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Service Innovation in Europe

Good Practice,
Methods & Tools
for SME



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Contents

1	Preface	3
2	Introduction into Service Innovation	4
2.1	The ambidexterity challenge	4
2.2	The elements of service innovation management: Search, selection, implementation and evaluation	4
2.3	The latest trend: Hybrid value creation as innovation strategy	9
3	Interview	10
4	Good Practice Examples	12
4.1	Vaillant, Germany	12
4.2	Parken Zoo in Eskilstuna, Sweden	14
4.3	Zwick, Germany	16
4.4	MT Unirepair, Netherlands	18
4.5	Process Vision, Finland	19
4.6	WMA Schmidt & Bittner GmbH, Germany	22
4.7	Kalevala Koru, Finland	24
4.8	EBV Elektronik, Germany	26
5	Knowledge Transfer in Service Business Development	28
6	Service Innovation Step by Step – Useful tools	36
6.1	Analysis of company's current situation	36
6.2	Development of service strategy	38
6.3	Evaluation of service potential	40
6.4	Design of service process	41
6.5	Evaluation of customer satisfaction	42
6.6	Product Service System	44
6.7	ServLab	45
6.8	Regulatory framework method	45
6.9	Service Balanced Score Card method	47
6.10	The KIT model	48
6.11	Bar Code technology	49
7	Useful Contacts	50
8	Bibliography	52

1

Preface

Services can range from product- or business-oriented service activities to complex product service systems. Especially the latter are often developed in a mutual interaction of technological progress and innovative service concepts aimed at providing solutions for business, industry and final users. Nowadays, many traditional manufacturers transform into solution providers in order to better meet customer needs and to create more value. A growing number of service companies interact for this purpose in strategic alliances, like cross-sector networks or clusters.

In Europe, regarding the fact that services are the crucial element in modern and competitive economies, there is general consensus on the need to encourage service innovation initiatives and measures. Particularly in the light of globalisation and a knowledge-based economy it requires transnational cooperation efforts at several levels and a horizontal approach in research and development. To succeed, we first have to set up conditions for an efficient knowledge transfer and find out how to support service innovation activities in enterprises.

Knowledge transfer can rely to technologies necessary for the creation and the management of the service innovation process. But it can also convey service innovation concepts, business models to offer innovative services as well as matched indicators and evaluation methods.

Systematic and effective implementation measures reduce development times and costs in enterprises and bring direct benefits such as competitiveness and better profit margins. Therefore, we need not only theoretically founded knowledge, but also tangible examples, methods and instruments. Especially small and medium-sized enterprises, the backbone of Europe's economy, can use them to improve their capacities and know-how for the development of necessary resources and strategies. On the other hand, many examples of successful implementations in European companies are available for a mutual learning process via research and development cooperation.

One of the objectives of the EPISIS project was to serve as a platform for knowledge transfer in the field of service innovation in Europe. EPISIS – European Policies and Instruments to Support Service Innovation – is a project under the PRO-INNO Europe initiative of the Directorate General for Enterprise and Industry. It aims at facilitating transnational cooperation between policymakers and innovation agencies in the field of service innovation through parallel policy, strategic and operational level activities.

This brochure is a transfer measure addressing especially the needs of service providing businesses. It conveys the economic advantages of service innovation and illustrates them with good practice examples from several European enterprises. You will also find here business-proven instruments and methods to support your own service innovation activities. We would particularly like to hand them over to the small and medium-sized enterprises as well as related transfer agencies and institutions.

We hope that you will find here inspiration and guidelines for your practice.

Pleasant reading!

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2

Introduction into Service Innovation¹

The exchange of goods and services was one of the primary purposes of early social contacts. Today, economists estimate that at least 60% of all economies involve the exchange of services, while in more developed economies services account for approximately 80% of all transactions.¹ Despite the clear lean toward service-dominated societies, many companies distinguish tangible 'product' offerings from the 'services' that facilitate their selection and use and spend research and development efforts primarily on products. Even in the many cases (from entertainment to banking) where services meet customer wants and needs without the exchange of tangible goods, attention to innovation is relatively rare.

2.1 The ambidexterity challenge

Successful German companies in the services sector recognized long ago that in order to cope with the challenges of global competition, they must not only implement a wide range of continuous innovations, but also be on the look-out for discontinuous concepts. They also recognized that these ideas had to be implemented and evaluated in the context where they would be realized. Implementing discontinuous innovation within the services sector is an ambitious aim. How do businesses go about discovering real discontinuous service concepts? How can they decide which single concept from the great variety of possibilities shows the most promise? How can businesses be sure that their seemingly innovative concept will also be seen as a needed innovation by the customer? These questions become even more challenging when the company aims to be ambidextrous – or capable of both continuous service

innovations as well as the occasional discontinuous leap that moves the organization into new territory. In order to stay in business, companies must monitor customer responses to their current product and service offerings. But as society becomes more complex, economies more interconnected and competition increases in many different sectors, companies are required to come up with new offerings that respond to changing needs and desires and meet the challenges of attractive innovations from competitors.

2.2 The elements of service innovation management: Search, selection, implementation and evaluation

Innovations are frequently equated with creative chaos. Who has not conjured up the scene of a wild-eyed genius imagining a new idea and then assembling it from odd bits and pieces of material? For this reason, it may initially seem paradoxical that research on innovation recommends a structured process to help companies succeed in meeting the challenges of an increasingly competitive environment.¹ This innovation process has four central pillars: Search and selection of innovative concepts and their implementation and evaluation. The elements of this process are closely interlocked as described on the next pages.

¹ Adapted from Reichwald, R., Möslein, K. M., Huff, A. S., Kölling, M., Neyer, A.-K. (2008), Services Made in Germany – A Travel Guide, Gebr. Klingenberg, Leipzig.

² Percentage of different economies dominated by services

³ Research support for a structured approach to innovation

Search phase

Any organization might stumble upon a groundbreaking innovation that transforms it into the market leader, or perhaps benefit from a genius in their midst, but it is not a good idea to depend on Lady Luck. It is far better to undertake a structured search for both continuous and discontinuous concepts that provide a comprehensive idea pool of service innovations independent of chance. This sounds pretty simple and is simple in principle, yet relatively few companies develop a rich pool of alternatives. The decisive question is: How to search systematically for concepts that have the potential for value-added service innovations?

Initial results from the *Discontinuous Innovation Lab* provide answers to this crucial question. As organizations do not possess the resources to undertake an unlimited search for concepts, search strategies are needed. Through the systematic utilization and combination of a variety of approaches, businesses can transform themselves into successful “treasure hunters” within the area of service innovation. Figure 1 provides a summary of twelve search strategies from the *Discontinuous Innovation Lab* that offer assistance in tracking down promising concepts.

Figure 1: Strategies for discovering continuous and discontinuous innovation concepts

	1. Search	2. Selection	3. Implementation	4. Evaluation
Phase Content	Using search strategies for the identification of potential innovative services	Selection and financing of innovative services	Design and introduction of innovative services	Evaluation of innovative services
Key Questions	Are we generating good concepts? Are we searching in the right places?	Are we good at evaluating and financing new concepts?	Are we good at the implementation of concepts?	Do the implemented concepts bring longterm benefits for business success?
Key performance indicators	Number of high-quality concepts	Percentage of all generated concepts that are selected and financed	Percentage of financed concepts that lead to profits. Time-line to introduction	Percentage of implemented concepts that still exist following a time period X. Contribution to business objectives

Source: Based on Bessant, J. and von Stamm, B., 2007

The Discontinuous Innovation Lab is an international network of interdisciplinary researchers and innovation managers. The objective of the regular workshops and network meetings the Discontinuous Innovation Lab holds on national and international levels is to master handling discontinuous innovation. Research has shown that radical changes in markets and technology cannot normally be approached through the customary routines of innovation management. At the same time, established processes inhibit the perception of unorthodox opportunities. As a result, the risk of missing an innovation leap is often not recognized. The Lab was established in 2006 as a cooperative effort between German, British and Danish academics and practitioners on the initiative of Professor John Bessant from Imperial College in London, with support from the Advanced Institute of Management Research (AIM). Initiatives in France, Australia and the Benelux countries have now become affiliated and related workshops have been held in Sweden, Norway, Finland, Italy and Switzerland. In addition to the meetings convened several times a year, the participating universities carry out research projects with partner companies. In the first two years the network has grown to approximately 250 individuals, including academics from over 20 institutes and managers from the executive levels of over 100 companies – from conglomerates to successful start-ups. More detailed information is available at www.innovation-lab.org.

Selection phase

A successful search will normally produce more interesting concepts with value-added potential than can be reasonably implemented, so the next logical step in a service innovation strategy is selecting the best concepts for further development. It is not sufficient to examine the potential opportunities of individual ideas, it is also necessary to compare different possibilities to one another with respect to company priorities. In addition, research has shown that though companies frequently express the wish to be innovative, discontinuous ideas often do not survive established budget processes. In the worst cases, this can mean that good concepts are doomed to failure in the early stages of the innovation process, before their potential can be adequately assessed. It is not just that opportunities are missed, but also that early rejections discourage employees involved in the innovation process. The selection process is therefore a major step in innovation strategy that must be handled with analytic expertise, sensitivity and farsightedness.

To guarantee a fair, comprehensible, and also potentially successful selection, it is necessary to develop suitable evaluation methods. Whether a selection strategy and associated methods of evaluation are suitable and appropriate depends to a great extent on the objectives pursued. The decisive factor is whether continuous or discontinuous concepts are to be evaluated. Should this difference not be recognized, concepts with a

potential for innovation leaps can be easily rejected without recognizing their potential. Often ideas for continuous innovations arise as a learning outcome from current activities. Simple and well-tested traditional evaluation methods can be of great help as selection tools when assessing these ideas for continuous innovation (which might also come from the observation of competitors or suggestions from customers). For example, check lists, discounted cash flow methods or portfolio approaches can result in the improvement of existing processes or services.

More advanced methods are necessary when concepts that have a potential for discontinuous innovation are evaluated. As a rule, fundamentally new concepts cannot be fitted into old patterns. Recommendations that radically question well established concepts and demand entirely new behavioural and utilization patterns from (often new) customers are more likely to receive support with selection strategies such as idea markets, forecast stock exchanges, service cases or service prototyping approaches.

- Idea markets permit the distributed evaluation of alternative concepts and project ideas. Typically, a wide range of individuals are invited to rank the selections offered on company-internal, cross-company or even more public electronic evaluation platforms.

- Forecast stock exchanges rely on the so-called swarming intelligence of the masses rather than expert opinions.² This is most suitable when specialized expert advice is scarce. In this method the problem is posted rather than the desired solution and a wide range of individuals are invited to offer solutions that meet specified criteria.
- Service cases concentrate innovatory ideas into highly concrete concept descriptions that cover content, processes and financial aspects of one or more recommended service innovations. The evaluating group can vary, but this method of selection offers them a more robust view of options than is typically available at an early stage in the innovation process.
- Service prototyping goes a step further than a case and attempts to produce a visible and tangible version of the recommended service innovation. The goal is to create a common comprehension of the service concept for all participants. Ideas from two different sources are described in more detail below. The prototype functions as an instant demonstration of service ideas that are primarily immaterial by definition. This tangible model aids common understanding of the new idea, which contributes to more effective collective evaluation of its strengths and weaknesses.

Implementation phase

Once the early phases of search and selection have been mastered, the next stage in the innovation process is implementation. During this phase, the relatively 'raw' concept selected in phase 2 is systematically developed to produce a marketable service. A variety of obstacles must be overcome at this point.

The cooperative interaction of all participants in the development process is vital; in many cases it is precisely the human factor that causes the implementation of good ideas into finished services or products to be unsuccessful. Companies aiming to develop discontinuous service innovations are faced with particularly fascinating challenges. In the immaterial world of services, radical new concepts challenge the imagination. Often different participants have very different ideas of what will

² "swarm"

be required for successful implementation. For example, the situation can easily arise in which engineers have a totally different perception of concept implementation than their colleagues in the marketing department. Company-internal communication processes and those involving the customer can also break down due to diverging visual concepts of a service.

As is the case with product innovation, this phase of developing a service innovation must have the overriding objective of winning the battle against tight time-lines and limited financial resources. A lesson learned long ago from software development is: There is substantially greater difficulty in the planning, supervision and control of implementation when the results are not sufficiently visible, tangible or comprehensible. Accordingly, specific techniques and action strategies are necessary to provide targeted support for the implementation process of service innovations. These include:

- Further development of early prototypes
- Regular exchange of information in all transitional stages
- Well-documented project management that integrates information from all parties involved. Further ideas to support this frequently neglected phase of implementation depend upon the concept and the situation. The key idea is that this step is of great significance for service innovation success.

Evaluation phase

The evaluation phase is the final part of the innovation process, one that offers central starting points for systematic learning about innovation. Evaluation of both the service innovation itself and the process of its development are important.

The achievement potential of service innovations on the market is tested in an initial evaluative step. While specific criteria for the evaluation of realized innovations depend on the individual company and its objectives as well as the nature of the service innovation and the market, the following general benchmarks can be listed (Bessant and Tidd, 2007):

- Operative output benchmarks, such as customer satisfaction, in relation to quality improvements and flexibility

- Non-sector-specific output benchmarks, such as product costs, market share and quality
- Strategic output benchmarks in comparison to expected efficiency increases for the company as a whole, such as larger market share and profitability.

In a second step, the internal innovation process itself is evaluated to optimize the processing of future innovations. Here the following criteria can be utilized (Bessant and Tidd, 2007):

- The number of new concepts in relation to service, product and process that could be discovered in the initial phase of the innovation process. Here, discontinuous and continuous concepts must be distinguished from one another;

Figure 2: Core content of the innovation process and relevant questions

Search Strategies	Characteristics
Sending out scouts	Assigns the task of detecting signs of competitive, technological, social, and other changes, that might generate new concepts
Exploring multiple futures	Examines possible future scenarios in order to discover the potential opportunities and risks of extreme developments
Using the web	Utilizes the world wide web as a source of information on trends and as a communication platform for the exchange of experiences
Work with active users	Integrates so-called lead users into innovation process with the objective of profiting from their know-how in the development and evaluation of potential innovators
Deep diving	Extensively surveys customers through explorative methods, and if necessary, observation and in-depth interviews for a deeper understanding of hidden needs
Probe and learn	Tests potential innovations under real conditions with the objective of learning by experience even if the risk of failure is high
Mobilize the mainstream	Involves non-expert employees in the generation of ideas for the extension or compensation of existing resources
Corporate venturing	Establishes specific corporate units with budget for special projects and any spin-offs independent of main business
„Corporate entrepreneuring/ intrapreneuring“	Creates a corporate culture that encourages innovation through incentives and the authorization of so-called submarine projects
Using networks	Develops tools to enable the exchange of experience and information between different areas of expertise
Encouragement of diversity	Accept a lateral thinking and encourages interdisciplinary cooperation
Idea generator	Uses of creative techniques to increase discontinuous innovation concepts

Source: Based on Hansen, M. T. and Birkinshaw, J. 2007

- Error rate – during the development process and on the market
- Percentage of budget and time overrun during the development process, answering the question of whether differences depend on the type of innovation (continuous or discontinuous)
- Development period/man-hours per completed innovation, answering the question of whether differences depend on the type of innovation (continuous or discontinuous).

At this point, many of the approaches and techniques that have already proved to be reliable within the area of product and process innovation can be implemented – independently of the nature of the specific service innovation and the context of its utilization.

Although we can still learn a great deal from the areas of product and process innovation for application in service innovation, it is important to examine their transferability carefully, and developing new methods is important. In addition, a completely new field of action is being developed: the interactive design of hybrid product-service bundles.

The illustration is a summary of the four phases of the service innovation process. The central questions identified by Hansen and Birkinshaw offer companies the opportunity to undertake a critical examination of their innovation process in order to establish strengths and weaknesses and be able to undertake relevant counter-measures.

Hybrid value creation is the process of generating additional value by innovatively combining products (tangible component) and services (intangible component).

2.3 The latest trend: Hybrid value creation as innovation strategy

The successful launch of the Apple iPod and the iTunes Store universally demonstrated the strategic role services could play even in the context of tangible products. The iTunes Store became a market leader soon after its launch and in just over a year had a catalogue of over a million songs. It clearly demonstrated that services offered in combination with products were no longer just an add-on but could actually be the core of the offering. Customers value and demand such problem solving solutions. They also pay closer attention to life cycle costs than in the past and therefore demand complete solutions leading to product-service combinations. Increased interaction between customers and suppliers leads to customized solutions that even better fit customers' needs, which in turn pushes the demand for further solutions from customers. This desire for hybrid services is coming from various sectors, from automotive and chemicals to white goods and food. It is also relevant in both B2C and B2B markets. In short, hybrids have immense economic potential for companies, if they use this trend to successfully implement innovative combinations of goods and services that go beyond incremental innovation into the fray of discontinuous innovation. Service bundling, which is not a new concept, is often limited to adding services to existing products so that the products can be better marketed. Hybrid value creation goes a step further as the borders between the product and service are blurred. Here the company is offering an integrated solution (Ernst, G., 2005). To successfully make the transition from selling standalone products or services to hybrid solutions, companies need to challenge and rethink conventional service development, implementation and marketing processes. Traditional sector-specific routines, basic assumptions and value generating concepts must be submitted to a radical scrutiny process. The solution-oriented new combination of services and products typically breaks up antiquated organizational thought patterns and challenges previously separate organizational and individual competences.

3

Interview

An interview of Dr. Martin Faust, Executive Director, Consultancy and Software Support Océ Printing Systems GmbH, a Canon Group Company, conducted by Till Post and Wilhelm Taurel from the AFSMi.

How do you see the actual situation regarding high-tech services in Germany and in your international business?

In recent years much has been accomplished in the high-tech services domain, but there are still challenges ahead. Globally, Germany is well known and respected for its "Made in Germany" high-quality products. However, high-tech services have not quite reached that same level overall. It is important to note that high-quality and durable products also require sophisticated high-tech services throughout the entire product lifecycle. It becomes a key differentiator for manufacturers in the global market by putting the focus on the customer and keeping it there. The benefits of implementing and maintaining high-tech services are multifold. Océ Printing Systems has seen its high-tech business and workflow consulting services lead to the development of innovative and highly productive digital print solutions. These open up new business opportunities as well as securing the continued customer loyalty that comes from our long-term policy of maintaining and protecting their customer investment.



Which are the main challenges of this business for the near future?

Océ Printing Systems opens growth paths for itself and for its customers into new business segments by means of innovative high-tech services. The main challenge is the increased complexity that often comes with new opportunities. Tackling this challenge requires broad factual technical skills, combined with methodical, social and intercultural abilities. This is needed not only in our own organization but also in those of our business partners. A further challenge is the need for continuous and fast optimization and automation of services delivery by making use of technical trends such as web and mobility, which have already been implemented in Océ's field maintenance services operations.

What are your experiences with knowledge transfer from research into your service business operations with regard to your main challenges?

Océ Printing Systems has a long-lasting cooperation with universities, institutes, academies and professional associations. Océ achieves very good results through such cooperation, especially with complex application-oriented projects. With this academic support we have implemented methods for services engineering which have resulted in a portfolio of innovative services for our customers in the digital colour printing business. These innovative services have played a significant role in Océ achieving its leading position in the global professional inkjet printing market.

How can other high-tech services businesses benefit from your transfer experience?

The benefit is in recognizing that the transfer is both bidirectional and progressive. It's a sharing of research, application and experiences that benefits all who participate. Océ Printing Systems continues to benefit from this exchange through guest lectures, active cooperation within professional associations and advanced training for its employees.

In 2010 Océ, a Canon Group Company, endowed a Chair in Business Services Innovation. The Endowed Chair will promote services innovation and knowledge development and has been established at the Venlo campus of Maastricht University.

What could help you and other service businesses to stay in, and even get even more competitive on, the world markets?

The services business is driven by three success factors: skilled people, leading technologies, and efficient processes. These three factors are highly dependent on education. This calls for a widespread, practice-oriented services education, within all business sectors and involving all levels of education (artisan, vocational, industry, university). Therefore, textbooks and training with a high degree of practical orientation that include the framework and application of high-tech services are an absolute must. The transfer and implementation of research results should be supported by industries as well as by German and European publicly-funded projects. Moreover, the implementation of technology trends such as the Internet on mobile devices will boost services automation, reduce costs, and increase customer satisfaction – all critical to staying competitive in today's dynamic global marketplace.

4

Good Practice Examples

4.1 Vaillant, Germany



Vaillant was founded in 1874 by Johann Vaillant and is an international family-owned company. The core business is heating technology. Vaillant is the second-largest European manufacturer in this industry. In addition, the Vaillant Group is active in the areas of ventilation and air-conditioning technology. The product portfolio comprises solar heat and photovoltaic facilities, heat pumps, pellet boilers, ventilation appliances for low-energy houses, heating systems based on fossil fuels (e.g. power-heat cogeneration or condensing boiler systems) as well as intelligent controllers. The company develops and manufactures its products and services at sites in Germany, France, the United Kingdom, Spain, Italy, Slovakia, Turkey and China. The Vaillant Group is present in over 20 countries with own national sales companies and exports to more than 60 states. In 2010, Vaillant had a turnover of 2.314 Million Euros. Currently, Vaillant has 12,400 employees.

Initial situation

In the field of heating, air conditioning and sanitary engineering (HAS), manufacturers produce sophisticated, technically complex products. The technical customer service (TCS) is mostly carried out by trade and repair businesses and service organizations in the area of HAS trade. The diversity of maintenance objects in the HAS industry results in different challenges. The challenge for manufacturers consists in communicating repair and product knowledge to the respective customer service organizations. Thus, training is provided for customer service technicians, telephone support for repairs is set up via call centres and technical documents are made available (paper or electronic form). The challenge for HAS businesses in the field of TCS is that they are obliged to manage products from different manufacturers and filter out the right information for certain repair situations from the abundance of information provided by manufacturers. The way the HAS trade works has changed from the

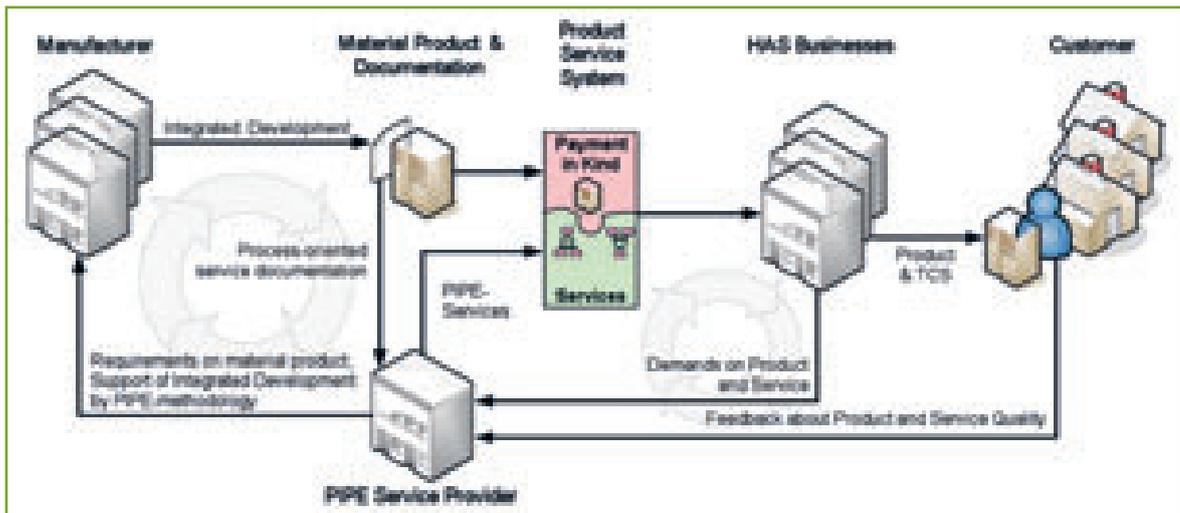
function-oriented division of labour to a more process-oriented view. The entire customer order process has become a main focus – especially in TCS. The customer service technician is responsible for carrying out his work correctly and identifying and procuring the spare parts required. Due to the rising complexity, the identification and optimum design of service processes has gained importance as well as the support of the TCS by mobile, internet-based information systems, which allow the customer service technicians to access the most current service information at any time and at any place.

The PIPE project provides solutions for the challenges described above. The PIPE project partners are: Institut für Wirtschaftsinformatik im DFKI; Universität Hamburg, Lehrstuhl für Wirtschaftsinformatik; INTERACTIVE Software Solutions GmbH; Vaillant Deutschland GmbH & Co. KG; Fachverband Sanitär-, Heizungs- und Klimatechnik Hessen und Mitgliedsbetriebe; Deutsches Institut für Normung e.V. (DIN). The Vaillant company needed support in the technical customer services by integrating industrial products and product-related services in the after-sales phase. In order to reach this goal, the PIPE project developed a process-oriented information system to support the working procedures of TCS engineers. The information system provides the TCS engineer with relevant service information for proceeding with the repair in a structured, multimedia-supported and interactive way on a mobile device (e.g. smartphone). The results provide a basis for new business and value creation models and supports product and service improvement.

Solution: Product Service System

The integrated development of physical product and service-relevant information clusters and the combination of both of these production factors to form efficient service processes available to

Figure 1: Hybrid added value with the PIPE concept



the TCS via mobile devices is addressed in the PIPE project. The main idea of the approach is to increase efficiency for the TCS in the machinery and equipment industry. To do so, a methodology for the development of Product Service Systems (PSS) was developed based on the integrated process-oriented examination of product development and service documentation and such a PSS was prototypically implemented using the HAS branch as an example. This approach is innovative due to the early coupling of product development, documentation, TCS, process consulting and modern information and communication technology, enabling the design of a PSS and allowing the creation of integrated process-oriented product and service information at the manufacturers with justifiable expenses and effort. The research results can be generally applied to the machinery and equipment industry and allow the "hybridization" of existing as well as future technical products.

The scenario in Figure 1 shows the result of the PIPE project for hybrid added value in the machinery and equipment industry. It can be seen as an extension of the status quo for the value-addition chain in the HAS branch. There are two cycles which contribute to the continuous improvement of the PSS. In the given scenario, Vaillant is situated in the manufacturer role and benefits from the improvement cycles.

Transfer

After the PIPE project, the scientifically supported prototype was advanced to a market-ready solution by former PIPE project partner INTERACTIVE Software Solutions (ISS). The market-ready solution is named INTERACTIVE Serviceportal. Under the umbrella of a Vaillant commissioned pilot project, an analysis of the economical application of the methodologies described above has been accomplished. The solution was presented to professional audiences – with positive feedback. Vaillant will introduce the INTERACTIVE Serviceportal under the name of "checkSOFT" into the market.

Detailed information on the methodology can be found in chapter six on page 44.

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4.2 Parken Zoo in Eskilstuna, Sweden



Parken Zoo in Eskilstuna Sweden is a zoo and an amusement park. It has roots going back more than 100 years, even though the attraction as it is today – with Zoo, amusement, dancing and evening events – started in the 1950's. In 1956, the Zoo had around 200 different species of animals. Today, Parken Zoo is one of Sweden's most visited attractions, even though the attraction has changed from an evening attraction to a day-time attraction for families over the years. As the focus has changed, so has Parken Zoo's business changed to meet the expectations of families (including camping and water park) and take an ever stronger responsibility in animal reservation. Parken Zoo is owned by the municipality of Eskilstuna and has a turn-over of approximately 8 M Euros annually.

Initial situation

Like many companies, Parken Zoo had a need to improve their attraction for their visitors, but the traditional market research methods and customer satisfaction research were insufficient when it came to giving guidance for the development of new offerings to enhance their pull on the market. One of the main challenges was that Parken Zoo did not have a unified perspective on customer and customer needs. Each department and probably all employees thought they knew and understood what the customers wanted and, as a result, development was neither addressed from a customer perspective nor with any guidance for customer-driven service innovation.

As Parken Zoo believed that customer attraction is essential to their business they were interested in developing processes for innovation that involved customers as well as customer expectations. It is increasingly suggested that involvement of customers as co-creators is a successful strategy to improve the success rate of new services.

In search of new ways to develop the offering, Parken Zoo looked for a process where the Zoo could learn from customers – not about them. This was a central question as knowledge and data were available about customers in the form of demographics and

attitudes. But this information did not give sufficient information on how the customer experience could be improved. What were customers really experiencing at the zoo – rather than thinking about the zoo?

By better understanding the customer needs and developing new offerings, Parken Zoo could better meet their business challenges to get customers to stay longer and spend more money in the zoo.

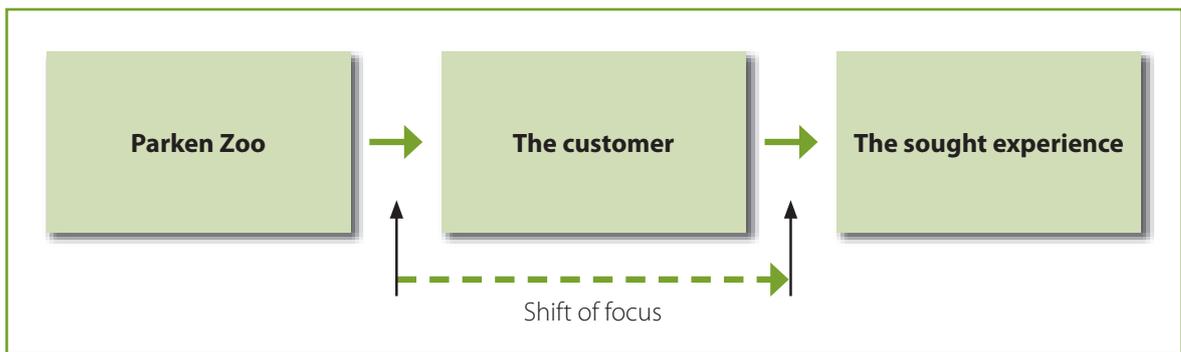
Solution – the KIT method

The KIT method was developed for use by practitioners especially for SMEs. The core of the KIT method is that ordinary users document their emotions and ideas in real time at the moment of truth. To achieve this, the method must be an open one. The KIT method shifts focus from the research of gathering information about the customer to information about the customer's intentions, sought experience as well as underlying hidden needs. The KIT process includes a step-by-step creative analysis that forms a map of users' "hidden needs". Innovation potentials are then generated by grouping together several hidden needs, which then form the basis for creating new and innovative service offerings.

The process of the practitioners' development work which resulted in the KIT method was supported by an ongoing communication and interaction with researchers about existing research focusing on the Service Dominant Logic (SDL) as well as research in the field of consumer psychology. From a research perspective, the study was also important as it contributed to the development of new research tools and estimates of the effectiveness of user involvement. The reported findings on how users perceive co-creation during new service development are of special importance in this context.

The zoo conducted a KIT investigation where 29 families with small children were given the task to co-create new ideas for future services. Participants were equipped with cameras and were asked to focus on emotions and incidents of interest and to use these situations as a means to come up with ideas for services that would improve the total customer

Figure 2



experience at the zoo. It was up to the participants themselves to decide what and how much they would document.

The 328 resulting situations and emotions described were then analysed by the practitioners according to the KIT analysis process, which resulted in service innovation ideas and concepts Parken Zoo chose to pursue a concept of “our family experiencing together”, which was typical for a hidden idea that would not have been discovered using traditional market research. The concept was subsequently developed and marketed the following year. Ordinary users were then invited to document their feelings and ideas in the same way, the spontaneous remarks from the participants confirmed that the new concept made the visit an enjoyable experience for the whole family together. This validated and thus strengthened the zoo’s strategy.

Project benefits

The goal for investing in the KIT method was to identify new business opportunities and to develop existing ones. The process gave new insights about Parken Zoo’s visitors and strengthened the strategic platform. The method was an important complement to traditional market research. By capturing customer’s needs in the right way and developing new services fulfilling these needs, the customers stayed longer and spent more money in the zoo.

The process also established a shared view of customers among the management and the employees at Parken Zoo. It also provided a solid and common base of information concerning the customer and the customers’ expectations, to develop customer-oriented offerings from. In establishing a

process for customer involvement and co-creation, Parken Zoo got a new way to understand the essence of the visit as well as a focused approach that helps the organization avoid unnecessary investments, which are off track and would not yield any benefits or income.

Detailed information on the methodology can be found in chapter six on page 48.

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4.3 Zwick, Germany

Zwick GmbH & Co. KG is that medium-sized family-run company based in Ulm that operates throughout the world and manufactures systems for materials and component testing. Over 800 employees work in three different divisions. The Series and Project division are responsible for the manufacture of testing machines and devices. Within the Service division, modernizations, spare parts and additional accessories as well as all kind of customer support products, e.g. calibrations, repair works, trainings are handled. Today around one third of the total turnover is generated in this Service division. In 2010, this figure was 35 million Euros out of a total turnover of 118 million Euros.

Initial situation

The Zwick management recognized how important services are for the further successful development of the company. For that reason, concrete solutions were identified at Zwick to anchor the formal concept of equality between services and products more



deeply in the company culture and in the minds of the employees and in this way further increase sales success. The cooperation between Zwick GmbH & Co. KG and the Fraunhofer IAO concentrated on the interaction between Sales and Service. There was firstly an analysis of the strengths and weaknesses based on the results of a series of interviews conducted by the services experts from the Fraunhofer IAO.

Solution: ServLab simulation

In a ServLab Workshop at the IAO in Stuttgart, concrete steps were identified on the basis of these findings regarding how the interaction between the two sectors could be improved. Initially, some critical situations in customer contact were identified in the ServLab from the perspective of Sales and Service and these were consolidated into six concrete scenarios of differing complexity. On the basis of this, different service settings were visualized in a 3D model (e.g. special machines found at a customer company locally). In addition, prototypical personality profiles of customers, service technicians and sales employees

Figure 3

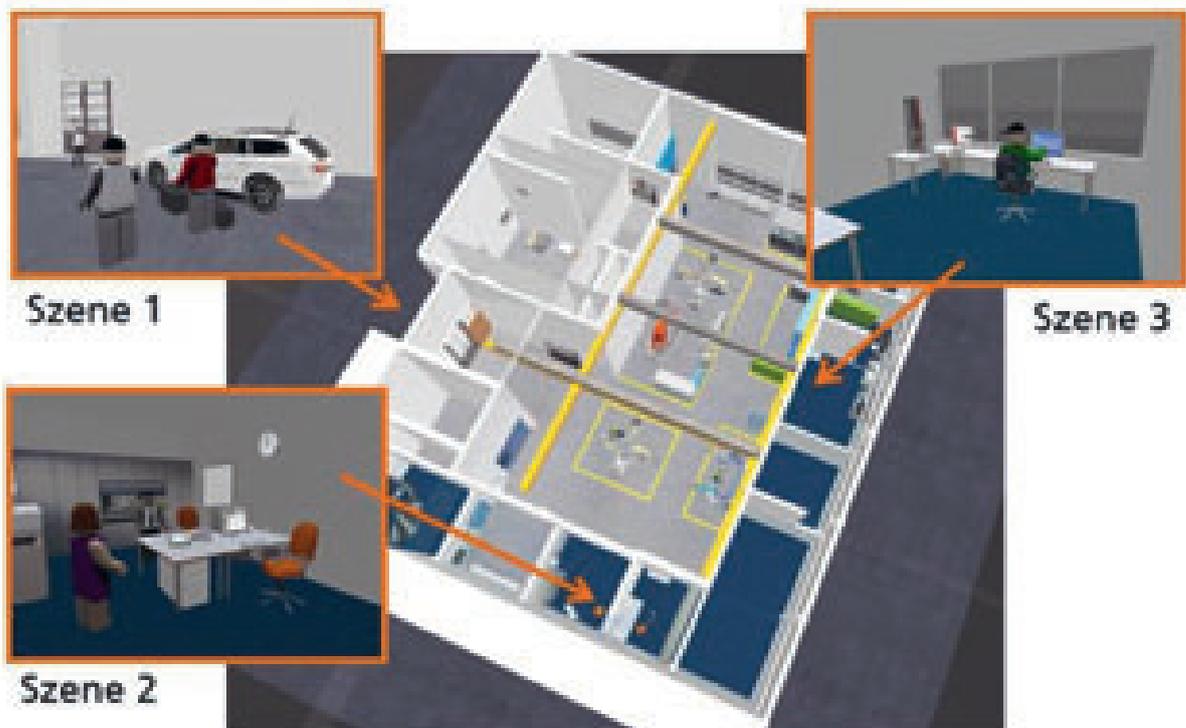


Figure 4: Scenes from the ServLab workshop



yees were described (including but not limited to their expertise, views about work, current emotional state and many more). The scenarios were simulated in the ServLab with the aim of creating a common development of behaviour strategies in critical service situations and of promoting a mutual understanding through changes in perspective within the scenarios.

Transfer

Countless findings could be gained from this and made fit for purpose. On the basis of these results, joint working meetings will be held in the future between sales employees and service technicians. As part of the measures for increasing the expertise among sales employees as well as service technicians, there are not only product training courses but also 'soft skill' trainings within the framework of the company training program so that the wishes of customers can be identified and satisfied more quickly, more comprehensively and to a higher quality level. A further beneficial result is the recognition of how important the appearance of the Zwick employees is in the perception of the customers and for the acceptance of their services. The question about service satisfaction will now be asked directly after a repair performed so that the effects can be observed more systematically in the future and reactions to customer requirements can be initiated more quickly.

The systematic work in the development of services and in the ServLab seems to have been crowned with success very quickly at Zwick GmbH & Co. KG. It is the aim of Zwick to win a calibration contract from customers within 15 months of delivery for 70 percent of

the newly delivered testing machines from the Series division. This figure may seem to be very ambitious, since in 2008 there were calibration contracts for only 30 percent of these machines. But now just three years later the result has more than doubled and the figure is already 65 percent – an impressive sign of how the findings developed can contribute to the creation of higher added value.

Detailed information on the methodology can be found in chapter six on page 45.

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4.4 MT Unirepair, Netherlands

MT Unirepair's main company's object is to repair, integrate and take care of logistics on a high quality level. MT Unirepair reduces the complexity of handling multi-vendor products by focusing on one central point of contact and services integration. This provides strong added value for the clients. Having MT Unirepair take over repair, refurbish and logistic activities creates less complexity in the processing and development of their customers' activities, who can therefore remain entirely focused on the main business. As a flexible organization, MT Unirepair is a high-speed, high-quality and decisive ICT partner, whilst utilizing some unparalleled strengths where required.

Initial situation

Everyone is familiar today with barcodes. Nowadays, everything in life is tagged from the very beginning. There is a barcode in any direction you look. Many of you even carry a barcode reader in your pocket. Without barcodes, lots of processes would fail and eventually stop the world from turning. From production plants to retail stores, from small envelopes to large pallets, when travelling by road, boat or airplane: these small codes open all doors for all kinds of applications.

Originally, MT Unirepair repaired spare part products of Memorex Telex (an international company providing information technology solutions including the distribution and integration of data network and storage products and the provision of related services in 18 countries worldwide) and took care of its stocks replenishment. Therefore, unique product identification was not required. But as time went by, more and more customers were acquired, bringing in the same type of parts. This required a major change in the parts handling process. It had to be ensured that parts would be shipped back to their original owner and not only to the main stock anymore. Adding a unique identification (serial) number to each product created a perfect system of traceability of all items.

The use of these serial numbers was introduced gradually, starting with some tests and examples and once the many advantages became obvious, it was fully implemented throughout the entire company for all incoming products. As of then, the handling,



repair, distribution and follow-up of the full process per item was raised to a new level.

Solution – Barcode advantages

The barcode has been around for many years, already largely applied in the business field. It allows the use of small, yet easily readable labels, reducing the risk of reading or typing mistakes. Scanning barcodes provides immediate access to computer data applications, thereby increasing efficiency and lowering the usage costs. MT Unirepair's application enables for each part to be followed-up in its every move and inform at which stage of the process it currently is. In order to obtain and enhance the quality of the process, all repair actions are fully documented, including replaced components if any. This information is turned into statistical reports, available to the customer.

Transfer – Customer satisfaction

What keeps a company on the market? Customer satisfaction! Using the bar-coding system, MT Unirepair has been able to improve the quality of the service it provides to its customers, providing valuable insights. Satisfied customers are often willing to pay for premium service. Satisfied customers are the best company reference in order to gain more market share and develop the business. The bar-coding process helped MT Unirepair to achieve these goals while keeping costs on a reasonable level.

Detailed information on the methodology can be found in chapter six on page 49.

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4.5 Process Vision, Finland

Process Vision is a leading provider of energy IT systems in Scandinavia and Central Europe. The company, founded in 1993, is dedicated to developing and supplying business critical IT systems to deregulated energy markets. Customers range from international energy exchanges and national system operators to local energy retailers and network operators. Process Vision's product portfolio offers solutions to all energy data management needs, regardless of the customer's market role or utility. In total, the company has over 300 customers worldwide.

The continuously growing company employs around 160 people in several locations: Helsinki, Jyväskylä and Kuopio (Finland), Stockholm (Sweden), Bussum (The Netherlands) and Fehraltorf (Switzerland). In addition, the company has a local system integration partner in Germany.

Process Vision became a part of the Norwegian Elis Holding Group in March 2011. This new entity forms a company with 260 employees and revenues amounting to 30 million Euros in 2011: a major software supplier in the Nordic energy sector as well as in Central Europe. This merger strengthens Process Vision's operations and product range in its current business areas.

Initial situation

Since the year 2000, Process Vision has been developing its GENERIS product for the information management needs of the energy sector. Today, GENERIS is a proven solution covering all the key business processes of energy companies. The GENERIS system can be deployed for electricity, gas, district heating and district cooling companies for measurement and contract management, balance settlement, market communication, internal reporting and billing.

Process Vision customers have been mainly energy companies, but in the future the company aims at widening its clientele to cover all energy consumers. Web-based electronic services are becoming common and the European Commission has set a target for Europe to become one of the forerunners in the development of intelligent, internet-assisted infrastructures and European customers and citizens should utilize the new solutions and services as ear-

ly adopters. At the same time, the debate on energy efficiency and reducing emissions is lively. All this has increased citizens' energy awareness. Intelligent energy information systems can help people to save electricity and even produce it in the future.

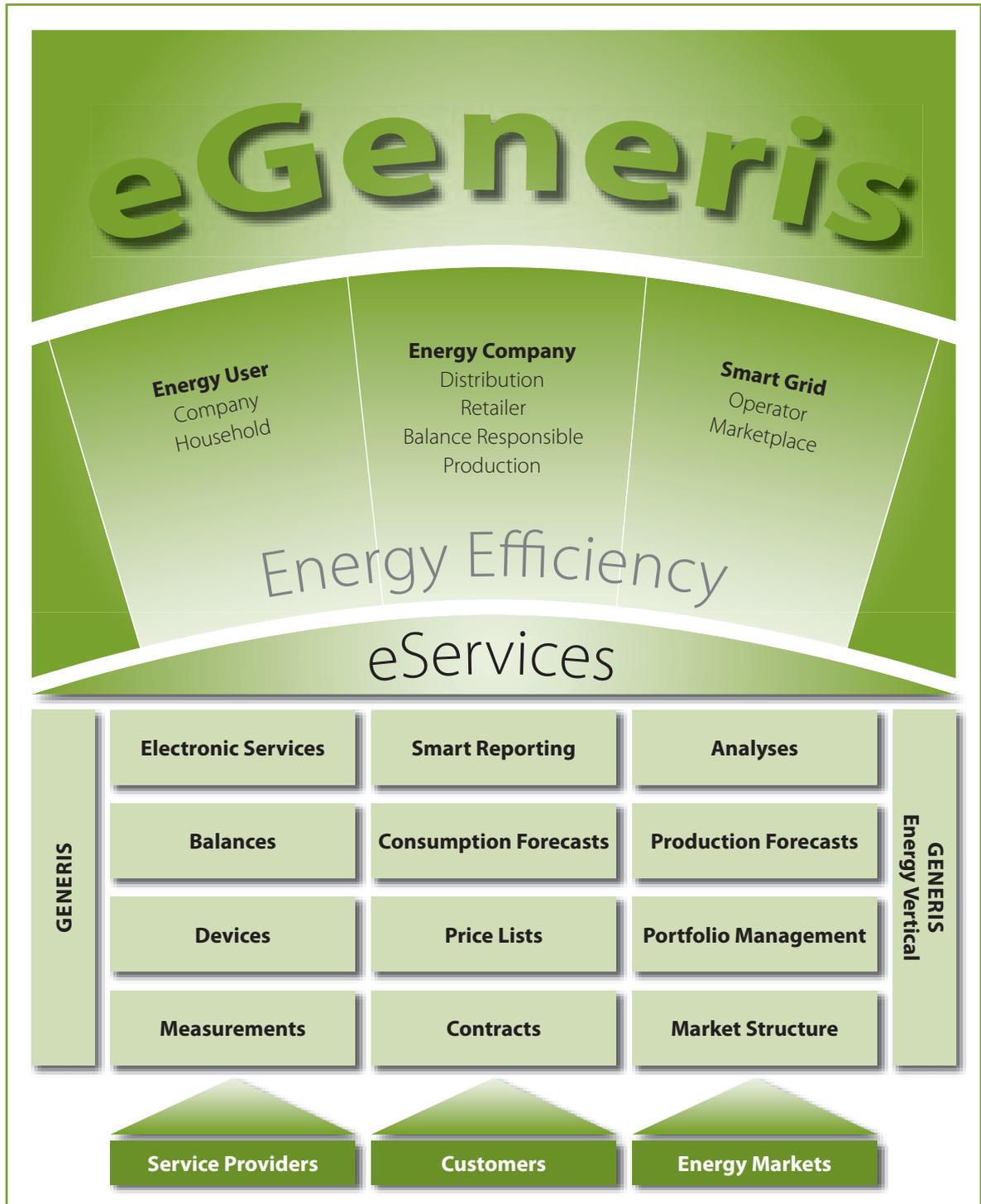
Process Vision has tentatively analysed the market and identified energy sector e-services based on the GENERIS system as one of its strategic growth areas. Based on this, the company has started a research and development project to build a new e-services platform called eGeneris. The project responds to many current societal challenges, such as the development of service business into the global market as well as the development of tools and services to maximise energy efficiency and to combat global climate change.

Project partners are private consultants, Metropolia University of Applied Sciences, Aalto University.

Solution: eGeneris

In the eGeneris project, a business model and technical prerequisites are developed for a new service concept. eGeneris provides energy consumers with consistent and timely information on their complete energy usage covering electricity, gas, district heating, district cooling and also water. eGeneris gathers the information from energy producer, distributor, reseller and consumer in one place. It offers a comprehensive e-services platform with a user-friendly interface for the needs of all market parties, service providers and different end user groups, and fulfils the consumption reporting and e-services requirements mandated by legislation and energy sector regulations. Using the eGeneris service, the individual consumer gets information about his electricity, gas, district heating, district cooling and water consumption in a consistent and timely manner. In this way, the system increases consumers' energy awareness and helps consumers to control their energy consumption. For the energy companies, the new eGeneris services automate many phases of energy data management and customer services, which have earlier required manual work.

Figure 5



The research and development project was started by defining the target markets and businesses for the new service. After this, a general framework was built for the portal of web-based services as well as reporting models for energy companies and end users. The focus of the project was on the development and testing of a pilot solution and a service concept for the customer interface. The pilot solution was implemented in co-operation with an energy company, a housing company and some private persons. Customer needs for this kind of new eService are just evolving, which made the evaluation of service benefits for end users an important part of the project. In addition to the feedback on the portal functionality, the pilot project provided important information on the service usability, the benefits users got from the service and the needs of the users for the service concept.

The biggest challenge in this project was to identify the readiness, needs and willingness of the end users to control their energy consumption in the future. In a user-driven part of the development project, an analysis was made to find out how easy-to-use, end-customer targeted e-services would increase the energy awareness of the public. In this part, the project is connected to the EU-funded Apollon project, in which researchers from Aalto University study user reactions and behaviour related to energy use in five Living Labs. The assumption is that the added value for the users can be found in flexible and user-friendly ways to control their energy use and energy efficiency.

Transfer

Process Vision has participated in many EU projects, from which the company has gained insights about the future of the energy business. The experience from these EU projects has been used in the development of the company's business models. The company has also listened to its customers very carefully. Wide clientele and multiyear partnerships have provided a solid basis for a comprehensive understanding of customer needs.

The eGeneris development project produced a lot of new knowledge and it has also wide-ranging effects. The project also examined new portal techniques, user needs for e-services, new methods to manage big volumes of data over internet, new activities to save energy and a new business model. There is a need for eGeneris solutions as more and more energy information becomes available and the need for efficient use of energy increases.

The outcome of the eGeneris project was a new productized e-services platform for Process Vision for its current and new customers in Finland and especially globally. The energy market is in constant change, and with this new e-services platform, Process Vision is better able to take its share in the developing markets.

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4.6 W M A Schmidt & Bittner GmbH, Germany



W M A Schmidt & Bittner GmbH is a successfully operating company for development, production, sales, distribution and service of resistance welding machines and spot welding electrodes. The products are used for sheet metal joining technology. Customers are internationally operating production or service enterprises within the machinery and automotive industries. WMA is located in the south-west of Germany between Stuttgart and Heilbronn in Ilsfeld-Auenstein and was founded in 1969 as a trade organization. WMA has about 30 employees and is certified according to ISO 9001 standard. This example will show some aspects of a change from a pure service provider to a system provider organization.

Initial situation

WMA started as a service provider and trade partner without any production and development facilities. In response to specific customer requirements, a production department was implemented in a first step and a development department in a second step. Setting up a development department within a small enterprise is a challenge, because only little development competence was available in the beginning.

Solution

Several activities were needed to manage the change from a mere service provider to a system provider. In the first run, the recruitment of competent personnel was an important issue. After this, the implementation of a new product development process, a new IT infrastructure, a regulatory framework, additional methods and an adequate service organization had to be faced. In the starting phase of development, the main work was not very complex. Often drawings had to be adjusted. Since the load was not stable, experienced part-time construction engineers were involved. Since work became more and more complex, an experienced full-time engineer is now coordinating the work. The right mix of competence in terms of qualification and experience is important. Especially when complex machinery is developed or modified nowadays, professional skills and expertise are necessary not only within the area of machine

construction but also pneumatic, electro-technical and electronic expertise is needed. If some specific competence like software development is required, external experts are subcontracted, but proper supervision and coordination is needed. Today, a pragmatic matrix is reflecting current competencies and future needs.

The company was already certified according to ISO 9001 without development. The next step was to implement a specific development process similar to the descriptions of the other processes which were already in place. Since WMA is a traditional service provider which responds very flexibly to customer requests, it was decided to document the processes visually on a high level (Figure 6). Internal and external inputs like requirements trigger activities which produce outputs like specifications. Main objectives and roles of the process have been defined. Relevant characteristics, needed resources and important records are maintained. Appropriate control activities help to fulfil objectives also under difficult situations. This process documentation gives a good overview and is an element of a process landscape where relevant interfaces between other processes of the company can be visualized. If necessary the activities of the process can be detailed in a flow chart or a blue print diagram.

The IT infrastructure was built up in several steps. A small ERP (Enterprise Resource Planning) System was implemented for customer interaction, order administration and production planning. Appropriate CAD (Computer Aided Design) software was brought in for the development of machinery and electro-technical equipment.

EU directives to ensure safety for end users are demanding CE conformity for each newly developed or modified machine. Within larger enterprises there are competent specialists dealing with this type of issues on a daily basis. Within an SME environment, the situation must be adapted in a pragmatic way. Such a process includes a seven step approach for two types of different machines: Documentation, applied standards, review of the life cycle, risk analysis, quality plan with records of verifications, user documentati-

Figure 6: 9D process overview of the development process



on and declaration of conformity; see separate chapter for further details.

Service providers as well as production enterprises are used to working and thinking in terms of processes. When it comes to development, system integration and similar work, the organization has to add a project management approach. This shift is a very complex one, especially if customers are not only present when the contract and the acceptance record are signed but also during the complete process. In such a situation, objectives are changing during the whole process. Here, a good mix of process, quality, project and customer oriented service management is an important methodical competence.

WMA provides technical and commercial services during different phases of the customer life cycle. Technical services within an implementation phase are assembly, installation, acceptance test, training and application support. During the operating phase of the machines, services such as inspection, maintenance, spare parts and repair services are available on a per-call or per-contract basis. The services can be delivered on site or off site. If required, update, upgrade or development services are offered. Commercial services such as renting or hiring services are available to overcome a temporary shortage of resources.

Transfer

Customers are demanding more individual and flexible solutions. Besides services, production, engineering competencies and methods are needed which are adapted to specific SME needs. Such tools may help to support service innovations also for other SMEs.

Detailed information on the methodology can be found in chapter six on page 45.

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4.7 Kalevala Koru, Finland

Kalevala Koru (www.kalevalakoru.fi), founded in 1937, is one of the largest jewellery manufacturers in northern Europe. Two strong brands of the group, Kalevala Koru and Lapponia Jewelry, together had a turnover of 22 million Euros in 2011, 80% from domestic trade. Both brands are well-known for their Finnishness: the company manufactures all its jewellery in Finland, and 98% of the personnel of 210 work in Finland.

Traditions and present day are integral parts of the production and design of Kalevala jewellery. The main materials are gold, silver and bronze. The company favours materials that have their origin in Finland. Traditional handicraft and high technology are combined in the production of jewellery; also nano-tech is used.

Kalevala Koru design is rooted in Finnish culture. Over 90 % of the company's turnover comes from modern jewellery design. The company cherishes its strong brand in all its activities from sales to production and marketing. According to recent research, Kalevala Koru was the 11th most valued brand in Finland in 2011. According to another research report, Finnish consumers rated Kalevala Koru as the 4th most responsible company among the most valued Finnish brands.

Initial situation

Kalevala Koru has gained merit in many fields: in branding, in marketing, in cultural co-operation and in social responsibility. During the past few years, the company has taken its first steps to turn from manufacturing and wholesale business to service and event business. The company has arranged company visits, work demonstrations, web services, jewellery guidance, customer events, training, exhibitions, maintenance service, etc. Still, its business logic has been the logic of a manufacturing and wholesale company.

Kalevala Koru is set to build a complete event industry concept on the basis of separate services. The service offering is developed, but also the business logic and earnings model are renewed; customer and service centred thinking is central to the entire value chain. The new concept includes, for example,

consumer participation in designing jewellery collections, meeting designers, and developing jewellery culture future. Communication channels, shops and procedures are developed to support interaction and service situations.

The new service concept of Kalevala Koru is important both to its domestic trade and to exports. Helsinki is the World Design Capital in 2012, and this special national and international focus of attention encourages design companies to introduce new openings and interesting business concepts, which can complete the value of design contents. Development of design, as such, demands active development of design business as well as to bringing designers together with their wider audience.

Project partners: Aalto University School of Arts, Design and Architecture, Aalto University School of Economics, Aalto University School of Engineering, University of Vaasa, Haaga-Helia University of Applied Sciences, service design experts.

Solution: From a manufacturing company to a service and event business

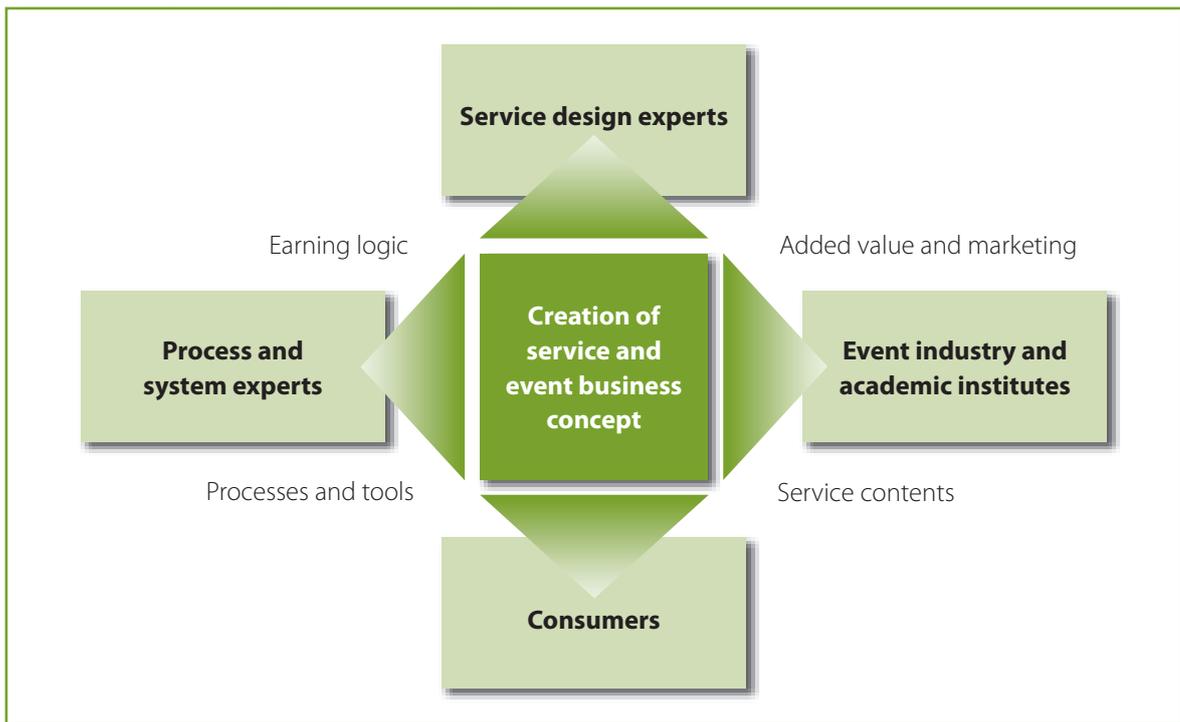
Kalevala Koru builds a comprehensive service and event business concept which consists of b-to-b and b-to-c entities. The service palette includes services to companies and other organisations as well as to individual consumers.

The research and development project of Kalevala Koru includes many-sided background analysis, planning, implementation and experimentation of a service and event business concept. The project is carried out in co-operation with various partners: with service business, process and system experts, as well as with other actors in event industry with whom Kalevala Koru has co-operated in e.g. movie, sports, fashion and exhibition projects.

The project has three phases:

1. In the first phase, market research is done on the main target segments, focusing on the needs and business potential in different segments. In addition, the needs and possibilities for service co-operation are mapped out among various actors in event industry and academic institutes, and potential consul-

Figure 7: Co-operation partners in the project



tants are identified for the next phases of the development project.

2. In the second phase, a service and event business concept is developed with the assistance of partners chosen during the first phase. The concept consists of services, networks, processes, standards, channels and the earning logic. The functionality of the various components of the business concept is improved with various target groups and event network partners.

3. In the third phase, the service business concept and the co-operation network are finished, and the service and event business, its concepts, processes, channels and separate services are piloted, and the basic functionality of the new concept is validated with customer feedback.

Transfer

Service and event business concept supports the manufacturing and wholesale functions of Kalevala Koru, and becomes a part of its business strategy. The primary innovation is the advanced service offering of Kalevala Koru. In addition to the jewellery, the company can provide a wide range of service products to its customers. The project has also indirect but notable elements for business renewal. The

organisation and the organisational culture are transformed from a planning and production entered way of thinking to a customer, user and service centred mode of action. The value chain is developed by bringing production and sales functions into closer co-operation with consumers, other event industry as well as with academic research on service design and consumer behaviour. The customer interface is renewed with new interactive and participatory services and modern communication channels.

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“The world of electronic components distribution is defined by constant changes for our customers, our suppliers, and of course for us. Globalization and supply chain economics will further influence our market environment, which now more than ever demand focus, clear direction and flawless execution. We, as a semiconductor specialist, are being asked to provide in-depth application support, value-added services and logistics solutions to a diverse customer base. EBV Elektronik will embrace these challenges as we take advantage of our strong position within the electronic components industry and our highly skilled and motivated employees. Changes can be an opportunity, but only if we take an aggressive position. The success of 43 years in our company’s history proves that EBV was and is able to respond in the right way to future challenges. Our goal is to meet and exceed the needs of our customers and vendors like never before, providing access to a new level of resources in technical expertise and supply chain solutions. Don’t expect anything else from us than the best-in-class service in semiconductor distribution.”¹

¹ www.ebv.com



Initial situation

EBV Customer Support is a department with about 30 employees providing several order administration services within an international environment. The guiding theme of Customer Support: Our job is excellent service. The mission: For our customers we are fulfilling orders in a reliable, effective and efficient manner. The vision: Customer Support is the first partner for sales and customers regarding order and logistic related questions. On the one hand, the existing reporting was not fully applicable to reflect the company’s actual objectives. On the other hand, a lot of current and historical information was available for some relevant service areas, but not for all. The following challenges were identified:

- Different types of data analysis and interpretation were in place.
- Information was segmented, no systematic overview available.
- The information was not presented in a comparable and visual manner.
- Root caused chains were not transparent.
- Interactions between different functions and processes were unclear.
- The objective was defined to set up an integrated controlling system with a Balanced Score Card approach.

Solution

For a solution, the team looked for alternative guidelines, methods and tools of high-tech service management. EBV decided to use Quality Function Deployment (QFD) in a first phase and Balanced Score Card (BSC) methodology for the second phase. Both methods were adjusted for specific service management needs. About 25 key performance indicators (KPIs) were defined; most of the historical information was available. Some of the missing information could be collected with limited effort, e.g. regarding sales satisfaction. For the missing rest, measures were defined to collect and analyze the information in the near future. An innovation KPI was implemented within the management perspective as a measure of how many transactions can be done automatically with the IT infrastructure without any manual interaction. One result can be seen in a Service Balanced Score Card (SBSC) diagram. With this systematic approach, former weaknesses of management reporting were solved and customers can rely on EBV's service excellence, since relevant requirements are now reviewed on a regular basis.

Transfer

The benefit is a systematic, integrated and transparent management reporting approach where key performance indicators (KPI) are clearly mapped to customer requirements. It is compatible with ISO 9001 requirements and can easily be adapted for similar applications.

Detailed information on the methodology can be found in chapter six on page 47.

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5

Knowledge Transfer in Service Business Development

Knowledge has long been argued to be one of the main sources of the competitive advantage of firms (Conner and Prahalad, 1996; Grant, 1996). Services require a high amount of knowledge transfer between firms, since knowledge is mostly embodied in people, and providing services requires more adaptation than does producing products. Therefore, there must be more customization and more knowledge exchange between service firms and their clients (Lindsay et al., 2003).

Strong evidence is accumulating that transferring knowledge from external sources has become central to firm success: Knowledge transfer increases firm performance and innovativeness (van Wijk et al. 2008).

The nature of service business development

Services have come to dominate economic activity by businesses across most industries. We need to understand what drives and renews the development of service business done by firms in both the service and manufacturing industries. We refer to "service business" as an organization's activity aimed at selling services (i.e. service offerings) directly to customers. These customers may be end users (consumers) or other firms and organizations as part of a larger value chain. Goods manufacturers can also perform service business, for example, by creating a sub-division devoted to service provision or by providing services in conjunction with their product offerings. The nature of service business is fundamentally different from the traditional business of trading goods because services have a number of characteristics that affect both the production and trade of services.

According to Edvardsson and Olsson (1996), services consist of three basic components: Service concept, service process and service system. The service concept includes the basic idea of the service as well as its basic content and structure. The service process describes the chain of activities to be carried out as well as the roles of the provider and the client. Finally, the service system constitutes the resources required, including sub-components such as the company's staff, the physical/technical environment and the organizational structure. Any one of these different components and their sub-components can be changed in the process of new service development.

To understand renewal in services, and its relation to knowledge transfer, we provide here a concrete list of sub-components based on Edvardsson and Olsson (1996) paper (Figure 1). Each of these sub-components can be targets of renewal in the three categories of basic components (Toivonen and Tuominen, 2006; Toivonen et al., 2006).

According to our view, the service concept includes not only the basic idea and structure of the service, but also the basic prototype of the service process and the type of resources used. These factors provide customers with the benefit promised in the value proposition. It is important to note that the boundaries between the categories are not clear-cut in development processes, nor do they designate specific phases of an innovation process. In reality, the service development is fuzzy and the process may start in any part of a service (see Figure 1).

Gallouj and Weinstein (1997) argue that the service's final characteristics are a combination of its multiple competencies and technical characteristics. According to them, service innovation is always an incremental change either in the competencies, technical

Figure 1: Possible targets of renewal in a service product

Service concept (basic structure and market qualities)	Service process	Service system (resources and infrastructure)
<ul style="list-style-type: none"> ● The elements of the service ● The status of different elements (core vs. supplementary elements) ● Discernible outcomes ● The relationship of this service to the firm's other services ● Pricing ● Markets (customer groups) 	<ul style="list-style-type: none"> ● Stages of the process ● Roles and tasks of the service firm and the client ● The nature of the client interface (e.g. personal vs. electronic delivery) ● The nature of the service relationship (e.g. single transaction vs. partner relationship) 	<ul style="list-style-type: none"> ● Technology ● Non-technological tools, models etc. ● Organization ● Competences of the service firm and the client ● Sub-contractors ● Physical environment

characteristics or both. In the model by den Hertog (2000), a service consists of four dimensions: 1) service concept, 2) client interface, 3) service delivery system and 4) technology. These dimensions are seen together with organizational capabilities, Human Resource Management (HRM) capabilities and marketing and distribution capabilities. The socio-technical service system describes the resources available for producing the service. Value creation is affected greatly by the competences and skills of staff as well as their motivation and well being.

From these three major conceptual models of services, it becomes clear that creating, developing and offering services require distinct service business capabilities that are different from traditional goods-based businesses. When focusing on service business, the appropriate unit of exchange is no longer the static and discrete tangible good, but more the application of capabilities, or specialized human knowledge and skills, for and to the benefit of the receiver (c.f. Vargo and Lusch, 2004; 2008).

According to service dominant logic (Vargo and Lusch, 2004; 2008), a service innovation is the creation of an offering not previously available to a firm's customers that requires modification in the set of capabilities of the service provider and/or its customers (see also: Menor and Roth, 2007; Ordanini and Parasuraman, 2011). Therefore, the creation of new or improved service business capabilities can be an important source of service innovation.

Knowledge and knowledge transfer in services

According to the resource-based view of the firm, the competitive advantage of a firm is based on the resources it utilizes to create new markets (Barney and Clark, 2007), and knowledge is considered among the key resources. This is different from the market-based view, where competitive advantage is based on studying the markets and responding to demand. It must be noted that the distinction between the two views is theoretical – in the real world, the firm succeeds in competition by taking both market-based and resource-based views into account. However, taking the ideas of the resource-based view of the firm as underlying assumptions provides a focus on capabilities and firm-level knowledge in value creation. The resource-based view also gives a freedom to presume that the firm that is able to manage its capabilities will also be able to create its own markets.

The knowledge-based view considers the firm as a collection of routines that is the aggregate of the individual's skills; therefore, the possession of knowledge is an attribute of the firm as a whole and the firm's aggregated knowledge base is not possessed by any single individual in the company (Nelson and Winter, 1982). This means that even if key individuals leave the organization, the knowledge base does not walk away at the same time.

A firm's knowledge includes many phenomena, like routines, practices and technologies (Rerup and Szulanski, 2004). Knowledge is being frequently divided into explicit and tacit dimensions. Explicit knowledge is knowledge that can be codified in a written form as manuals, blueprints and books. Tacit knowledge cannot be codified; it is the internalized skill of performing activities, for example riding a bicycle. The knowledge-based view of the firm highlights the role of tacit knowledge, because it is fundamentally the source of innovation in knowledge creation (Nonaka and Takeuchi, 1995).

Knowledge transfer is "the process through which one unit (e.g., group, department, or division) is affected by the experience of another" (Argote and Ingram, 2000, p. 151). Examples of mechanisms that transfer knowledge from one service firm to another, or between intermediaries, universities and firms, are research projects, executive education, benchmarking workshops and individual knowledge brokers such as researcher consultants.

Service business capabilities and underlying knowledge

The essence of any organizational capability is the integration of an individual's specialized knowledge (Grant 1996). Knowledge as such does not function as a source of competitive advantage for firms, but it is rather the use of the knowledge that matters. Also, if knowledge is only held at an individual level, then firms could transfer it simply by changing employees (Kogut and Zander, 1992). Each company in the market is different in terms of specialized knowledge (Grant 1996). These differences have implications for a firm's innovation activities (Leiponen, 2006). Therefore, it is impossible to define the exact knowledge bases that are behind service business capabilities in an industry, not to speak of individual competencies. Even company executives are not aware of the exact capabilities that ensure the firm's success.

Instead of strictly defining key capabilities, it is possible to build hierarchies of capabilities to define certain higher-order integrated sets of knowledge that are common for all firms in the same industry. The service business capability that matters is in fact a capability to integrate multiple knowledge bases related to the service business.

An everyday example of the challenge of defining the knowledge base behind a capability that results in competitive advantage is thinking about why some companies are better than others. We know that a company that buys inputs cheaper than its competitors and sells products or services in the market at a higher price survives best. Success may seem easy, but it is impossible to define and transfer the exact reasons behind it. However, it can be roughly defined that some companies have superior sourcing, sales or human resource functions compared with others. But the underlying reason for the success of the sales function in a company remains hidden. In other words, when defining the knowledge bases of service business capabilities, we have to rely on outcome measures and try to figure out which factors affect desirable outcomes.

Despite the obvious hardships of defining and measuring the exact service business capabilities that lead to success, studies have stated the relevant knowledge bases in services. These state that if a company takes care of the knowledge related to these issues in the business, the outcome of the business will be better.

Management consulting companies represent archetypal knowledge-intensive firms (Werr and Stjernberg, 2003), since their knowledge sold to clients is produced with knowledge, using knowledge as a resource. In management consulting, service capabilities are built on complementarities between explicit knowledge, in the form of methods, tools and cases, and personal tacit knowledge in the form of the consultants' experience. After interviewing the two largest multinational management consulting companies, Werr and Stjernberg (2003) conclude that there are three common interacting knowledge elements that constitute service capability in a management consulting firm: Methods and tools, cases and the experience of individual consultants.

Empson (2001) (see also Alvesson, 1993; Lowendahl, 2000) identified two types of knowledge in professional service firms: Technical knowledge and client knowledge. Technical knowledge is related to a certain field, embedded in the organization or in an individual. Client knowledge is context-specific, namely the general understanding of the particular industry, detailed knowledge of a specific client firm and personal knowledge of key individuals within the client

firm. Agarwal and Selen (2009) grouped service business (dynamic) capabilities into four groups: Customer engagement, collaborative agility, entrepreneurial alertness and collaborative innovative capacity.

Figure 2 summarizes some of the knowledge bases of service firms presented in the professional service literature.

Figure 2: Knowledge bases in services based on Werr and Stjernberg (2003) and Empson (2001)

Knowledge base	Description	Use
Methods and tools (Werr and Stjernberg, 2003)	General description of methods and how-to guides	Providing a common language and knowledge structure in planning and executing consulting projects
Cases (Werr and Stjernberg, 2003)	Documents produced in projects e.g. process maps and proposals	Carrying knowledge in a narrative form to obtain examples and inspiration from previous projects
Experience of individual consultants (Werr and Stjernberg, 2003)	Individuals' experience of previous consulting tasks	For the adaptation of methods, tools and cases to the specific consulting project
Technical knowledge (Empson, 2001)	Sectoral (generic), organizational (firm-specific) and individual (proprietary to each professional) forms of knowledge	Forms the prerequisites for value creation
Client knowledge (Empson, 2001)	Context-specific understanding of particular industry, detailed knowledge of a specific client firm, personal knowledge of key individuals in a client firm	Is used in implementing the technical knowledge for client projects
Customer engagement (Agarwal and Selen, 2009)	Loyal and committed customer base	New opportunities for innovation; resource for innovation
Collaborative agility (Agarwal and Selen, 2009)	Swift interactions with customer, orchestration of internal operations and use of external partners	Respond to changes and transform organization quickly
Entrepreneurial alertness (Agarwal and Selen, 2009)	Discovery of new opportunities	Explore the markets, detect current and future market threats and opportunities
Collaborative innovative capacity (Agarwal and Selen, 2009)	Ability to come up with innovative ideas	Capture ideas and execute them
Collaborative organizational learning (Agarwal and Selen, 2009)	Deliberate learning efforts in the organization	Articulate and codify collective knowledge

Barriers of knowledge transfer between service firms

It has been noted that learning in services is slower compared with learning in manufacturing (Darr et al., 1995). Besides the characteristics of individuals (whether they are willing to share their knowledge), the factors that potentially make service knowledge transfer less efficient compared with technology transfer are related to the characteristics of the organization (whether the service is based on specialization or standardization) and the nature of the demand function (whether the demand is predictable or not).

Although service business knowledge is not embedded in technology as much as in manufacturing, there are certain key technologies that drive knowledge transfer in services (Grosse, 1996). Service businesses such as advertising, banking, computer software, hotels and consulting use certain key technologies, such as SAP. The knowledge in certain services may thus be related to the use of key technology – but then it might be wise to talk about the transfer of service technology instead of that of service knowledge (Gopalakrishnan and Santoro, 2004).

What hinders or even prevents knowledge transfer between service firms? One of the most often used explanations relates to the capacity of the receiver of the knowledge to understand and assimilate external knowledge – the absorptive capacity of the receiver, a term popularized by Cohen and Levinthal (1990).

The idea behind absorptive capacity is that the ability of a firm to absorb new knowledge is affected by the stock of knowledge that it previously held. It is thus easier to learn new things when there is an existing knowledge base (Cohen and Levinthal, 1990). Lane et al. (2001) note that absorptive capacity is a broad concept that includes 1) understanding external knowledge, 2) assimilating it and 3) applying it commercially.

According to Szulanski (2005), barriers are related to the hardships of exploiting existing knowledge. According to him, two factors affect the successful exploitation of knowledge: 1) causal ambiguity and 2) the stickiness of knowledge. Causal ambiguity is uncertainty related to whether a process or capability invented in one place and time can be successful in another place and time. The factors explaining why a capability works cannot be precisely determined, which makes it inherently ambiguous. According to Szulanski et al. (2004), causal ambiguity is related to many uncertainties on how the source of knowledge is able to produce superior results but is unable to communicate the capability, or template as they call it, to the recipient.

For von Hippel (1998), knowledge is context-dependent and thus difficult (or sometimes impossible) to transfer (“sticky” knowledge). In professional services, knowledge used in problem solving is local and tied to the service process. Stickiness can also be related to the transfer process in addition to the quality of knowledge – certain units of knowledge may be easy to transfer in one situation but difficult in another. Reasons for stickiness in the transfer process relate to such things as the source (i) may have only partial or imperfect knowledge about what is being transferred and how it works, (ii) is unlikely to be able to teach the receiver how to implement the knowledge or (iii) may mistakenly think that the knowledge is correct (Rerup and Szulanski, 2004). Figure 3 summarizes the barriers to knowledge transfer between service firms.

Figure 3: Barriers to knowledge transfer between service firms (Lane et al., 2001; von Hippel, 1998; Rerup and Szulanski, 2004)

Barriers related to the absorptive capacity of the receiver	Description
Ability to understand external knowledge	Trust between the knowledge sources, cultural compatibility, prior knowledge about the source, source's relatedness to own business (Lane et al., 2001)
Ability to assimilate external knowledge	Flexibility and adaptability, management support, training, formed goals, specialization (Lane et al., 2001)
Ability to apply external knowledge commercially	Business strategy, training competence
Barriers related to transfer process or organization	Description
Knowledge is embedded in individuals, not technology	Skill levels and other personal characteristics of individuals determine how well knowledge is transferred
Organizational characteristics not same in source and receiver of knowledge	The same knowledge does not necessarily apply in both firms
Demand is not the same in source and receiver of knowledge	Market situation is different for each service firm, therefore the service capabilities also differ
Production of services cannot be sequenced	Knowledge about manufacturing machinery is easier to transfer since efficiency can be achieved with producing the products to warehouse
Barriers related to the nature of knowledge	Description
Knowledge is not task-specific	In the production of material goods, knowledge may relate to a specific task in the process. Service processes are more ambiguous and knowledge is therefore rarely related to a certain task
Causal ambiguity of knowledge	Knowledge that produces value in one situation does not necessarily produce value in another situation. It is unclear how the knowledge produces value
Sticky information	Knowledge is strongly related to situational factors in one organization and some knowledge is impossible to transfer

Knowledge management strategies

Some of the barriers related to knowledge transfer between service firms can be overcome by relating them to the knowledge management strategy of the firm. The strategy must be identified and then the prerequisites for knowledge transfer thought accordingly. Before transferring knowledge, it must be made clear what the knowledge will be used for. Then, it is easier to understand the contingencies of the specific receiver and adapt the unit of knowledge being transferred to the recipient's needs (Rerup and Szulanski, 2004).

In a personalization strategy, the main type of knowledge in value creation is tacit and embedded in individuals. This makes it possible to design new services for the needs of clients. In a codification strategy, the main knowledge resource is in a codified form and stored in IT systems. Then, inexperienced personnel

can access the knowledge and utilize it during routine service (Hansen, 1999).

Firms need to balance between exploring and exploiting knowledge to survive in competition (March 1991). This balance is a fundamental paradox in management. It is impossible to achieve both simultaneously – those firms that are good at efficient production are rarely innovative and innovative companies lack efficiency. In a personalization knowledge management strategy, exploration (search, variation, risk taking, experimentation, play, flexibility, discovery, innovation) is dominant, whereas in codification, exploitation (refinement, choice, production, efficiency, selection, implementation, execution) is highlighted. Figure 4 further describes the personalization and codification of knowledge management strategies.

Figure 4: Personalization and codification of knowledge strategies in service firms

	Personalization knowledge management strategy	Codification knowledge management strategy
Operation mode	Exploration: Search, variation, risk taking, experimentation, play, flexibility, discovery, innovation	Exploitation: Refinement, choice, production, efficiency, selection, implementation, execution
Services	Tailored according to clients' needs	Routine one-size-fits-all approach
Main type of knowledge resource	Tacit, embedded in individuals	Codified, stored in IT systems
Personnel	Senior experts	Junior managers
The role of knowledge in value creation	Core asset. New knowledge tailored to the client produces most value	Complementary asset. Effective use of existing knowledge for the client produces most value
Core service capability	Knowledge and experience to design new service	Methodologies and technical information on how to produce service
Means to leverage inter-firm knowledge transfer with social networks	Highlight strong ties and closure	Highlight weak ties and reach

Successful knowledge transfer

Social network structures have important implications for knowledge transfer. There are two lines of thought in network theory on the optimal network structure. The stream of theory that highlights strong ties and closure that is suitable for refining tacit knowledge was first argued by Coleman (1988) and later refined to an argument on social embeddedness (Uzzi, 1996). The other stream of theory that highlights weak ties, sparse network structure and reach across boundaries of groups was introduced by Granovetter (1973) and later built to an argument on the role of brokers in innovativeness (Burt, 1992). However, it has been argued that the optimal network structure for a company combines these two network structures.

Knowledge transfer between firms is related not only to the relationships between the source and the receiver of knowledge, but also to the organizational and regional environments. In their study of inter- and intra-firm networks and industrial districts, Inkpen and Tsang (2005) list facilitating conditions for successful knowledge transfer. In the firm, personnel transfer, decentralized authority, low turnover, shared visions and collective goals, accommodation of different cultures and clear and transparent reward criteria ensure the knowledge being transferred in the firm. In an industrial district, facilitating conditions are proximity to other members, boundary spanners between cliques, stable personal relationships, cooperative norms, informal relationships and social ties as prerequisites of commercial ties. These prerequisites then support repeated exchanges of knowledge, multiple knowledge connections, non-competitive approach on knowledge transfer, clear goals, cultural diversity and foresight in knowledge transfer between two firms.

Summary

Based on the knowledge-based view of the firm, service business capability can be defined as the capability of the organization to integrate multiple knowledge bases related to service business. According to the theory, it seems evident that successful knowledge transfer related to service business is highly dependent on the transfer of tacit knowledge. In the successful transfer of tacit knowledge, the circulation of staff in a service firm and communication among individuals from different firms are important factors.

Knowledge transfer in services is largely learning from the individuals working on the service. This learning then can be observed in the increase in the knowledge of different knowledge bases in the service firm, which results in improved productivity, efficiency and novel service concepts. In the learning process, knowledge is recreated, redefined, linked with other knowledge, shared and enriched (den Hertog, 2000). This increases the possibility for the service firm to offer more efficient routine services and more innovative tailored services to its clients.

The goal in service business should be the transformation of tacit knowledge to explicit knowledge. However, this is possible only to a certain extent. Therefore, mechanisms to transfer tacit knowledge will have to be introduced.

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<http://www.vtt.fi/inf/pdf/publications/2011/P776.pdf>

6

Service Innovation Step by Step – Useful Tools

The *Institut für Technik der Betriebsführung beim Deutschen Handwerksinstitut e.V.* developed in close cooperation with small and medium-sized enterprises a tool box tailored to the identification and strategic

elaboration of innovative services. The tool box can be structured in a five-step process with respective instruments (Figure 1).

Figure 1: Five steps to innovative services



6.1 Analysis of company's current situation¹

A basic requirement for the development of innovative services in your company is an in-depth analysis of the current process in delivering services to customers. In general such a process includes activities along four phases in which (potential) customers and your company interact. During the information phase, customers are informed about the type and scope of the services your company offers. A contract between both parties for the delivery of a certain service is negotiated in the purchase phase. During the delivery phase, the service contract is fulfilled. In the utilization phase, your company focuses on customer support activities.

The aim in analysing all activities along the service delivery process is to identify which value-adding potentials exist and can be harnessed to support your company's core business. In addition, the analysis will

reveal the scale of unique selling propositions and financial implications of the exercised activities.

Using the activity filter

The activity filter makes it possible to find the strengths and weaknesses of existing services and systematically derive new design potentials for the service portfolio of the enterprise under analysis either alone or with the assistance of consultants.

1. After assigning a consecutive number to each service to be analyzed, the first step consists in filling in a designation for the activity that is as specific as possible into the activity filter.
2. The next step is to distinguish between standard services and unique services. Standard services are provided using skills that are common in the industry and form part of the common service offering. Unique services refer to the ability of the enterprise to perform a certain activity particularly well in com-

¹ Adapted from: Harms, D.-J., Heinen, E.; Kuiper, K., Myritz, R.; Nenniger, B., Otto, U., Strina, G. (2009), Dienstleistungen systematisch entwickeln. Ein Methoden-Leitfaden für den Mittelstand, Köln 2009.

Figure 2: Activity Filter

Fig. 2: Activity filter								Enterprise:		Date						
								Business field:		Sheet						
No.	Standard service	Uniqueness	Phase from customer contact circle				Activity / service	Strategic significance				How calculated?			Brief description of customer benefit	
			Information phase	Decision & purchasing phase	Project phase	Usage phase		Higher price for basic service	Process optimization / cost reduction	Open up new target groups	Increase customer loyalty	Improve willingness to pay	Has a price	Is negotiated		Given away for free
1																

parison with other enterprises. Such a service involves a competitive advantage and is not so easy to copy by a competitor.

3. Tick the appropriate phase in the activity cycle of the enterprise resulting from the analysis of the customer contact circle.

4. The strategic significance of the service is determined here. This is about:

- A higher price for basic services
- Process optimization/cost reduction
- Open up new target groups
- Increase customer loyalty
- Improve willingness to pay

In order to be able to determine the strategic significance exactly, questions about these results should be answered for the specific service offering:

- Is a higher price obtained for the standard service?
- Does the activity offered optimize the enterprise's processes by simplifying handling processes (e.g. ordering via Internet)?

- Are new target groups opened up?
 - Does the activity offered enhance customer loyalty?
 - Does it improve the customers' willingness to pay?
 - Multiple answers are possible here.
5. The individual activities are now subjected to a profit and/or cost analysis. The following four questions serve to find out if the service has a price, if the price is negotiated, if the activity is given away for free or if the price is hidden in the overall package:
- Is the service perceived by the customer as work provided and invoiced by the enterprise?
 - Is the price negotiated and/or is the service invoiced only in part?
 - Does the enterprise give the service away for free intentionally and is the customer aware of this?
 - Has the activity not yet been perceived as a service neither by the enterprise nor by the customer and therefore not been invoiced to date?

6. After the complete analysis of your company's activity/service portfolio, the service delivery and customer satisfaction competence will be evaluated. For this reason, three check lists will help you to identify strengths, weaknesses, opportunities and risks along your service delivery chain. Each list focuses on a relevant topic:

- Your company's performance in identifying customers' needs

- Your company's performance during the delivery phase
- Your company's performance in visualising/marketing

A feasible optimum or the market average in delivering such services should serve as a benchmark for your company's performance.

6.2 Development of service strategy²

These questions should be answered after determining the current situation:

- Which customer areas should be addressed systematically in the future with which strategic intention?
- In which phases – e.g. pre-sales or after-sales phase – should this be achieved with which new or revised service offerings?

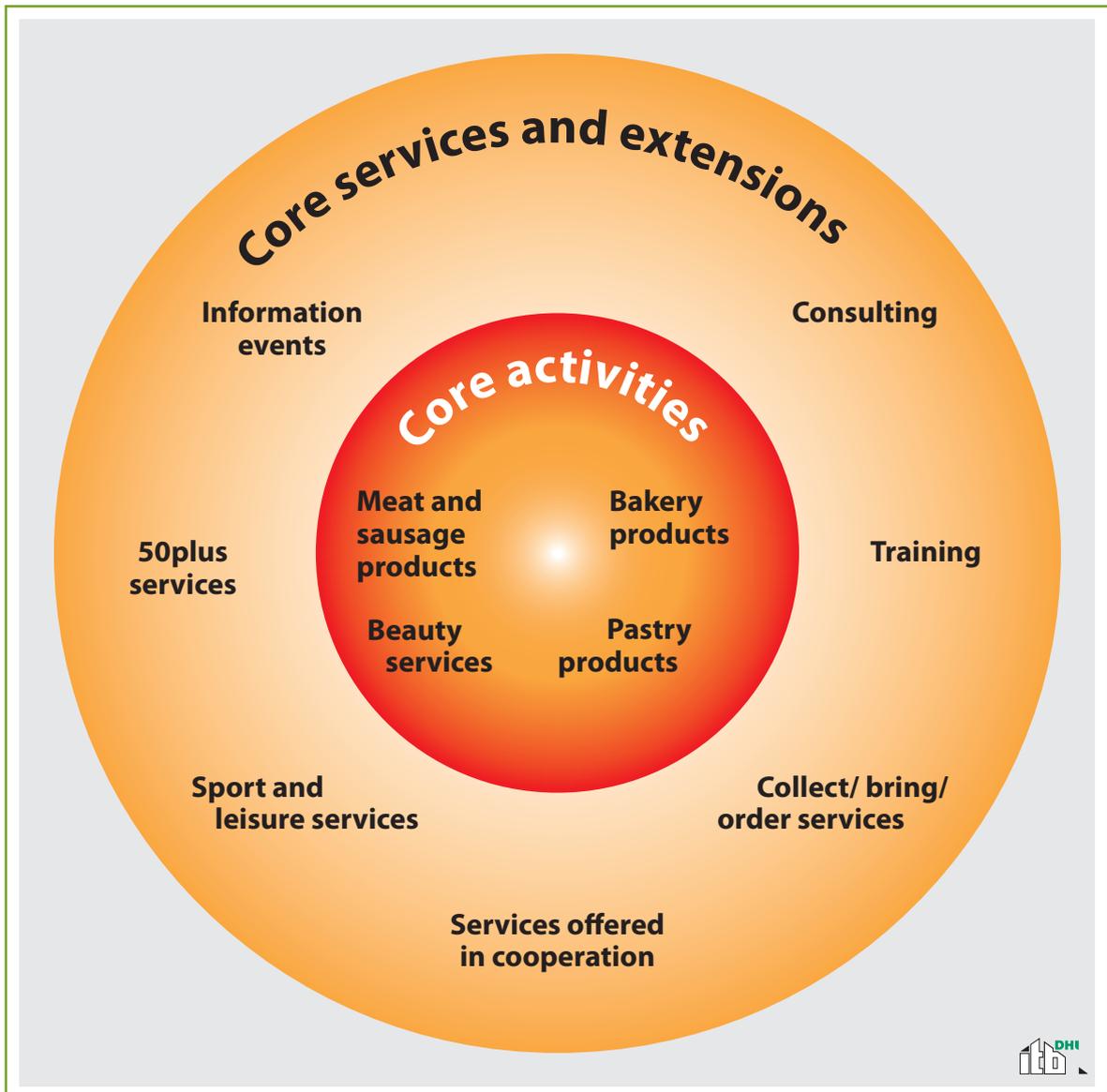
The result of these decisions is a set of clear goals that you and your company have to focus on. These goals should be described precisely and their achievement should be verifiable. One useful tool for this task is the so-called SMART method.

² Adapted from: Harms, D.-J., Heinen, E.; Kuiper, K., Myritz, R.; Nenniger, B., Otto, U., Strina, G. (2009), Dienstleistungen systematisch entwickeln. Ein Methoden-Leitfaden für den Mittelstand, Köln 2009.

Figure 3: SMART method

Fig. 3: SMART method	Enterprise: Business field:	Date: Sheet	DMH 1111
Objectives should be "S M A R T" :			
S	Specific	phrased specifically, precisely and unambiguously	
M	Measurable	quantitatively and qualitatively	
A	Attractive	phrased positively and motivating	
R	Realistic	the objective should be attainable for me	
T	Timed	by	
In one sentence:			

Figure 4: Core services and extensions



Use the results of your analysis from the activity filter and use the information about your core services to decide about potential extensions of your service portfolio. Use figure 4 as a guideline.

These decisions result in clear objectives which the business should focus on in the future. This should also involve an exact and traceable definition of the envisaged business objectives. The SMART method is a suitable instrument for this (cf. fig. 3). SMART means:

- Specific – phrased specifically, precisely and unambiguously
- Measurable – quantitatively and qualitatively
- Attractive – phrased positively and motivating
- Realistic – attainable, judging one's own potential appropriately
- Timed – provided with explicit time-limits

6.3 Evaluation of service potential³

A suitable instrument for the systematic development of new service ideas is the Morphological Box, also referred to as Morphological Tableau (cf. fig. 5). This involves compiling the essential parameters and functions of the service to be developed in a matrix

(table). Numerous new solution approaches result from the combination of the different options associated with the parameters.

The Morphological Tableau is processed in five steps:

Figure 5: Morphological Tableau

Parameters (parameters recurring with all solutions)		A l t e r n a t i v e s						
		1	2	3	4	5	6	7
A								
B								
C								
D								
E								
F								
G								
H								
I								

1. Defining the task:

An unambiguous definition of the task is the prime prerequisite for successful application of the method. The following questions have to be answered here:

- For which customers should the service be developed?
- Which specific requirements apply to the service to be developed?

2. Determining the essential parameters and/or functions of the service:

The parameters should meet these requirements:

- They should exist independently of each other, i.e. they should not rely on each other.

- They should be relevant for the general solution of the problem.
- They should be feasible.
- The parameters of the service idea collected are noted down in the left-hand column of the table one below the other.

3. Determining the potential options associated with the individual parameters:

All possible and imaginable options for the parameters are collected and noted down on the right in a line next to each parameter. At least three different options should be found for each parameter.

4. Combination of the options of parameters:

In this "synthetic" phase, the various combination alternatives are checked. This involves selecting one

³ Adapted from: Harms, D.-J., Heinen, E.; Kuiper, K., Myritz, R.; Nenniger, B., Otto, U., Strina, G. (2009), Dienstleistungen systematisch entwickeln. Ein Methoden-Leitfaden für den Mittelstand, Köln 2009.

option from each line and combining them with each other. This results in numerous new potential combinations. This process is performed several times in order to eliminate both meaningless combinations and any service versions already known.

5. Selecting the best service idea:

The various alternative solutions are analyzed for their feasibility. Technically and economically insignificant solutions are eliminated. The viable solutions are marked in the table with lines and followed up.

6.4 Design of service process⁴

When the current situation in the business is known, the service objectives and thus a strategy have been developed and when the first ideas have been produced and assessed, the issue of designing the service process is at the focus.

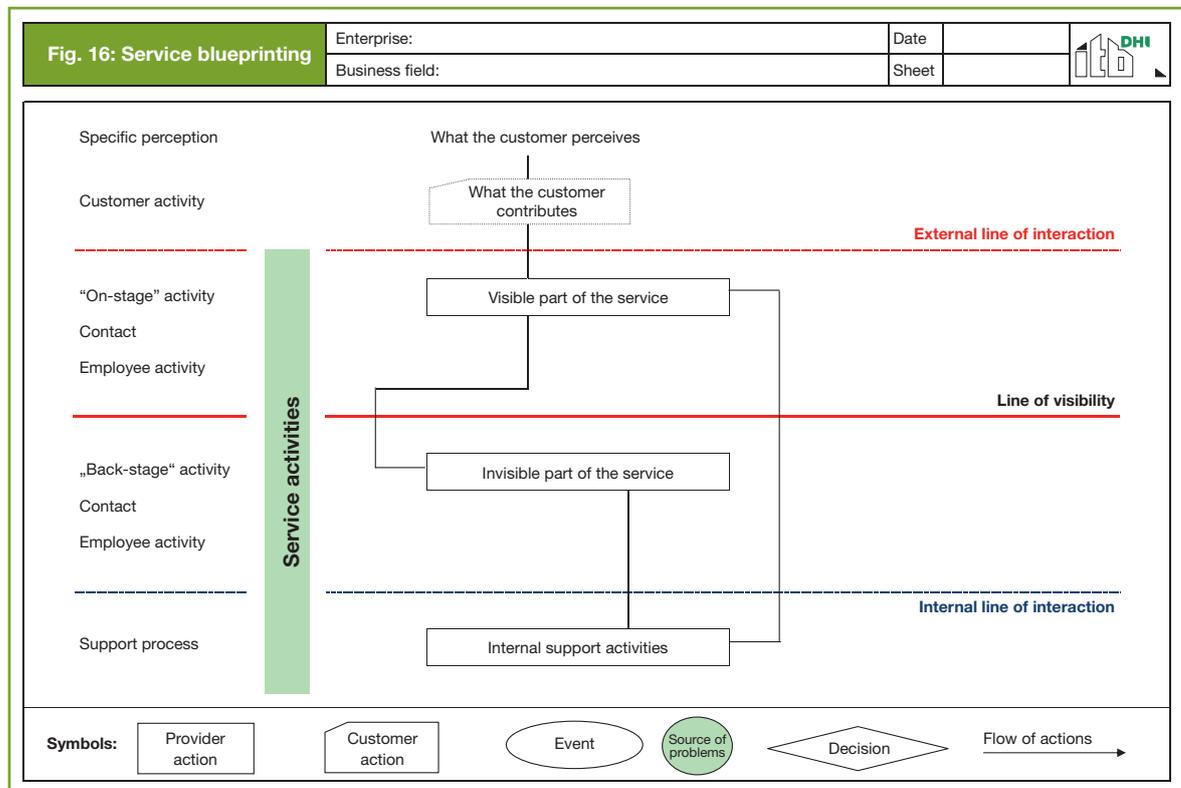
A service blueprint is a detailed and transparent representation of a specific service process in the form of a chronological flowchart. Developing and producing such a model is referred to as blueprinting (cf. fig. 6). The method is suitable to show the actual situation of workflows, interfaces and relationships in the context of the service process. The representation can be designed in such a way that the blueprint reflects both the most important decision situations.

and potential sources of errors in the workflow of the specific service process.

However, service blueprinting can also be used for planning and development of new services and is governed by this guiding theme: Where and how can services be standardized without the customer losing the feeling of being treated in a unique manner? If the envisaged workflows and foreseeable interfaces are clearly visualized here, it is possible to uncover any potential weaknesses as early as before implementing the service. In any case, an important aspect of this method is the view of the specific service from the customer's perspective. Service blueprinting is performed in four steps:

⁴ Adapted from: Harms, D.-J., Heinen, E.; Kuiper, K., Myritz, R.; Nenniger, B., Otto, U., Strina, G. (2009), Dienstleistungen systematisch entwickeln. Ein Methoden-Leitfaden für den Mittelstand, Köln 2009.

Figure 6: Service blueprinting



1. Selecting the service to be analysed:

A clearly delimited service is selected from the complete service portfolio of the enterprise for more detailed analysis.

2. Delimiting the service process:

The boundaries of the service process to be mapped are defined in order to be able to break it down into individual meaningful sub-processes which can eventually be analysed separately. The initial and final events of the service process to be mapped as well as all inputs and outputs should be clear.

3. Recording the workflows:

For a representation of the service process, it is important to make a clear distinction between the actions of the customer and those of the enterprise so that a potential involvement of the customer into the overall flow can be recognized. This is facilitated by the line of visibility in the centre of the blueprint, which

clearly indicates that all activities below this line are not visible to the customer. In addition, the “external line of interaction” delimits all activities of customers from those of the customer contact employees. The “internal line of interaction” delimits activities of different units within the enterprise from each other.

4. Finding sources of problems:

Errors and problems in the service process become evident as early as when preparing the service blueprint. Any weaknesses found should be marked immediately so that they can subsequently be addressed systematically.

As a general rule: Avoiding problems in good time is more economical than eliminating problems later. The later a problem is discovered in a process chain, the more difficult and complex is its elimination. This is aggravated by the fact that mistakes made at service delivery cannot be rectified or undone whereas this is possible for mistakes made during service development.

6.5 Evaluation of customer satisfaction⁵

The simplest and most efficient method of verification of the result of a service is a customer survey. Fig. 7 shows such an instrument, with which many small and medium-scale enterprises have had positive experience.

Develop the customer survey method to become a regularly used and systematic instrument of verification of your success. Always ask your customers after every activity about their satisfaction with the service just rendered – this is best from person to person or on the phone. In addition, conduct customer surveys at larger intervals using a questionnaire. Caution: The questionnaire should never be longer than one DIN A4 page.

⁵ Adapted from: Harms, D.-J., Heinen, E.; Kuiper, K., Myritz, R.; Nenniger, B., Otto, U., Strina, G. (2009), Dienstleistungen systematisch entwickeln. Ein Methoden-Leitfaden für den Mittelstand, Köln 2009.

Figure 7: Customer survey

Fig. 7: Customer survey	Enterprise:	Date	
	Business field:	Sheet	

We are very interested in knowing your opinion about us and your experience with us. Please answer the following questions and return the sheet to us in the stamped addressed envelope.

<p>How did you learn about us?</p> <p>From friends or acquaintances <input type="radio"/></p> <p>From our advertisements <input type="radio"/></p> <p>From our vehicles <input type="radio"/></p> <p>From our entry in the Yellow Pages <input type="radio"/></p> <p>From Internet search engines <input type="radio"/></p> <p>Accidentally <input type="radio"/></p> <p>From _____ <input type="radio"/></p>	<p>What was important to you when placing the order?</p> <p>Primarily the price <input type="radio"/></p> <p>Confidence in the enterprise <input type="radio"/></p> <p>Other persons' opinions <input type="radio"/></p> <p>The popularity <input type="radio"/></p> <p>The availability <input type="radio"/></p> <p>The date <input type="radio"/></p> <p>The recommendation by _____ <input type="radio"/></p>
---	---

What is your general impression of our enterprise ?	☺	☺	☹	
How satisfied were you with our advice ?	☺	☺	☹	
How satisfied were / are you with the order execution ?	☺	☺	☹	
Have the agree deadlines been met ?	☺	☺	☹	
Were / are our employees	friendly ?	☺	☺	☹
	reliable ?	☺	☺	☹
	competent ?	☺	☺	☹
	clean ?	☺	☺	☹
What was your impression of us on the phone ?	☺	☺	☹	
How do you like our appearance (logo, etc.) ?	☺	☺	☹	
Would you place an order with us again ?	☺	☺	☹	

Would you like to be kept informed about news from our enterprise ? Yes () No ()

What did you like or dislike particularly ? Please give your opinion frankly:

Did you observe anything in particular with us / about us recently ? Yes () No ()

If so, what is it ? _____

Thank you very much for your cooperation. Every month we draw a prize among all sheets returned:

Would you like to participate in the drawing ? Yes () No ()

If you would like to tell us your favourite hobby, we could respond to it at the next opportunity:

6.6 Product Service System

The main idea of this approach is to increase efficiency for the technical customer service (TCS) in the machinery and equipment industry. To do so, a methodology for the development of product service systems was developed based on the integrated process-oriented examination of product development and service documentation and such a product service system was prototypically implemented using the HAS industry as an example. The development of the solution requires the development of two underlying methodologies. On the one hand, a framework has to be developed in order to support the engineering of a Product Service System (PSS). On the other hand, a methodology has to be developed in

order to support the modelling of the service process and the corresponding information objects.

The framework for PSS engineering governs the required activities (Figure 8). Moreover, the framework supports incremental development, i.e. engineering is accomplished stepwise. The framework is designed in an iterative manner. Hence, repeated passes of activities are possible. Developer and customer can approach the problem solution step by step. The research results can be generally applied to the machinery and equipment industry and allow the "hybridization" of existing as well as future technical products.

Figure 8: Framework for PSS engineering

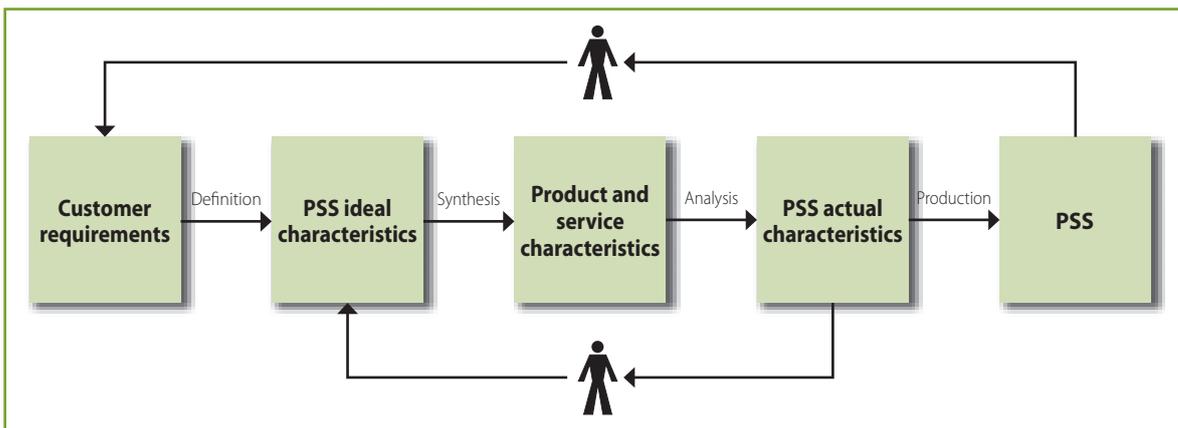
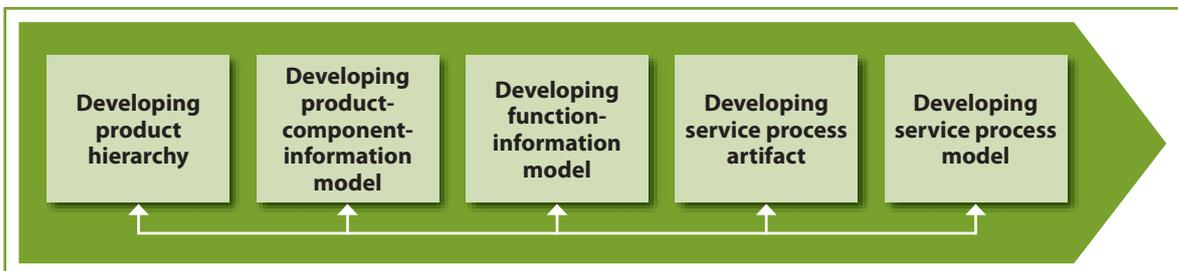


Figure 8 represents the 5-level development methodology for the modelling of technical service information and service processes.

Figure 9: Methodology for the modelling of technical service information and service processes



This development methodology is part of DIN PAS 1090, a standardization specification that has been developed within the PIPE project. According to PAS 1090, service information is product related information that can be modelled in different granularity.

6.7 ServLab

ServLab is a platform with extensive options for visualizing and testing innovative service concepts and related solutions. It bundles the service excellence of the Fraunhofer IAO into a worldwide unique laboratory in which service innovations can be made visible, tangible, and experienced. New service solutions can be developed, tested and optimized jointly with employees, customers and partner businesses in this environment. Projects within ServLab follow a systematic approach, supported by suitable service-specific methods and tools for:

- Creation and evaluation of ideas
- Analysis of customer and employee feedback
- Process design and resource planning
- Simulation of servicescapes
- Simulation of interaction
- Creation of training materials
- Realization of training measures

It is important that situations and environments for innovative service processes can be simulated to allow service crash tests within a controlled laboratory environment. The ServLab facilitates comparisons of the service to be tested with potential alternatives for redesigning services. Different processes can be visualised and the interaction scenarios can be simulated in a close-to-reality environment. Adjustments can be made before the market launch by identifying interdependencies and effects of modifications to the service. With the conceptual design and development of the ServLab, the Fraunhofer IAO has made a major contribution to the encouragement of innovation within the service sector for both the business world and for research. This is reflected by the intense international interest in creating ServLabs as locations for service innovation in other countries.

The logo for ServLab, featuring the word "Serv" in red and "Lab" in grey, with a red checkmark above the "v" in "Serv".

6.8 Regulatory framework method

In Europe, essential health and safety objectives are important, especially when complex machinery is introduced into the market or modified. One method is the CE labelling of machinery which everybody may know. The European Machinery Directive⁶ is, maybe besides others, the basic regulation for each manufacturer, importer or operator of machinery in Europe. Nowadays also more and more service providers and SMEs are doing design, manufacturing or modifications on machinery. This directive distinguishes between completed machinery which is defined as a ready-to-use product with at least one moving part and partly completed machinery is a component of machinery which cannot operate alone. The

following checklist helps to analyse which elementary steps have to be fulfilled to bring completed or partly completed machinery into the market or use and which documentation has to be maintained and handed over to customers or end users. The work with regulations should follow this sequence: Identification of requirements, how to transform the requirement, what is needed as an input and finally a documentary proof of the transformation.

⁶ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:157:0024:0086:EN:PDF>

Figure 10

CE

Checklist for a CE-conformity process

Product: _____ Type: _____
 Serial number from: _____ To: _____

	Requirement	Transformation	Input	Output
Procedures for assessing the conformity of completed machinery. (Article 12)				
Procedure for partly completed machinery. (Article 13)				
x	General description of the machinery (Annex VII, part A)	is actually available		
x	Relevant technical documentation (Annex VII, part B)	is actually available		
x	Check Categories of machinery to which one of the procedures referred to in Article 12(3) and (4) must be applied e.g. Circular saws with additional special requirements.	is actually available		
x	x	Harmonized standards, other standards and technical specifications used, are identified (Article 7 & Annex VII, part A)	is actually available	
x	x	Overall drawing of the machinery and drawings of the control circuits, as well as the pertinent descriptions and explanations necessary for understanding the operation of the machinery. (Annex VII, part A)	is actually available	
x	x	Detailed drawings, accompanied by any calculation notes, test results, certificates, etc., required to check the conformity of the machinery with the essential health and safety requirements. (Annex VII, part A)	is actually available	
x	x	Hazards and Risk Analysis (Annex I) with ISO 12100:2011 for all relevant phases (attachment B3 e.g. with a Failure Mode and Effects Analysis FMEA).	is actually available	
x	x	Technical reports giving the results of the tests carried out. (Annex VII, part A)	is actually available	
X		Copy of the instructions for the machinery. (Annex VII, part A)	is actually available	
x	x	Servicing, cleaning, inspection, maintenance, repair, according to EN 13306 (voluntary, but recommended)	is actually available	
x	X	Declaration(s) of incorporation of partly completed machinery (Annex II, part B)	is actually available	
x	X	Assembly instructions for partly completed machinery (Annex VI)	is actually available	
x	x	For series manufacture, the internal measures that will be implemented to ensure that the machinery remains in conformity with the provisions of this Directive. (Annex VII) e.g. with a Quality Management Plan (QM-Plan)	is actually available	
X	-	CE labelling (Article 16 & Annex III)	is actually available	
X	-	EC declaration of conformity of the machinery. (Annex II, part A)	is actually available	
x	x	The manufacturer of machinery or his authorised representative shall keep the original EC declaration of conformity for a period of at least 10 years from the last date of manufacture of the machinery. (Annex II 2)	is actually available	
x	x	Market surveillance. (Article 4)	is actually available	

x = internal document X = external document, for customers

Prepared: Date, Name _____ Released: Date, Name _____

Regulation:
 according to European Machinery Directive
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:157:0024:0086:EN:PDF>

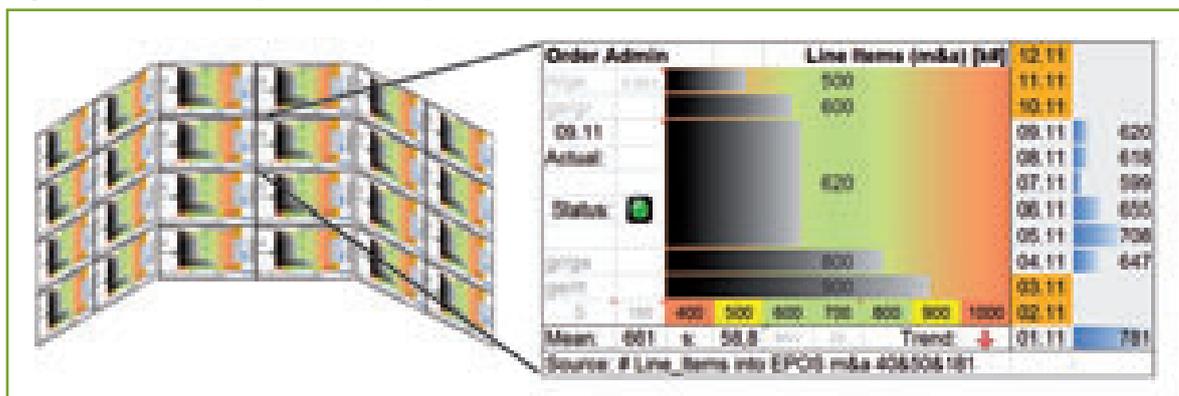
x = internal document
 X = external document, for customers
 Checklist for a CE conformity process

6.9 Service Balanced Score Card method

This application provides a systematic, transparent and integrated controlling system for a service provider. It is based on requirements of different target groups, mapped to specific service characteristics and key performance indicators (KPI) and visualized by a Strategy Map, Service Balanced Score Card Diagram and a Cockpit. For small & medium sized applications, the method can be implemented in a spreadsheet. For larger applications, special software is recommended. This method describes major steps for the development of a Service Balanced Score Card (SBSC).

1. Relevant external and internal target groups have to be identified and described with their individual relevant and weighted requirements.
2. Based on the requirements, a service catalogue with service offerings should be developed and documented. Each service has a target group, a description with relevant characteristics and a benefit.
3. The traditional BSC approach consists of 4 typical perspectives – customer, finance, process and resources. It is recommended to add a service/result perspective and, if applicable, a supplier perspective; others may be renamed, too.
4. Within a strategy map, the relation between perspectives, requirements and characteristics should be documented and visualized. As an option, interactions between different perspectives can be identified.
5. For relevant service and quality characteristics about 25 key performance indicators were developed. These KPIs are listed in a KPI catalogue, each one with a weighting, and target values, tolerances, units, frequency of data evaluation, direction of optimization, actual date, status and trend are defined and maintained.
6. A Service Balanced Score Card Diagram shows the level of service excellence for each perspective within given limits with a traffic light approach. In addition, a Service Performance Index is calculated based on weighted perspective indexes (see section: Good Practice Examples).
7. A Service Balanced Score Card Cockpit with an overview of all KPIs for each perspective will support a continuous improvement process and service excellence. Target values and given limits are transparent. Current and historical data are presented for each KPI. The status is shown by a traffic light relative to defined limits. Mean value, standard deviation and trend are available for further interpretation.

Figure 11: SBSC Cockpit with 6 perspectives and service/results details



6.10 The KIT model

Using the moment of truth as a resource for service innovation

Many companies want to start working with methods to involve customers in their innovation and development process, but they lack knowledge of how customers perceive this situation. Thus, there is a need to investigate how co-creation is experienced when involving customers in service development projects.

By letting customers register and document their experiences, ideas and emotions as they interact with the service and company – the co-creation process – you get data that can be used for service innovation and service development. The KIT model is a behavioural research-based method that helps to analyse and understand the customers' experiences and their hidden needs, which are then used to identify service innovation potentials. The Parken Zoo case is one example of a successful application of this model.

The process:

The process is an open innovation process, using the customers' experience as the resource for new ideas. It starts by giving customers the instruction to focus on emotions and/or problems they perceive as they are interacting with the service/product. The observations need to be recorded in real time ("in situ") in order to get as "clean" observations as possible. This is done, for example, by using cameras. After these observations, they should be interviewed about their experiences.

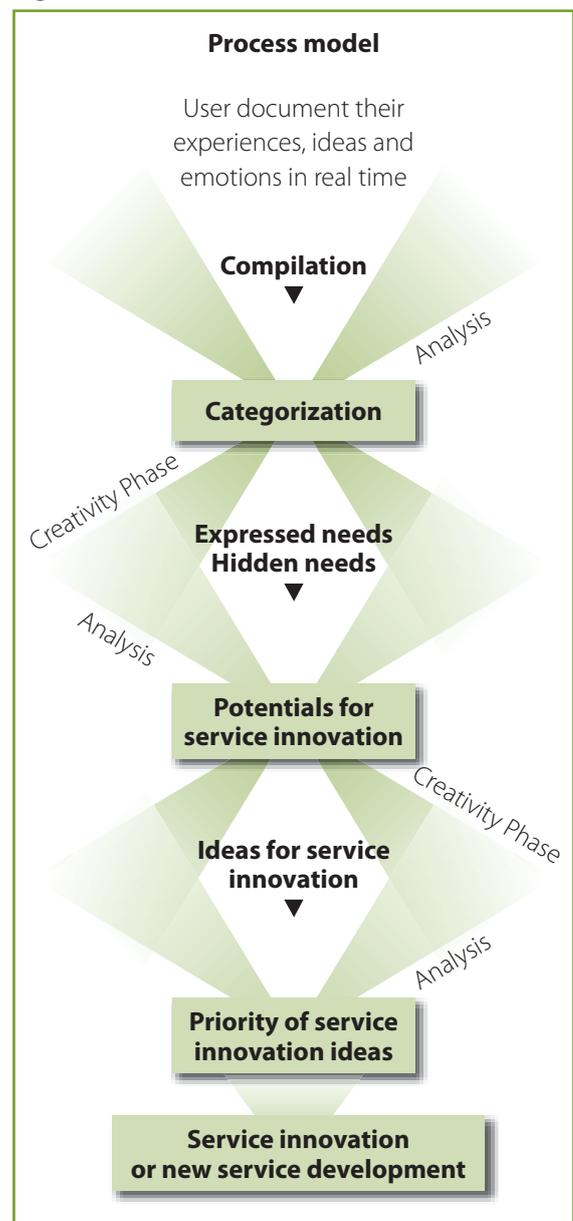
The experiences are then analysed in two loops in order to understand the hidden needs as well as develop innovation potential. The first loop is the categorisation of the observations, where you cluster the observations in a structured way. The second loop goes through a creative and analytical process based on behavioural research methods to identify the hidden needs expressed in the observations. These represent a deeper understanding of why customers interact, and what they would like to experience.

The outcome:

The outcomes of the process are mainly insights and knowledge about:

- Users' hidden needs – A step-by-step creative analysis forms a map of users' hidden needs.
- Innovation potentials – The potentials are then generated by grouping together several hidden needs, thus identifying a gap in the offering today and a potential offering, better corresponding to, and based on, the users expectations and desires.

Figure 12



6.11 Bar Code technology

This method describes the implementation of an enhanced logistic process via an integrated barcode system. The solution involved everyone in the company. A business analysis was completed to define the goals and requirements. One part will be tracked from dock to dock by reading the “serial number”.

- A barcode reader is installed at any operator bench.
- The barcode application locates the part anywhere in house.
- The unique serial identification number serves for warranty.
- To get a higher added value a unique application will be created to record repair processes data against this serial number.

The IT team developed new software to track the parts’ internal moves. This software enables for each item to be followed-up in each of its moves, its whereabouts and at which stage of the process it currently sits. Is it still defective, in repair or test process, qualification stage or at the final packaging area? The software also records who at MT Unirepair has handled the repair and can easily provide statistical information regarding the kind of part, to which customer it belongs, the number of similar items in repair and much more. The barcode reader is the key

item in avoiding mistakes in reading or writing the serial number of the item. It also speeds up the reading process and allows faster data access.

The implementation of the serial number process resulted in an improved database system, now containing all data linked to that number.

The customer requirements are individually defined with each customer and the application parameters are setup to follow these specific requirements. Each item is subject of a number of questions that respond to these requirements. This data is recorded and provides a better understanding of the parts’ issues, e.g. the most current failure reason, time of usage and so on. This information is turned into statistical reports sent to the customer.

In order to obtain and enhance the quality of the process, all repair actions are fully documented and recorded in that same system. If a product is returned once or even more than once, it is immediately identified upon receipt by its serial number. All previous actions will be taken into account while setting up a new plan for that particular item. This helps the qualification team to learn more about the reason(s) of failure and in the end also to amend and optimize the repair process or quality test wherever necessary or possible.

Figure 13

Item	Value
WH -- Return Tag Available	2
WH -- Packaging Problems found (describe)	
WH Manufacturer S/N	N/A
WH Customer PO no.	N/A
WH ID NBR (OSP) - Call ID	CP5070
WH CE-Engl - Engineer name	Jefford
WH Date of the last shipment	N/A
WH From-machine serial number	0005465
WH DOA requested on cust. return - doc.	n
WH USED-UNUSED: from cust. return - d	
WH -- Interrelated	N
WH -- Fault Reported by Customer	continually adding mixing oil overflowing suspect float
WH -- Completed By	JEFF

7

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