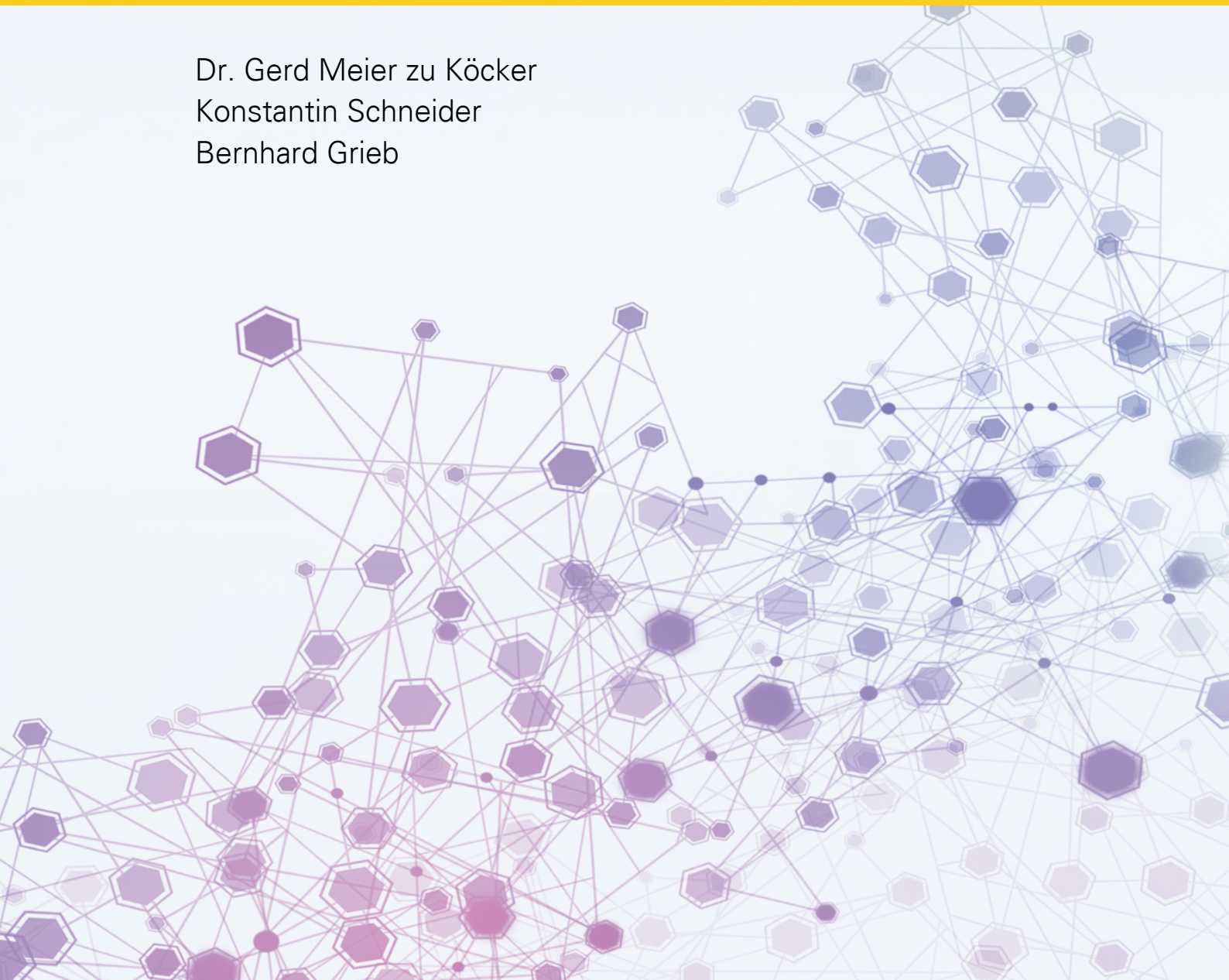


# Success Through Thinking out of the Box

Strategic differentiation in enterprises initiated  
by cluster initiatives

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# 1 Introduction

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Who has ever heard of the company “Diamond Multimedia”? Nobody most likely. And yet, this was the company that launched the first MP3 player on the market, as early as in 1998. There is, however, another product that is inseparably linked to the commercial success of MP3: Apple’s iPod and the related sales platform iTunes.

This is a perfect example that shows that technological pioneering spirit is not necessarily profitable on the market. Because there were many more aspects than the technological superiority of the iPod that were decisive for Apple’s market success. In particular, these were its classy design, an ingenious marketing campaign, and – most importantly – its own sales platform Apple iTunes that allowed the legal purchasing of MP3 tunes. So, it was actually a combination of design, marketing, business model, and sales platform that was necessary to break the dam for this technology and open up the mass market.

That means that impressive innovations today, such as Apple’s iPod, for example, are mostly smart combinations of technologies, services, processes, design, and marketing. They are created where markets are changing and industries overlap. With this in mind, it is not surprising that cross-subject cooperation projects offer the best opportunities. This form of cross-sectoral cooperation may have diverse root causes, for example, new market trends, changing customer needs, new legal conditions or crises.<sup>1</sup>

Of utmost importance in this context is the ability to think out of the box. Thinking out of the box here means to leave established paths and structures and find new solutions. The targets of thinking-out-of-the-box processes in companies should be to find new ways to position themselves ahead of their competitors, and also to strategically distinguish themselves from other market participants. This strategic differentiation may either be realized through completely new products and services or through adapting existing products to the needs of existing or new customers. Modified or new business models and processes, or a different use of systems or resources within or outside of the companies may also result from thinking out of the box.

For most of the stakeholders from industry, research, and politics, thinking out of the box is not an easy process. Trying new ways beyond one’s own competencies, products, service ranges and markets requires long-term commitment and the willingness to take risks, because success cannot be taken for granted. On the contrary, new cross industry and sectoral innovations are more likely created by chance and only rarely result from systematic processes. In the future, innovating should not be seen as a target but rather as an instrument to be used to better prepare for the industrial transformation processes.

During the last years, more and more cluster managements have recognized this potential which can be better developed in cross-industry cooperation. Therefore, they reach over the borders of industrial sectors by integrating different industries into an already existing or newly established value chain and engage in cross-clustering. In addition to the existing and new cross-clustering activities, strategic differentiation and support, as another field of activity for cluster initiatives, could be an option for the formerly neglected phases of the innovation process, for example, by offering workshops and other new forms of support activities.

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<sup>1</sup> See Matthes: Plädoyer für ein neues Innovationsverständnis, 2010, [Online] [www.wiwo.de/technologie/fortschritt-plaedoyer-fuer-ein-neues-innovationsverstaendnis/5687186.html](http://www.wiwo.de/technologie/fortschritt-plaedoyer-fuer-ein-neues-innovationsverstaendnis/5687186.html), [Access on 02-May-2016].

## 2 Cluster initiatives as think tanks for strategic differentiation in enterprises

Cluster initiatives provide the perfect basis for companies who are open for “thinking out of the box” or strategic differentiation. On the one hand, they bring together the different stakeholders along the value chain, which means, they usually tend to collaborate with other companies with similar interests. On the other hand, all of these companies contribute their differing capabilities and experiences. This is important in the context of strategic differentiation because together they reach the critical mass and need not act alone and independently, and this is exactly the point where cluster managers have the chance to expand their roles in the innovation processes. From the perspective of a cluster management, this requires a sound knowledge of the industry and an excellent trust basis with their members so that they can be sparring partners or moderators in a process of strategic differentiation. The example of Silicon Saxony shows how cluster stakeholders, coordinated by the cluster management, can differentiate in new application markets.<sup>2</sup>

Nonetheless, we can see in practice that the majority of cluster initiatives that have taken up this topic have found it rather difficult. And this is not due to a lack of awareness on the part of the government that has promoted cooperation between companies from different clusters under the motto of “cross-clustering”. Many cluster managements have undertaken corresponding activities but have repeatedly faced a great deal of reluctance on the part of the companies. This raises the question about the reasons of such reluctance and what could or should have been done differently by the cluster managements.

To be able to really use cluster initiatives as think tanks for measures of strategic differentiation in companies, the cluster managements and their members must have a better understanding of how companies can distinguish themselves from their competitors today and thus achieve a competitive edge.

### **Silicon Saxony as an example for the successful strategic differentiation of a network**

#### *From the semiconductor industry to a driver of innovations in the area of energy efficiency in electronics*

The Silicon Saxony network has become a leading microelectronics location in Europe. The microelectronics / ICT industry employs about 48,000 employees in and around Dresden, with annual sales of almost €10 million euros (see [www.silicon-saxony.de](http://www.silicon-saxony.de)). Despite this seemingly comfortable position, the network management of Silicon Saxony has always been concerned with using suitable tools to monitor and analyse the technological and market-relevant trends worldwide. In this regard, they have used several of the network tools described above. One important finding of the application of these network tools was that the success of the semiconductor technology could not be expected to be a permanent one. For example, the use of ICT systems

meanwhile causes two percent of the global CO2 emissions – a quarter of the emissions of the entire passenger car traffic. The cost of energy for the operation of the information and communication technology infrastructure has become a significant economical factor.

Therefore, the goal of the Silicon Saxony cluster initiative was to provide for a strategic differentiation in the area of energy efficient semiconductor components through close cooperation projects with partners not only from within their network but also with external organizations. The cluster management of Silicon Saxony thus initiated a process which resulted in the successful strategic differentiation of the entire network (“energy efficiency in information and communication technology”). In the course of this process, they did not give up their original market position or fields of business, but added new ones instead.

<sup>2</sup> See Meier zu Köcker and Bovenschulte: Instrumente zur intelligenten Diversifizierung von Unternehmensnetzwerken, Netzwerkzeuge, Springer Fachmedien, Wiesbaden, 2013.

What are the drivers of strategic differentiation and where are its limits? We will elaborate on this in more detail in the following chapters.

## 2.1 Drivers of strategic differentiation

Unique selling propositions are becoming increasingly important for the competitiveness of companies. Only if the products and services of a company offer a true added value that exceeds that of their competitors will customers be prepared to pay a higher price and – maybe even more important – establish a steady business relationship.<sup>3</sup> The same, by the way, applies to consumers and industry customers.

There is, however, the question of how enterprises will be able to successfully distinguish themselves from their competitors in the future. The often heard answer to this question is “through innovation”. Because innovations – mostly technological in kind – result in products and services that stand out against those of competitors. Their differentiation on the market is considered a matter of fact, meaning, it virtually results from their technological superiority.

Basically, this approach is not wrong but it must be examined more closely. Because practice shows that, today, a differentiation on the market as a result of the mere technological superiority of a product cannot be taken for granted any longer.

Yet, why is the strategic differentiation so complex today and why is it no longer sufficient to simply provide for a technological edge on the market? There are mainly two reasons for this: increasing global competition and changing customer requirements, which cannot be met as easily as, let’s say, 50 years ago.

In the 1960s and 1970s, the population’s basic essentials were the main concern of the economy (figure 1). The first priority was to supply the population with cars, refrigerators, and TV sets. The focus of all innovation activities was mainly on measures for cost-cutting to make products available to the broad public. This included, for example, the advancement of mass production.

Period	1960s to 1970s	1980s to 1990s	Millennial
Goal	Make products and services cheaper	Improve products and services	Offer better products and services
Competitive edge	Costs	Quality and reliability	Creativity and authenticity
Activities	Division of labour, automation	Automation, flexible specialization, just-in-time production	Design, innovation, differentiation

Fig. 1: Characteristics and primary goals of innovations<sup>4</sup>

<sup>3</sup> See Zook und Allen: Repeatability: Build Enduring Businesses for a World of Constant Change, Harvard Business Review, Boston, Massachusetts, 2012.

<sup>4</sup> See Rosenfeld: The Nexus of Innovation and Clusters, Peripheral and Less Favoured Regions Guide to smart cluster strategies, European Commission Directorate-General Regional Policy, Brussels, 2012.

Over time, however, the customers' requirements also grew. The goal was no longer to supply the people with sufficient goods, but with high-quality goods. So, in the 1980s and 1990s, the main focus was on quality improvement of the products. At the same time, of course, the cost of production had to be kept low because foreign competitors from low-wage countries became increasingly competitive and they were also able to supply the populations of the industrial nations with simple low-cost products.

Innovation activities therefore focused mainly on the improvement of quality. With better products, companies could stand out from their competitors abroad and at the same time meet the higher requirements of their customers. In addition to that, there were important process innovations, for example, just in time production, which reduced the production costs even further.

During this period, the innovation activities mainly happened within a sector or industry. They were concerned with the continuous improvement of their own products.

With the turn of the millennium, a third phase of this development could be identified. The customer requirements have continued to grow. Today's customers expect to be enthused by their products. Products are expected to trigger emotions. At the same time, competition from abroad grows increasingly stronger. Countries such as India or China are more and more successful in producing high-quality and competitive products. In many areas of production, these countries have even become global leaders.

For industrialized countries, this means that quality and a low price will not be sufficient any longer to distinguish them from their competitors. It is becoming increasingly important to emotionalize products and services for the customers, that means to create a wow factor. This is also described as the unique user experience.

Aspects such as marketing and sales play an increasingly important role in this regard. The customer should identify himself with the brand and its products – that is become a true fan. But that's not all. A large number of engineers work for Porsche, Mercedes, Audi, and BMW, designing scents and noises for cars. Every switch must feature a

certain resistance so that it feels like it is of particularly high quality, and picking up the new car is arranged as an impressive show.

But it is not only the consumer markets where emotional factors count. Even in mechanical engineering, designers now pay attention to appearance and usability. According to a designer, for example, white or blue machines can be sold much more easily than machines with a green coating. Until the beginning of the 90s, almost all machines were green, which is why green machines are automatically perceived as being old.<sup>5</sup> However, this is only an example that shows how important it is today not to rely on technological inventions alone. Today, successful innovations comprise a great variety of different inventions from completely different areas such as marketing, sales, design, usability, and also technology.

Insofar, companies must take into consideration the most diverse aspects when realizing successful innovations. This also becomes obvious when looking at the companies in Baden-Württemberg. Answering the question of which were the fundamental drivers for strategic differentiation, companies named the following root causes:<sup>6</sup>

- *Market as a driver:*  
Often, the core business in a company's primary market does not grow to the extent expected and necessary to provide for long-term development perspectives. Growing international competition (new players in the field of technology) and the fear that alternative technologies could result in an established market vanishing unexpectedly make strategic differentiation necessary, based on a company's own core competencies.
- *Customer as a driver:*  
Customers often make new complex demands or initiate changes in the supplier structure (for example, aviation) that can only be mastered through strategic differentiation.
- *Statutory requirements as drivers:*  
Electric mobility and the need to make production more energy efficient than before are good examples of how statutory requirements can act as drivers.

5 See Nowak: Auch Maschinen wecken Emotionen, Wirtschaft in Baden-Württemberg Nr. 2, Stuttgarter Zeitung Verlagsgesellschaft mbH, Stuttgart, 2016.

6 ClusterAgentur Baden-Württemberg und Leichtbau BW GmbH, workshop with selected companies, Stuttgart, on 19-Feb-2016.

- *New technologies as drivers:*

New or converged technologies allow completely new solutions (man-machine interaction, flexible adaptive systems, miniaturization, etc.).

These can be excellently applied in connection with a company's own core competencies, to target new markets and thus to differentiate from competitors.

However, they also mentioned several other conditions that make a strategic differentiation easier for companies in Baden-Württemberg. At this point, we would like to mention the location factor in particular, because a good infrastructure, the availability of excellent specialists, the proximity to competitors, the high location costs, and the high density of cooperation partners are beneficial for strategic differentiation.

This provides an enormous potential for cluster initiatives. They must promote measures and activities that stimulate a thinking out of the box and make companies open for new ideas.

## 2.2 Limits of strategic differentiation

Yet, cluster managements and cluster political stakeholders must take care that they don't overstrain the companies with their demands for thinking out of the box and the resulting options for strategic differentiation because it is easy to identify new ideas and trends and experiment with them. The challenge, however, is to also utilize and market them. Only after companies have found functional business models and the right markets, can they successfully stand out from their competitors and differentiate strategically.

The "Kodak" example shows how difficult this can be. Kodak had once been the pioneer in the area of digital photography. In 1975, it was the first company to develop a digital camera and was the first to launch it on the global market in 1991. Today, digital photography has become an absolute standard but the "Kodak" company has practically vanished from the market. The entire film and photo production and the film processing division were sold. The remaining parts of the company were merged with "Kodak Alaris".

There are of course several reasons for the demise of Kodak. But one thing is for sure. As a pioneer of digital photography, the company was unable to realize a sustainable utilization and marketing of the new technology. Among other things, a reason for this is that Kodak had not focused on its core competencies, that is films and the processing of films, but tried to focus on digital cameras and printers instead. In these areas however, competitors, with competencies that were clearly higher than those of Kodak, had already been in these markets. If Kodak had taken a closer look at how the digitalization affected their core business, the company could still be in the market today.

An example from Germany shows that a different outcome is possible. The company CEWE Stiftung & Co. KGaA had originally also been focused on analogue photography laboratories. They were able to cope with the change and manage a similarly challenging reorganization process. Up to this day, the company is still active in the classic Kodak sector, with the exception that the customers today do not order the processing of films but rather prints of their photographs from digital cameras. All this still happens in the drugstore or at the photo centre.

Now, Kodak was a large-scale enterprise and these are often said to be specifically slow in terms of innovations. But also small and medium-sized enterprises have their problems with respect to the utilization and marketing of technologies in the market. This is because SMEs are mostly highly specialized in specific products and services. Some enterprises may even offer only one product or service. New products, services, but also business models, are therefore always extremely risky.

It is thus easier for them to continuously improve existing products or services to accomplish a differentiation in the market. In the future, however, these improvement innovations will not suffice any longer to stand out from competitors. New products and services must be developed that require a diversity of competencies to launch them on the market. There are two reasons that make it particularly difficult for SMEs. On the one hand, they cannot afford to just test new products or services in the market because, if they fail, this could also mean that the entire company will vanish from the market.

On the other hand, they cannot easily establish new departments that can take over the required competencies such as design, marketing, or the like. For this, they are dependent on other external partners, which means extra expenses. As a result, the utilization and marketing of new ideas is highly risky for SMEs and must be well prepared. In most cases, they will not have a second chance.

Last but not least, we have the start-up companies. It is slightly easier for them to integrate new trends and developments into their business models. Mostly, they do not have fixed structures and can therefore react extremely flexibly in the market. Start-up companies are, therefore, open for all options of differentiation from their competitors. Often however, they don't have the necessary funding and the trust of the markets. Without the necessary trust, it is difficult for them to find investors to support their ideas.

It appears that the utilization and marketing of new ideas is particularly challenging for these companies. Their own competencies and resources therefore determine the limits of their options for further strategic differentiation.

Yet, here lies the enormous potential for cluster initiatives because these challenges can be faced and mastered through common action within an initiative. For this, it is necessary to develop suitable services for companies and to carry out effective measures.

### 3 New perspectives regarding innovation processes

To carry out more targeted measures for the promotion of a strategic differentiation of companies in cluster initiatives, it would therefore be reasonable to adopt a new perspective on innovation processes that has its focus on the two aspects mentioned in chapter 2.1. On the one hand, this means that innovations will no longer be perceived as purely technological inventions, but rather as a combination of very differing ideas and developments from a diverse range of fields, industries, and sectors. On the other hand, the utilization and marketing of new ideas are increasingly placed in the focus.

Because the instruments used for promoting technologies and innovations – including the many measures taken by cluster initiatives – are still based on a rather traditional perception of the innovation process, innovation is depicted as a linear process. It starts with fundamental research, continues with applied research and ends with the marketing and thus successful introduction of a new product or service on the market. Figure 2 shows an example of such an idealized process.

The starting point of the process is an invention – mostly technological in kind – that has its origins in fundamental research. This invention is then developed further in the direction of specific applications in applied research. At this point, it is taken up by the companies who will then perfect them until they are ready for the market.

The successful placement on the market at the end of the innovation process is almost seen as a matter of course. By its technological superiority, the product differentiates and stands out from other offerings on the market and will, therefore, be commercially successful in the end.

The core element of the innovation process is therefore the technological invention. It ultimately leads to a competitive advantage in the market. This perception of the innovation process results in a simplified idea of input and output with regard to innovations. According to this, as many technological inventions as possible will automatically lead to the creation of many new successful products and services that will secure the competitive advantage of companies on a global scale.

This perception is reflected by the measures supporting innovations, whether taken by the companies themselves or by politics. Many resources are used to advance technological innovations in particular. This is evident in the many innovation indicators that are still valid even today. Often, a high proportion of R&D investments, or a high number of patent applications per inhabitant, are seen as indicators for a particularly innovative economy.

However, this perception of innovation processes falls short. The Oslo Manual, in which the OECD describes the term innovation with all its subcategories, recognizes the importance of these different aspects. It differentiates between service, marketing, design, or process innovations to name just a few (Oslo Manual, 2005).

However, this perception is again based on silos. It creates the impression that a decision must be made for either one or the other. This leads to the idea that companies must specialize and choose a specific form of innovation. Yet, this concept would also be too simple because it is the combination of a very diverse range of ideas from the most different areas that ultimately makes for successful innovations.

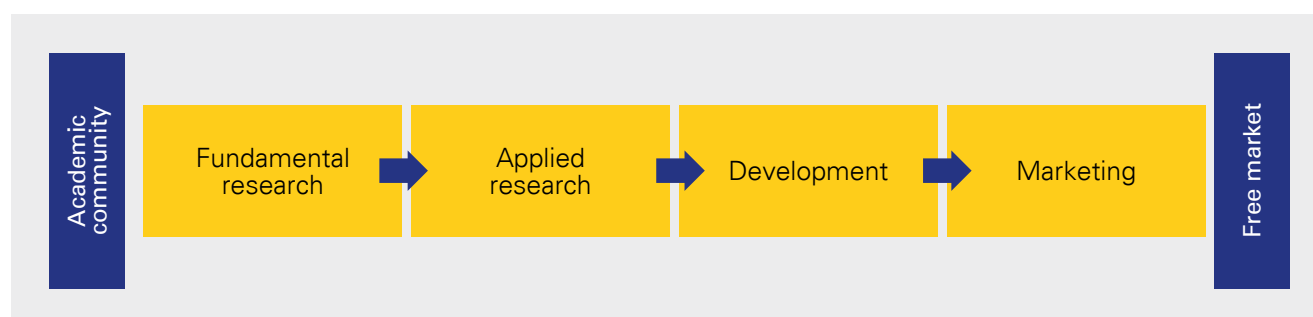


Fig. 2: Ideal innovation process

This is the only way that companies will be able to stand out in the market and emphasize their unique selling propositions in the future. This is why it is necessary to take a look at the innovation process from a completely new angle.

The question is, what should this new perspective look like? It is perfectly clear, however, that it won't be possible to represent the full complexity of innovation processes in a model. It is still important to develop an idea of how innovation processes work, and which difficulties or problems can occur as they develop.

At first, it is necessary to determine the assumptions upon which the perception of innovation processes is based.

- *Focus on the company's perspective*  
It is the responsibility of cluster initiatives to promote innovations in companies. For this, the innovation process must be regarded from the perspective of a company. This is not always about technological progress and development, but rather about competitive advantage.
- *Utilization and marketing as important elements of the innovation process*  
Given the fact that companies should be in the focus of innovation processes, it is important to make the utilization and marketing of new products and services a priority. They have become increasingly important elements of the innovation process, ultimately adding the decisive added value for the companies.
- *Define the new role of research and development*  
Putting the focus on utilization and marketing also means a new role for research and development (R&D).  
In the process, however, two important aspects are neglected:
  - Companies very often adapt the technologies developed by the research institutions; that means that they are the consumers of the new technologies only. That is, they are not actively involved in their development. They only use the technologies to tackle their challenges and solve their problems.
  - Many innovations do not require any additional R&D expense at all. They are created by applying existing technologies in new contexts.  
This new role of R&D must be included in the

representations of innovation processes to a greater extent.

- *Result-driven method*  
The structuring of innovation processes should be driven by the results and should not describe the measures and activities taken to achieve such results. The involved participants themselves will individually decide how these results will be implemented in the end. It would not make any sense to outline requirements in this regard.

### 3.1 Important elements of the innovation process

From the given facts mentioned in chapter 3, certain elements of the innovation process can be defined. Accordingly, there are different phases that may be designed very differently.

In the following, these phases will be explained in more detail.

- *Creative phase:*  
This phase focuses on the generation of ideas or the analysis of a problem. The difference between the two is, whether a company intends to actively work out a solution (generation of ideas) or, if it must react to changes in the market (problem analysis). Both approaches will ultimately result in the definition of the problem and the planning of a project or activity to solve the problem.
- *R&D realization phase:*  
The goal of the R&D realization phase is a marketable product or service which can either be the outcome of a radically new development or a simple optimization measure of the same. For this, it is not necessarily required to develop new technologies. It is also possible to adapt developments made by state-owned research institutions. In this phase, it is no longer decisive whether these developments have been made in fundamental or applied research. The only thing that counts here is that, at the end of the process, there is a marketable product or service.
- *Utilization phase:*  
The focus of the utilization phase is on the development of new business models. Its goal is to generate sales and profits with new products or services. Especially for companies, a solid stable business model

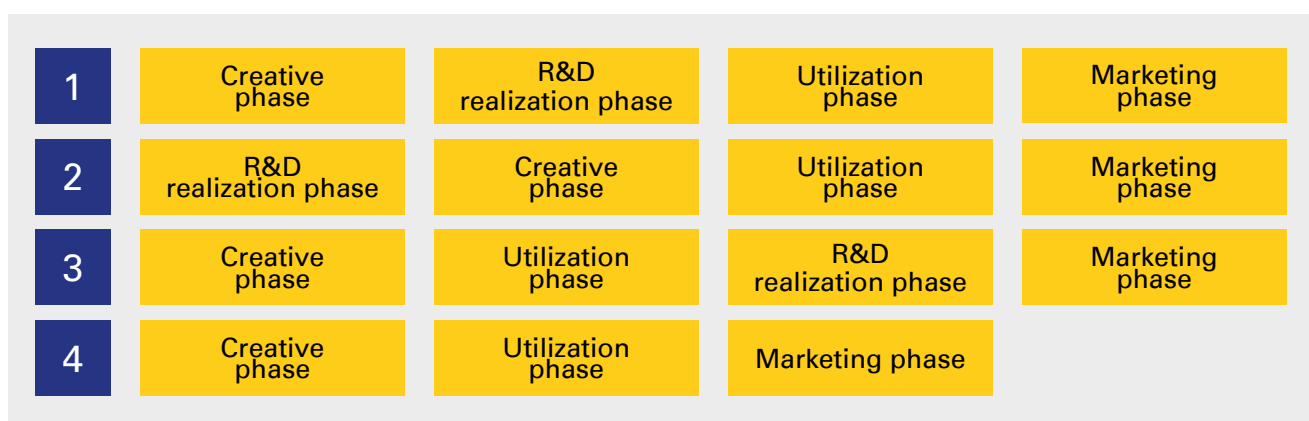


Fig. 3: Different options for workflows of innovation processes

is of particular importance for new developments. A crucial factor is that existing business models can also be used for utilization in this regard. Moreover, there may well be several different business models for a product, or these could be applied and utilized in different contexts. Needs of, and benefits for, the target groups and sales markets must be taken into consideration as early as in the utilization phase. The utilization phase is a decisive one for the companies because it significantly contributes to a company's strategic differentiation.

- **Marketing:**

In the marketing phase, the goal is to successfully place the product or service on the market for the target group. The timing and the readiness for the market play another important role here – the readiness for the market in two ways actually: how ready is the product for the market and how ready is the market for the product or service. In this phase, the corresponding marketing and sales strategies must be developed based on the markets and target groups.

Of course, the elements of the innovation process are portrayed simplistically only. And yet, the result-driven approach becomes very clear. It is still up to the market participants to design their own individual phases in detail. The results that are worked out are decisive. This becomes obvious, for example, in the R&D realization phase. Basically, it is irrelevant whether research has been conducted for many years or existing technologies have only been adapted. The important thing is that, at the end of this phase, there is a marketable product or service.

### 3.2 Different types of innovation processes

The individual phases that are explained in more detail below can run in different settings. Figure 3 shows the different workflow options of the innovation process.

- **Scenario 1: traditional innovation process**

Scenario 1 describes the ideal traditional innovation process. During the creative phase, the problems are defined that can be solved with the support of research and development. On this basis, a new business model is developed for the new products and services, or an existing one is used. At the end of the process, the products or services are marketed after a successful launch.

- **Scenario 2: research-driven innovation process**

At the beginning of the research-driven innovation process, there is an invention as a result of research. Therefore, the R&D realization phase is at the beginning of the process. Companies take up these new developments and work out ideas in the creative phase as to how these could be introduced to the market. In the utilization phase then, business models are designed that allow the marketing of these new developments.

- **Scenario 3: business model-based innovation process including R&D**

The difference between the business model-based innovation process and the traditional innovation process is that the utilization phase comes before the actual R&D realization phase. This means that the suitable technologies to implement the solutions are identified based on a possible business model.

With this approach, the company becomes the consumer of the suitable technologies developed by the research and development institutions. A company is not pushed to the suitable business model as it is the case with the traditional or research-driven innovation process.

- **Scenario 4: business model-based innovation process without R&D**

An idea can also be directly realized in a new business model without any additional R&D expenses. The main priority here is the exploration of new fields of business and markets. For example, a new sales model can lead to the successful launch of existing products and services on a market. Or products and services can be used in a new context without any major changes.

### 3.3 The role of business models in innovation processes

When speaking about innovations and progress, people usually think of technological innovations. It is easily overlooked that over the past years more and more successful companies have been founded, that managed to successfully establish their businesses on the market by so-called non-technological innovations. Non-technological innovations include new types of product, service, process, organization, and marketing concepts. In addition, non-technological innovations also include a new business model.

The term business model means the description of how a company generates value and income on the market by designing the value adding process.<sup>7</sup> The business model generally represents the core business of the company and its revenue model. This includes products, services, operating model, revenue model, target customers, supply chain and suppliers, and strategic partners.

In chapter 3, it was explained that the business model plays a key role especially in the utilization phase and that it is the ultimate success factor for a specific innovation. It therefore makes sense to work out the topic of “business models as innovation drivers” in more detail. The study conducted by IBM in 2006 was the first practical study to have a closer look at the topic of “business mod-

els as innovation drivers” (business model innovations).<sup>8</sup> At that point in time, in the opinion of the interviewed managers, business model innovations were already the third important innovation type used by companies worldwide following product and service innovations (first place) and innovations involving entrepreneurial core processes (second place). Just under 30 percent of all innovation activities involved the development of new or the improvement of existing business models. These activities are and have been mainly driven by the extremely positive financial effects that can be achieved by business model innovations. Their importance has increased significantly since then.

#### 3.3.1 Business model innovations

Usually, business model innovations are understood to be significant changes in a company’s business model, through which the customer requirements can be fulfilled better than with the original business model. These changes can be realized by adaptations or combinations of existing elements. Business model innovations can either be completely new developments or advanced business models.

Sophisticated business model innovations combine product or service innovations with newly developed or advanced capabilities, structures, and processes. However, the importance and effectiveness of business model innovations is still underestimated. Although it clearly shows that if an optimal business model is used, even an average product or service innovation may generate big profits (for example, App Store). It is also true that even an outstanding product or service innovation cannot compensate an inappropriate business model.

<sup>7</sup> See Ripsas and Tröger: Deutscher Startup Monitor 2014, KPMG Germany, Berlin, 2014.

<sup>8</sup> See IBN Global Services (editor): Expanding the Innovation Horizon, The Global CEO Study, New York, 2006, [Online] [www-935.ibm.com/services/us/gbs/bus/pdf/ceostudy.pdf](http://www-935.ibm.com/services/us/gbs/bus/pdf/ceostudy.pdf), [Access on 25-Apr-2106].

The necessity to innovatively design and continuously develop business models represents a specific challenge for companies in Baden-Württemberg, especially after having operated successfully on the market for so many years. The willingness to change or advance existing business models is therefore extremely low. And this is the critical point. An innovative business model is indispensable for a sustainable success on the market. In times of constant change, companies must actively counter dynamic market situations, industrial transformation processes, and the continuously growing environmental influences. If these influences are neglected by clinging to formerly successful business models, companies can easily experience economic difficulties. Especially recent years have shown that there is no such thing as an everlasting competitive advantage. Outdated business models lose their formerly strong market position or are completely driven out of the market.

More and more often, established companies are confronted by competitors from other industry sectors. The following examples in particular, Motel One, in the hotel business, and Car2go, in car sharing, show how established participants can be driven out of the market.

- *iTunes*

With the introduction of CD ROMs and digitalization, a new quality of storing and playing music was achieved. The progress made in the production of storage media and with new data compression methods formed the technological basis for MP3 players. With these, tunes (and later also videos) were no longer bound to physical media and could be copied without any loss in quality. This led to the establishment of exchange platforms that circumvented the copyright laws. Based on this situation, Apple developed a business model that made the data rather than the storage media the key of its business model. To make this business model viable for the end customer, including the necessary payment processes, they developed the iTunes software as well as the iPod product range as the necessary hardware. Their concept of operation is based on the existing Apple philosophy. iTunes allows the playing of music, including data management and integration with the end devices.

- *Motel One*

At first glance, when it was founded in 2000, Motel One appeared to be a low cost hotel chain like many others. Motel One's innovative business model is

based on a successful combination of attractive prices, high quality, and central locations. The Motel One hotels are located in big cities at the best locations, room prices start at €49 per night, furnished in accordance with certain individual mottos, with a classy design to create a lounge-type atmosphere. Their best sales argument – the price – can only be kept so low by reducing additional features and services. There are no closets, safes, minibars, no room service and no telephones in their 16 m<sup>2</sup> rooms. Breakfast is also not included. However, they offer name-brand flat screen TV sets, designer lamps, granite flooring, and high quality bed linen. This concept is much appreciated by business customers and tourists on city trips who do not demand much service and book for a few nights only.

- *Car2go*

Another example for successful companies are Car2go or moovel who offer car sharing services, that means, flexible mobility solutions. The impetus for this type of innovation are, among other things, the changing behaviour patterns in the society. While it was formerly true, without any limitations, that every person of legal age or at least every household should own their own car, a new alternative mobility practice has established itself over time: cars can be shared; one can use it without owning it. Today, car sharing is an established mobility concept that has become a fixed element of big-city life in particular. Technological developments such as smart phones, internet, or telematics facilitate car sharing, but must rather be seen as instruments.

Business model innovations are of high interest, especially for founders of enterprises, because the development expense is usually lower and the market can be entered quickly. It is therefore not surprising that start-ups in the ICT sector, in particular, are increasingly based on new business models rather than product or technology innovations. Examples for this are Uber, WhatsApp, and Spotify.

Original business model including core competency	Business model evolution
<b>HOCHTIEF Aktiengesellschaft:</b> Construction company with development and management competencies	<b>HOCHTIEF Airport GmbH:</b> Airport investor, manager, and consultant
<b>Deutsche Lufthansa AG:</b> Airline including airport competencies	<b>Lufthansa Consulting GmbH:</b> Air traffic consultancy
<b>BLG LOGISTICS GROUP AG &amp; Co. KG:</b> Port handling company including automobile competencies	<b>BLG AUTOMOBILE LOGISTICS GmbH &amp; Co. KG:</b> Automotive finisher and logistics services
<b>Porsche AG:</b> Automotive manufacturer including restructuring competencies	<b>Porsche Consulting GmbH:</b> Consultancy for operative business optimization
<b>BASF SE:</b> Chemical company including material competencies	<b>BASF Battery Materials division:</b> Lithium ion battery component manufacturer
<b>geobra Brandstätter GmbH &amp; Co. KG (Playmobil); Lego A/S, Ravensburger AG:</b> Toy manufacturer including entertainment competencies	<b>Playmobil FunPark; Legoland Freizeitparks; Ravensburger Spieleland:</b> Amusement park operators
<b>JCDecaux SA:</b> Outdoor advertising specialist including inner-city decoration competencies	<b>Cyclocity:</b> Bicycle rental system
<b>Fjällräven:</b> Clothing manufacturer with outdoor competencies	<b>Fjällräven:</b> Outdoor, expedition, event organizer
<b>Betty Bossi Verlag AG:</b> Cookbook publisher with culinary cooking and baking competencies	<b>Betty Bossi Kochschule:</b> Culinary school operator
<b>Telefónica Germany GmbH &amp; Co. OHG; Vodafone GmbH:</b> Telephone / internet provider	<b>MPass:</b> Mobile cash financial service provider
<b>Parfümerie Douglas GmbH; Marionnaud Lafayette:</b> Perfumery with beauty competencies	<b>Beauty Lounge der Parfümerie Douglas GmbH; M Institut:</b> Beauty lounge / day-spa operator
<b>BYD Company Limited:</b> Lithium ion battery manufacturer with production competencies	<b>BYD Company Limited:</b> Manufacturer of electric vehicles

Fig. 4: Selected business model evolutions<sup>9</sup>

<sup>9</sup> Zentes and Steinhauer and Lönnes: Geschäftsmodell-Evolution: Unternehmensentwicklung als Dynamisierung von Kernprozessen, Institut für Handel und internationales Marketing (editor), Saarbrücken, 2013, p. 3, [Online] [www.uni-saarland.de/fileadmin/user\\_upload/Professoren/fr13\\_ProfZentes/sonstiges/Zentes\\_Steinhauer\\_Lonnes\\_2013\\_-\\_Geschaeftsmodell-Evolution.pdf](http://www.uni-saarland.de/fileadmin/user_upload/Professoren/fr13_ProfZentes/sonstiges/Zentes_Steinhauer_Lonnes_2013_-_Geschaeftsmodell-Evolution.pdf), [Access on 28-Apr-2016].

The question is how well-established companies can deal with this challenge? Large companies use either the tool of spin-offs or a targeted improvement of their often multi-layered business models. In practice, there are many examples of how established companies have developed their business models through dynamization of their core competencies, based on different drivers. These examples show that business models are not static objects but must be continuously optimized and innovated by the companies to be able to maintain a sustainable position in the market (figure 4). In this respect also, product and technological innovations play only a minor role.

Mid-tech companies or standard production companies usually manufacture products with only a low level of technological and functional complexity and a high degree of standardization; these are often produced in large series and are based on a mature and well-established technological principle. We know that they are under pressure from two sides: Firstly, they must react to fiercer price and cost pressure due to globalization. Secondly, these SMEs usually employ standardized business models as suppliers and their human and financial resources are limited. Nevertheless, the company size also has its advantages. Based on their small size, their strengths are their great flexibility, which is reflected, for example, in a low degree of formalized organizational structures. Based on the fact that the manager is very often the owner of the company too, they tend to have a trust-based company culture. Cluster managements can be specifically effective here if they manage to build the required trust and offer relevant services.

With their very specific organizational and personnel structures, these SMEs can be very successful despite their problematic situation – the limited resources and simple standard products that are under price pressure. It is critical for their success that the companies manage to develop and realize comprehensive or “holistic” business models. Chapter 4 shows some examples for this.

### 3.3.2 Digitalization as a current driver of new business models

Especially the continuous digitalization process facilitates the development of new business models which can be used by start-ups and traditional companies alike. However, the internet also enables new economic or technological business models. The rapid changes in the digital world make it impossible to rely on former experiences, in this respect, and make it hard to estimate the chances of success.

Digitalization is a driver of innovations and a major force behind the business model disruptions in many industries: It started with Amazon, Google, and Apple. However, that was only the beginning. Recent examples show how young companies such as WhatsApp, Tesla, Uber, or Airbnb revolutionize entire industries with a single clever idea, how they break up the value chains and startle established market participants which are often large enterprises. Old industries and companies are seriously challenged by small newcomers, unless they prepare for them in due time and digitalize their own business models. The developments in the music and film distributing industry hold some good examples for this: Former top dogs such as Warner Music and the Sony Music Group are only shadows of their former selves and have even mutated to candidates for restructuring measures (for example, Sony). Blockbuster Video became insolvent and vanished from the market completely.

Minor incremental changes are sometimes sufficient to adapt business models to new requirements that have become necessary due to the digital change.<sup>10</sup> Many business models had already existed before the digitalization process took place, but they include elements that are compatible with the characteristics of digital products and services. Three such business models are listed below as examples:<sup>11</sup>

- **Freemium** – the basic product is available free of charge, upgrades can be purchased and are used to fund the full offering (examples: Adobe, Skype, Spotify).

10 See Buchholz and Wangler: Digitalisierung und neue Geschäftsmodelle, iit-Themenband 2016, Wittpahl (editor), Springer Vieweg, Wiesbaden, 2016.

11 See Gassmann and Frankenberger and Csik: Geschäftsmodelle entwickeln: 55 innovative Konzepte mit dem St. Galler Business Model Navigator, Hanser-Verlag, Munich, 2013, p 73 et. seq.

- **Make more of it** – know-how and the available resources are not used for their own products exclusively, but are offered as services to other companies as well (examples: Porsche, Festo Didactic, BASF).
- **Razor / razorblade model** – the basic product is extremely cheap or even free of charge, the required wearing parts, however, are expensive and generate high margins (examples: Gillette, Nestlé Nespresso, PC printers).

Extremely critical for the necessary digital business model innovations are essential software and web-based technologies for the further use of cloud computing and big data. Both trends trigger disruptive changes because they have the potential to create completely new markets and to make new demands on existing business models. The ability to analyze and utilize large volumes of data commercially must be seen as a key competency to benefit from these change processes that are described above. However, innovative business models, in the context of cloud computing and big data, are often primarily developed by young companies.<sup>12</sup>

At the same time, the digital change leads to restructurings of existing value chains. The borders between the internal and external areas of the businesses are becoming blurred. The spectrum in this regard ranges from product-based collaborative cross-company engineering to the self-organized production in the sense of the Industry 4.0 paradigm, and ends with predictive maintenance. This increasing digital penetration of the value chain has a horizontal (along the product's life cycle) and also a vertical (along the actual value chain) effect. This is demonstrated as an example of engineering as a key competence of technology-based innovation processes.

Another challenge is to recognize and address the changes in the requirements regarding competencies that result from the digital change. This applies to both areas of training, basic and advanced, but at completely different levels. Partly, this also requires changes in the corporate cultures of the rather traditional small and medium-sized companies. How difficult it is to implement a cultural change is shown by the large number of companies that were among the best in the past in terms of technology, but which have missed out on the new trends because, among other things, they were unable to establish new successful business models.

Despite these challenges, digital change provides a large number of opportunities for companies who manage to use and benefit from it. A key finding is that the successful realization of digital potential requires the development of new business models. At the same time, the digitalization increasingly leads to radical changes of existing business models and, as a result, business model innovations are becoming more and more important.

However, digital transformation not only incurs risks imposed by new aggressive market participants, it also creates many new opportunities for companies. To continue to generate sales, companies should think about how they can expand their existing product portfolios with the help of digital platforms and technologies to add value for their customers (product development). Companies also have the opportunities to develop completely new digital products and services and offer them on completely new markets (diversification). In this regard, digitalization is a driver of innovations and a major force behind the actual product and service innovations in many industries. The internet develops constantly and this will definitely not change in the future.

<sup>12</sup> See Künzel and Schulz and Gabriel: Engineering für Industrie 4.0 – das Zukunftsmodell, Berlin, 2016.

## 4 Successful strategic differentiation of enterprises

In the following, we will go into more detail with examples of companies who have successfully implemented their strategic differentiation, in most cases with the goal to ensure their competitiveness or to expand their businesses. It shows here that differentiation primarily takes place within the area of a company's core competencies, that is, that they are relevant for the innovation process.

### 4.1 Bernd Kußmaul: innovation through coordination and product upgrades

After working as an employee in sales and purchasing in the racing business, Bernd Kußmaul, a mechanic, mechanical engineer, and graduate in technical business administration, founded his own one-man business. As a sourcing specialist, he coordinated projects with regard to mechanical components in the areas of mechanical engineering and medical engineering. Only three years after founding his business, he took over the purchasing and project management for all of the newly designed engine parts for the Audi RS4. Today, 17 years later, the company Bernd Kußmaul GmbH has about 50 employees and describes its competencies as project and production management, and the communication of such processes.

Research and development in the traditional sense – involving research institutions and funding applications – take too long in Kußmaul's opinion and are not efficient enough. Therefore, he uses the innovation process described above in scenario 4 that starts with the creative phase, proceeds with the utilization phase and ends with the marketing phase (chapter 3.2). Bernd Kußmaul and his team use this process for all products related to the topics of lifestyle, mobility, health, and individuality, primarily for luxury products. These can be trims made of anodized high-gloss aluminium for the interior or exterior of luxury cars such as Bugatti or Jaguar, or their own products, for example, the TimeTube. The TimeTube is a handcrafted individual piece of furniture for collectors to store timepieces or cigars. All of the parts for this are, by far, not manufactured by the Kußmaul company; the company considers itself as the architect of the technical processes.

In most cases, the products are realized within the partner network that they have established over the years. And this is their unique selling proposition and the extraordinary business model of the company.

Within this close network which is built on common projects and the partners' intense cooperation, there is a high degree of trust and a well-established system of cooperation. The goals of this network are to create high-quality and flawless products, to which every partner contributes their specific capabilities to a common project which is profitable for all of them. Kußmaul sees itself as the leader of this network who acts as the contractor for the large enterprises and subcontracts individual jobs to its partners.

Furthermore, Bernd Kußmaul is actively involved in individual cluster initiatives to expand his base of contacts, to expand his knowledge network, and to gain new knowledge, mostly from areas beyond his own key areas. His goals in this regard are rather long-term and unspecific. In this context, his company is usually one of many. For innovations, however, an involvement in both types of networks is important. There is a certain degree of permeability.<sup>13</sup>

### 4.2 Festo: research using networks and cooperation projects

The company Festo with headquarters in Esslingen am Neckar is a specialist for pneumatic and electric automation technology. With €2.64 billion in sales and 18,700 employees, they are global players and, at the same time, an independent family-owned enterprise. Since it is a technology company that exclusively supplies business customers (B2B), one would assume that they have not only classic research and development but also standardized innovation processes. Indeed, the traditional innovation process described in model 1 is the one that is best suited for Festo's requirements where a defined problem is at the beginning of the process that needs to be solved with the help of research and development. Festo intends to be an innovation leader and conducts

<sup>13</sup> See Bernd Kußmaul GmbH, [online] [www.bernd-kussmaul-gmbh.de](http://www.bernd-kussmaul-gmbh.de), [Access on 19-May-2016].

research in the areas and topics that are of critical importance for the company. These areas are mechatronics, the latest simulation technologies, microsystem technology, and smart components for the connected industry – or industry 4.0 – and for interaction with humans. Each year, Festo invests more than €200 million – that is 8% of their annual sales – into research and development, thus following what sometimes is a more unconventional path and using a much more comprehensive and creative approach than most of the other mechanical engineering companies.

For example, Festo uses the annual Hannover fair, the largest trade show worldwide, to present a new bionic concept, mostly in the form of an animal. In April 2016, these were cybernetic ants. The ANT in BionicANTS stands for both their natural prototype and for Autonomous Networking Technologies, which copy the social behaviour of ants in their colonies. Ants make their own decisions and act autonomously but communicate with each other before they transport things together. These are properties that will also be required in future factory control systems. This cooperative behaviour of animals was translated into the world of technology for the first time by using complex algorithms. Festo named this research programme Bionic Learning Network.

The Scharnhausen technology factory is a production plant and also a research and development facility. At this model factory, the production plants feature a modular design through which they can react highly flexibly to different product variations, which can be tested and optimized there as well. The plant is also Festo's leading location for the production of valves, valve clusters, and electronics. Industry 4.0 is to become a reality at the technology factory. There, the employees cooperate with flexible robots which take over ergonomically awkward assembly tasks. Another key issue at Festo is energy efficiency. It is considered a competitive factor that is consequently integrated into development, production, and customer processes. Therefore, the model factory also has a holistic system of energy transparency in which all the energy currents and consumptions within the factory are documented. The maintenance staff can quickly identify and remove all faults and errors on machines with the help of a tablet computer and an app.

For six years now, the company has issued the Festo Trend Barometer. The Gallup Institute, which conducts the study on behalf of Festo, interviews other companies and prepares the results, which are published by Festo free of charge. In February 2016, for example, they interviewed 500 representatives from other industry sectors on the telephone for this study. Topics were, for example, the awareness for industry 4.0, their expectations with respect to its effects, and basic and advanced training.

With these and partly other very open-minded research approaches, Festo distinguishes itself considerably from its competitors and other companies of the same size. It literally instructs its employees in the area of R&D to try things out and experiment in addition to their work on the classic innovation processes and controlled scenarios or trend analyses. This includes the participation at events and trade fairs, and also the active involvement in clusters and networks. Cooperation with partners and networks is considered a part of their innovation strategy and is even mentioned on their website as an element of Festo's innovation culture. The company considers their dialogue with partners from industry, science and the government to be beneficial because it helps them pick up impulses from the global research environment more quickly. Together with network partners, they develop future perspectives and smart solutions.

Festo cooperates with a large number of regional, national, and European networks, for example, with the Forschungscampus ARENA 2036, the Innovationsallianz innBW, the Landesnetzwerk Mechatronik BW, the Fachverband Fluidtechnik within the VDMA, microTEC Südwest, the industrie 4.0 platform, the European technology platform ManuFuture and the EFFRA – European Factories of the Future Research Association.<sup>14</sup>

<sup>14</sup> See Nowak: Die Industrie ist gegenüber Google im Vorteil, Stuttgarter Zeitung 25.04.2016, [Online] [www.stuttgarter-zeitung.de/inhalt.festo-chef-im-interview-die-industrie-ist-gegenueber-google-im-vorteil.c8066ea9-96be-46ee-b873-3d433afa8f59.html](http://www.stuttgarter-zeitung.de/inhalt.festo-chef-im-interview-die-industrie-ist-gegenueber-google-im-vorteil.c8066ea9-96be-46ee-b873-3d433afa8f59.html), [Access on 19-May-2016].

See Hommel: Industrie 4.0 verbannt Menschen nicht aus Werkhallen, Handelsblatt 28.04.2016, [Online] [www.handelsblatt.com/technik/hannovermesse/das-internet-der-menschen-die-fuehrungskraft-wird-zum-dirigenten/13496690-2.html](http://www.handelsblatt.com/technik/hannovermesse/das-internet-der-menschen-die-fuehrungskraft-wird-zum-dirigenten/13496690-2.html), [Access on 19-May-2016].

See Festo AG: Netzwerke und Kooperationen, [Online] [www.festo.com/group/de/cms/10269.htm](http://www.festo.com/group/de/cms/10269.htm), [Access on 19-May-2016].

See Festo AG: Industrie 4.0 - Das Thema der Bildungselite?, [Online] [www.festo.com/cms/de-at\\_19301.htm](http://www.festo.com/cms/de-at_19301.htm), [Access on 19-May-2016].

### 4.3 Vorwerk: waiting for the market to become mature and learning from Apple

Thinking about the Vorwerk brand, a dark green vacuum cleaner that is rather old-fashioned, and a sales representative at your door who tries to sell such a “Kobold” vacuum cleaner may come to mind. The 133-year-old family enterprise from Wuppertal that started out as a carpet factory, meanwhile generates annual sales of more than €1 billion (€2.8 billion in 2014) with their Thermomix TM5. This food processor costs €1,199 and has a delivery time of 12 weeks. This raises the question why this product is so successful?

The product was launched by Vorwerk in the 1970s as a heatable mixer. The idea came from the manager of their French branch at the time, who asked himself how practical it would be to be able to cook soup in a mixer. For a while, the device remained unnoticed by-product until Vorwerk started with the creative phase again and redefined its design and use in 1998. The self-conception that the Thermomix stood for a new way of cooking and that it required recipes that came directly from the manufacturer was the key to success. Moreover, a device that intends to revolutionize the cooking process must have a futuristic design and have an eye on usability. In this process, Vorwerk was strongly influenced by Apple, admits Uwe Kemker, head of the design department in an interview with the ZEIT magazine, for example, when it comes to the colour selection (white instead of green), and the intuitive operation that allows the selection of recipes like the tunes on an iPod. You just select one of 200 recipes in the display, click through the ingredients one by one by using the integrated scales until the dish is ready to eat. Although it required the integration of technological features, it rather resembles a business model-based innovation process without R&D, because the basic technology of the device has barely changed since the 1970s.

The creative phase is therefore followed by the utilization and marketing phase. These two phases are very close to each other and even overlap in parts. The success of Thermomix is closely related to its readiness for the market. Even if the product had had a more attractive design and a different marketing concept at the point of time it was invented, Vorwerk would likely not have been able to sell significantly more products. At the beginning of the 21<sup>st</sup> century, however, the time was ripe to create

the market for this product. Other than in the 1970s, we no longer have the classic housewives, but more single households, single parents, and working parents, who have less time to cook daily. The digitalization and also the trends towards home-made things and organic and healthy food are beneficial for sales. Whether vegan lunches or home-made baby food, the Thermomix can be used to fulfil all these needs more easily and quickly than traditional kitchen utensils.

The existing business model of direct marketing that had been successful for so many decades was applied to the Thermomix and optimized. There are no TV commercials, no ads in papers, or billboards. The Thermomix cannot be purchased in stores or on the internet. It is only sold directly through representatives, using a sophisticated psychological sales method following a certain script. It follows the concept of the Tupper party where you meet in a trusting private environment and test and try everything. This concept of participation is intended to trigger the desire to own the device while attending the presentation. There are training courses and manuals for the representatives. They earn their margin from each product sold without bearing any financial risk. Representatives doing very well receive attractive rewards, with a Brilliance Club for the best of them. Vorwerk attempts to control this model as well as possible. The sales figures alone show the power of this business model and its successful marketing. In Germany, there are about 34,500 freelance Thermomix representatives. The company's website states the unbelievable number of 591,156 self-employed representatives world-wide who sell Vorwerk products.

In the meantime, the former products are following the Thermomix, which has been awarded with renowned design awards. In 2013, for example, the Kobold vacuum cleaner models were redesigned in a completely white design. Indeed, the Thermomix itself will be adapted to trends and markets in order to successfully defend their USP which was created by strategic differentiation. In this regard, there also appears to be a parallel to Apple. Similar to iTunes, a web-enabled Thermomix could be used to download new recipes from the internet. They are even thinking about ordering ingredients via the internet and a delivery service. This also explains Vorwerk's involvement in the HelloFresh delivery service that was founded in 2011.<sup>15</sup>

#### 4.4 ZIM aircraft seats: from service provider to product manufacturer

With the foundation of the ZIM Flugsitz GmbH in 2008, Angelika and Peter Zimmermann of Markdorf on Lake Constance decided to no longer remain the service provider they had been since 1995 with their engineering firm ZIM GmbH, but to become manufacturers of aircraft seats. Through their highly qualified engineers with their comprehensive experience in aircraft development and fibre composite structures, the engineering firm already had the competencies to design aircraft seats that were lighter than the current models on the market. This procedure comes closest to a development-driven innovation process (Scenario 2) during which the engineering firm developed their own product, but without the involvement of external research institutions or universities. Of special significance in this regard is the utilization phase that required a decision on how the product development could be marketed successfully. After all, the company had only 20 employees at that time and faced an extremely powerful international competition with regard to its first economy seat EC-01. That was also the time when demanding certification and testing procedures were necessary which are required in the aviation industry to market an approved product at all. As its business model, ZIM Flugsitz opted for an assembly plant with suppliers that should be located in the vicinity of their own plant to produce the individual seat components. With regard to the marketing of the products, the company benefitted from their many years of experience in the industry which allowed a realistic assessment of the market potential and also the establishment of a sales organisation that addressed the airlines directly.

The intention of their entrepreneurial decision to manufacture their own product, was to reduce the exchangeability and dependency that they had experienced as a service provider before. This must clearly be understood as a strategic differentiation. Decisive for the implementation of their business model was – in addition to the undoubted technological innovation of a new and lighter aircraft seat – the attractive design of their seat and their convincing appearance on the global B2B market. In this market, ZIM Flugsitz was the only SME to compete as a

manufacturer of aircraft seats “Made in Germany”. Since their foundation, ZIM Flugsitz GmbH has achieved an impressive growth (€48 million in sales and 145 employees at the end of 2015). In 2014, the company received the Crystal Cabin Award in the “passenger comfort components” category for another innovation, the premium economy seat EC-00. The Crystal Cabin Award is a prestigious award for innovations in the area of aircraft cabins. The jury consists of 24 scientists, engineers, representatives of aircraft manufacturers and airlines, and journalists from the industry. In the same year, the company was awarded the contract for the complete refurbishing of the new premium economy class of the Lufthansa fleet with these ZIM seats.

Managing Director Angelika Zimmermann is personally involved in the regional cluster initiative for the aerospace industry, BodenseeAIR, and the German association of the aerospace industry (Bundesverband der deutschen Luft- und Raumfahrtindustrie, BDLI). Beside these industry-specific networks, ZIM Flugsitz also participates in the activities of the cross-sectoral state agency Leichtbau BW.<sup>16</sup>

#### 4.5 REIS furniture systems: niche markets in the craftsman business

The trades are also very much familiar with the topic of differentiation. An excellent example for standing out from competitors as an expert is the craftsman business REIS Möbelsysteme. The company was founded in 1996 as a traditional cabinetmaker business. Today, the business has seven employees and specializes in the area of lightweight construction.

Ten years ago, REIS Möbelsysteme had to make a decision about whether they should invest in newer but more expensive and innovative technology – a CNC machine – or simply replace their old machines. They opted for an investment for the future. This and the underlying strategy development process have proven extremely successful. The creative phase was completed with the decision to invest in new technology.

15 See Rohwetter: Das iPhone aus Wuppertal, ZEIT ONLINE GmbH, year 2015, edition 42, 29-Oct-2015, [Online] [www.zeit.de/2015/42/thermomix-vorwerk-wuppertal-erfolg-kuechenmaschine](http://www.zeit.de/2015/42/thermomix-vorwerk-wuppertal-erfolg-kuechenmaschine), [Access on 19-May-2016].

See Vorwerk & Co. KG, [Online] [www.newsroom.vorwerk.de](http://www.newsroom.vorwerk.de), [Access on 17-May-2016].

See Fasel: Jede Frau hat einen Thermomix verdient, WeltN24 GmbH, 18-Apr-2015, [Online] [www.welt.de/regionales/nrw/article139704543/Jede-Frau-hat-einen-Thermomix-verdient.html](http://www.welt.de/regionales/nrw/article139704543/Jede-Frau-hat-einen-Thermomix-verdient.html), [Access on 19-May-2016].

16 See ZIM FLUGSITZ GmbH: Innovation im Bereich hochwertiger, mechanischer Flugsitze, [Online] [www.zim-flugsitz.de/das-unternehmen/historie](http://www.zim-flugsitz.de/das-unternehmen/historie), [Access on 20-May-2016].

Having now the possibility to produce individual customized pieces of furniture of different materials, the utilization phase began. Due to their innovative machinery, REIS Möbelsysteme was able to serve new business models and also new customer groups. The opportunity to process all kinds of material (solid wood, plastic, solid surfaces, paper, or even aluminium), not only offered new utilization options but also opened up the field of lightweight construction.

Today, lightweight construction is REIS Möbelsysteme's major area of expertise. The key points here are tool-free assembly, low weight, and modular systems. Pleasant and, at the same time, functional – noise and fire protection – designs made of lightweight material are the hallmark of the craftsman business. Their product portfolio ranges from simple lightweight building boards to ready-for-use furniture, or a complete trade fair booth made of lightweight components including their own fittings.

Besides their customers from the exhibition stand production industry, museums, or office furniture industry, REIS Möbelsysteme also acts as a supplier to other cabinetmakers and even manufactures bathroom systems. Smart, customized, and especially round components that require specific technologies and special machines enable the craftsman business to act as a supplier. Their extraordinary and round forms are REIS Möbelsysteme's unique selling proposition in their region.

In the course of the specialization process during the marketing phase, they also removed the "carpenter" part from their company name. Today, the company is called REIS Möbelsysteme, meaning REIS furniture systems.

For REIS Möbelsysteme, networking is also part of the strategy process. The craftsman business is active in two different types of networks. Firstly, REIS Möbelsysteme maintains a close network of partners resulting from their intense, and partly long-term, cooperation projects, and secondly, the company actively participates in cluster initiatives and networks (Leichtbau BW and Interessengemeinschaft Leichtbau (igeL) e. V.), to make new contacts, to expand their knowledge network, and to gain new knowledge.

Managing director Reis has tried many things. He is convinced that the strategy of specialization was the right decision and that they are not yet at the end of their path of innovations but that it will continue with specialization. For him, differentiation and the utilization of innovative technologies is a must to maintain a sustainable position in the market.

The goal of differentiation is – as a result of price pressure and competition – to stand out from the mass market, like IKEA does, for example, and thus to find a niche market and one's own market position.<sup>17</sup>

#### 4.6 Daimler: group start-ups for new markets

As mentioned earlier in chapter 3.3, car sharing as practised by Car2go may be considered strategic differentiation. While Daimler at least deploys some of their Smart brand vehicles in their company Car2go, the younger start-up moovel is even further away from their core competency, which is the production of high-quality cars. It demonstrates, however, how new products and services tackle existing markets or even create their own new markets which have not existed as such before. Moovel is a great example for how thinking out of the box and smart connections may create new business models. It connects different mobility service providers and plans the optimal route from A to B. The moovel mobility app brings together public transport, the car sharing services Car2go and Flinkster, mytaxi and taxi dispatcher services, rental bikes, and the German railway company Deutsche Bahn. On the one hand, Daimler pursues the path of digitalization as the current driver of innovations and new business models (chapter 3.3.2). The innovation process follows the 3<sup>rd</sup> scenario: a creative and utilization phase is followed by a R&D realization phase during which, however, the only development product is a software. On the other hand, Daimler moves one more step away from their core competencies and moves into a niche or secondary market. There is the risk that – similar to Kodak – they engage in a field of business that is too far away from the company's former products and that there are other market participants that have operated there longer and therefore have the more favourable capabilities.<sup>18</sup>

<sup>17</sup> See Schreinerei Möbelsysteme Reis, [Online] [www.reinhard-reis.de](http://www.reinhard-reis.de), [Access on 19-May-2016].

<sup>18</sup> See moovel Group GmbH, [Online] [www.moovel.com/de/DE](http://www.moovel.com/de/DE), [Access on 23-May-2016].

## 5 The role of cluster initiatives in the strategic differentiation process

As we demonstrated in chapter 2 with the example of Silicon Saxony, cluster initiatives may be good instruments for companies to achieve strategic differentiation. Other examples are cluster initiatives such as VDC Fellbach, CyberForum, or BioRegio STERN with similar success stories at the individual corporate level. An important condition for this is to have a professional cluster management that can support the stakeholders in cluster initiatives in many different ways.

Along and beyond the process of innovation, cluster managements can play different supporting roles or may be involved more or less intense. This strongly depends on the innovation process itself. In the following, we describe this role in relation to the four innovation processes (chapter 3.1, figure 5).

### • Scenario 1: traditional innovation process

This innovation process represents a huge challenge for the cluster managements because there are two phases in which their support is required, but there also is a phase in between that runs without their involvement. The creative phase is about identifying, together with the other members, specific ideas or problems and initiating the corresponding innovation process. On the part of the cluster managements, many excellent instruments exist to support their members.<sup>19</sup> During the R&D realization phase, the companies usually conduct their development activities without the support of the cluster managements. An option for the cluster initiative to get involved is, for example, to make contacts with partners in academic environments or to provide support in the acquisition of public funding. This, however, requires the right competencies to be able to actually support the members with their applications, like the CyberForum does, for example. Difficult is the stage when the cluster management becomes involved again at the beginning of the utilization phase, during which such questions as, for example, how to find the suitable business model for marketing, or, how to best possibly transfer a R&D prototype into a marketable product, must be answered. If the cluster management fails to closely

follow or accompany the R&D process, their reinvolvement in this phase is often unsuccessful. Successful examples for this are the cluster initiatives that have been funded in the context of the Leading-Edge Cluster competition such as microTEC Südwest, E-Mobil BW, or the Software-Cluster. Here, the cluster managements had expressly been made responsible for staying in close contact and assisting the members during the creative, R&D realization, and utilization phases.

### • Scenario 2: research-driven innovation process

This process represents the toughest challenge for the cluster management. A reason for this is that during the start phase (R&D realization phase), academic partners are involved more often than not, or that the research was conducted without any relation to a specific enterprise-related problem or market demand. Based on the R&D findings, possible products or services must then be designed during the creative phase. If there were no companies involved who are well positioned in the market, it is also necessary to identify any possible utilization partners.

Cluster managements will still be able to achieve good results if the quality of the research results is excellent and the market demand is high. At this point of the process, they can organize matching events, for example, under the motto of “science meets industry” or “R&D meets marketing / sales” where research and development-oriented companies or institutions can meet companies with suitable marketing or sales capabilities. To be successful as a cluster initiative in this respect, it is important for them to have a sound knowledge of the fields of business of their members so that they bring the right ones together. Consulting services for founders and supporting programmes for start-ups and accelerators could be reasonable services in the course of this process to motivate and support involved researchers to found a start-up with “their” research findings.

<sup>19</sup> See Künzel and Meier zu Köcker and Köhler: Cluster und Innovation - Cluster-Initiativen als Innovationstreiber, ClusterAgentur Baden-Württemberg (editor), Stuttgart, 2015, p. 19.

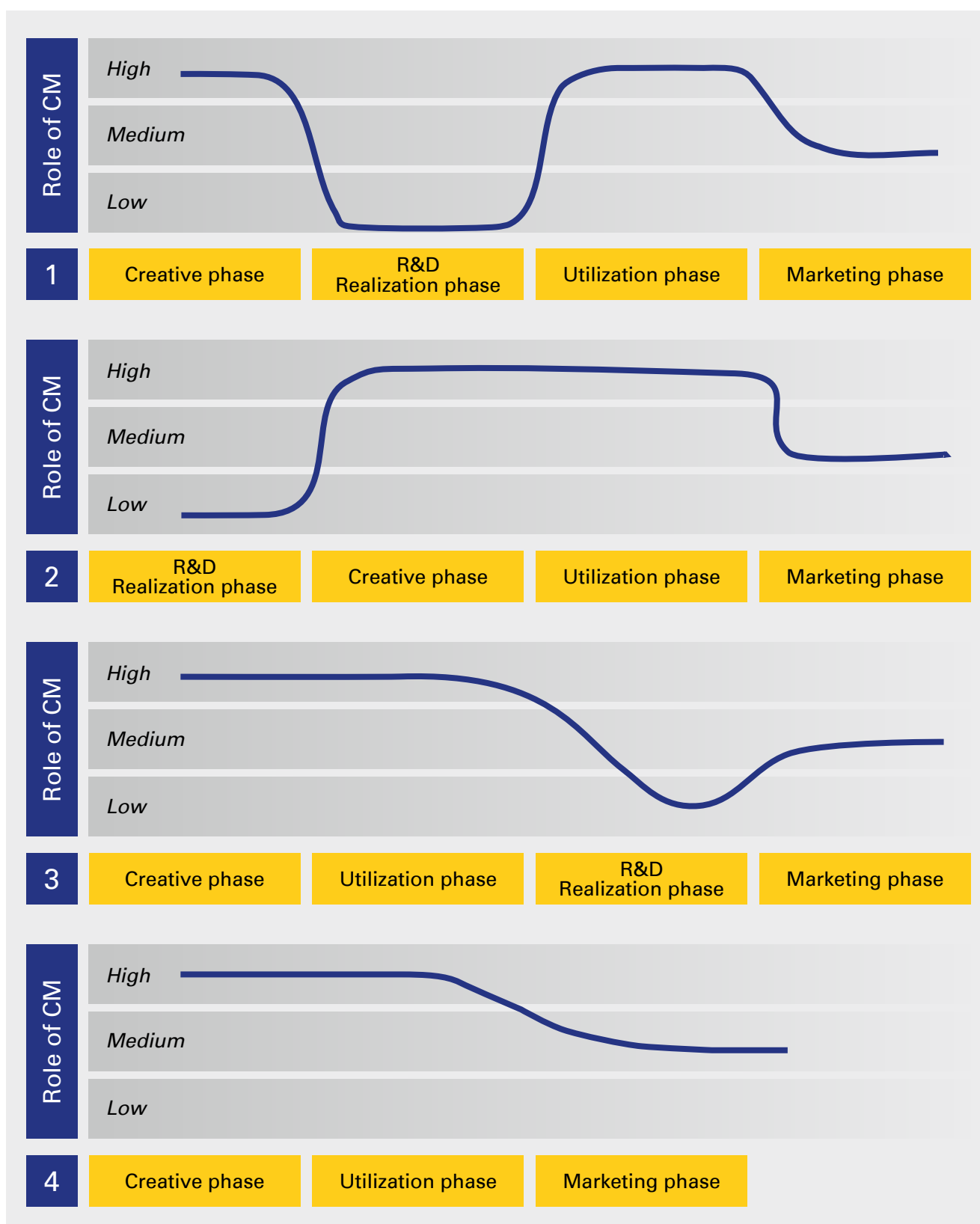


Fig. 5: The four innovation processes and the role of the cluster management

- **Scenario 3: business model-based innovation process including R&D**

The potential for cluster managements to successfully support the members of a cluster initiative is very high in this innovation process. During the creative phase, ideas / problems are identified jointly, and then the corresponding business / utilization models are determined. This can be done individually, at the level of an enterprise, but also within a group of companies. At the end of these two phases, it is clear which properties / specifications the innovation must have and based on which strategy / which business model it can be launched on the market. The following R&D realization phase, usually more development than research, may be very much based on the needs. Finding the corresponding partners – who have the required competencies – is usually very easy. Often, public funding is rarely necessary in this phase, firstly, because the R&D realization phase is rather short, but also because the development goal is a very precise one and the involved companies can invest their own funds, also to save time and administrative expenses. There are also cases in which the cluster management takes over the project management during the development phase for the involved companies by an active inclusion of the two preceding phases. If this is successful, the marketing phase will be comparably short and the involvement of the cluster management is hardly necessary in most cases. Many innovations that were created within the Kunststoff-Netzwerk Lüdenscheld (a plastics industry network) had followed this pattern.

- **Scenario 4: business model-based innovation process without R&D**

This innovation process is the ideal prototype for cluster managements, also in the context of cross-cluster cooperation. As shown in figure 5, the options for involvement are constantly high or medium. During the creative phase, ideas or problems are identified jointly. The following utilization phase is used to translate these into specific products or services and to identify or design the suitable business models. If it becomes clear at this point, that other competencies from different sectors are required, the cluster management can include other partners / cluster initiatives and their member companies through cross-clustering activities. Due to the preceding creative phase, the needs of all involved parties are well known so that it is comparably easy for the involved cluster managements to mobilize and bring together the right stakeholders (for example, by open space innovation

arenas or cross-cluster events, etc.). Once the corresponding partners are matched up, they can work out and market the suitable solutions that are in demand on the markets. In this phase of marketing, the cluster management does not need to provide much support.

Irrespective of which innovation processes are the dominating ones in a cluster initiative, all relevant supporting measures should be integrated into a comprehensive approach. A common innovation strategy within a cluster initiative can be extremely helpful in this regard to include all of the interested members and to demonstrate the fundamental goals that relate to common innovation activities, for example, strategic differentiation. As a successful example, we would like to mention microTEC Südwest at this point (see box).

An analysis of the basic situation in 2010 showed that microTEC Südwest featured a unique concentration of innovative companies, excellent research and educational institutions, and complementary institutions in the key technologies of microsystems engineering. It therefore had the potential to become the key institution of international microsystem-related knowledge generation and the globally leading research, development, and production location for smart products or solutions in strategic future markets. This process ultimately led to an identification of three fields of activities (see figure 6). This shows very clearly that two different innovation processes are relevant for the cluster initiative – on the one hand, a long-term research-driven innovation process, and on the other hand, a rather short-term business model-based innovation process.

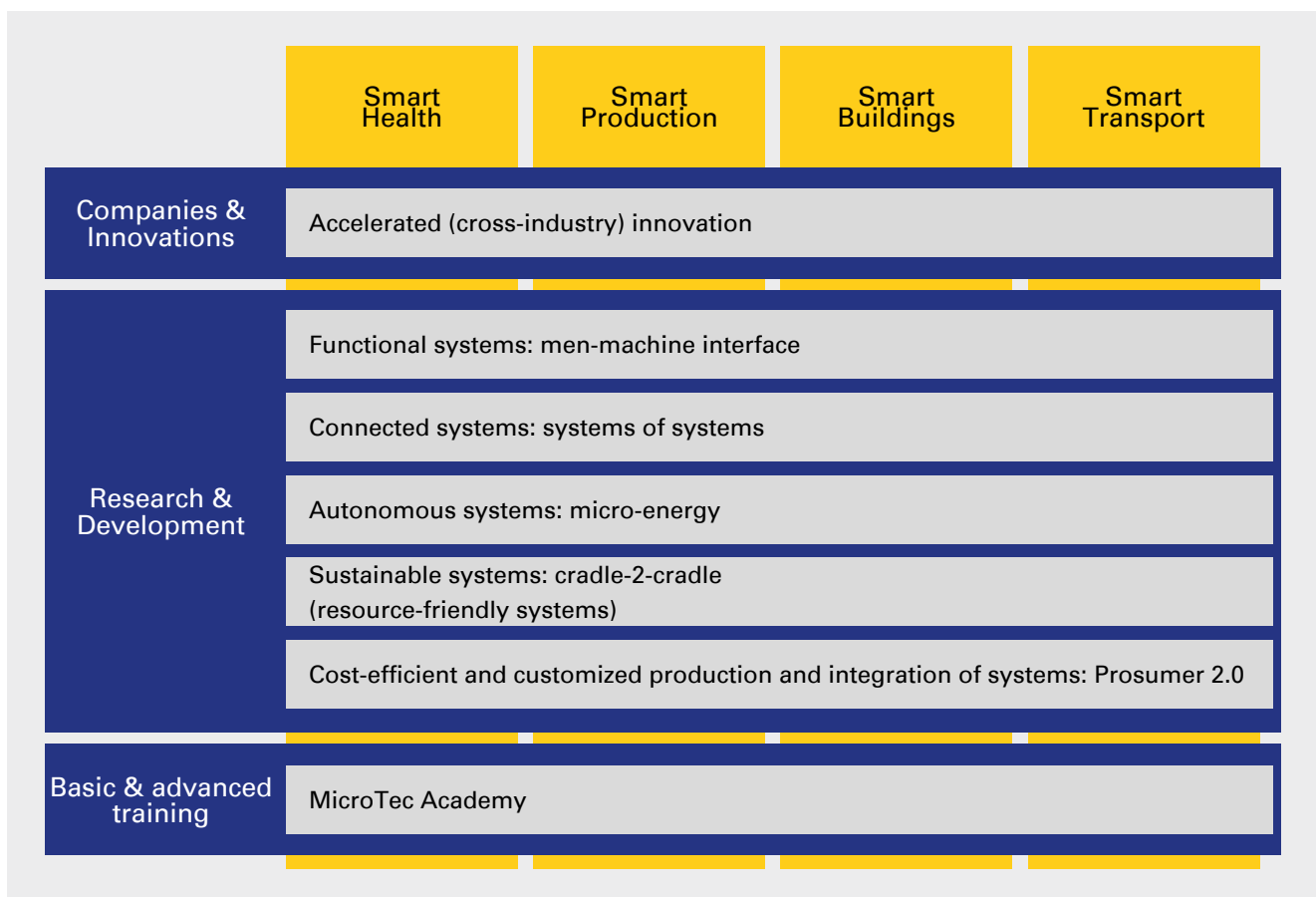


Fig. 6: Visualization of a comprehensive innovation process<sup>20</sup>

## 5.1 Identify the right stakeholders

So far, the presumption has been that cluster management should primarily provide need-based innovative service concepts for the cluster stakeholders which would then be used and implemented by their members to innovate and differentiate strategically.<sup>21</sup> However, practice shows that this expectation is not fully correct because many cluster managements and their cluster stakeholders have difficulties with the generation of true innovations. It seems that there are two major reasons for this:

- The services do not cover the entire innovation process.
- The services address the wrong stakeholders.

### The services do not cover the entire innovation process

Many measures that intend to help companies in the process of initiating innovations take place before the actual creative phase starts (figure 3). Their focus is more on the generation of technological and market-relevant knowledge (roadmapping, expert meetings, events, or creating contacts between enterprises and universities). Such activities are definitely important and necessary to generate sufficient knowledge of strategic differentiation but they do not provide continuous support when it comes to translating the gained knowledge into ideas and solutions during the creative phase.

<sup>20</sup> Clar and Sautter: Roadmap 2020+, in: MicroTEC Südwest – The Leading Cluster for Smart Solutions, MST BW Mikrosystemtechnik Baden-Württemberg e.V. (editor), Freiburg, 2014, p.11.

<sup>21</sup> See VDI/VDE Innovation + Technik GmbH: Ausgewählte Clustererfolge – Ergebnisse aus der Förderung innovativer Services, Bundesministerium für Wirtschaft und Energie (editor), Berlin, 2015.

Currently, cluster management services targeting the initiation of cross-sectoral innovations are popular as well (cross-clustering, open space innovation arenas, cross-cluster events, etc.). Yet, it is often hard for cluster managers to find interested cluster stakeholders and motivate them to take part in activities because these measures are often isolated. Without a preceding creative phase or a following utilization phase, many companies – especially SMEs – do not understand the importance and relevance of these measures for supporting cross-sectoral cooperation. They also often lack an understanding of cross-sectoral cooperation as an element of strategic differentiation.

Therefore, the business model-based innovation process without a R&D realization phase (figure 3) could be supplemented by the aspects of “knowledge generation” and “cross-clustering”. Figure 7 explains this well.

#### The services address the wrong stakeholders

Usually, services and activities targeting innovations address all of the companies in a cluster initiative. It is often forgotten, however, that by far not all of the stakeholders

have the necessary mutual trust to engage in common innovation activities or are prepared for such processes.<sup>22</sup> In the context of strategic differentiation, this becomes even more relevant. Strategic differentiation must be understood as a controlled corporate process, but not as one that can take place at short notice as the result of a corporate strategy (at least not in the case of SMEs). Of course, a first step in this direction may happen by accident. However, the potential or the motivation for strategic differentiation must become part of the vision or mission of a company. This applies to HR / the selection of personnel (interdisciplinary competencies, open for new subjects), to the organizational and leadership structures (early inclusion of personnel in different subjects or work areas, room and incentives for creativity, open communication, fault culture, etc.) and applies to the dealing with customers. At the same time, such companies are permanently successful who have established (in addition to their activities in the cluster initiative) a close and trusting partner network that goes far beyond normal networks.

With respect to the initiation of cross-sectoral cooperation in cluster initiatives, the cluster management must differentiate between four groups:

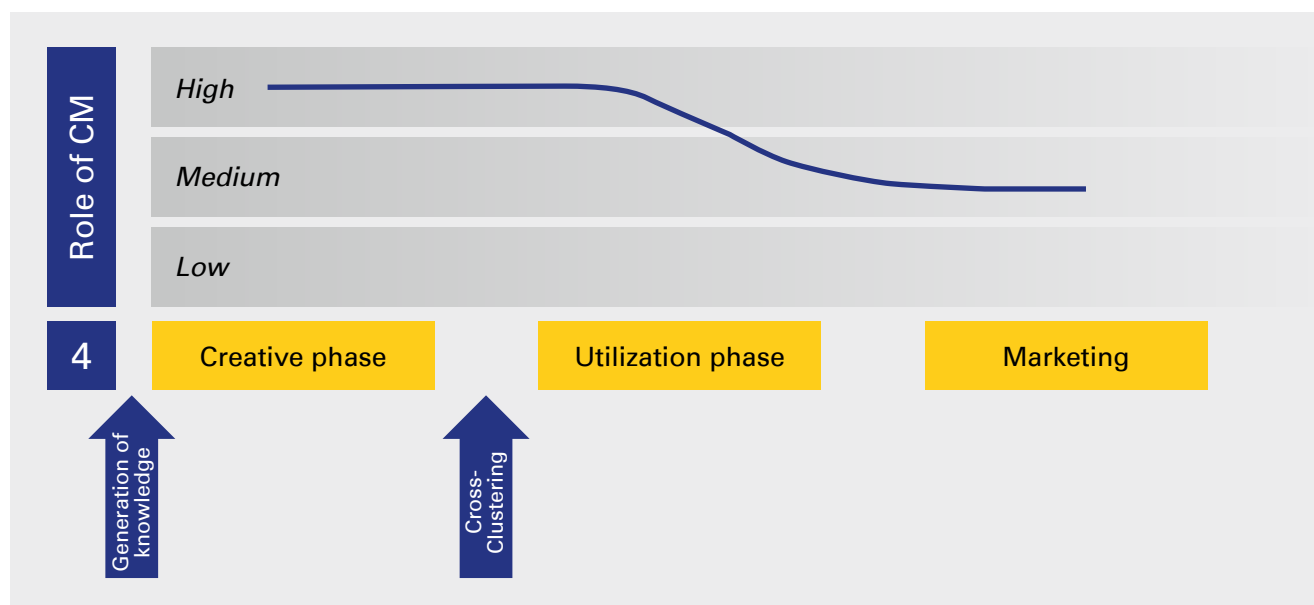


Fig. 7: Classification of measures for knowledge generation and cross-clustering in the business model-based innovation processes without R&D realization phases

<sup>22</sup> See Gedai and Koczy and Meier zu Köcker and Zombori: Cluster Games II – About Cooperation, Selfishness and Joint Risks in Clusters, Danish Ministry of Science, Technology and Innovation and Institute for Innovation and Technology (editor), Copenhagen/Berlin, 2015, [Online] [www.iit-berlin.de/de/publikationen](http://www.iit-berlin.de/de/publikationen), [Access on 19-May-2016].

*Group 1: passive stakeholders*

Since common innovation activities or the initiation of cross-sectoral cooperation projects require intense and trusting interactions, this group of stakeholders is excluded per se. This type of stakeholder is more interested in quick wins, for example, measures targeting the generation of knowledge.

*Group 2: cross-sectoral innovation drivers*

This group of enterprises is already used to differentiate strategically or to target new markets based on their core competencies. Examples for such enterprises are mentioned in chapter 4. Insofar as such enterprises are actively involved in cluster initiatives, their innovation and differentiation potential is often exploited to a large extent. It therefore makes sense to win these companies as motivators and mentors (for example, Festo, see chapter 4.2) to attract and convince companies from other groups (especially group 4). For the innovation drivers, it is the process as such that is interesting, especially within the context of the constant expansion of the knowledge / partner network (for example, Bernd Kußmaul, see chapter 4.1). It is important for the cluster management to not only address companies from this second group.

*Group 3: innovation specialists*

This group consists of enterprises that are well positioned in the market but are also focussed on their own product group for different reasons and understand the topic of innovation mostly as a means to improve or enhance their existing product range. Innovation does play an important role for these companies, but mostly in their original areas / markets. These companies have neither integrated strategic differentiation in their corporate structure nor in their corporate culture. They lack the awareness, openness (for example, for an exchange of knowledge), and willingness for cooperation (for example, the collaboration with other industries) to allow strategic differentiation. Measures or services provided by the cluster management addressing strategic differentiation or cross-sectoral cooperation are therefore often not utilized.

*Group 4: cross-sectoral high-potentials*

This group represents the actual target group of all the measures provided by cluster initiatives for strategic differentiation and cross-sectoral innovations. High-potentials have all the basic requirements and are truly interested in long-term commitments. Often, they belong to the major drivers in the cluster initiatives and have built trusting relationships with many of the stakeholders. With suitable measures targeting cross-sectoral innovations, a professional cluster management can achieve a lot with these enterprises, especially if they accompany them throughout the entire innovation process.

It is therefore important that the cluster managements gain a sense for which enterprises actually belong to their target group and then integrate them in cross-sectoral measures and activities for strategic differentiation. Young cluster initiatives should therefore wait with providing these services until they have built up the necessary trust and until they know their “candidates” for such measures.

## 5.2 Initiate cross-sectoral / cross-industry cooperation projects

Services provided by the cluster managements that initiate cross-industry cooperation projects are usually more demanding and more difficult to implement. It is mainly up to the cluster management to launch the specific preparatory activities. In this respect, practice also shows that cluster stakeholders can be won much more easily for such cross-industry activities if specific roadmaps are created and positions are determined in advance or if the overall goals are agreed upon within the cluster initiative.

Especially in the launch phase, the involved cluster management is much challenged because despite all the preparatory work, communication barriers may exist between the representatives of the different industries, and there may be a lack of trust between the partners who are not yet familiar with each other or have differing expectations.

There are several success factors that have proven to be highly relevant:<sup>23</sup>

<sup>23</sup> ClusterAgentur Baden-Württemberg, interviews regarding 6 EU projects that specifically targeted the initiation of cross-sectoral cooperation projects, in the period between February and April 2016.

- *Target group*

As we described in chapter 5.1, the target group that should ultimately be addressed is often a very small one only (the cross-sectoral high-potentials).

- *Point of time*

Ideally, common cross-clustering activities should take place after the creation of a common roadmap or determination of the position, so that this is considered to be one of several measures for a strategic differentiation.

- *Long-term process*

Cross-sectoral differentiation or cross-clustering are long-term targets that cannot be achieved with one or two measures or workshops. The cluster managements and the involved companies must therefore establish a sustainable long-term process.

- *Cluster management*

Even though the involved companies must provide for their own strategic differentiation or cross-sectoral innovation activities, the cluster management should actively accompany this process – to the extent possible – and should always get involved if the processes within the enterprises have halted. That does not mean that the cluster management must accompany the process itself. It could also bring in competent partners with the necessary expertise.

The most important thing about successful cross-clustering activities, which are mainly targeted at helping the cluster stakeholders to innovate at new interfaces, is to provide a sufficiently broad base for cross-cluster cooperation projects and to make them sustainable. The cluster management is therefore no longer focused on removing barriers between the cluster initiatives and acting as a moderator – as was the case in the beginning – but should ideally cooperate with the other involved cluster managements to ensure that these cross-cluster cooperation projects are of a lasting nature. This is usually achieved by establishing subject-related sub-networks that consist of stakeholders from different cluster initiatives. Thus, former cross-network cooperation projects can be combined in a “new” sub-network with all the typical management structures of a network and the respective tools. This helps to consolidate the cooperation projects and to establish an innovation pipeline that is fed by cross-industry innovations from different cluster stakeholders.

This can take place in the form of so-called user-supplier clubs in which a small group of stakeholders from different industries (and cluster initiatives) collaborates for a specific period of time. The cluster managements then act as moderators “only”. User-supplier clubs can be regarded as cross-sectoral workgroups, but they must have an exclusive character. They must not have an open design and should be accessible for only such stakeholders (cross-sectoral high-potentials) that have the potential and the will to tackle the topic of strategic differentiation. It is helpful if the members of such user-supplier clubs are required to pay a separate contribution because this is a good indicator of the parties’ commitment. It also makes sense for the participating companies, because they can expect an added value for their contribution too. For the cluster managements, the advantage is – besides the extra income – that the participating companies will primarily be those who have a genuine interest in it.

In addition to a trusting working environment and, if necessary, signed non-disclosure agreements, the critical success factors for user-supplier clubs are

- their clearly defined problems and targets,
- the fact that they are well and actively moderated,
- that their members have an earnest interest to make achievements; and that they have various competencies and / or participants from different industries.

The challenge for the cluster management is to organize and structure the sub-networks in a way that generates the best possible benefit for all the participants without a cannibalization of their services or network activities. They must also identify and decide which topics are suitable for sub-networks and, as the case may be, if it should be indicated, to completely redesign or realign the existing “parent” cluster initiative. As a rule, sub-networks should be limited in time and project / problem-based, and they should be dissolved after a problem is solved. To organize cross-sectoral cross-network cooperation projects within a “new” sub-network, including all of the management structures and tools that are typical for networks, support programmes such as ZIM cooperation networks (ZIM = Zentrales Innovationsprogramm Mittelstand, a central innovation programme for SMEs) can be useful, for example, or the support programmes for regional clusters of the state of Baden-Württemberg, and the state-wide and cross-regional innovation platforms (CLIP 2014-2020).

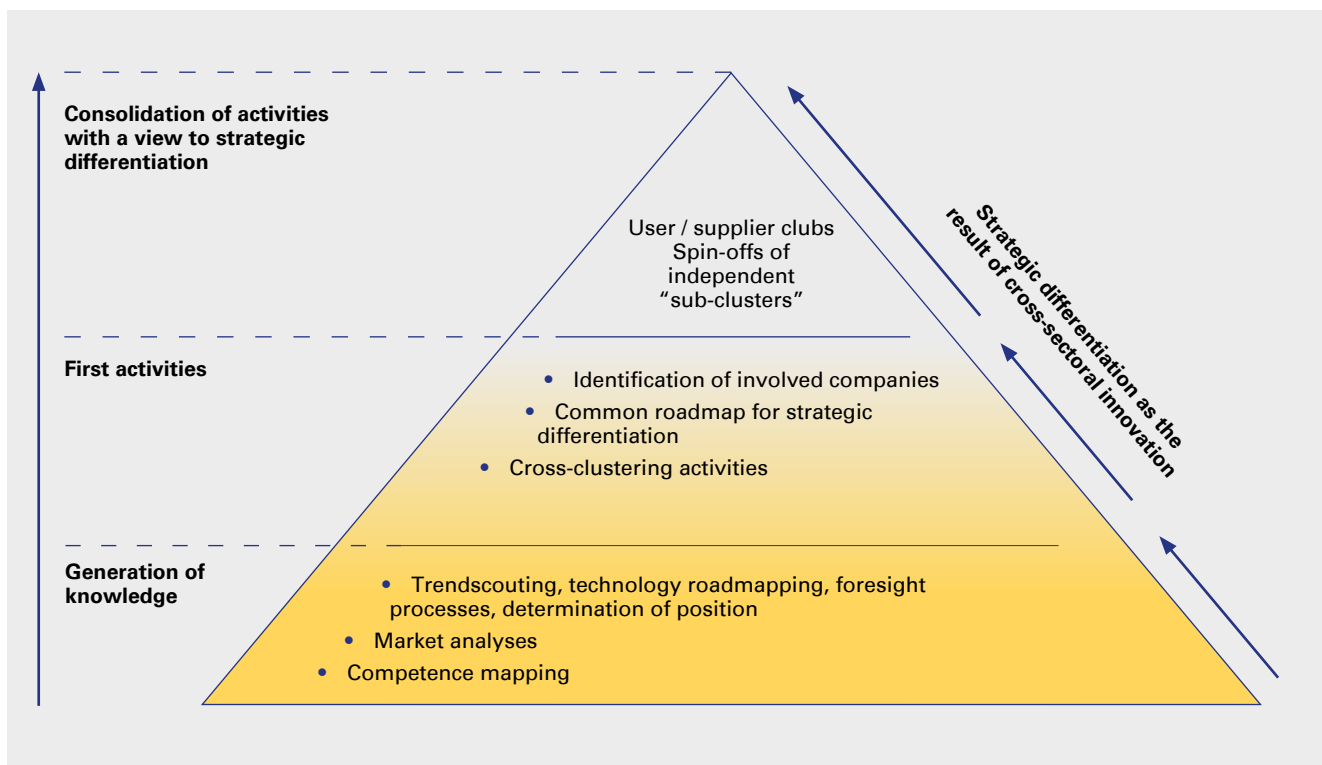


Fig. 8: Comprehensive approach for a strategic differentiation of enterprises initiated by cluster initiatives<sup>24</sup>

There may be cases where a sub-network results in a new cluster initiative with a long-term goal and design. This helps to consolidate the cooperation projects and to establish an innovation pipeline that is fed by cross-industry innovations from different cluster stakeholders (figure 8).

Other instruments and services for strategic differentiation that are initiated by cluster managements are described in chapter 5.3.

### 5.3 Examples of good practice

The following examples of good practice show which concrete measures can be successfully implemented in cluster initiatives to support companies in their strategic differentiation activities. They also show that, at best, the cluster managements not only accompany individual process steps on the way to the strategic differentiation of individual enterprises and bring together the right partners at the right time, but that they can also trigger and accompany a strategic differentiation within their industry or field of technology through their institutional position. This will then integrate companies and stakeholders in

the process that had not recognized their own potential for strategic differentiation until then.

#### 1. Example: Cross-Cluster Challenge

For a result-based design of the cooperation between cluster initiatives described as cross-clustering, the Cluster-Agentur Baden-Württemberg developed the Cross-Cluster Challenge format. To put it simply, this programme brings together stakeholders with specific problems or unsolved challenges with such stakeholders that have the necessary competencies to solve these problems (problem solvers). On the one hand, it is the role of the involved cluster managements to identify the member companies and their specific problems. On the other hand, it is necessary to find companies from other clusters that have the required capabilities for possible solutions. To moderate this process appropriately, the involved cluster managements must have established a high degree of competency and trust within their initiatives, that reaches into the creative phases of the innovation processes of the individual enterprises. In addition, their qualities as moderators should be high enough for a business model-based approach.

24 See Künzel and Meier zu Köcker and Köhler: Cluster und Innovation - Cluster-Initiativen als Innovationstreiber, Cluster-Agentur Baden-Württemberg (editor), Stuttgart, 2015, p. 19.

However, the involved cluster member companies must also fulfil certain requirements to be able to implement the oftentimes difficult process of collaborating with the other partners. Their internal organisation structure plays an important role in this respect. For example, the personnel in cooperating companies must have a high interdisciplinary competence and must be curious and motivated to approach new subjects. Of great significance is also the strategic alignment of the companies in the direction of cross-sectoral and business model-based activities. The basic conditions must be created to allow the best possible operative cooperation. Among other things, this involves technological or legal aspects when data is exchanged or tools are used.

The first Cross-Cluster Challenge took place at the CUBEX41, the founding and competence centre of medical engineering in Mannheim, on 11 May 2016. It was organized and carried out by the ClusterAgentur Baden-Württemberg and BIOPRO. It was intended to bring together the stakeholders in the medical engineering industry (challengers) with the representatives of the ICT industry (problem solvers). In a first step, and with the active involvement of the cluster managements from the medical engineering area (clusters Medizintechnologie Mannheim, Medical Mountains, Bio-Region Freiburg, and Pflegenetzwerk Heilbronn), the problems of the cluster stakeholders from these networks were identified. The focus was on identifying challenges at the man-machine interface of medical devices, whose performance could be boosted by an improved ICT, and which should be in the utilization phase of the innovation process at best. Through close cooperation and the high degree of trust between the cluster stakeholders and cluster managements, the problems could be identified specifically enough and aligned. In a next step, the cluster managements from the ICT were involved (CyberForum, cyberLAGO, IT-Forum, microTEC Südwest, and bwcon). They identified cluster stakeholders, which they assumed to have the necessary competencies and experience to support the medical engineering companies in the solving of their problems or facing of their challenges. This cross-cluster process was coordinated by the Cluster-Agentur Baden-Württemberg. The Cross-Cluster Challenge then introduced the respective companies of the medical engineering and the ICT industries within small bilateral groups, in a trusting atmosphere, to speak about their individual company-specific challenges and approaches, and their further collaboration.

As a result of the Cross-Cluster Challenge, it must be noted that the solution-based matching in advance of the challenge had the effect that, for most of the identified topics, specific approaches could be worked out during the challenge. These will be detailed in follow-up meetings by the parties involved. Partly, the results were concrete ideas for innovation projects. This process will basically be accompanied by the respective cluster managements.

## 2. Example: Supply Chain Excellence initiative

The civil aviation industry is currently undergoing dramatic changes. A strong growth in the industry itself and high demand has resulted in the strategic differentiation of the OEMs, in particular at the European aircraft manufacturer Airbus. The vertical integration was significantly reduced and more components and subsystems are to be delivered to the final manufacturer instead of single parts. This puts the SMEs, in the positions of 2<sup>nd</sup> or 3<sup>rd</sup> tier suppliers in the supply chain, at risk to be replaced by other bigger suppliers from abroad. In order for an SME to be able to survive in this global consolidation and industrialization process, cluster and state initiatives all over Germany have triggered a process of strategic differentiation for SMEs. A total of 14 regional associations, clusters and initiatives, the BDLI (the German Aerospace Industries Association), and the industry organisation SPACE Germany joined together and founded the joint Supply Chain Excellence Initiative (SCE) in 2015. This initiative is also supported by the government. Brigitte Zypries, a parliamentary state secretary at the Federal Ministry for Economic Affairs and Energy and coordinator of the Federal German government for German Aerospace matters, became a sponsor, as did the ministries of economic affairs of the states of Bavaria, Lower Saxony, and Baden-Württemberg at the state level. It is also expected that they provide significant financial support in this regard.

The goal of this initiative is to support the supply chain of the German aerospace industry that is characterized by medium-sized companies in this beginning structural change process so that the SMEs can appropriately benefit from the opportunities presented by the global growth market. At the same time, the competitiveness of the German aerospace location is to be increased further on the global scale. To reach these goals, the SCE uses and supports successful national and regional activities and structures and actively connects them. In addition to this, specific measures are intended to help companies sustainably improve their performance. The associations cooperate at the federal level to link specific supporting programmes in the six core areas: business model, internationalization, industrial performance, financing and contracts, sales & operations planning, and cooperation. Within these fields of work, benchmarking or individual checks on site in the companies are used, for example, to check where the weak points are or the needs for optimization, and they work out suitable solutions and innovations together.

The SCE clearly shows that competitive pressure can also be the driver of strategic differentiation. The current situation in the aviation industry is not a question of research and development activities or inventions but a question of business models and processes that we can see in scenario 4 “Business model-based innovation process without R&D”. The initiative shows the potential that lies in associations and cooperation projects of cluster initiatives and networks if they specifically target the current needs of the companies in their industries.<sup>25</sup>

### 3. Example: SEFEX - strategic management, increase in efficiency, and expansion among member companies

Wirtschaftsförderung Raum Heilbronn GmbH accompanies two cluster initiatives, KunststoffDIALOG and MetallDIALOG, with great potentials for a more intense cooperation. Both cluster initiatives are characterized by owner-operated family enterprises. Their owners are the decision-makers and the impulse generators at their companies. They are responsible for HR planning, investment planning and general strategic decisions. Furthermore, many of the companies are suppliers to large companies from the areas of automotive, mechanical engineering, and plant engineering. The majority of the companies are

qualified contract manufacturers. Long-term decisions are therefore rather difficult. Many business decisions are ad hoc decisions and are mostly reactions to prevailing market conditions.

Short-term planning, low margins and traditional corporate structures are generally not the best conditions for strategic differentiation, that is, to open up new fields of business or business models. Despite these conditions, however, mainly the companies from the plastics industry have managed to redesign their businesses in the past and to develop from supplier companies to product manufacturers. This makes them less dependent on large enterprises and they can achieve higher margins as independent suppliers on the market. These higher margins can then be used to develop new products.

In the metal industry, however, this transformation process has not proceeded very far. The companies here are still very much dependent on the large enterprises. Therefore, the metalworking sector could benefit and learn from the experiences of the plastics industry as to how they could develop from pure supplier companies to product manufacturers in the market. An advantage in this regard is that there is no direct competition between the companies of the metal industry and the plastics industry. As a consequence, both parties can communicate very openly with each other.

This is exactly the point where the Strategic Management, Boost of Efficiency, and Expansion project (“SEFEX”) starts. This project is carried out by the MetallDIALOG cluster management and is sponsored by the CLIP support programme of the Ministry of Economic Affairs, Labour and Housing.

SEFEX’s approach is the widest one possible and intends to support the companies in the metal industry in the following areas.

- *Strategy:*

The goal of the systematic development of their own corporate strategies is to allow the companies to assume the responsibility for the development of their companies and to contribute to reduce the dependency on individual large enterprises.

25 See Berlin-Brandenburg Aerospace Allianz e.V., [Online] [www.bbaa.de/ueber-uns/projekte/national/supply-chain-excellence](http://www.bbaa.de/ueber-uns/projekte/national/supply-chain-excellence), [Access on 14-May-2016].

- *Increase in efficiency:*

The systematic increase of the companies' efficiency is to contribute to the optimization of the income situations and the cash flows. This will help the companies to invest in their own products and services in the future, or to open up new markets. The employees of the companies are to be involved in the design and implementation of the projects to boost efficiency. This will increase the creativity of the workforces and result in optimal results.

- *Product / service development expansion:*

With the Product Development Expansion module, the companies shall be enabled to reflect on their own competencies and – based on this – create new products and services. Contract manufacturers should develop into – at least partially – product-oriented companies with higher margins.

- *Market development expansion:*

The Market Development Expansion module is to make it easier for companies to identify and canvass new target markets with respect to an areal expansion into other regions within Germany or Europe.

The services of professional corporate consultants are used for all modules. They are expected to bring in their experiences with large enterprises for the benefit of the SMEs. A key point, however, is that employees from KunststoffDIALOG companies are included in every single phase. They are to pass on their experiences in the transformation process – from a supplier only to a product manufacturer – to the MetalDIALOG companies.

The SEFEX example shows how cluster initiatives can support their member companies in the area of strategic differentiation. On the one hand, SEFEX is designed for the long-term and tries to lead the companies to new business models step by step, and on the other hand, it shows, using concrete examples of the companies from the plastics industry, how strategic differentiation can be successful and how the experiences from other industries can be used for the development of the companies in the metal cluster.

## 6 Summary

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In the light of global competition and ever increasing customer requirements, it becomes more and more difficult for companies to distinguish themselves from their competitors, meaning to strategically differ from other market participants. The challenges faced by the companies are to include ideas and developments from other industries or sectors into their own product and service development activities; that means to “think out of the box”. Cluster initiatives can be an important support tool in this respect.

For this, however, the perception of innovations must be broadened. To be innovative does not only mean to take a leading or pioneering position in terms of technology, but also to be successful in the market. It is therefore important to utilize and market innovations. In chapter 3.2, we demonstrated how exceptionally critical the utilization and marketing phases are for companies in the innovation process. This, in particular, involves the development of new business models that must be adapted to the circumstances in the markets in ever shorter periods of time as digitalization proceeds (chapter 3.3). And this is what we can learn from successful companies such as Vorwerk, Festo, or ZIM Flugsitz (chapter 4).

Cluster initiatives can play an important role in the utilization phase although this is not an easy undertaking. It requires the identification of the right stakeholders and the initiation of sustainable measures (chapter 5).

With respect to the stakeholders, it is important for the cluster managers to become aware of their differing characteristics. On the one hand, not every cluster member may be open-minded enough to “think out of the box”. On the other hand, there may be some members that already use input from neighbouring industries today. It is the task of the cluster initiatives to appropriately integrate both sides into their different activities, so that the different stakeholders can benefit from each other in the best possible way (chapter 5.1).

The measures for supporting cross-sectoral cooperation projects must be designed comprehensively and sustainable. This means that individual measures are not sufficient to promote a cross-industry cooperation. The problem must be clearly defined together with the cluster members, and there must be an earnest interest by all of the involved parties to achieve something in common.

Only then is it reasonable to bring together stakeholders from different industries (chapter 5.2). That this can be done is shown in our list of examples of good practice in chapter 5.3.

These examples show how cross-industry cooperation can be successfully initiated by cluster managements. Nevertheless, the topic of cross-sectoral cooperation has not yet been taken up with much energy in many cluster initiatives. Activities to this end must be expanded in the future.

Ultimately, cluster initiatives are an ideal platform to actively support companies in “thinking out of the box” or strategic differentiation. Hardly any other institution can bring together different stakeholders along the value chain from the one side, meaning companies with a common interest, and integrate new competencies and expertise from other sectors of industries from the other side. Requirement for this are an excellent knowledge of the industry and an extraordinary basis of trust among the members. Only then can the cluster managements be the outstanding sparring partners or moderators in a process of strategic differentiation.

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