scientific side, the study was accompanied by Prof. Ellen Enkel and her team.

Increase of innovation performance within and beyond open innovation

The winning candidates were selected from more than 150 companies from Germany, Austria and Switzerland, which participated in our innovation study until autumn 2012. Thereby, the central selection criteria was not how much a business practices open innovation, but how systematically and purposefully it does with regard to innovation culture, business model innovation and cross-industry innovation.

Out of the participating companies in the quantitative study, the top 15 companies were asked for interviews based on several objective ranking criteria. Further, case studies, including examples of cross-industry and business model innovation activities were written by Prof. Enkel and her team and delivered to an expert committee for evaluation. In a third step, the top five companies from the anonymous case study phase were selected for a site visit. On the basis of these full-day visits, which took place in September and October 2012, the three winners were chosen. Prizes were awarded in the categories „best overall implementation of open innovation in a large company,” „best overall implementation of open innovation in an SME” and „anticipatory open innovation”.

Best practice in open innovation - The winners

Henkel operates worldwide with leading brands and technologies in three different business areas: Laundry and Home Care, Beauty Care as well as Adhesive Technologies. Henkel was founded in 1876 and today, holds a leading market position in the consumer and industrial business with well-known brands such as Persil, Schwarzkopf and Loctite. Both product and business model innovations are of strategic importance, as Henkel regards innovations to be the basis for the company’s long-term success. Today, about a third of Henkel’s turnover results from new and innovative products. In this context, open innovation initiatives meaning the early involvement of external actors in the innovation process play an important role for Henkel.
Prof. Dr. Thomas Müller-Kirschbaum, who is the head of R&D/Technology/Supply Chain of the Laundry and Home Care division at Henkel, sees open innovation as excellent orchestration and option for linking internal and external competencies. Henkel pursues numerous open innovation approaches. Apart from the collaboration with selected suppliers, start-up companies and with an extensive network of university professors, the early and systematic integration of cross-industry innovation partners delivers the greatest value for Henkel. Through the establishment and on-going exchange with the own cross-industry innovation network (including companies, universities, research institutes, knowledge brokers and other competent partners), Henkel has successfully launched a variety of radical innovations during the past years. Furthermore, a targeted monitoring of cross-industry trends regarding new consumer demands is also part of Henkel’s strategic innovation management. For this purpose, creative meetings with consumers and other external actors take place on a regular basis.

Especially in the Laundry and Home Care division, Henkel has systematized its cross-industry innovation approach in order to promote new product development and to incorporate new technologies in another context. Employees, who have a broad experience in predefined target industries, operate as technology scouts to identify technologies in more or less distant industries. These newly identified technologies might then be useful for Henkel’s future innovations.

Through the concept of the so-called “Innovation Days”, all employees at Henkel have the possibility to exchange new findings, knowhow and information about new trends across industry boundaries. Additionally, Henkel invites external partners from different sectors to the company’s „Innovation Fairs“ every six months to discuss relevant future innovation topics and trends. With respect to the long-term documentation of knowledge (incl. cross-industry knowhow), Henkel has set up a comprehensive information technology system. Furthermore, all three divisions have also established a global internal online network, called Innovation Lounge. Here, employees can present and explain new ideas which are evaluated by defined cross-functional experts in a next step. Finally, the best entries will be presented to the top management.

Under the umbrella of Open Service Innovations, Henkel continually develops new business areas in the Laundry and Home Care division. In this context, Henkel has established a new service concept around Persil to strengthen the brand name. This new service concept (or even new business model) has been implemented through partnerships with numerous medium-sized cleaning businesses. In the B2B sector for example, “Persil service” shall address individuals who have little time for doing their laundry at home. Consequently, these individuals can bring their dirty clothes to special service points at the workplace and collect the clean clothes after work. Furthermore, “Wash & Coffee”, which was established in cooperation with the company Bosch, is another service concept with similar objectives.

J.W. Ostendorf is a leading manufacturer of decorative paints and varnishes for do-it-yourself stores, retailers and the industry. JWO covers a broad value chain from the development and production of decorative paints to the marketing at the point of sale. This includes the development and expansion of retail customer brands, so-called „private labels“, as well as its own JWO brands. In all its business processes, JWO emphasizes the concept of sustainability. In 2011 the company employed around 650 people and realized sales of 350 million euros. In the case of brand strategy regarding its retail customers, JWO is not pursuing a me-too-approach, but sets frequent trends in its business segments, with which the company responds to the changing consumer needs. Foundation of the company’s success is the professional innovation management, including a continuous review of the range and development process. Environmental awards such as The Blue Angel, the EU Ecolabel, Nordic Swan and numerous awards by the Stiftung Warentest and Ökotest were achieved for the innovation measures.
To meet the needs of the product’s end user and achieve the highest possible quality level at the desired price-performance ratio, JWO involves the expertise of numerous external partners in its development processes. The use of innovation networks and the cooperation with the commodity industry over the entire value chain provides the company a significant additional value. Cross-linking with partners from other industries enjoys a high priority at JWO. Executives from the research and development department work in different sectoral and cross-sectoral networks and associations, such as the Start-Up cluster Münster or the „Netzwerk Oberfläche NRW“ (surface technology network in North Rhine-Westphalia, Germany). Here, representatives of different sectors such as raw material suppliers, user industries (e.g. furniture), plastic mold makers, manufacturers, universities and research institutions are active. In specific search fields, JWO follows a problem-centered strategy with the aim to identify lead industries which help to solve the problem. JWO integrates the knowledge of external institutions, which accompany the development process on a scientific and analytical way, through creative workgroups. JWO adopts Open Innovation systematically for product innovation as well as for process and business model innovation. In addition, the integration of end users and market operators from the do-it-yourself sector is an important source for innovation. The use of Netnography plays a significant role in the consumer segment. Thereby, specifically relevant forums are followed as well as customer feed-back and customer needs collected and analyzed.

At JWO, Open Innovation is lived and communicated through the culture, structures and processes of the company. In order to develop ideas or to improve existing ideas, the company holds innovation workshops in which own employees, external stakeholders from various disciplines, industries and countries participate regularly. In addition, the company has a suggestion system which employees use regularly to communicate new ideas to the top management. New ideas will be awarded according to their potential for innovation and communicated to all employees within the company.

Business model innovations play a central role in this company. An example for a radically new business model is the „Plug & Spray“-system of JWO’s own brand named „Signeo“. In this case the convenience-based model of Nespresso, which is positioned in the premium segment, served as an cross-industry analogy. To address the needs of the do-it-yourself-user, the enterprise searched for an innovative business model approach and found, through its cross-sectoral search, the Nespresso business model in the food industry. „Signeo Plug & Spray“ is a design-oriented and simple-to-use system, where color cartridges are inserted in a spray pistol similar to the Nespresso capsules. The product idea was realized in cooperation with a leading company in the spray equipment industry and won the „red dot design award 2010“.

The games publisher Ravensburger is a leading European manufacturer of jigsaw puzzles, games and activity products. With production facilities in Germany and the Czech Republic, the group also includes a book publisher and other business areas, such as the „Ravensburger Spieleland“ or „Ravensburger Digital“, which develops and merchandises smart phone and online-based games.

Ravensburger considers itself as a premium manufacturer and is ambitious to hold its leading, quality oriented market position in the business of traditional toys, as well as to develop new growth fields by incremental and radical innovations. The company’s philosophy of quality covers in particular the production of elaborate, intelligent and educational plays and ideas which distinguish themselves. In daily business the company strives to ensure that all products express values such as joy, education and community.

Caused by the historical roots as a traditional publishing house, a high willingness to open towards external idea givers is anchored in the company culture. “Open innovation and the long-term cooperation with partners are basic for us”, Clemens Maier, board member of the Ravensburger group, explains. Beside the integration of these inventors, different other partners such as universities or consultancies are integrated. The aim of these projects is not only the drafting of concrete innovation contents, but also a “learning from the partner“ to be able to use the acquired abilities in later projects again.

For Ravensburger, its established industry experiences great change within the classical
play market due to the increasing digitalization. With foresight on this change the company builds systematically on open innovation activities. Here, the innovation strategy is based on three columns „classical board games and jigsaw puzzle“, „hybrid play concepts“ which integrate electronic components, as well as „digital plays“. Especially in the hybrid sector, very successful innovations were launched during the last years. For example, Tiptoi® is an electronic pencil which can be used in combination with books, plays and jigsaw puzzles and extends these with tones and noises as well as interactive plays and learning contents. This innovation was realized together with a developing partner and addresses, with enduring effects, the increasing digitization. The generation of ideas for such innovations occurs through specific integration of external partners and the use of exploratory approaches such as the „Blue Ocean strategy“. Within the same innovation project, other new business and product ideas, which are partly already introduced in the market, were generated. The digital supplement of jigsaw puzzle by the „Augmented Reality contents“, which can be activated by smartphones and tablets, is exemplarily for this again.

To maintain the traditionally open culture and to open and systematize the innovation activities further, a central innovation management was installed four years ago. The innovation management deals with all activities regarding the innovation process, starting with the generation of ideas and ending up with the market launch. In order to define concrete projects and to develop these through a stage-gate-process, the determination of specific innovation goals and innovation strategies belongs to the major tasks. Today, the innovation management consists of two employees who exchange themselves regularly, in so-called innovation and interlinking meetings, with the different business divisions as well as functional departments of the company about current and future projects, consumer trends as well as cross-sectoral plans. Among other things, a defined field of tasks is the linking of the existing offline products with new technologies. Through this institutionalization the sustainable integration of partners for the development of contents and methods as well as the stabilization of an open innovation culture Ravensburger addresses the upcoming change in paradigms in a very farsighted way.

*Best Open Innovator Award ceremony at the Management Circle conference in Munich 2012. Dr. Weintz (Best Open Innovator SME), Dr. Scherb (Schaeffler Technologies, jury member), Prof. Dr. Enkel, Prof. Dr. Müller-Kirschbaum (Best Open Innovator Enterprise), Dr. Biel (Beiersdorf, jury member) and Herr Müller (Best Sustainable Open innovation Approach, Ravensburger Spieleverlag)*
Technology manager’s absorptive capacity of external knowledge

The capability of a technology manager to capture knowledge from outside the firm is a critical element of a firm’s innovation capability. However, former research has tended to overlook the roles that technology managers play in identifying, assimilating, and utilizing external knowledge. By examining absorptive capacity at the individual level, we seek to enrich the understanding of how technology managers learn from their external technological and market environment and how such efforts are linked to the technology strategy in their fields.

Technology manager’s absorptive capacity as a critical element of a firm’s innovation capability

As competition intensifies and the pace of change accelerates, firms are increasingly compelled to renew themselves by exploring and exploiting potentially valuable external knowledge for innovation (Jansen et al., 2006; Floyd & Lane, 2000; March, 1991). External knowledge provides greater prospects for the combination and recombination of knowledge in order to innovate (Leiponen & Helfat, 2010; Laursen & Salter, 2006; Fleming & Sorenson, 2004; Rosenkopf & Nerkar, 2001). In Cohen & Levinthal’s (1990) seminal paper on absorptive capacity, individual R&D managers were seen to be at the frontlines of allowing organizations to learn from external sources of knowledge. Fundamentally, the absorptive capacity of a firm depends on the ability of its members to recognize valuable external knowledge in the environment, align it with existing organizational capabilities and promote its utilization within the organization. Staying close to the original logic of this concept, individual-level absorptive is defined as “the level of effort that individuals undertake to identify external knowledge, assimilate it and utilize it to commercial ends” (ter Wal et al., 2011, p. 4).

However, many firms still rely predominantly on internal sources of knowledge, as transferring knowledge within the organization remains much easier than transferring it across organizational boundaries (Kogut & Zander, 1992). Hence, R&D managers are finding themselves under pressure to not only act as ‘technological gatekeepers’ (Allen, 1977) but also as carriers of external ideas into and across the firm (Mowery, 2009) – that is, technology managers.

Moving from technological gatekeepers to technology managers

Our current image of R&D managers’ role is tied to concepts of technological gatekeepers. Technological gatekeepers act as funnels of information from external to internal sources. However, this concept does not offer a complete picture on how individuals reshape and champion external knowledge to ensure its absorption by the wider organization. In a review of the literature on absorptive capacity, Volberda et al. (2010) come to the conclusion that research has overlooked the role that individuals play in absorbing external knowledge. In other words, the understanding of how technology managers should identify, assimilate and utilize external knowledge to facilitate innovation remains incomplete. Current challenges to technology managers are:

| Identifying useful external knowledge is costly in terms of resources to keep track of changing technological opportunities and market demands (Cockburn & Henderson, 1998; Katila & Ahuja, 2002; Laursen & Salter, 2006) |
| Assimilating new external knowledge to existing knowledge is exacerbated, as it entails cognitive distance (Nooeboom et al., 2007) and does not align with existing organizational categories (Lane & Lubatkin, 1998) |
| Utilizing an external idea internally is particularly difficult as a result of the Not-Invented-Here (NIH) syndrome (Katz & Allen, 2007) |

Figure 1 represents the different process stages of individual-level absorptive capacity. Even more, technology strategy is influencing the degree of excellence in which these capabilities are crucial for the individual company.
“The firm’s absorptive capacity depends on the individuals who stand at the interface of either the firm and the external environment or at the interface between subunits within the firm.”

Cohen & Levinthal, 1990, p. 132
Technology strategies

We assume that the quality of those capabilities is strongly related to the company’s technology strategy. Fundamentally, a firm’s technology strategy includes the basic decision which technological knowledge to incorporate into a firm’s technology portfolio (Porter, 1985; Ford, 1988). Following previous literature, we distinguish between exploratory and exploitative technology strategies, which can be classified along two domains: (1) the proximity to existing technologies, products, and services, and (2) the proximity to existing customer or market segments (Jansen et al., 2006; Benner & Tushman, 2003; Danneels, 2002; Abernathy & Clark, 1985). Accordingly, exploratory technology strategies comprise the development of radical innovations which require new technological knowledge, thereby departing from a firm’s existing knowledge base. Conversely, exploitative technology strategies include the development of incremental innovations which build on related technological knowledge, thereby broadening a firm’s existing knowledge base.

Linking technology strategy and individual-level absorptive capacity

Raisch et al. (2009) note that explaining why some managers are better prepared to adapt to the level of exploration and/or exploitation activities in their technological fields may depend on the individual-level absorptive capacity. In a similar vein, Nooteboom et al. (2007) assume a differential effect of a firm’s technology strategy on absorptive capacity depending on the strategy’s extent of exploration versus exploitation. From the viewpoint of cognitive distance between knowledge sources, in exploration the role of absorptive capacity is supposed to be different than in exploitation (Nooteboom et al., 2007).

More specifically, exploratory technology strategies deal with searching for new, technological knowledge at a higher cognitive distance. Thus, we argue that this requires individuals to strengthen their capabilities to identify external knowledge, assimilate it and utilize it to commercial ends. By contrast, given the characteristics of exploitative technology strategies, with their focus on contextually localized search, we do not expect that individual-level absorptive capacity is as important as in exploration. In exploitation, absorptive capacity may be built up of more experience-based, tacit knowledge that already resides within the firm and within relations with trusted suppliers and customers.

In conclusion, it is important for technology managers to understand the importance and execution of searching for new, technology based business opportunities. Moreover, technology managers need to be aware that employing exploratory technology strategies, driven by the goal to benefit from distant search, comes at a risk of decreasing efficiency of search activities (Nooteboom et al., 2007). To deal with this, technology managers need to improve their capabilities to effectively locate and capture novelty value in their technological environment when moving beyond local search.

Technology manager survey

To empirically examine how technology managers learn from their external technological environment and how such efforts are linked to the technology strategy in their fields, we conduct a large-scale survey of R&D scientists and engineers across different industries (for participation see below).
Participation invitation –
Are you working as a technology manager?

Find out how to effectively learn from external knowledge within your technological field!

Your study participation: www.zu.de/tm-survey

Receive an benefit from an individual self-assessment and
an exclusive final report with all research results.

The survey takes about 15 minutes. All data collected is used for academic research only and we guarantee the confidential treatment of your data. Please do not hesitate to contact Sebastian Heil (sebastian.heil@zu.de) in case of any questions.

Thank you in advance for your participation.

Further readings


Sebastian Heil, Dipl Kfm
Doctoral candidate
Tel. +49 7541 6009-1288
Email: sebastian.heil@zu.de
Balancing open and closed innovation: Business strategy as determinant

This chapter deals with the question if and how a company’s business strategy might impact its degree of openness and its innovation performance. How does a firm’s strategic orientation affect its innovation approach and its balance with respect to an open or closed innovation paradigm?

Introduction

Despite an approved affiliation between strategy and innovation (Gianiodis et al., 2010), the impact of strategy on the application of diverse collaborative innovation formats has not been satisfactorily investigated yet (Keupp and Gassmann, 2009). Nevertheless, the examination of this relationship is fundamental, as it significantly affects a firm’s innovativeness (Droge et al., 2008) and financial performance (Fiss, 2011). Research is still not clear about the balance between open versus closed innovation leading firms to achieve a certain innovation performance. With respect to the degree of openness, business strategy might act as determinant. In this context, case studies analyzing distinct strategic archetypes help with approaching this question.

Theoretical concept

In order to analyze dissimilar business strategy forms considering both market orientation and internal structures and processes, the Miles and Snow (1978) strategy concept provides the core structure. Since its introduction, this conceptualization has been among the most extensively investigated and confirmed strategy frameworks (Fiss, 2011; Hambrick, 2003). Hence, the business landscape can be represented via three proactive strategic archetypes which we redefined as the “opportunity-seeking Prospectors”, the “market segment securing Defenders” and the “dual-oriented Analyzers” as hybrid in between. Due to the fact that the “Reactors” as fourth archetype do not act proactively, but rather reactive, innovation as such does not play an important role. Consequently, we focus on the three proactive strategy archetypes towards innovation in our research.

Based on the original Miles and Snow (1978) strategy typology which was extended by market and innovation orientation characteristics (DeSarbo et al., 2005; Fiss 2011; Slater and Mohr, 2006), we could deduce distinct innovation strategies, behaviors as well as collaborative innovation formats affecting innovation performance. Businesses vary in performing opportunity search and in opening up towards the external environment (Laursen and Salter, 2006). Certain companies exploit collaborative innovation formats to skim a range of ideas and insights from external actors, whereas others emphasize in-house R&D and rarely cooperate with external actors. Via a multiple case study analysis it shall be examined if business strategy determines the balance of open versus closed innovation and shall demonstrate if and how firms can successfully deduce this balance from their strategic orientation.

Methodology

In order to classify prosperous firms with different business strategies for a multiple case study analysis, data of a non-compulsory innovation survey of the years 2010 and 2011 (N=241) was considered. Thirteen successful companies with different business strategies were selected considering their market position, turnover and reputation in the market. Both big companies as well as small and medium-sized enterprises with different industry affiliations were included to study polar types (Eisenhardt and Graebner, 2007). In order to augment validity, data collection was based on semi-structured interviews and combined with information from firm-internal documents and archival data (Yin, 2003).
Results

The multiple case study analysis supported the existence of the three proactive strategic archetypes which deduct different innovation practices from strategy. The opportunity-seeking Prospectors aspire technology leadership and broadly open up to the environment. Scouting activities and early trend identification are crucial for this archetype which cooperates with a variety of external partners. Opportunity-seeking Prospectors frequently include their propensity towards open innovation within their strategy formulation. Due to the fact that they are experienced with respect to diverse open innovation formats, they commonly utilize a well-elaborated system for measuring and benchmarking the success of their open innovation efforts. Based on this archetype's willingness to take risks, its willingness to cannibalize and its future orientation, the opportunity-seeking Prospectors usually gain a substantial percentage of their revenues from radical innovations.

The market segment securing Defenders are positioned at the other strategic end, since they go for market segment leadership. Furthermore, they put an emphasis on maintaining their existing market shares. As a result, market segment securing Defenders strive for cost leadership and attempt to considerably optimize their internal processes. Regarding this objective, a great degree of firm openness is not essential. In its place, market segment securing Defenders concentrate on the results of their in-house R&D and the internal production depth. Because of efficiency reasons, this archetype predominantly integrates current customers or suppliers in the internal innovation process if opening up. Our analysis shows that especially a close and adjacent linkage with the current customers is crucial for the market segment securing Defenders. Other external knowledge sources are less important and are hardly exploited. This orientation and the propensity towards efficiency bring the market segment securing Defenders to create a significant percentage of their revenues via incremental innovations.

The dual-oriented Analyzers are positioned between the two other strategic extremes. In some marketplaces they emphasize the strategy of an opportunity-seeking Prospector, while in other markets they behave as a genuine market segment securing Defender. This duality sometimes results in a profitability problem if the top management is not able to deal with the complexity of this dual strategic orientation. However, since we only selected profitable dual-oriented Analyzers for our multiple case study analysis, they excellently dealt with this issue. In contrast to the opportunity-seeking Prospectors and market segment securing Defenders, the dual-oriented Analyzers put an emphasis on the collaboration with other firms and business units, especially across industry boundaries. According to the findings from our multiple case study analysis, we discovered that internal and external cross-industry innovation is typical for the dual-oriented Analyzers. With regards to commonly well-established partnering concepts, dual-oriented Analyzers often utilize dissimilar KPIs for measuring the success of their partnerships.

Implications

We consider our empirical results to be germane for theory and practice in order to understand that innovation management should be geared to a firm's business strategy. It is apparent that all three proactive strategic orientations can lead firms to success if they closely educe their innovation practices from strategy. There is no need for broadly and deeply opening up to the external environment if a firm follows the strategy of a market segment securing Defender. Instead, the company should exercise purposive innovation practices to enhance resource efficiency, accelerate time-to-market and create a product or service in close collaboration with current customers or suppliers.

However, if a firm acts as opportunity-seeking Prospector or dual-oriented Analyzer and continuously searches for methods to revolutionize
markets, it is likely to maintain a greater degree of firm openness. Frequently, these firms use more progressive open innovation formats, e.g. cross-industry innovation, cooperative business modeling, netnography and others. Consequently, R&D managers should always consider a firm’s strategic orientation and its vision, when executing (radical) changes in its innovation management. Hence, we were able to approach the question to which extent companies should balance their open and closed innovation activities in order to be successful.

Outlook: Future research regarding strategy archetypes of collaborative innovation

| What is the influence of certain innovation cultural aspects on the degree of firm openness regarding dissimilar strategy archetypes? |
| What do successful strategic “Best Practices” look like with respect to innovation cultural attributes? |

At a glance – Summary

| A company’s innovation management should be geared to its business strategy. |
| Although the innovation approaches of the three proactive strategy archetypes differ from each other, all three types can achieve a great success in the markets. |
| The opportunity-seeking Prospectors successfully utilize a variety of open innovation formats, whereas market segment securing Defenders tend to focus on their internal R&D and on the integration of current customers and suppliers. |
| With respect to their duality, the Analyzers frequently use cross-industry innovation approaches. Internally, they frequently rely on collaborations across business units, whereas externally, innovation projects with partners of distant industries are characteristic. |

Further readings

Search strategies for cross-industry innovation

Development of a multi-job multi-method matrix with BMW

The realization of the overriding principle of sustainable mobility requires a fundamental change in technology management in the automotive sector. Viable technologies for energy-efficient and powerful vehicles need to be developed quickly, applying already existing technologies from other industries to avoid time-consuming and costly developments. Moreover, the automotive industry is known for its distinctive vertical R&D alliances between manufacturers and suppliers and the focal position automobile manufacturers (OEMs) play therein. However, vertical R&D alliances between OEMs and suppliers trap OEMs in a setting where they are increasingly running the risk of failing to seek out alternative technologies. Ultimately, automotive OEMs’ may miss opportunities for innovation and their innovativeness may suffer substantially. Cross-industry innovation prevents firms from becoming locked in to a specific field through combination of distant pieces of knowledge and interaction with „idea suppliers“ from distant technological domains. In this age, a systematic and integrated approach in technology management across industries is a prerequisite for success. For example, in the field of electric mobility, links between vehicle manufacturing and renewable energy industries will help to take advantage of spillovers from mutual learning processes.

The BMW Group consistently worked on technological innovations to increase energy efficiency and is in the process of professionalizing its external technology sourcing even further. With many years of experience in conducting open and cross-industry innovation projects in the automotive sector, we support BMW in optimizing its outside-in technology management. In recent cooperation with BMW’s central unit for outside-in technology management, which is under the management of Christian Huber and part of BMW’s research and development department, we have touched upon the question: How to systematically search for radical inputs across industries in the front-end of technology management?

How BMW’s technology managers find out relevant knowledge outside the core in a targeted way

The search for promising technologies from outside the core is dominated by uncertainty, oscillation between different sources of new technologies, and analogical transfer. We aimed at the systematization of several search strategies to increase technology manager’s effectiveness in the identification of potentially valuable technologies from both adjacent and distant industries. To this end, a so-called multi-job multi-method matrix based on search approaches that serve as a synopsis of search strategies for cross-industry innovation was developed (see Figure 1). The matrix suggests the appropriate use of search methods and their functional consequences according to different job definitions:

| Optimization of cost and quality: E.g., electric mobility requires efficient, safe, affordable and powerful battery systems; on the other hand, reductions must be made in weight, volume, and charging time. Innovation in this field will come from information and communication technology enterprises. IBM, for example, is currently on a pioneering challenge to produce the very first commercially viable metal-air battery in the world. |
| Solving of concrete problems: E.g., the reduction of energy consumption and CO2 emissions requires alternative bearing concepts to improve energy efficiency. Here, the innovation impetus will come from firms in renewable energy industry optimizing bearing concepts for wind power plants, for example. |
| Generation of technology stimulated innovations (see section on “Search strategies in use”). Across all job definitions, relevant methods are scenario planning, patent snapshot, mass screening (publication search and bibliometrics), patent search, pyramiding (expert search), and cross-industry workshops. Thereby, the chances of identifying analogous solutions are increased if... |
the problem with the job definition is abstracted to the level of its key technical functions, allowing abstract search terms to be generated. In a joint workshop, we presented techniques to help succeed in desk research, as well as tools for searching technological know-how and experts.

**Search strategies in use**

With respect to the job definition of generating technology stimulated innovations, a pilot project for the development of a cross-industry map of patent data for the field of energy management was conducted.

In the course of the analysis, the project team first developed abstract search terms such as ‘energy absorption’ and ‘transformation of kinetic energy’. With these terms in mind, the team members were able to build associations with different kinds of technologies, applications and industries in which the absorption and transformation of energy is crucial. Thereby, identification of analogical solutions was facilitated using systematic-discursive creativity methods such as the Osborn checklist as well as results from our network analysis (see article by Sebastian Heil about distant collaboration). The latter inspired technology managers in which industry an appropriate technological solution might lie. The team members then started to search patent databases with the focus on the previously identified key terms and target industries. In this way, they identified several promising technologies of distant areas such as low-energy houses, white goods and aeronautics.

<table>
<thead>
<tr>
<th>Method</th>
<th>Job definition</th>
<th>Strengthening of technology stimulated innovations</th>
<th>Alternative solutions for departmental challenge</th>
<th>Alternative solutions to optimize cost and quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario Planning</td>
<td></td>
<td>Initiation function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patent Snapshot</td>
<td></td>
<td></td>
<td>Orientation function</td>
<td></td>
</tr>
<tr>
<td>Mass Screening (Publication Search, Bibliometrics)</td>
<td></td>
<td>Information function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patent Search</td>
<td></td>
<td></td>
<td>Information function</td>
<td></td>
</tr>
<tr>
<td>Pyramiding (Expert Search)</td>
<td></td>
<td>Information function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-Industry Workshop</td>
<td></td>
<td>Information function</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Figure 1: Multi-job multi-method matrix]

Your contact person for outside-in technology management

Sebastian Heil, Dipl Kfm
Doctoral candidate
Tel. +49 7541 6009-1288
Email: sebastian.heil@zu.de
“We borrow with pride“: Cultural and structural capabilities for systematic cross-industry innovation

This chapter delivers first insights into a mutual research project with the company Henkel. Due to the fact that Henkel has successfully systematized its cross-industry innovation strategy, this case shall serve as “Best Practice” providing useful findings for both theory and practice.

Relevance of cross-industry innovation

During the last years, cross-industry innovation has gained in significance. Cross-industry innovation describes the process of how a firm systematically integrates external know-how from more or less distant domains in its innovation processes in order to foster product, service or business model innovations (Herstatt and Kalogерakis, 2005; Enkel and Mezger, 2013). Particularly in new product development, cross-industry innovation counts as appealing approach for creating both radical and incremental innovations (Kalogerakis et al., 2010, Nooteboom et al., 2007, Wuyts et al., 2005). The process-related set-up of this activity can be described by (1) the abstraction of a problem uncoupled from the own industry, (2) the creation of analogical solutions on an abstract level discovered in distant industries, and (3) the final adaptation of a cross-industry solution within the own industry (Gassmann and Zeschky, 2008).

Cross-industry innovation approaches are of particular interest, as specifically the conceptualizations of absorptive capacity and analogical thinking support firms in achieving a competitive advantage over rivals (Kalogerakis et al., 2010). This is true, since absorptive capacity enables firms to “recognize the value of new information, assimilate it, and apply it to commercial ends“ (Cohen and Levinthal, 1990, p. 128).

Previous research highlights that the creation of radical innovations can strongly be enhanced via cross-industry innovation approaches (Dahl and Moreau, 2002, Herstatt and Kalogерakis, 2005) having a positive effect on firm performance as well (Gavetti et al., 2005). Due to the fact that a solution has already worked effectively in a distant industry, uncertainty and risk are significantly cut down in the innovation process (Enkel and Gassmann, 2010).

Theoretical concept

In order to systematize cross-industry innovation within a company, certain organizational antecedents need to be established. Apart from cultural aspects like willingness to cannibalize and willingness to take risk, aspects regarding a business’s management structure should also be considered. First, these aspects are assumed to impact a company’s opportunity search across industry boundaries. Second, an effect on a reactivation and recombination of distant know-how in future innovation projects is assumed (Enkel and Heil, 2012).

The willingness to cannibalize describes the scope to which a company is willing to cut down current or prospective investments in its resource base and organizational routines (Chandy and Tellis, 1998; Tellis et al., 2009). The willingness to take risk appears if a company is prepared to take hazardous or rather risk-averse project decisions (Herzog and Leker, 2010). If a firm behaves in a very risk-averse way and sets up a lot of risk filters, this action might drastically decelerate an innovation project’s flow (Smith and Reinertsen, 1991). Such a behavior could even lead to missing great possibilities and pioneering trends in different markets (Calantone et al., 2003). Although a firm’s employees continuously try to reduce innovation project risk, a certain degree of risk is regarded to positively affect a firm’s innovation outcome. Nevertheless, a positive innovation result can only be achieved, if a firm’s cultural capabilities match with its strategic
orientation and the final innovation behavior (e.g. degree of firm openness) (Herzog and Leker, 2010). Hence, this leads to the existence of different archetypes of collaborative innovation which we call opportunity-seeking Prospector, dual-oriented Analyzer and market-segment securing Defender (Enkel and Bader, 2012).

The construct of management and leadership structure comprises several aspects concerning the control of resources, the level of routinization and the degree of formalized hierarchies (Brown et al., 2001). Depending on the above-mentioned innovation archetypes, these characteristics are more or less pronounced. On the one hand, the market-segment securing Defender strongly controls its resources building on routinization and formalization. On the other hand, the opportunity-seeking Prospector uses flexible structures and flexible forms of resource allocation, as a quick response to new trends in the markets is necessary. The dual-oriented Analyzer as hybrid strategy positions itself in the middle between the other two extremes adopting characteristics of both Prospectors and Defenders (Enkel and Bader, 2012; Miles and Snow, 1978; Olson et al., 2005).

The willingness to cannibalize and take risk as well as the stated structural capabilities are hypothesized to positively influence an opportunity-seeking Prospector’s systematic cross-industry innovation approach which we measure via two statistical constructs. The first variable regarding opportunity search and recognition in distant industries includes a company’s established, cross-industry specific incentive system as well as the regular exchange with more or less distant business and institutional partners (Arbussà and Coenders, 2007). The second variable regarding the reactivation and recombination of distant knowledge relates to the employees’ skills in exploiting stored, distant know-how for future innovation projects. In this context, firms need to cope with the preservation of acquired and already assimilated know-how which permanently should be accessible for a business’s employees (Lane et al., 2006; Marsh and Stock, 2006).

Furthermore, we hypothesize the three defined organizational capabilities to have an effect on a company’s financial success, mediated by a systematic opportunity search and recognition in distant industries as well as by a systematic reactivation and recombination of distant knowledge streams in future innovation projects. However, such an effect can only be achieved if a particular level of systematization is actually accomplished.

Methodology and analysis

Due to the fact that the company Henkel shows typical characteristics of an opportunity-seeking Prospector (see Enkel and Bader, 2012) and has achieved great success via its systematic cross-industry innovation strategy in the past, we selected Henkel’s Laundry and Home Care division for a single case study analysis. Although a single case study approach is frequently criticized with respect to generalizability, it makes sense for our research to describe a “Best Practice” case. We strove for a sounder understanding of the described relationships by analyzing a company which counts as an expert regarding cross-industry innovation (Siggelkow, 2007).

Furthermore, we created a special case by choosing a mixed methods approach to explore how Henkel has systematized its cross-industry innovation strategy. First, a questionnaire was designed which was filled in by 38 employees at Henkel working in the area of Laundry and Home Care and specifically in R&D and Marketing. Second, interviews with leading employees in the field of strategy and innovation were conducted in order to support the statistical results via further in-depth information.

So as to analyze the questionnaire data, structural equation modeling with Bayesian estimation and the corresponding credibility intervals was applied. Due to the fact that Bayesian estimation does not rely on large sample theory, it delivers an adequate solution for our collected data (Muthén and Asparouhov, 2012). In order to avoid the Heywood Case with respect to the limited sample size, we created Bayesian factor score estimates and factor score standard errors for all latent variables in our model. In this context, all variables except the financial success variable were concerned. The Bayesian factor score estimates utilized the plausible values utility in order to calculate the
posterior mean for every latent variable (Asparouhov and Muthén, 2010).

Additionally, the hermeneutic interview data were systematically examined (Mayring, 2002) to derive deeper insights into innovation cultural aspects and aspects regarding the management structure and internal innovation and communication processes. By combining the statistical and hermeneutic analyses, we were able to exploit all advantages of a mixed methods approach.

Statistical results

The findings of our Bayesian structural equation model (see Figure 1) show that there are certain organizational antecedents of systematic cross-industry innovation behaviors. The 95% credible intervals or central credibility intervals (CCI) support that in several stated relationships we achieve a 95% probability that the population value Θ ranges within the bounds of the confidence intervals (Jackman, 2009). Consequently, there is a statistical significant difference between the populations, if the credible intervals do not contain zero. This means that the two boundary values of a credible interval are either positive or negative.

Accordingly, the willingness to cannibalize has a significant effect on the opportunity search and recognition in distant industries [CCI= 0.287, 0.786] as well as on the reactivation and recombination of distant know-how for future innovation projects [CCI= 0.012, 0.552]. The willingness to cannibalize displays significant effects in the structural model, as firms like Henkel occasionally need to be willing to abandon familiar products, services or processes and be open for new methods, technologies and capabilities which might even come from distant industries. Henkel does not only utilize cross-industry solutions for its product innovations, but also for its new business models. This is true, since new cooperative business models like “Wash&Coffee” or “Persil Service” were established via insights from distant industries and now considerably strengthen Henkel’s product brands.

Correspondingly, it is necessary that Henkel is willing to take risk in order to come up with pioneering
solutions and stay competitive in the markets. Consequently, the statistical findings show that the willingness to take risk has a significant effect on both the opportunity search and recognition in distant industries [CCI= 0.006, 0.607] as well as on the reactivation and recombination of distant know-how for future innovation projects [CCI= 0.246, 0.818]. Our interviewees also supported this effect.

Interestingly, we demonstrate that the two innovation cultural antecedents, namely willingness to cannibalize and willingness to take risk, do not have direct effects on Henkel's financial success, but significant indirect effects through the mediating construct of the systematic opportunity search and recognition in distant industries (see Figure 1). This result exhibits that Henkel's systematic cross-industry search significantly contributes to the firm's financial success, setting Henkel apart from competitors.

**Antecedents in practice**

The division Laundry and Home Care has successfully systematized the cross-industry innovation approach by primarily having defined a set of distant lead industries such as food and beverages, plastic materials, pharmaceuticals, medical engineering, printing, electronics and electronic devices as well as robotics. These lead industries were marked, as the division achieved great success with distant technological solutions from those industries in the past. The division employs a variety of technology scouts with specialized capabilities and knowledge in the defined industries. The responsible scouts continuously scan their focus industry independently from each other trying to discover creative innovation approaches and to solve difficult innovation problems which cannot be solved with already known methods.

On top of this, Henkel motivates all employees and not only the scouts to continuously scan distant industries. As a result, the firm grants the ”Borrow with pride” award on a yearly basis. With this prize a single employee or a group of employees is awarded for having transferred and assimilated a radical technological solution, process or business idea from a distant industry to the own industry. A jury selects the award winners regarding the cognitive distance between the industries, the level of innovativeness and the expected market success.

With respect to the mediating construct of the reactivation and recombination of distant know-how for future innovation projects we cannot prove any significant indirect effects on Henkel's financial success (see Figure 1). The information gained from the interview data exhibited that the maintenance, reactivation and recombination of distant knowledge is not yet as systematic as the opportunity search and recognition in distant industries. There are some differences among the departments, as some departments store distant knowledge more systematically than others within Henkel.

Three years ago, the Technology Department established a project- and task-related technology thesaurus with keyword search. In this technology database the employees can continually add all forms of more or less distant problem solutions and process cycles for future innovation projects in order to be able to revert to it and reactivate it again. Additionally, the project or task creators’ names are saved as contact persons for further questions if necessary. Almost all employees within the division Laundry and Home Care can access the technology database without restrictions.

In addition to this technology database, the department Technology Development also installed an intelligent online documenting system which contains all information of the preceding innovation projects. Subsequently, no information gets lost. Due to the fact that both systems have differing orientations, the combination of both systems is highly valuable.

Moreover, the division Laundry and Home Care provides an online grid with the profiles of all technology scouts. In so doing, the reactivation and recombination of distant knowledge can be promoted more easily, as the right employees can directly be addressed within Henkel. Furthermore, the cross-divisional and cross-departmental exchange within Henkel is advanced via the company’s fixed InnoDays in which employees of different departments and business divisions participate in order to discuss and brainstorm on future innovation projects. Via Henkel’s
“With our systematic cross-industry innovation approach we were able to generate an impressive number of product innovations during the last years in the area of Laundry and Home Care. Each of these pioneering innovations was highly successful in the markets.”

Dr. Juan-Carlos Wuhrmann
Henkel AG &Co. KGaA
Laundry & Home Care
Corporate Director Global R&D Management
InnoLounge the company-wide knowledge exchange and recombination is also fostered online.

**Implications**

We regard our empirical findings to be relevant for both theory and practice showing that the right combination of specific organizational antecedents and a systematic cross-industry innovation approach has an effect on the financial success of a firm’s product and service program. Additionally, we could demonstrate that a systematic cross-industry innovation approach is an effective method for firms like Henkel to significantly improve their innovation output.

There are certain organizational antecedents inciting a company to perform cross-industry innovation successfully. If a firm is not willing to cannibalize actual resources, products, services or processes and if it is not prepared to accept a certain risk level, an effective systematization of cross-industry innovation is unlikely to work within such a business. Furthermore, managers can learn from our interview data that companies require the capabilities to recognize, assimilate, preserve and utilize external know-how if a systematic cross-industry innovation approach is aspired. If a firm’s top management does not foster these processes equally, cross-industry innovation will work less effectively as intended (Lane et al., 2006; Zahra and George, 2002).

Additionally, firms should not underestimate the value of cross-industry innovation, as it is a challenging approach to imitate (Enkel and Gassmann, 2010; Song et al., 2005). Businesses performing cross-industry innovation make themselves stand out from competitors due to the fact that they solve problems differently and often produce more radical and pioneering solutions.

---

**At a glance – Summary**

| „Borrow with pride“ is not just a yearly award at Henkel, but a philosophy which is lived by all employees throughout the company. |
| The willingness to cannibalize and to take risk and the well-elaborated partnering concept are important antecedents of systematic cross-industry innovation at Henkel. |
| The importance of a structured and systematic opportunity search in distant industries should not be underestimated with respect to a company’s financial success. |
| Employee development towards cross-industry and cross-field thinking is crucial. Testing the capability of thinking across field and industry boundaries is continuously in the focus of scouts and all other employees. |

---

**Further readings**

Bader, K. & Enkel, E. “We borrow with pride” – Organizational antecedents of systematized cross-industry innovation (work in progress).

---

**Your contact person for innovation strategies**

Karoline Bader, MA
Doctoral candidate
Tel. +49 7541 6009-1285
Email: karoline.bader@zu.de
Cross-industry innovation entails distinctive innovation opportunities and challenges according to the knowledge heterogeneity between the collaborating firms, their 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 how firms can find collaboration partners that are at an optimal cognitive distance and improve their ability to understand and evaluate distant knowledge.

Cross-industry innovation potential

Cross-industry innovation, i.e. the application of established knowledge or technologies of partners from outside the own value chain, has been identified as a key driver of innovation performance in new product development (Enkel & Gassmann, 2010; Gassmann et al., 2010). Whether a partner in a cross-industry collaboration gains incremental or radical results depends on the knowledge heterogeneity between the collaborating firms, referred to as the organizational cognitive distance. Nooteboom (1992, 1999) propose 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; Wuyts et al., 2005; Gilsing et al., 2008). However, when cognitive distance reaches a certain degree, the effect on novelty value reduces as too much diversity hinders efficient absorption (Cohen & Levinthal, 1990). The crucial implication of these opposite effects is that firms engaging in distant collaboration have to perform the dual task of developing access to heterogeneous sources of knowledge and, at the same time, of ensuring that distant knowledge, once accessed, can be adequately absorbed.

The raised issues suggest that much more remains to be understood about how cognitive distance between cross-industry partners can be assessed and utilized in order to generate radical rather than incremental innovation. We aim at closing this gap by our research investigating (1) how cognitive distance between partners from different industries can be assessed before patent results are created and (2) which specific capabilities firms engaging in distant collaboration possess in order to succeed.

Preparing for distant collaboration

To address this challenge, we developed a new, empirical-based measure that can be used ex ante in order to identify the industry of potential partners according to the intended outcome of the collaboration. Using survey data on 215 bilateral cross-industry collaborations between firms from a variety of industries, we conducted a network analysis and captured cognitive proximity (the inverse of distance) in terms of knowledge redundancy between firms, based on an industry level analysis of structural equivalence. Two industries are structurally equivalent to one another when the aggregate firms from these industries are connected to the same other industry firms in the cross-industry network.

The network graph shown in Figure 1 illustrates the collaboration patterns among industries based on our network analysis. The graph represents the network as a series of nodes, which denote industries, connected by linear ties, 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), whereas there is a strong tendency for automotive to have ties to industries that pharmaceuticals does not, and vice versa (← cognitive distance, their knowledge does not overlap).
Second, successful cross-industry innovation, particularly when applied over higher distances, requires a firm to be able to exhibit a high potential absorptive capacity (Zahra & George, 2002; Cohen & Levinthal, 1990) and combine distant pieces of knowledge for radical innovation. Potential absorptive capacity makes firms receptive to understanding and evaluating external knowledge. It prevents them from becoming locked in to 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 & George, 2002; Lane et al., 2006). Thereby, Zahra & George (2002) 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, as illustrated in Figure 2.

![Figure 1: Cross-industry network graph (Blue ties link automotive with mechanical engineering and pharmaceuticals through mutual partner industries; ICT: Information and communication technology)](image)

![Figure 2: Implications of coordination antecedents on potential absorptive capacity and cognitive distance (adapted from Nootenboom et al., 2007)](image)
We further examined how firms develop higher potential absorptive capacity for managing high distance collaboration. In order to identify antecedences to capability development, we studied seven companies by conducting interviews and gathering secondary data. The analysis of all case study data reveals three alternative approaches of coordination antecedents that enhance a firm’s potential absorptive capacity in order to nurture radical innovation at higher distance:

Firms with a decentralized, well-funded technology sourcing and a large business unit portfolio apply a wide search scope and make regular use of a broad range of mechanisms for recognizing and assimilating distant knowledge. This ‘innovation flexibility approach’ implies an increase in the variability of distant knowledge that can result in both more exploratory innovation and failure (Katila & Ahuja, 2002; Fleming, 2001). The larger the scope of external search activities, the more likely the firms are to identify valuable external knowledge that can be combined with internal knowledge in a novel way (Gary et al., 2012; Fleming & Sorenson, 2001). Similarly, decentralization of decision authority may lead to a larger volume of diverse information as it broadens communication channels and increases the quantity of ideas and knowledge retrieved for problem solving (Jansen et al., 2006). Furthermore, a wide scope on searching for novelty through many decentralized activities increases the proportion of new knowledge to be integrated into a firm’s knowledge base (Ahuja & Katila, 2004).

In contrast, firms with a centralized technology sourcing and low resource investments show a much smaller number of mechanisms and apply a problem-oriented, narrow search. When adopting this ‘resource efficiency approach’, the costs of search and integration of distant knowledge decrease (Henderson & Clark, 1990) while there is a limit to the number of new insights that can be found by applying a narrow search scope (Katila & Ahuja, 2002; Fleming 2001). In other words, firms with a resource efficiency approach run the risk of missing opportunities for innovation but are more resource efficient than companies following the innovation flexibility approach.

Most interestingly, firms with a centralized technology sourcing and reasonable resource investments are also limited in search scope, but stay focused on certain key industries while making additional use of more intelligent mechanisms for recognizing and assimilating distant knowledge. They gain a combinatorial advantage by applying a targeted recognition and assimilation of distant knowledge while simultaneously complementing their external search activities via broadcasting problem information to a diverse community, for example. This ‘combinatorial approach’ allows for a proper balance between the costs of searching and the benefits of acquiring a variability of distant knowledge. On the one hand, given the infinite size of the technological search space outside the industry’s boundaries, concentration allows firms to spot opportunities that are really valuable. On the other hand, mechanisms that efficiently leverage external scope in recognizing and assimilating distant knowledge deepen the awareness of what type of external knowledge the firm may need. In turn, they help to develop a more refined filter when actively searching the technological environment for valuable knowledge.

In conclusion, all approaches have yielded promising results, enabling different types of innovative firms to prepare for distant collaboration. Thus, studying certain developmental approach of potential absorptive capacity offers important insights for both researchers and practitioners about how firms may develop important sources of radical innovation.
At a glance – Summary

| Cross-industry innovation entails distinctive innovation opportunities and challenges according to the knowledge heterogeneity between the collaborating firms, their cognitive distance. |
| Cognitive distance between firms from different industries determines whether a partner in the cross-industry collaboration gains incremental or radical results. |
| Our network analysis helps technology managers to assess cognitive distance with potential partners from different industries and guides partner selection according to the intended outcome of the collaboration. |
| Moreover, firms should develop sufficient resources in recognizing, assimilating, and maintaining external knowledge beyond established industry boundaries to enhance potential absorptive capacity and set the stage for future knowledge transfer to occur. |
| Thereby, firms may adopt a certain developmental approach that enhances their potential absorptive capacity in order to nurture radical innovation at higher distance. |

Further readings

When distant partners become your closest friends: Ambidexterity through cross-industry collaboration projects

Inter-firm collaboration has become central to the value creation in large firms’ innovation processes. In particular, research on ambidexterity has prescribed inter-firm collaboration, the ability to alleviate the tensions that the simultaneous conduct of radical and incremental innovation bears. However, while prior research stipulates their structural, temporal or contextual separation in inter-firm projects, we ask whether and how both innovation types may originate simultaneously in single project settings. Focusing on cross-industry innovation, we analyze eleven case studies on new product development (NDP) projects. Our findings suggest that individual learning potentials differ for the collaboration partners, acting as a function of the initial knowledge distance, project objective and subsequent process architecture.

Why cross-industry collaboration can lead to ambidexterity

In today’s volatile markets adaptability determines the survival or failure of an organization (Bettis & Hitt, 1995). As presented by Foster and Kaplan (2001), the lifespan of S&P 500 organizations has dropped by 75%. Whereas these companies still faced an average lifespan of 90 years in 1935, results published by McKinsey in 2005 revealed an average current life expectancy of only 15 years (O’Reilly & Tushman, 2007). Despite this rather disillusioning perspective, there are companies that seem to manage high levels of change that originate outside their organization's boundaries.

In the attempt to clarify the factors that differentiate these companies, the concept of ambidexterity has generated considerable theoretical and managerial significance (Li, Vanhaverbeke, & Schoenmakers, 2007; Raisch & Birkinshaw, 2008). By ambidexterity we denote the balance of exploiting existing knowledge for incremental innovation and exploring novel impulses to develop more radical innovations as a decisive factor of a firm’s survival and performance (March, 1991). Research on ambidexterity has drawn on multiple theoretical lenses, however, most prevalent the organizational learning perspective assumes the ability to absorb knowledge and adapt subsequently to maintain a competitive advantage (March, 1991). Consequently, maintaining competitiveness is profoundly determined by the firm’s ability to source beyond the corporate environment and to complement its knowledge with external sources. As a result, inter-firm collaboration has received increased attention to define how to leverage external knowledge sources to drive organizational ambidexterity (Lavie & Rosenkopf, 2006).

We define inter-firm ambidexterity as the pursuit of exploitative and exploratory activities through collaboration to generate both incremental and radical innovation. In this paper, we developed a holistic understanding to explain how organizations balance exploration and exploitation in single collaboration architectures. Applying the concept of cross-industry innovation, the empirical findings suggest that exploration and exploitation require the configuration of the new product development process to differ with respect to the inter-organizational collaboration's function and the collaboration partners' attributes. The majority of research assumes that exploitation and exploration are at opposing ends of a continuum, competing for scarce resources and managerial attention (Ahuja, 2000; Davis, Furr & Eisenhardt, 2006). This paper contributes to the limited perspective that proclaims that exploitation and exploration can indeed nurture each other rather than being mutually exclusive (Im & Rai, 2008; Lavie & Rosenkopf, 2006; Raisch & Birkinshaw, 2008). Linking the established ambidexterity discussion with the new field of cross-industry innovation contributed to our understanding of how partners from different knowledge domains can contribute to exploratory and exploitative results.
Methodology

This paper draws on inductive theory building through multiple case study analysis to provide insight into the structural and procedural mechanisms that underlie cross-industry collaborations to generate organizational ambidexterity. We have collected data from eleven cross-industry NPD projects in different industries, as shown in Table 1. The cases were chosen for their companies' acknowledged outstanding innovation performance and specific recognition of their cross-industry developments. All case studies were undertaken within a ten-year timeframe from 2002 to 2011. We conducted a total of 81 interviews, using a semi-structured interview guideline. In approximately three joint workshops per company, we discussed these interviews, made several site visits to each company, and had access to internal documents. We reported our findings to the interviewed companies and sought their feedback to correct possibly erroneous interpretations. Following our logic of differentiation between collaboration objective, process, and learning, we were able to cluster the cases and develop archetypes that support ambidexterity in each type of collaboration.

Results: How companies pursue ambidexterity

The synthesis of the data from our case studies served as the basis to explain how companies employ different collaboration processes to derive distinct exploitative and exploratory learning mechanisms. Our analysis suggests that there are three distinct components that influence the overall collaboration outcome. First component is the collaboration objective, in which the focal organization defines its strategic intent for the collaboration. In this phase, we found that collaboration decisions were defined in accordance with both partners' body of knowledge and the precision of the problem statement antecedent the collaboration. Second, during the actual collaboration process, team structure and process mechanisms were particularly highlighted as collaboration differentiators. As Madhavan and Grover (1998) assert, learning can be described as a function of project design. We apply this logic to cross-industry collaborations and suggest that both innovation objective and design influence the potential to generate exploitative and exploratory learnings within single inter-organizational projects. Finally, the learning outcome varies as a function of each partner's initially defined process features and individual knowledge distance.

At the process level, this paper contributes towards a clearer understanding of how processes, collaboration objective, and learning interact in order to nurture inter-firm ambidexterity (Beckman, Haunschild, & Phillips, 2004; Dodgson, Gann, & Salter, 2008; Rothaermel & Deeds, 2004). It illustrates that collaborations based on broad problem statements benefit from integrated, continuous innovation processes, thereby nurturing secondary individual exploratory learning for both collaboration partners. While Lavie and Rosenkopf (2006) found that alliance partners may generate ambidexterity over a long-term perspective, we provide evidence that the right setting and partners from distinct industries yet potentially overlapping knowledge structures may induce both exploitation and exploration on single projects. This is due to each partner learning from the project's overall activities to develop their individual knowledge endowment. Conversely, clearly defined problem-oriented collaborations feature modular, sequential processes that prohibit a potentially extended learning effect.

Our results pertaining to the knowledge possessed by collaboration partners, particularly complementary knowledge in exploratory processes, and distinct knowledge pools in exploitative processes are counterintuitive. While theory suggests that absorptive capacity (Cohen & Levinthal, 1990) decreases with a higher degree of cognitive distance between partners (Nooteboom
et al., 2007), our results illustrate that partners with distinct knowledge backgrounds typical of a large cognitive distance reach exploitative results. In the same vein, the generation of exploratory innovation with partners that provide for a common knowledge base questions earlier results regarding the correlation between partner distance and innovation performance and degree of radicalism.

This paper also provides evidence that universal propositions on innovation process architectures do not reflect the diversity and complexity of innovation processes. These propositions provide insights into the context dependency of particular innovation types in accordance with tailored collaboration architectures that allow the inherent learning potential to be leveraged (Madhavan & Grover, 1998). These rich results could only be obtained through qualitative data instead of quantitative analysis, as these data are established in ambidexterity literature (Davis et al., 2006; Dussauge et al., 2000; Gulati, 1995).

Managerial contribution

While these insights hold clear benefits for research, they also hold practical implications in the form of normative guidelines for management. The propositions we put forward suggest that there is no universal approach to innovation collaboration and that the characteristics of particular innovation projects require different processes. As our findings suggest, ambidexterity can be achieved in single inter-organizational collaborations, providing management with a further indication that driving incremental and radical innovation requires multiple parallel collaborations. The findings support previous research that shows that organizations generate higher performance impacts through exploration and exploitation within single inter-organizational collaborations than through single focus alliances. Most importantly, the framework indicates that management can leverage the cost and time-frame involved in exploration projects by linking them to exploitative innovations, thereby increasing the output generated from exploration objectives. On the other hand, exploitation-oriented collaborations provide the basis for nurturing exploratory ideas that are the basis of future developments.

Further readings

Cross-industry innovation: Why should a marine biologist cooperate with a chemical company in an innovation project?

This chapter exhibits distinct motivational factors with respect to participating in cross-industry innovation and particularly in cross-industry innovation workshops. It explains why external experts of more or less distant fields or industries contribute in innovation projects which go beyond their own industry boundaries.

Introduction

In order to foster cross-industry innovation, it is crucial to integrate experts of distant industries and diverse backgrounds who contribute in the generation of novel, radical ideas and innovations (Enkel and Gassmann, 2010). The experts' reasons to participate are likely to differ from those of customers, suppliers and online contributors who often contribute in open innovation activities. Although literature already reveals motivational factors for the latter group of contributors (Franke and Shah, 2003; Jeppessen and Frederiksen, 2006), the motivational factors for participating in cross-industry innovation activities have not been covered, yet. Why do or why don't experts from analogous industries participate in cross-industry innovation efforts?

Theoretical concept

Ajzen's (1991) theory of planned behavior is applied in order to analyze the motivation and subsequent behavior of cross-industry experts. As this theoretical and empirically tested framework has not yet been applied to innovation management in the fuzzy front-end, it shall help to understand why external experts are motivated to participate in ideas workshops across industry boundaries. As a result, their attitudes, subjective norms and perceived behavioral control regarding cross-industry innovation are targeted to predict their behavioral intention and final commitment or denial.

The three predictors are adapted towards cross-industry innovation in a way that characteristics like cognitive distance (Nooteboom et al., 2007), strategic intent (Gassmann and Zeschky, 2008) and analogical thinking (Kalogerakis et al., 2010) are considered. The attitudes regarding cross-industry innovation are either positive or negative and relate to an expert's experiences with previous projects across industry or field boundaries. The subjective norms refer to what third parties (e.g. the top management or the direct supervisor) think about an expert's participation in cross-industry innovation projects. The perceived behavioral control regards an expert's self-efficacy with respect to his or her capabilities to abstract and create analogies. Additionally, an expert's perceived probability of coming up with solutions for a problem in a distant field or industry is considered.

In a next step, these three predictors are regressed on the experts' behavioral intention regarding cross-industry innovation as well as on the experts' final commitment or denial concerning the cross-industry innovation workshops, arranged by the chemical company (see Figure 1).

Method and analysis

By arranging a series of cross-industry innovation workshops with a leading chemical company, expert-related data of diverse fields such as biotechnology, chemistry, oceanography, nutrition technology, bionics and renewable primary products could be collected. Then, these data could be used to approach the existing research gap. Before participating in the workshops, the experts were interviewed on the telephone with respect to their attitudes, subjective norms and their perceived behavioral control regarding cross-industry innovation. Both scientific and business experts who finally joined and who did not join in
the cross-industry workshops were embraced in the sample.

In total, 52 potential experts were identified and called. Since only 35 experts volunteered for an interview, we achieved a response rate of 67.3%. In order to also perform statistical analyses with the interview data, an integrated qualitative-quantitative research design was applied (Srnka and Koeszegi, 2007). Three researchers autonomously coded the experts’ hermeneutic answers into numbers before consolidating the coded results. The three predictors, namely attitudes, subjective norms and perceived behavioral control regarding cross-industry innovation, were created from the arithmetic means of the suitable items’ sums. Within the specific predictors all items were weighted equally. We selected this approach to diminish the amount of free parameters in the structural model (Bagozzi and Yi, 1988).

Structural equation modeling was used for the statistical analyses demonstrating an excellent fit according to established fit measures ($\chi^2$/df = 1.054; CFI = 0.998; RMSEA = 0.040; SRMR = 0.0233). Furthermore, both convergent and discriminant validity could be proven. Additionally, the experts’ hermeneutic answers were analyzed in detail (Mayring, 2002) to derive specific motivational factors and to exploit all advantages of this mixed methods approach.

Results and implications

Based on the external experts’ attitudes, subjective norms and perceived behavioral control regarding such a cross-industry innovation approach, the intention and the behavior can be predicted with a high degree of accuracy (see Figure 1). In particular, the variable perceived behavioral control verifies a significant influence ($\beta=0.350$; $\rho<0.05$) on the experts’ behavioral intention of participating in the cross-industry innovation workshop.

One major motivation of participating in cross-industry innovation activities might result from the
experts' individual qualification assessment and the self-efficacy considering their own capabilities and competences across fields. Despite Ajzen’s (1991) theory, the perceived behavioral control does not show a significant effect on the final behavior. In this context, we learnt from the expert interviews that the firm’s strict non-disclosure agreement led to some denials, although the experts felt highly self-confident with respect to their cross-industry thinking.

The predictor perceived behavioral control seems to even have a stronger impact than the attitudinal factors regarding cross-industry innovation ($\beta=0.280; \rho<0.1$). Due to the fact that scientific experts and particularly university professors work independently and do not have supervisors, the subjective norms regarding cross-industry innovation hardly play a role. This led to a non-significant result with respect to this relationship. By having focused on business experts only, this relationship might have shown a different result. Furthermore, our findings demonstrate that the experts’ first behavioral intention towards cross-industry innovation has a significant influence on the final commitment in such workshops ($\beta=0.902; \rho<0.01$).

We contribute to theory and practice, as this empirical research verifies Ajzen’s (1991) framework in a new context. In addition, it delivers new insights in the field of cross-industry innovation. Furthermore, our results support firms in effectively finding qualified and motivated external experts for such innovation activities. This might result in a higher quality of generated workshop ideas.

At a glance –
Summary

| Positive experiences with projects across fields or industries have a significant influence on the participation in a cross-industry format. |
| An expert’s self-efficacy in his or her capabilities to abstract a problem and to create analogies has a strong influence on the behavioral intention regarding cross-industry innovation. |
| External experts might also be motivated through potential networking and learning effects in distant fields which can be useful for future projects. |
| Subjective norms towards cross-industry innovation might become an important motivational factor with respect to business experts, but not for scientific experts (e.g. university professors). |

Further readings

Your contact person for cross-industry workshops

Karoline Bader, MA
Doctoral candidate
Tel. +49 7541 6009-1285
Email: karoline.bader@zu.de
Guidelines on where to search appropriate collaboration partners

In open innovation it is important to search and find the appropriate external partner. In a two-year research project our institute analyzed cross-industry innovation projects of Henkel. As a result we were able to specify search approaches on project level and to identify three cross-industry archetypes. The results are of importance not only for research but also for practice.

Innovation is mostly grounded in the combination of existing knowledge and ideas. This knowledge and the pool of ideas within one company is however limited. For this reason, an increasing number of companies are following an open innovation approach. By doing this, external resources add new elements of knowledge for new and possibly unique recombinations. The effectivity of open innovation has been proven by research, i.e., by demonstrating the positive impact on innovation success (Laursen and Salter, 2006).

Open innovation, however, spans across a huge variety of tools and practices, starting from customer and supplier integration, over lead user innovation to cross-industry innovation. Furthermore, each individual practice provides various options of externals to be integrated. This poses a major challenge to today’s managers: not only the most appropriate practice, but also the best fitting external source needs to be activated.

In a two-year research project our institute collaborated with Henkel, an international player within the fast-moving consumer goods industry with well-known brands such as Persil, Schwarzkopf and Loctite. Henkel is known for its open innovation activities and has lately been awarded the open innovator’s award 2012. Within the scope of our research we focused on eight cross-industry innovation projects at Henkel, which we studied in depth mostly relying on semi-structured interviews. In total, we collected qualitative and quantitative data from fifteen interviews with senior R&D managers as well as with senior executives of the firm, followed by thirty-one interviews with executives engaged in the eight selected projects.

In cross-industry innovation, already existing knowledge, technologies or concepts from one industry are creatively imitated and adopted to the applying industry (Herstatt and Engel, 2006; Enkel and Gassmann, 2010). Thus, the identification and the access to the most appropriate external source are of major importance. In our research we build upon insights from the research field of search. However, existing research has largely focused on search strategy itself and revealed insights on search dimensions. The latter basically cover the parameters breadth and depth (Katila and Ahuja, 2002; Laursen and Salter, 2006), where breadth represents the diversity of knowledge sources and depth measures the intensity of search activities. Although studies indicated that firms are able to use various search approaches simultaneously (Katila and Ahuja, 2002), no one has yet elaborated search mechanisms on individual project level such as cross-industry innovation projects.

As a result from our research project we were able to transfer findings from firm level to project level. Surprisingly, our findings partly contradict with existing research on firm level. As a main contribution from our work we identified three different archetypes of cross-industry innovation reflecting different search approaches. These archetypes are shown in the figure below. The cross-industry archetypes represent different search approaches. Therefore, our findings not only support but also extend earlier findings that firms may use various search approaches (Katila and Ahuja, 2002). With our study we provide insights on how to search depending on the problem at hand. We therefore also enrich earlier views that managers selectively exploit external sources depending on their specific problem (Grimpe and Sofka, 2010). Our archetypes may also help managers to optimize their search approaches in innovation projects.
Cross-Industry Innovation

Further readings

Figure 1: Archetypes of cross-industry innovation

Your contact person for search mechanisms
Annette Horváth
Doctoral candidate
Email: annette.horvath@zu.de
Increasing digitalization enables and demands new digital business models

Digitalization is an increasing phenomenon influencing customers’ behaviour, market demands and technological possibilities. Digitalization consists of three aspects: Content is becoming digital (e.g. in books) and the value chains (e.g. production, distribution) as well as the information-based economy are breaking up. Those trends demand changes in organizations in terms of technological competence, product functionalities as well as new digital business models to meet the already established behaviour of customers. Historically, the impact of digitalization is comparable with the impact of industrialization. In industrialization, man power was replaced by machines, and processes were automatized. Today, digitalization automatizes knowledge.

Never before, the internet has been closer to the user as through smartphones, tablets and PCs in nearly every work or private space. Results from a recent survey (See Markt-Media-Studie Internet Facts, September 2012) show that information, communication and shopping are the primary activities which users utilize the devices for. While emailing is still the major activity for online users (86%), searching the web with search machines such as Google and web-catalogues becomes more and more important (83%); this is followed by gaining information about weather (71%) and world news (69%). Online shopping has already conquered position no. 5 in online activities, done by every two of three users. Overall, acceptance of online media is high across generations and gender.

The eBook has already outperformed market penetration of paper books in many segments and executive education will be connected to “serious gaming”. Here, the content is designed as a game to increase the motivation of learners. Furthermore, there is no single American university that does not experiment with online courses in order to improve the level of education.

The increasing demand for changing business according to the digitalization was also formulated at the IT summit 2012. Germany’s federal minister of economics, Philipp Rösler, demands that German should conquer one of the top positions in digitalization by 2020. „The digital economy is the growth driver of all industries“, so Rösler. Already one fifth of productivity growth in all industries of the economy is related to the increasing application of IT and this number will grow further in future, concludes a study presented at the IT summit. This fourth industrial revolution, or industry 4.0, is “the biggest chance” for Germany, so German chancellor Angela Merkel. The energy industry is exemplary. Growth impulses come from the development of intelligent nets in central infrastructures of energy, in order to direct transportation flows more easy and the production of energy according to demand. Furthermore, transportation and health are also key industries affected by digitalization. The following table shows the industries already hit by digitalization:
<table>
<thead>
<tr>
<th>Industry</th>
<th>Examples of increased digitalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media</td>
<td>Books (e.g. gamification): Book publishers and video games producers join forces to develop products like the Sony Wonderbook as new periphery tool for PS3 console, which connects content with technique and narrative styles in computer games; books as multimedia product through the integration of video sequences</td>
</tr>
<tr>
<td></td>
<td>Newspapers / magazines: Beyond digitalization of content, additional services such as recognition and linking of outfits of celebrities to online marketplaces or articles produced by non-professional individuals and communities, selection of content by readers</td>
</tr>
<tr>
<td></td>
<td>Music: Digital ecosystems such as Apple’s iPod and iTunes are the de-facto standard in the music industry today, new releases are offered on digital platforms such as Youtube and rarely on CDs</td>
</tr>
<tr>
<td></td>
<td>Imaging / Video: Digitalization almost completed here, the market of analogue film-based cameras is only a niche market today</td>
</tr>
<tr>
<td></td>
<td>Film / TV: Online download platforms for blockbusters gain market share compared to traditional, stationary DVD rental stores</td>
</tr>
<tr>
<td></td>
<td>Marketing: Internet marketing has outperformed TV marketing already. The internet is the highest revenue driver in entertainment and media market with 23%, as a recent study of PWC shows. Just in 2011, the online marketing revenue increased by 12% .</td>
</tr>
<tr>
<td>Retailing</td>
<td>E-Commerce: e.g. Zalando and Lieferheld</td>
</tr>
<tr>
<td>Information/communication technologies</td>
<td>New technologies: e.g. Social networks like facebook, Xing; Cloud computing</td>
</tr>
<tr>
<td>Travel and transportation</td>
<td>Online marketplaces: price comparison and online booking gain market share in comparison to traditional travel agencies</td>
</tr>
<tr>
<td></td>
<td>Car sharing / ride sharing: Mobility concepts like Daimler's Car2go combine telecommunication and web services to identify rentable cars close</td>
</tr>
<tr>
<td>Gaming industry</td>
<td>PC / video games: Free-to-play, online games, Facebook games</td>
</tr>
<tr>
<td></td>
<td>Board games: Traditional designers of board games increasingly deploy digital content and technology, e.g. Ravensburger TipToi®, an electronic pen which recognizes pictures in books or on board games and links them to digital games and music, etc.</td>
</tr>
<tr>
<td>Financial services</td>
<td>Online payment solutions such as PayPal</td>
</tr>
</tbody>
</table>
But, most of these industries still lack successful business models. There are questions that need to be addressed in all above mentioned industries.

- How to change the current business models in order to adapt towards changing demands and how to profit from digitalization?
- How to develop new business models to additionally address other, more online-affine customer groups?
- How to decrease costs and time to market by adding digital elements in analogue business models?
- How to learn from successful digital business models for the own industry?

Therefore, the executive Master in Digital Pioneering (eMA DIP) at Zeppelin University focuses on how to gain the skills and competencies in order to develop digital business models. The eMA DIP covers such topics in modules like “Business Model Design”, “Digital value chains in B2B & B2C”, or “Consumer behavior and marketing of digital goods”. Furthermore, there is a strong emphasis on corporate entrepreneurial culture, thinking and development for all participants. So, the students need to develop, present and implement their own business idea which is evaluated by practitioners, entrepreneurs and other pioneers within the digital world.

In order to develop new digital business models, companies have to build up their portfolio of competencies on different levels. First, digitalization requires companies to handle change and to identify new opportunities and threats. Companies need dynamic capabilities to address these challenges (e.g. Teece, 2007), whether the companies are “digital natives”, i.e. start-ups within the digital world, or whether digitalization disrupts industries with previously “analogous” business models. Companies that want to take advantage of the digitalization and (re-) configure their digital business models need specific competencies for business model innovation. Our current research indicates which capabilities differentiate successful business model innovators from others (see also chapter 1 about benchmarking). These capabilities include aspects such as thinking in ecosystems or the identification of needs of current non-buyers. For example, new business models require companies not only to care about their core product, but to consider complementary products and services as well. Digital business models are more and more focused on providing “nothing-to-worry-about solutions”. Current non-buyers might be attracted by new compositions of digital business models, e.g. via online shopping portals and at-home-delivery. Decision-making for new business models should focus on customer needs and should adapt to the speed of the Internet.

On a more operational level, digital business modeling requires ideas and creativity. In that sense, learning from already successful industries is a key method to find radically new solutions. “Leading industries” have introduced digital business models and have proven their value. For example, fashion shops lead the e-commerce world, and new start-ups of different industries more and more reflect their own business ideas against the successful practices of Amazon.com and Zalando. Hence, looking across the boundaries of formerly narrow market segments enables companies to innovate their business model (see the next chapter).

However, digital business models also differ from analogous business models, as they comprise new aspects such as “how firms do business”. Value propositions move from products to solutions, e.g. consumers do no longer buy jeans, t-shirts and jackets separately, but take out clothes subscriptions or buy entire outfits which are suited to their needs and tastes. Moreover, information and communication are core aspects of e.g. social networks or information providers such as Google. Mobility-oriented solutions gain in significance.

Moreover, revenue models are evolving – freemium, free-to-play, advertising-based solutions have become more relevant today. In internet-based business models, especially the management of two-sided markets becomes more fundamental (e.g. Apple’s AppStore with developers and users
as two sides of the market). “Freemium” serves as an example for one particular type of business model in two-sided markets. The majority of users receive the product or service for free, while another, more demanding group of users pays for additional functionality or capacity.

Xing with its free and premium accounts counts as such a freemium model. Here, our research clearly indicates the high relevance of differentiating the specific product characteristics available to these user groups (free product vs. paid product) in order to generate a strong customer base on both sides.

Moreover, the partner management is another key topic in two-sided markets in which one side provides complementary products (e.g. Apps in the AppStore). Thus, in our on-going research we look more closely on how successful companies manage their partner network in the business models of two-sided markets.

To provide more advice to companies which are facing the issues linked with the increase of digitalization and the emergence of new digital business models, we currently approach several research areas besides the topics outlined above.

**Further readings**

Designing radical business models by looking across industry boundaries

Radically new business models enlarge value creation (Amit & Zott, 2001) and create competitive advantages (Mitchell & Coles, 2003). Creative imitation provides a highly relevant approach for designing such radical business models by recombining existing business model components of a source industry or a source market segment with new business ideas, products, and services within the target industry. The systematic consideration of cross-industry business models is not only relevant for traditional industries and companies, but also for start-ups, e.g. in the Internet domain.

Innovation through imitation

While cross-industry innovation has become an accepted method within product and technology innovation, it is still in its early stages regarding business model innovation. However, our research sheds light on the possibilities and potential of looking across industry and market boundaries, when designing and implementing radically new business models. In this context, we are not talking about “copy cats”, i.e. a mere duplication of successful business models (e.g. StudiVZ as a copy of Facebook), but a systematic search for analogies in other industries followed by creative recombination of different business model components. This form of imitation overcomes the barriers of dominant logic (Prahalad & Bettis, 1986) and industry recipes (Spender, 1989) and creates new, valuable business models.

When to use imitation

Start-ups and established companies face increasing pressures to introduce new business models in ever changing industries, which are for example subject to digitalization or commoditization. Companies need to address new customer needs, emerging niche markets, or new international markets that differ from their established market segments. Furthermore, start-ups have to find ways to monetize their innovative service ideas and essentially create profits. In such cases, already established business models in other industries provide answers to the following questions:

- How can we reshape the value proposition to address customers adequately?
- Which revenue models do other industries use?
- How can we design a sustainable and valuable customer relationship?

Leveraging cross-industry innovation in these situations enables companies to find radically new business model deviating from the established concepts of “how to do business”, which all other competitors still follow. It also speeds up the implementation process and eases communication to future customers and investors. As some business model components have been successfully established, both customers and investors have the chance to see the basic principles of the business model in the source industry. This facilitates the “proof of concept” for the new business model, which ensures a fast understanding by customers and secures financing from investors.

Imitation at work: An example

J.W. Ostendorf, a producer of paint and finishing products, serves as an example how this approach works. The company traditionally serves male customers by producing private label paints for do-it-yourself retailers. Recently the company searched for a new business model in order to specifically address women as customers. Through a targeted search in other industries, the company found the business model of Nespresso. J.W. Ostendorf imitated the “convenience”-aspect of this business model based on an easy-to-use combination of a coffee machine (hardware) and capsules (consumables). They developed a new “Plug-and-Spray”-System that allowed a convenient application of newly design colors in
special capsules (consumables) through a spraying system (hardware) designed by a partner company.

The new marketing and distribution model targets the convenience- and lifestyle-oriented market segment – similar to Nespresso.

**A systematic process for imitation**

To pursue this approach systematically, we propose a three-stage process, similar to technology-related cross-industry approaches (e.g. Gassmann & Zeschky, 2008). The three structural phases are abstraction, analogy identification, and adaptation (see Figure 1).

*Abstraction* reduces a problem to its core aspects and formulates a highly abstract reference point necessary for recognizing and identifying analoguous solutions (Weiß, 2004). For business model innovation, a company has to define a new value proposition, based on its core product but also serving some generic customer needs (e.g. “convenience” at J.W. Ostendorf). This forms the base of their targeted new business model. These generic aspects of the value proposition can typically be found in various industries and provide the search terms to look across industry boundaries.

Within the *analogy identification* phase, companies compare these generic customer needs with value propositions companies in other industries or market segments offer. Once an industry is found that addresses structurally similar aspects (e.g. Nespresso’s convenience- and lifestyle-oriented business model for premium coffee), the company can evaluate whether the business model components providing this value proposition might be also valuable to implement the new business model in the target industry.

In the last phase, *adaptation*, customer-oriented business model components (e.g. customer relationship or revenue model) are transferred in order to implement the new value proposition. It is not always possible to transfer specific components directly. However, cross-industry searches can also provide ideas how business models look like in other industries and how principle mechanisms and interactions between different components of these business models, e.g. for revenue creation, work.
**When imitation creates value**

If companies creatively adapt business model components from other industries, they enlarge value creation in their own industry. By adapting the value proposition to the specific needs of a target market segment, more sustainable and valuable customer relationships are created. The adaptation of the Nespresso business model enabled J.W. Ostendorf to leverage strong incentives for rebuying as their spraying system are ideally aligned with the paint capsules. At the same time customers are willing to pay an extra charge for this premium-positioned product.

Hence, imitation of business models across industry- or market-boundaries provides a starting point to achieve profitable growth in new or changing markets.

---

**At a glance – Summary**

- Business model innovation complements a firm’s innovation activities regarding product, process, and service innovation.
- Imitation of business models from other industries or market segments can be approached through a systematic three-step-process.
- “Abstraction” identifies generic customer needs that can be found in a variety of industries, “analogy identification” searches and evaluates business models of other industries, which serve the previously identified customer needs. Finally, “adaptation” transfers these business model components to the target industry.

---

**Further readings**


The rise of low-cost carriers, consolidation waves and the fact that various prestigious airlines have faced bankruptcy during the past years, have led to the questioning of current business models of established airlines. The industry has become more competitive and profit margins are amongst the lowest compared to other industries. Airlines have to rethink their strategy and moreover rebuild their business model to ensure survival in the near future. In this regard, business model innovation and especially dynamic capabilities are essential for the future success of an airline.

Facing a competitive environment

The airline industry has changed enormously over the past years: Customer expectations vary more than ever and the supply side of air transportation has become more dynamic as traditional network carriers have to face new, cost-efficient airlines. Both rising costs as well as declining revenues have forced legacy carriers to reconsider their business models. The research paper ‘Dynamic Capabilities and their Relevance for Business Model Innovation in the Airline Industry’ analyses the airline industry and especially the ability of different airlines to cope with the exogenous changes the airline industry currently faces. Accordingly, the research paper examines different airlines and studies their ability to innovate their business models. The paper draws on the theories of business model innovation (Chesbrough, 2007, 2010) and dynamic capabilities (Teece et al., 1997; Teece, 2007, 2010) as its driving force. Six airlines are selected, which represent various business models with different degrees of maturity. The sample consists of legacy carriers, which prior were state-owned and provide full network carrier services. Also, so called niche carriers are selected, which specialize in a certain niche of the airlines industry, like low-cost segment or regional carrier services. In-depth interviews with strategy departments or CEOs reveal insights about the business models in place and especially activities of sensing change and seizing opportunities to re-new the existing business models. A cross-case analysis helps to reveal similarities and point out crucial differences.

Sensing the change, not seizing the opportunities

Although almost all airlines understand the importance of business model innovation, the capabilities of perceiving change and transforming these insights into new features or renewed business models is less developed especially amongst legacy carriers. Carriers understand changing customer behavior and recognize trends as well as regulatory changes. However, as the seizing of upcoming opportunities is not well developed, airlines lack to factor in those economic, social or ecological upheavals. The results of the study indicate that the industry’s changes and the renewal of business models are mainly driven by changing customer expectations. Technological evolutions and regulatory interventions are mentioned as well. Accordingly, business models have to be adoptable to new customer expectations and should be responsive enough to react as fast as possible. As many legacy carriers were state-owned in the past, organizational and systemic structures as well as mature labor agreements hinder the renewal of business models. Especially airlines that did not innovate their business model over the past years and tend to follow the same principles and strategies and thus rely on an existing system, have difficulties in realizing dynamic capabilities for seizing opportunities. In comparison, airlines with flexible and decentralized structures as well as a high degree of customer orientation, more easily
adapt their way of doing business to changing customer expectations or changing environmental conditions. Furthermore, organizational learning capabilities as well as constant measurement of key performance indicators like customer satisfaction or quality perception are named as indispensable factors of business model innovation capabilities by airline executives. Apparently, less mature airlines tend to be more flexible and thus have developed dynamic capabilities to a greater extent compared to their legacy competitors.

Implications and recommendations for airlines

The presumption of Teece and his colleagues that dynamic capabilities enable and support business model innovation was worked out and confirmed in this study. But, as pointed out, the research paper revealed differences amongst the airlines and showed that more specialized airlines like the sample of niche carriers have developed dynamic capabilities to a greater extent. Accordingly, path dependency is assumed to influence the development and existence of dynamic capabilities to a great extent. Inertia, which is caused by inflexible structures and size or legal burdens and obligations, is revealed as a main reason for the inability to react to the fast changing environment and erratic customers.

This finding indicates that especially legacy carriers have less dynamic capabilities and thus have more difficulties to further develop and innovate their business models. As this result is in line with the current economic situation of many legacy carriers, those airlines are recommended to overcome their inertia find its ideal relative size, leave well-trodden paths and invest in the development of dynamic capabilities, innovate their business models, establish a competitive advantage and operate both profitable and sustainable in future.

Extract from master thesis of Michael Mandery (Spring 2012)
How to systematize business creation: The case of Europe’s largest aerospace company

EADS (the European Aeronautic Defence and Space Company) is Europe’s largest aerospace company, achieving a turnover of €49.1 billion in 2011 with 133,151 employees. EADS operates in stable industries such as aerospace and defense and security systems with relatively long product life cycles. Due to the exceptional structure and format of the aerospace industry, cost leadership needs to be taken into consideration, but is not the company’s key objective.

Resulting from an increased competition and reduced or at best stable budgets in governmental markets, the company opened up to increase potential solutions and create new businesses, based on an internally acknowledged and widely applied “EADS Business Model Innovation Framework” (see Enkel et al., 2012). This framework and process was established in 2010 and since then, has been promoted via a bottom-up approach across several EADS divisions.

Based on the elaborated framework, two major ways of conducting business model innovation at EADS can be described. On the one hand, individuals or teams sit together in so-called “Business Model Idea Creation Workshops” to perform brainstorming sessions in a guided and systematic way. In such workshops, the teams emphasize the creation of disruptive ideas, and set up novel potential business concepts by neglecting problems regarding the feasibility in a first step. In this context, an established business model manual helps the teams to discuss the most important aspects with respect to business modeling. In so doing, the creation of new business concepts and business models can be accelerated within the distinct EADS business divisions.

On the other hand, EADS conducts “Business Model Elaboration Workshops” in which already existing business ideas are elaborated within interdisciplinary, interdivisional and even intercultural teams. Usually, a middle management jury has already approved the business ideas, since they frequently stem from a company-wide ideas competition. In order to systematically build a working business model around such business ideas, the “Business Model Elaboration Workshops” provide the necessary structure.

To offer an adequate workshop frame, the Walt Disney Method delivers the basic structure for these “Business Model Elaboration Workshops.” The Walt Disney method is a classical role play in which one or more individuals are invited to view and discuss a specific topic from three different perspectives: the visionary, the reviewer and the idealist. Due to the fact that such a workshop helps to build on an already existing business idea, some general conditions are already set.

In the “visionary” phase, an interdisciplinary group of employees brainstorms with respect to the already defined business idea. Criticism is not permitted during this phase allowing all kinds of ideas to be presented. In order to structure the brainstorming session to some extent, the established “EADS Business Model Innovation Framework” serves as template to frame an idea. The employees can write all their ideas on sticky notes and attach each one to the suitable business model component within the framework. For instance, one sticky note might consider a specific convenience or customization aspect which could be allocated to the model’s value proposition component. Another sticky note might specify a partner without whom the new business model could not survive. This partnership should then be allocated to the component called partner network. Before delving into the next phase, all ideas shall be presented in the group.
In a following step, the group examines all ideas from the “reviewer” perspective. Now for the first time, criticism is allowed and all ideas (sticky notes) are critically discussed. In order to again provide the necessary structure, changes, adaptations as well as opportunities and threats are written down on customized “Business Model Elaboration Cards”. After having filled in the cards, they can be allocated to the “EADS Business Model Innovation Framework” to generate a full picture.

In the final phase, the “idealistic” phase, all elaborated ideas are viewed again. Now, the group must select the most relevant business model component aspects to prepare the “sales pitch” corresponding to a short presentation in front of the top management. This final step is important to focus on the most relevant business model characteristics, when trying to sell a new business model idea. Furthermore, the group creates a timeline with milestones serving as a first draft of the new business model launch.

It is clear that all three phases are equally important, as the quality of the “sales pitch” as well as the preparation for critical questions finally decide

“A mediocre technology pursued within a great business model may be more valuable than a great technology exploited via a mediocre business model.”

Chesbrough, 2010
about the continuation of a potential business model. EADS has realized that providing a great business model with a specific technology is at least as important as the technology itself (Chesbrough 2010). Thus, specific EADS divisions have already started to systematize the application of these “Business Model Elaboration Workshops.” Apart from the described workshop organization, the EADS Nursery Fund – attached to the EADS Corporate Technical Office – also applies this structured approach for elaborating its disruptive innovation projects.

At a glance –
Summary

- Employees shall be incited to work with the established business model innovation framework (both individually and in teams).
- It is necessary to create a solid innovation culture and adapt a firm’s incentive system towards new business creation approaches.
- The bottom-up communication and persuasion should not be underestimated with respect to introducing new innovation methods. The employees need to realize the added value of the novel business creation approach themselves.
- The utilization of a workshop structure and the integration of creativity methods (e.g. Walt Disney Method) might help a firm to guide the business creation process and to guarantee a good structure.

Further readings


Your contact person for structured business creation approaches

Karoline Bader, MA
Doctoral candidate
Tel. +49 7541 6009-1285
E-mail: karoline.bader@zu.de
How to “fight” Amazon and Google: Business model innovation in the specialized publishing industry

Established publishing companies have to face up to multiple problems regarding the position in their industry, their business models and their future course of actions. Digitalization significantly disrupts traditional value chains regarding authors, publishers, distribution channels and readers. New competitors are entering the market by offering “self-service” publication channels to authors. Considering these developments it becomes essential to cope with such changes and adapt to the new situation, a matter for which dynamic capabilities and business model innovation can be seen as key factors.

Changing industry landscape

Due to an ongoing digitalization, changing customer and user needs, the specialized publishing industry faces severe structural upheavals (Steinröder & Pitz, 2009). With traditional business models becoming less efficient, new approaches are needed and specialized publishers have to undertake a transformation. This paper investigates these changes and the responses of traditional and new companies within the specialized publishing industry by using the theories of dynamic capabilities and business model innovation (Teece et al., 1997; Teece, 2010). The aim of the paper is to analyze and evaluate the potential of the participating firms to sustain a successful long-term performance in the field of specialized publishing. In-depth interviews with experts from specialized publishers were conducted to gain insights about the structure, actions, perceptions and business models of companies operating this industry. All interviewees were executives from established companies and new participants in the industry to gain insights about the structure, actions, perceptions and business models of companies operating this industry.

Dynamic capabilities, business model innovation and transformation

Specialized publishers nowadays often have to compete with global corporations as Google, Amazon or Apple as well as with small, innovative start-ups which offer new approaches for customers and users. With their experience and expertise about their content and their target groups, though, specialized publishers can provide unique and valuable products and services when they adapt their processes and structure. This applies particularly for very specific target groups, local information and complex, individualized solutions. In this context, specialized publishers have advantages over new entrants and can build their business models on these value propositions. However, they cannot effectively seize such business opportunities without adapting to the new situation in the industry and reconfiguring their own resource base. By analyzing the interviews it became clear that such a transformation process is extremely difficult and can be influenced by various factors, varying from structural inertia in a company to mental models from managers.

Recommendations for change

The findings show e.g. that specialized publishers have understood the importance of business model innovation. In contrast to start-ups and technological companies from other industries, however, it is not a vital issue. Moreover, it is problematic for specialized publishers to recruit people who are capable of business model innovation and are familiar with digitalization and its effects. Thus, it becomes essential to change organizational structures, to become more dynamic and innovative and to find new business models which are more suited to a digital industry and customer and user behavior in this environment.
It became apparent that companies need to know exactly what their customers and users want and apply effective feedback and exchange processes with customers and users. One element of achieving a constant feedback and exchange process could be the usage of tools like Google Analytics for digital products and services. Moreover, the identification of substantial trends by deploying a systematic innovation management is a crucial task. Such an innovation management can also test new business models.

Business model innovation has been named as one central aspect for sustaining success in the future and companies should dedicate sufficient resources to this topic. Here, the regular application of dynamic and iterative trial and error processes can be a central step to quickly test new products, services and business models. However, such trial and error processes have to be combined with fast feedback and decision processes. Similarly, another proposition states that one potential approach for companies within the specialized industry may be to actively look across industry boundaries. With the usage of cross industry innovation firms may find valuable business models which can be adapted to the specialized publishing industry.

Another critical issue is the modularity of content which describes the fact that print, digital and mobile content should not be treated as completely separate areas. Instead, companies should try to establish processes and structures to provide modular content for all channels and devices from one operational unit and by this use their resources more efficient. In this context, collaboration between different departments within a company or cooperation between companies can play an important role, since both forms enable firms to foster knowledge exchange and transfer and help to work with limited resources. Furthermore, it seems to become crucial to possess technological and digital resources and competencies in order to provide targeted products and services. Thus, companies have to build these resources and use them to move beyond their existing business models. Although transformation is a complex undertaking, it is necessary when traditional business models and approaches prove to be less and less effective.

Extract from master thesis of Florian Schild (Spring 2012)
Research brand equity

Research Brand Equity is a joint project with various sub-projects where a bunch of different perspectives is involved – Innovation Research (Prof. Dr. Ellen Enkel, Jun. Prof. Dr. Marco Hubert), Marketing (Prof. Dr. Peter Kenning; Zeppelin University) and Psychology (Prof. Dr. Arnd Florack; University Vienna) – with the goal to analyze the impact of perception on a firms performance as well as economic values like willingness to pay or specific performance indicators (i.e. market value, Tobin’s q).

Relevance and motivation

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 consumers perception of a firm as 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 (Falker, Wagner, 2011).

Because of the different possibilities firms have to innovate and to 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:

Project I: Effects of Flagship-Products on Consumer Innovativeness Perceptions of a Firm – First Insights for Three Different Industries

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. Due to the development of innovative products the whole brand might be perceived as innovative and the firm may be able to realize a competitive advantage.

Moreover, studies investigating processes and forms of brand extensions have shown that there exist 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.

Hypotheses

Against this background, the questions arise, a) if the existence and the acknowledge of a flagship-product has an impact on the perceived innovativeness of a firm in general (H1a), b) if there exist differences between industries (H1b) and c) if the perception of the known flagship-product and the evaluation as typical has an impact on the perceived innovativeness of a firm (H2).

Method and analysis

To increase variance in perception and knowledge of different flagship-products and firms, we investigated three different industries (Cars (C), Electronics (E), and Pharmaceuticals (P)) and three different firms (C1/C2/C3, E1/E2/E3, P1/P2/P3) within each industry. Each subsample consists of 150 participants with 50 participants per known firm, which leads in consequence to a total of
450 participants. In an online-questionnaire each participant had to answer items for their specific firm-industry combination (C1/C2/C3, E1/E2/E3, P1/P2/P3) with regard to their innovativeness perception of the firm (7 items, alpha=.950, KMO=.932, AVE=77.125), if they know a specific flagship-product, their innovativeness perception of the known flagship-product (8 items, alpha=.975, KMO=.932, AVE=84.998) and the interacting identification (typicality) of the flagship-product with the firm (5 items, alpha=.920, KMO=.884, AVE=76.045). Additionally they had to answer questions regarding their individual consumer innovativeness (6 items, alpha=.910, KMO=.869, AVE=69.455) as well as general socio-demographical questions (i.e. gender, age, net income).

The analysis included only those participants who could name respective couldn't name a specific flagship-product (binary variable: yes, no) within their firm-industry combination. Overall, 269 participants (124 female; Mean(age)=38.94, SD=12.9, participants(C)=73; (E)=87; (P)=109 ) were included within the analysis. We controlled for gender differences as well as differences in age and consumer innovativeness and found no significant main effects between the industry-subsamples for gender (Chi²(2, 266)=1.59, p=.924), age (F(2, 266)=.782, p=.458) and consumer innovativeness (F(2, 266)=.880, p=.398).

Results

Regarding hypothesis H1a, to measure an overall effect of knowing a flagship-product on the perceived innovativeness of a firm, we entered innovation ratings over all industries into an one-way (flagship-product: yes, no) ANOVA and found a significant main effect for flagship-product (Mean(yes)=4.896, SD=1.31; Mean(no)=4.40, SD=1.07; F(1, 267)=10.387, p<.001).

Regarding hypothesis H1b, to measure industry-dependent effects we entered innovation ratings as dependent variable into a general linear model with flagship-product (yes, no) and industry (electronics, cars, pharmaceutics) as factors and found again a significant main effect for flagship-product ((Cars): Mean(yes)=4.79, SD=1.27; Mean(no)=4.40, SD=1.11; (Electronics): Mean(yes)=5.04, SD=1.52; Mean(no)=4.68, SD=1.28; (Pharmaceutics): Mean(yes)=4.79, SD=1.005; Mean(no)=4.31, SD=0.99; F(1, 267)=5.958, p=.015) but no significant main effect for industry (F(2, 266)=1.280, p=.280) as well as no significant interaction effect for flagship-product*industry (F(1, 266)=.052, p=.949).

Regarding hypothesis H2, to measure the influence of the innovativeness perception of the flagship-product and the identification with the firm, we entered innovativeness ratings of the firm as dependent variable into a general linear model with industry as factor and perceived innovativeness of a flagship-product and identification as covariates. Here we found a significant effect of the innovativeness perception of the flagship-product (F(1, 267)=8.880, p=.003) and a significant interaction effect of industry*innovativeness perception of the flagship-product*identification (F(2, 266)=3.998, p=.020). We found no main effect for industry (F(2, 266)=2.843, p=.061) and identification (F(1, 267)=3.564, p=.061) as well as no main interaction effect of innovativeness perception of a flagship-product*identification (F(1, 267)=1.933, p=.166).

Summary

These results show, that there is 1) a general relationship between a known flagship-product and the perception of a firm as innovative in general and this holds true for the industries, but 2) there is a difference between the industries on firms innovativeness perception regarding the impact of perceiving the product as innovative and additionally evaluating this product as typical for a specific brand.

In a similar vein, if we assume the importance of a firm's perception as innovative we have to analyze the impact of innovativeness perceptions on economic and financial values:

Project II: Determinants of perceived innovativeness and the effect on consumer willingness to pay

Relevance and motivation

Research in marketing and innovation science shows that firm innovativeness (Rubera and Kirca, 2012) determines several economic variables such as firm values (e.g. Tobins Q, Stock Market
Performance), market values (e.g. sales, sales growth, market share) or the financial position (e.g. ROA, ROI, ROE, ROS) (Rubera and Kirca, 2012).

Furthermore, research provides evidence that from a consumer perspective the perceived innovativeness of a firm which can among others be influenced by a company’s communication strategy is positively correlated with 1) the success of a company in new markets (Keller and Aaker, 1997, Shankar, Carpenter, and Krishnamurthi, 1998), 2) the credibility and perceived expertise of a company (Golder and Tellis, 1993) 3) the perceived quality and buying intention of the products (Keller and Aaker, 1997) and 4) the stability in the buyer-seller relationship (Falkner, Wagner, 2011).

Research questions

Up to now it still remains unclear 1) which determinants drive the perception of innovativeness, 2) how investments in research and development lead to changes in the perception of consumers and other stakeholders 3) if there is a discrepancy or fit between the actual and perceived innovativeness, and 4) how actual and perceived innovativeness can add to better explain economic performance indicators.

Methods and analysis

A first study was conducted to analyze specific determinants of consumers perceived innovativeness of a firm. We investigated 450 participants, investigated three different industries (Cars, Electronics, and Pharmaceuticals) and three different firms within each industry (for more details see notes to project 1). Participants were asked within a questionnaire of how innovative they perceive the service, price setting, employees, environment, quality and marketing of a specific firm and the firm itself.

Within a second study we investigated 746 participants and 27 companies from different industries (cars, electronics, pharmaceuticals, insurances etc.). Here people were asked how they perceive the innovativeness of the given firm, the quality of the products and their general willingness to buy those products for the given firm.

Results

Figure 2: Perceived innovativeness as moderator
Next Steps:

- Collection of various performance indicators, i.e. firm value, market position or financial position
- Analysis of mediating or moderation effects of the perceived innovativeness on the causal connections between firm innovativeness and firm value, market position and financial position

Your contact person for innovation marketing

Jun. Prof. Dr. Marco Hubert
Junior Professor for Innovation and Entrepreneurship, especially innovation communication and behavioral science
Tel. +49 7541 6009-1274
Email: marco.hubert@zu.de
Introduction and theory

The field of brand research is concerned with examining the important influence of brand information on decision-making (Ailawadi & Keller, 2004). A prominent concept within the framework of brand research is “brand personality” (Aaker, 1997). Advertising often applies this construct by using product descriptions that correspond to humanlike traits. Therefore it is quite obvious, that an emotional and symbolic benefit of a brand can be an important factor to discriminate oneself against competitors in saturated markets. That is why marketers are increasingly embracing alternative forms of brand-building activities. Although it would be rather intuitive to think of the original producer as brand builder or brand owner, new forms of brand builders emerge to date (Pennington & Ball, 2009).

From a theoretical perspective, the occurrence of new forms of brand builders can be explained – among others – by the relationship model (Fournier, 1998). This model regards a brand as an active element, an active partner of consumers that they can enter a relationship with – just like human partnerships (Fournier, 1998).

This conceptualization of a brand includes that groups different from the original producer of a good or service can be involved in the building process of brands as well. In that function these other groups have to be taken into consideration as direct determinants of brand personality. That is why we hypothesize that different brand builders lead to different perceptions of brand personalities by consumers.

Against this background, the aim of our study is to use an experimental design to reveal the influence of different brand builders on the concept of brand personality and subsequently, the impact of brand personality on relevant outcome variables (Figure 1). We address this topic because we believe that brand builders act as additional direct drivers of brand personality. They are involved in or even absorb the entire process of creating a unique name and image for a product, good or service and should be considered as a significant and differentiated presence in the building process of a brand with the aim to attract and retain loyal customers (Paharia et al. 2011).

![Figure 1: Hypothesized research model](image-url)
Methods and analysis

Stimulus material consisted of a new German wine brand. The wine market in Germany is characterized by almost unlimited different brands and wine is seen by the consumer as an extraordinary “difficult” product with a lot of information that the average consumer cannot process in advance of the actual purchase. This leads to a simplified purchase decision based on rather little information (Lockshin et al. 2006). We manipulated the brand building history of the wine brand in the experimental conditions using a message framing approach (Figure 2; e.g., Blanton, Stuart & V. d. Eijnden 2001).

We selected two groups of brand creators and randomly assigned participants to one of the scenarios: In the first scenario the whole brand was built by the winegrower himself (WG-group), in the second scenario the brand was built by an online community (OC-group). The two scenarios were presented credible, informative and short. Brand personality was measured using the brand personality dimensions introduced by Mäder (2005).

In total 347 subjects participated in the main study. Those were randomly assigned to the WG-group and to the OC-group. Within the WG-group we had 174 participants (92 male; 82 female; Mage = 32.95; SD = 12.11). Within the OC-group we had 173 subjects (78 male; 95 female; Mage = 32.72; SD = 13.62). Neither significant age differences between both groups could be observed (t(345) = 0.171 with p-value = .864) nor significant differences in product involvement (t(345) = 0.063 with p-value = .950) or product knowledge (t(345) = 0.878 with p-value = .381).

For the analysis of our data regarding the effect of different brand biographies on the perception of brand personality, we used two samples independent t-tests (Figure 3a). To identify differences in outcome variables due to different brand biographies, see Figure 3b. In a next step, we used multiple linear regression to reveal the influence of different brand personality facets on the outcome variables (Figure 4 for regressions with the dependent variable “price premium”).
### Results

**Multiple regression model "Winegrower"**

<table>
<thead>
<tr>
<th>Construct</th>
<th>Coefficient B</th>
<th>Standard Error B</th>
<th>β</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.499</td>
<td>0.219</td>
<td></td>
<td>-2.280</td>
</tr>
<tr>
<td>Attractiveness</td>
<td>0.252</td>
<td>0.095</td>
<td>.198**</td>
<td>2.663</td>
</tr>
<tr>
<td>Reliability</td>
<td>0.320</td>
<td>0.089</td>
<td>.307***</td>
<td>3.582</td>
</tr>
<tr>
<td>Spirit</td>
<td>0.134</td>
<td>0.083</td>
<td>.128n.s.</td>
<td>1.607</td>
</tr>
<tr>
<td>Stability</td>
<td>0.025</td>
<td>0.070</td>
<td>.026n.s.</td>
<td>0.360</td>
</tr>
<tr>
<td>Naturalness</td>
<td>0.222</td>
<td>0.066</td>
<td>.247**</td>
<td>3.377</td>
</tr>
</tbody>
</table>

Model "Winegrower" (N = 174): Dependent variable "Price premium"  

Price premium $R^2$ (adjusted $R^2$)  

0.572 (adjusted 0.559)

Note: * $p < .10$; ** $p < .01$; *** $p < .001$; n.s. = not significant; Overall model statistics: $F_{5,168} = 44.828$, $p < 0.001$. A check of variance inflation factor (VIF) and tolerance statistics for data collinearity revealed no suspicious values.

*Figure 3: Multiple regression model “Winegrower”*
Conclusion

The results of our exploratory experimental study show that (1) that there are significant differences between both brand creators (winegrower and online community) and the perception of brand personality dimensions. Here, a producer-driven brand creation approach is associated with higher levels of reliability, stability or naturalness whereas a consumer-driven brand creation approach is associated with higher levels of dynamics and creativity (spirit). In addition, facets of brand personality influence economic outcomes like price premiums differently dependent on the group "winegrower" or "online-community".

Your contact person for brand creation

Jun. Prof. Dr. Marco Hubert
Junior Professor for Innovation and Entrepreneurship, especially innovation communication and behavioral science
Tel. +49 7541 6009-1274
Email: marco.hubert@zu.de
Further Information
Research & teaching at the institute

The Dr. Manfred Bischoff Institute of Innovation Management of EADS, is named after its founder, European Aeronautic and Space Company, and this company’s “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 not occupied in 2011), as well as PhD candidates and student assistants.

Fields of research

The institute researches within the area of innovation management for businesses based on the interaction of strategy, organization and financing. By combining theory and practice of technology and innovation management 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 and culture. Theoretical focal points are resource- and knowledge-based business theories.

The chair works preferably practice- and application-oriented and tries to gain insights from practice and to develop, to implement and to optimize new concepts on a theoretical basis through a close cooperation with companies. Our publication formats range from practical journals up to internationally recognized 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 to 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 in the following: 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 Modelling (BA, CME)
- Advanced Open Innovation (MA, CME)
- Knowledge Management (MA, CME)
- R&D Metrics & Creativity (MA, CME)
- Innovation & Technology Management (eMA DIP)
- Digital Business Modeling (eMA DIP)
- Introduction to Management and Economics (eMA DIP)
- Networks and Collaboration (eMA DIP)
- New Technologies & New Markets for Digitalization (eMA DIP)

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 innovative capacity of companies. During the theoretical part of the course, students discuss the topics portfolio management, R&D metrics, R&D controlling, innovation culture and different creativity techniques. The subsequent practice phase allows to collaborate with companies to work in intensive workshops in order to define improvement levers for those. 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 analysis and concepts, but also approaches relevant for corporate practice.
Further publications of the institute

Refereed journal articles:


Managerial press and book chapters:


Conference publications:


Cooperation in practice

Ever since the founding of the Chair of Innovation Management we have closely worked and researched together with the practice, either on site at the 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, workshops) |
| 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 engaged interns |

Current projects

| Henkel, derivation of specific organizational capabilities in order to systematize a cross-industry innovation strategy. |
| BMW, optimization of the outside-in technology management, especially from beyond established industry boundaries. |
| Friesland Campina, optimization of the open innovation metric system. Identification of meaningful direct and indirect key performance to measure impact. |
| Astrium, application of a joint ESA project in order to evaluate and adapt space technologies for terrestrial use. |
**Team**

**Research team**

**Ellen Enkel** is professor for innovation management and head of the Dr. Manfred Bischoff Institute of Innovation Management of EADS at Zeppelin University in Friedrichshafen. Since 2008 she holds the Chair for Innovation Management at Zeppelin University.

Prior to that, she has been researching 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.

Her research focus comprehends the topics 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 EADS at Zeppelin University in Friedrichshafen. Prior to that, he has been researching and working 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 already has published numerous articles in highly ranked academic journals.

**Karoline Bader** works as research fellow and PhD candidate at the Chair for Innovation Management. She received her bachelor's degree in "International Business – Intercultural Studies" at Heilbronn University in 2009. Following, she graduated at Zeppelin University in "Corporate Management and Economics" and finished her master studies with distinction in 2011. During her studies, the German National Academic Foundation supported her. At the institute, she investigates the relationships between innovation culture, innovation strategy and specific open innovation formats. Since September 2011, Karoline Bader works as lecturer at Zeppelin University and is responsible for the course “Open Innovation”.

**Sebastian Heil** works as a research fellow and PhD candidate at the Chair for Innovation Management. He received his graduate diploma in business administration with distinction from the University of Mannheim. His research focuses on antecedents and consequences of collaborative innovation, especially beyond established industry boundaries (cross-industry innovation). He is lecturer responsible for the course “Innovation & Technology Management” at Zeppelin University and engages in cooperation projects with firms across industries to develop new theory-based concepts and gain new insights from managerial practice.

**Annette Horvath** is PhD candidate and about to finalize her dissertation. Her research focuses especially on open and cross-industry innovation as well as on motivational factors. Before, Annette was leading an international production project for a fast moving consumer good company and employed in a consulting company.

**Florian Mezger** is PhD candidate at the Chair for Innovation Management. After studying business administration with a specialization in corporate finance, management accounting, and strategic management at the University of St.Gallen, Switzerland, he worked for more than two years as a consultant at The Boston Consulting Group. Currently, his research focuses on business model innovation and dynamic capabilities. He is lecturer at the bachelor and executive master level.
Katja-Maria Prexl is PhD candidate working with Junior Professor Marco Hubert in the area of Innovation Communication and Behavioral Science. After various academic stations in Mannheim, Newcastle Upon Tyne and Friedrichshafen in the field of economics, communications and cultural science, she worked for several companies and start-ups across industries and was engaged in a research project about brand-rituals. Currently, she is starting a course about „Foresight and Design Thinking“ with Junior Professor Marco Hubert and Dr. Ulf Pillkahn. Her research focuses on mankind in the center of innovation, foresight and design innovation, the responsiveness of companies and innovation culture and behavior.

Extended team
Sabine Marx is administrative head of the institute. After an employment of 25 years in facilities for the handicapped, she passed a triennial training for management. Since September 2008, she works at Zeppelin University.

Currently, the Bachelor student Jana Kremer supports the institute. She assists in single research projects and also fulfills other administrative duties as student assistant.

We look forward to exploring these and further issues with you in 2013!
The institute goes international

RADMA in Grenoble, France

EURAM in Rotterdam, Netherlands

Summer School in Cambridge, UK
ISPIM in Barcelona, Spain

IPDMC in Manchester, UK

Research visit in Berkley, USA
References


Zeppelin Universität gemeinnützige GmbH
bridging
business, culture, politics

Sabine Marx
Department Corporate Management & Economics
Am Seemooser Horn 20
D-88045 Friedrichshafen | Bodensee

phone: +49 7541 6009-1500
fax: +49 7541 6009-1299
email: sabine.marx@zu.de
www.zu.de

Seat of Registration Friedrichshafen | Bodensee
Court of Jurisdiction Ulm, HRB 632002
Managing Directors: Prof Dr Stephan A Jansen | Niels Helle-Meyer | Katja Völcker