

LEADING open INNOVATION

Encouraging Conversations
about Service Innovation
& Discontinuous Change



Ideas for Innovative Leaders
from the PETER PRIBILLA FOUNDATION



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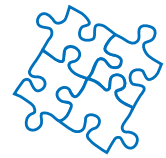
Employees are the
source of success.



We have to make sure that people in organizations truly engage in innovation and creativity. This is a primary challenge for leaders on all levels.

-PETER PRIBILLA (1941 - 2003)

Introduction to the PETER PRIBILLA FOUNDATION



Professor Ralf Reichwald

Peter Pribilla was a member of the Managing Board of Siemens Corporation. He was also one of the most influential corporate partners of the Technische Universität München. He taught a regular course at TUM for a number of years in addition to numerous guest lectures. In recognition of his many contributions in research, teaching and administrative advice, he became an honorary TUM professor in 1997. In the same year he was appointed to the Siemens Managing Board and elected to the Corporate Executive Committee at TUM. We were just completing a joint study on corporate leadership at the time of his untimely death in August 2003.

The activities of the Foundation in his honor are based on the content and the style of Peter Pribilla's very fruitful interactions with TUM. We are fostering personal connections among business people and academics to advance understanding about the leadership of innovation – a critical subject in today's globalizing economy.

In March 2007 the second meeting of the Peter Pribilla Network was held at HHL – Leipzig Graduate School of Management, which is the home of the Center for Leading Innovation and Cooperation (CLIC). The meeting focused on the broadening 'bandwidth' of organizational innovation and securing government funds to do research in that area. On the input side, Professor John Bessant from Imperial College in London summarized the increasing need for discontinuous innovation and showed how non-competing companies are sharing techniques for identifying such opportunities. Professor Frank Piller from RWTH Aachen University followed with examples of open innovation, emphasizing companies that are successfully using innovative ideas from customers. He also told us about a bold plan by the government of Denmark to make open innovation a central theme in government policy and funding.

On the second day of our meeting we discussed the increased scope of innovations affecting firm outputs, giving particular attention to service innovation. Professor Bessant recounted how one government funding body in the UK is helping people understand the significant differences between service and production. Dr. Gerhard Ernst from the DLR (Deutsche Luft- und Raumfahrt), the project management organization of the German Federal Ministry of Education and Research, then summarized what is to our knowledge the most significant government investment in this area – a 12 year program supported by 125 Million Euro from government and company sources. He also announced the next subjects for research and development funding on services, with a particular emphasis on innovation with services.

As established at our first meeting in 2006, implications for practice and further research were outlined by each presenter. These ideas, along with additional resources for considering the links between innovation, leadership and cooperation, are suggested at the end of each summary.

I hope that readers who share our enthusiasm for leading innovation will find the report useful and inspiring, and will look forward to information about our third meeting in 2008. Subgroups of the Peter Pribilla Network have been developing several different proposals for joint research projects since our March meeting. One project summarizing German research on services over the last decade began in summer 2007. Two other projects are in a second stage of funding review by European as well as German sources. The outcome of these efforts will shape the content of our next meeting.

Cordially,

Prof. Dr. Prof. h.c. Dr. h.c. Ralf Reichwald
Technische Universität München

The PETER PRIBILLA FOUNDATION Focuses on Two Themes:

• INNOVATION

How can companies use a full range of internal and external resources for current and future benefit?

Competitive settings require the rapid development of new ideas. Well-organized internal structures for generating innovations remain important, but are increasingly complimented by contributions from other sources. The PETER PRIBILLA FOUNDATION encourages research that increases understanding of how companies can successfully refine current offerings while discovering desirable new products/services/experiences.

• LEADERSHIP

How can companies foster individual initiatives that go beyond today's task requirements?

The need for leadership expands as organizational contexts become more complex and unforeseen events have multiple impacts. Leaders look beyond their current role and responsibilities to cope with unexpected situations and they inspire those around them to do the same. The PETER PRIBILLA FOUNDATION emphasizes research on effective leadership in complex, trans-organizational settings.

The report from our first meeting drew on a presentation by Professor Lynda Gratton from London Business School to highlight the importance of cooperation for leading innovation.

This meeting discussed the broadening scope of innovation inputs and outputs

On the input side: How can the innovative ideas of users improve organizational offerings and managerial processes?

Open innovation is an increasingly popular strategic theme, but practical ideas for implementation are still being developed. The PETER PRIBILLA FOUNDATION was established to support interactive value creation. We are especially interested in three things: how firms can learn from one another, how new processes and products can co-evolve with users/customers, and how our network of researchers and practitioners can increase understanding of these important activities.

On the output side: How can organizations increase the innovativeness of the services they offer?

Today, innovation often begins with an understanding of the expanding role of service and the changing nature of both organizational and individual recipients of service. The PETER PRIBILLA FOUNDATION is especially interested in the coordination of input, throughput and output innovation, recognizing that change is especially complex on this frontier.

Editor's Summary

Professor Anne Sigismund Huff

This meeting of the PETER PRIBILLA FOUNDATION examined the broadening scope of innovation activities. The first day emphasized how organizations are expanding inputs to innovation. Professor John Bessant suggested that:

- Many companies trying to develop radical innovations none-the-less search for new solutions 'under the lamp-post' established by past success.
- Two skill-sets are required to recognize and respond to discontinuous environments: the ability to reframe existing resources and solutions into new combinations, and the ability to co-evolve new knowledge elements with actors outside of the organization.
- As an example, 12 search strategies for uncovering opportunities for discontinuous innovation illustrate how interaction with noncompeting firms can expand a firm's innovation repertoire.

The second presentation by Professor Frank Piller focused on inputs by users and customers. He argued that:

- Increasingly sophisticated mechanisms support problem broadcasting rather than solution seeking as an innovation strategy.
- Those responding to firm problems are often motivated by different incentives than traditional paid employees, for example they are energized by the opportunity to solve an interesting puzzle. Their inputs tend to be low-cost contributions to the innovation process.
- Some companies have successfully outsourced the entire innovation process to users/customers – from idea generation to selection among prototypes for mass production.
- Government support is important; the broadest program to date is funded by the Danish government.

Both presenters emphasized that:

- A 'not invented here' response jeopardizes the successful transfer of new ideas into an organization.
- Organizations need to establish a dedicated culture (corporate mindset) to profit from open innovation and to master discontinuous change.

The second day of the meeting moved to output innovations involving services. Professor Bessant summarized multiple differences between production and service, but also argued that there is much to be learned from previous experience producing goods for market needs. We then were fortunate to hear a summary of a 12 year program on service research funding in Germany by Dr. Gerhard Ernst of DLR, the project management organization of the German Federal Ministry of Education and Research. He noted that:

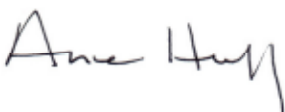
- Government ministries are working together to increase innovation capability and capacity in Germany, and are being evaluated in terms of both economic success and impact on society.
- R&D about innovation with services should contribute the same excellence in the service sector as it has already in industrial production.
- Further funding for research will emphasize demographic changes, productivity, and professional work in the service sector.

Both presenters indicated that:

- Services now account for the bulk of most countries' domestic product, but attention by academics and practitioners lags behind that supporting production.
- The international scope of service delivery requires particular attention.

At the end of this booklet Professor Reichwald recognizes the intellectual and emotional contributions made by Hannelore Pribilla to a wide range of projects concerning innovation and leadership. Her activities touched most members of the PETER PRIBILLA NETWORK. We definitely miss her.

Cordially,



Anne Sigismund Huff
Permanent Visiting Professor of Strategy & Innovation

Search Routines to Support Discontinuous Innovation

Professor John Bessant is Chair of Innovation Management at Tanaka Business School, Imperial College London, and co-Director of the Innovation and Productivity Grand Challenge, a collaborative program with Cambridge, Cranfield, Loughborough and Liverpool Universities in the United Kingdom.

He has advised a number of companies, various national governments, and several international bodies – including the United Nations, the World Bank and the OECD. Three recent books published by John Wiley summarize key aspects of his research for academics, practicing managers and students: *High-Involvement Innovation*, *Managing Innovation* (with Joe Tidd and Keith Pavitt, in its 3rd edition) and *Innovation and Entrepreneurship* (with Joe Tidd).



Professor John Bessant

Professor Bessant addressed the broadening innovation theme of the PPF meeting by emphasizing the difficulties of developing new search routines in unfamiliar, increasingly complex environments. His call for “360° Search” is illustrated by techniques companies are learning from each other in the *Discontinuous Innovation Lab*.

Professor Bessant, could you please begin by telling us how you know that a firm is a successful innovator?

It is often not easy to recognize a currently successful innovator, in part because a good reputation can hide problems. I recently visited a well-known Danish medical devices producer. The company enjoys a dominant market position and has received multiple awards for innovation. It has deep competencies around skin/wound care, in part because of its active user paradigm, which regularly draws on panels of nurses.

Yet managers are not as happy as I expected them to be. One person said: “People get all these good ideas, but there’s nowhere to take them.” There seemed to be general agreement with the observation that: “The improvements have just been minor things in the past few years – not so big innovations. It’s been a long time since we’ve had a really new concept.”

What’s the problem? One person said: “We’re too busy.” Another one thought: “It’s so structured here, there’s no real room for radical ideas.” That fits with the observation that: “The words ‘out of the box’ are there, but there’s no commitment.”

The company is facing the challenge that many successful companies face. They do what they do very well, but have a problem with discontinuous innovation; they

can't re-create the fluid innovative state that created their current success. The situation is so pervasive that I've spent years investigating it. We've all seen good companies stumble and fall as their environment changed. I've been working with companies that want to discover what they can do to anticipate and avoid that disaster.

Good companies often do not innovate as their environment changes. The question is how to anticipate and avoid that disaster.

Even if a company is seeking a discontinuous innovation that will have spectacular effects, shouldn't they also keep using established innovation procedures that have already been proven successful?

Most companies should try for a balance in my opinion, but it is not easy. A core theme in discussions of innovation relates to the tensions between 'exploitation' and 'exploration' activities. *Exploitation* essentially involves leveraging what the firm already knows. Firms need to produce a steady stream of incremental product and process innovations that effectively 'do what they do better.' This is often a good thing, but the innovation that results is not that far from what is already being done.

In increasingly competitive environments firms also need to 'do something different.' They have to find radical product or process innovations rather than imitations and variants of what they and other competitors are already offering. *Exploration* is necessary to find less familiar knowledge that will support big departures from the status quo.

The 'innovation space' that firms must thus try to encompass is large. It is not just about products and processes, but about the paradigm the firm uses to conduct its business, and the positions it takes with respect to buyers, competitors, suppliers and other players in the marketplace.

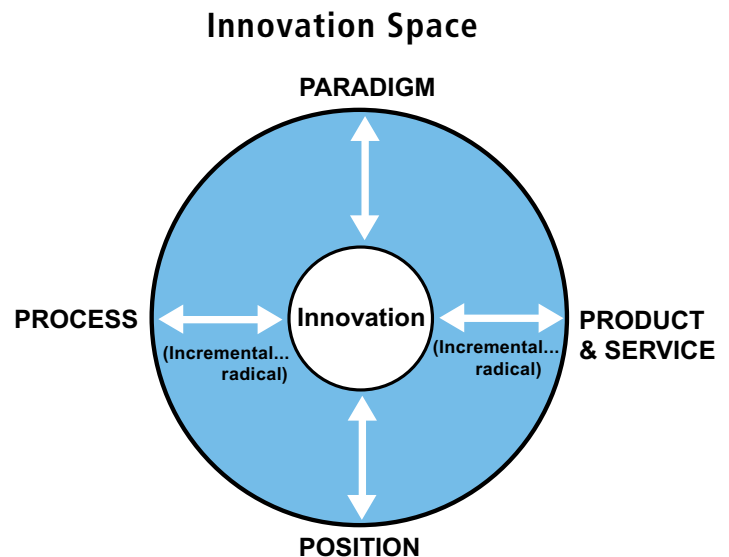


Figure 1: The space within which firms can innovate

While firms ideally cover the large space shown in Figure 1, the organizational routines needed to support the two kinds of innovation are quite different. On the one hand, incremental exploitation is facilitated by structured processes and typically results in many small scale changes carried out within operating units. This is what established and well-regarded companies like Medproducts know how to do very well. Radical innovation, on the other hand, is occasional and high risk. It typically requires a cross-functional combination of resources and a looser approach to organization and management, as shown in Figure 2.

Type 1	Type 2
Clear and accepted paradigm, or rules of the game	No clear paradigm, high tolerance for ambiguity
Path dependent innovation based on current offerings	Path independent, emergent, probe and learn innovation
Clear selection environment	Fuzzy, emergent selection environment
Selection and resource allocation linked to clear trajectories and criteria for fit	Risk taking, multiple parallel bets, tolerance of (fast) failure
Operating routines refined and stable	Operating patterns emergent and 'fuzzy'
Strong ties and knowledge flows along clear channels	Weak ties and peripheral vision important

Figure 2: Differences between exploitation and exploration

There is no easy prescription for carrying out these two types of innovation, given the tensions between them. Many organizations aim for a degree of ambidexterity, a word popularized by Professors Tushman and O'Reilly in 1996 and used

more recently by Professors Birkinshaw and Gibson. For example, a firm may invest in a few 'blue sky' or high risk outside bets but concentrate on a larger number of projects around their core technology. Market research might similarly search for a few new markets but also focus on developing deeper understanding of established key market segments.

Ambidexterity sounds like a promising idea and your ideas about 360° search behavior seem to be an important contribution.

Thanks! Based on years of observation, I think most companies begin to have problems with exploration right at the beginning of the innovation process, as they search for the ideas that will feed radical Type 2 innovations. We know firms increasingly face discontinuities in their environment that require new or radically modified search routines. Examples of such discontinuities include major changes in technology, significant political shifts, or redefinition of the regulatory environment. Under such conditions it is clear that local search for new ideas will not be helpful.

However, observation and research reveals that most firms' attempts at *exploration* behavior continue to be bounded and path-dependent, even though conditions indicate a need for radical change. Because of their success with *exploitative* innovation, firms continue to focus on regions believed to hold promise and search along trajectories which are relatively stable. Open-ended research may be carried out, but in zones which are perceived as having connections to the current knowledge base.

My colleague Bettina von Stamm and I argue that these firms are rather like the drunk who has lost his keys on the way home and is desperately searching for them under the nearest lamp-post 'because there is more light there.' Despite increasing change and uncertainty, firms have a natural tendency to search in spaces they already know and understand. Unfortunately, the weak early warning signals that reveal the emergence of totally new possibilities – radically different technologies, changing public opinion or political context, new regulatory threats or opportunities, and (most important) possible new product or service offerings – are unlikely to be discovered

under the firm's particular lamp-post. Instead firms must move out to the darkness. They need to develop ways of searching that cover 360 degrees of the innovation space!

Even when firms face unknown and increasingly complex conditions, they have a natural tendency to search for new innovations in the spaces they already know and understand. They do not cover 360° of the potential innovation space.

Figure 3 highlights the search challenge. The routines required to develop innovations in the bottom left quadrant are (relatively) straightforward – they involve systematic consideration of new developments in a space the firm already understands. Key lines of enquiry have been established. Members of the firm understand basic technology, are familiar with current markets and their competitive dynamics, know a lot about regulatory conditions, the political framework and its constraints, and so on. With skill they are able to exploit what they are already doing and find better solutions over time.

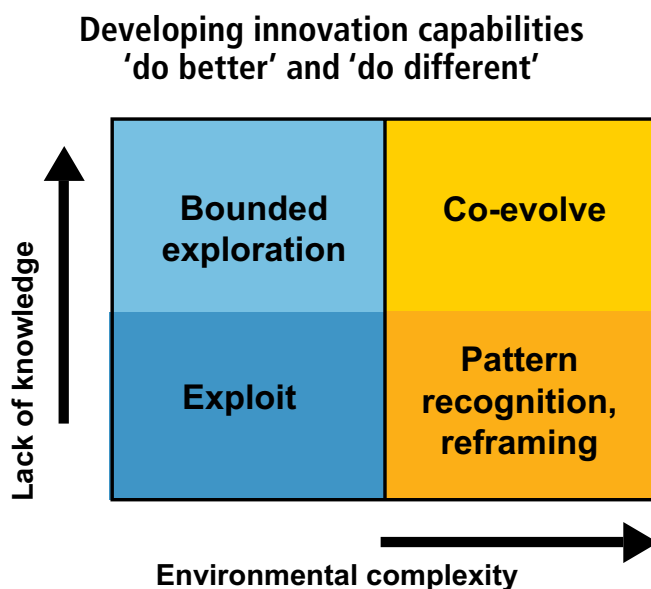


Figure 3: Conditions under which different kinds of search behavior are important

When uncertainty increases, the firm has a more difficult innovation problem – but if it remains in the same environment, and searchers still have a good idea of the directions in which to place their bets. In the upper left quadrant of Figure 3 search

goes beyond current technological or regulatory pathways into new but promising market opportunities. Search for new ideas is certainly required, but it is bounded by rules of a business game with which the firm (and its competitors) are relatively familiar.

Innovation can be more difficult if the environment becomes more complex. As new markets and technologies, competitors, regulators and other players emerge, innovation may require reframing and unlearning old 'rules' of the game as shown at the bottom right on this figure. For example, the revolution created by low cost airlines some years ago introduced a new business model. It was not simply a matter of low prices – but a complete reframing of the way different elements interacted. Successful low cost airlines had to develop rapid turnaround capabilities, sophisticated pricing models, flexible and multi-skilled working arrangements, and so on. They moved beyond the routines of established airlines. Still, they were working with many understood dimensions of competition.

That kind of challenge, though significant, is eclipsed in many of today's discontinuous environments shown in the upper right quadrant. For example, the rapidly growing field of VoIP (voice over internet protocol) communications is not developing along established trajectories towards a well-defined end-point. It is emerging. The broad parameters are visible – including the rising demand for global communication, increasing availability of broadband, multiple peer-to-peer networking models, and growing technological literacy amongst users. Yet the dominant design for VoIP is not yet visible. Instead there is a rich fermenting soup of technological possibilities, business models and potential players from which a new competitive arena is gradually emerging.

Search for information in this kind of situation must explore new territory. There is unpredictability and no clear place to start – companies are in an unexplored space where completely new games can emerge. The challenge for Skype and other contenders is to do something different – something that no firm has yet done. Searchers seeking a position in this and other emerging situations must ask whether any of their prior assets are useful. They must search for answers in

unexpected places, picking up and learning about radically different and unimaginable possibilities. Searchers are groping forward in a fog.

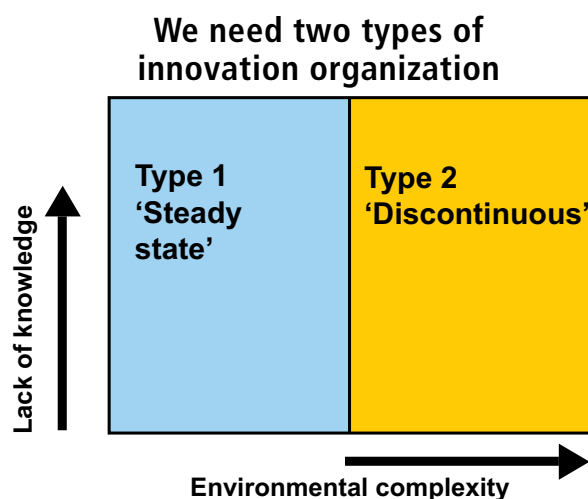


Figure 4: Steady state ('do better') versus discontinuous ('do different') innovation

Our research suggests companies in this situation use a mixture of judicious experimentation and a lot of fast adaptive feedback to emerging situations. They essentially 'probe and learn.' Firms need to acquire two core skill sets underpinning these experiments: the ability to reframe existing elements in new combinations and the ability to co-evolve new knowledge elements. Their successful use requires searching in unlikely places, building links to strange partners, allocating resources to high risk ventures, exploring new ways of looking at the business - all of which challenge the 'normal' way companies have approached the innovation problem.

Two core skills are needed to respond to discontinuous environments: the ability to reframe existing elements into new combinations, and the ability to co-evolve new knowledge elements with those outside of the firm. Both require searching in unlikely places and making links to unfamiliar partners.

While we know a lot about how to manage the steady state kind of innovation (doing what has been done, but better) we are much less clear about where and how to start building discontinuous innovation capability for doing

things in new and different ways. Smart firms are carrying out various experiments in this direction, but no-one can claim to have found ‘the’ answer for dealing with discontinuous environments. We’re all still learning – and that’s where the Discontinuous Innovation Lab comes in.

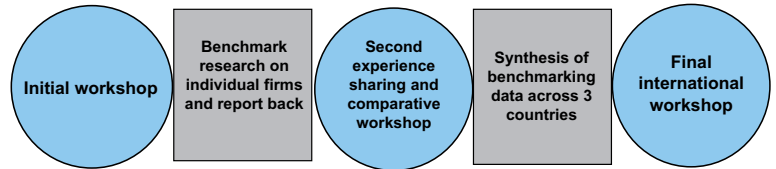


Figure 5 – Outline of DILab Network meetings

What is the Discontinuous Innovation Lab?

Very simply, the Discontinuous Innovation Lab (DILab) is an experiment in open innovation. It is an opportunity for firms to learn together about managing discontinuous innovation: sharing experiences, trying new things out, reflecting on what has and has not worked and looking at new ideas and models. DILab provides a chance to compare, contrast, share and develop understanding of the major challenges of discontinuous environments by linking up with other non-competing firms, working with (practically-minded!) academic researchers and drawing on experience in different sectors and countries.

DILab has a simple structure with four elements, as shown in Figure 5.

- Recruiting companies in each country is followed by an initial workshop surfacing DI challenges and capturing experiences, as well as issues and experiments in progress within participating firms.
- A data collection phase follows, using a short benchmarking framework. This results in a snapshot of each firm in terms of its approaches to dealing with key DI challenges.
- This snapshot is the subject of a review meeting with the firm, followed by a second networking workshop which facilitates sharing experience and identifying cross-company learning opportunities.
- Finally, the results of networking activity in the first three countries (UK, Denmark and Germany) formed the basis for a large workshop to which participating firms and researchers from the three countries were invited.

What’s in it for the participating firms?

Firms get the chance to share ideas and network with other firms from very different sectors but facing common problems. They hear about new ideas and tools, new approaches, and have an opportunity to reflect and explore in a safe and confidential way. By bringing together the experience of around 50 organizations in different sectors and countries we can build a simple benchmarking framework that will help firms identify what they could learn and from whom.

Firms invest time and commitment. We look for active involvement with the workshops and for help with case study interviews – by identifying who we should talk to and helping us set up the research agenda. DILab is meant to be an effective learning network rather than a public relations showcase, which is illustrated by the results of our first research project on innovation search, which yielded information about 12 search strategies for discontinuous conditions.

The first DILab discussions yielded information about 12 search strategies for innovations responding to discontinuous conditions.

Can you summarize what firms are learning about searching for information under discontinuous conditions in the DILab network?

Not surprisingly, different firms had different approaches to exploring new ground for discontinuous innovation and potentially benefit from expanding their repertoire in different ways. Upon discussion many realized they were

doing more than they initially thought, especially when they counted less formal activities. My colleagues and I summarized the different potentially reinforcing approaches into these [12 search strategies](#):

Search Strategies	Mode of operation
Sending out scouts	Dispatch idea hunters
Exploring multiple futures	Use futures techniques to explore alternative possible futures and develop innovation options
Using the web	Harness the power of the web to detect new trends.
Working with active users	Team up with product and service users to understand the ways in which they are changing
Deep diving	Study what people actually do, rather than what they say they do
Probe and learn	Use prototyping as a mechanism to explore emergent phenomena and learn from key stakeholders.
Mobilizing the mainstream	Bring mainstream actors into the product and service development process
Corporate venturing	Create and deploy venture units
Corporate entrepreneuring / intrapreneuring	Stimulate and nurture talent inside the organization
Use brokers and bridges	Widely cast the ideas net to connect with other industries
Deliberate diversity	Create a diverse workforce and diverse teams.
Idea generators	Use creativity tools

Some of these search methods don't sound that fancy, but as we found more and more examples among large and small firms, including firms that are included on lists of the most innovative companies in the world, we became increasingly interested in the result of this first effort at open sharing. Because more information is available (as listed under resources below) I will give you only a brief account of the detail we have in our data base.

The Discontinuous Innovation Lab brings non-competing firms together, within and across national boundaries, to share experience about the innovation process.

1. Sending out scouts.

A number of firms have established specific projects to identify and process new ideas. For example, the German telecommunication firm O2 has a trend-scouting group of about ten people who interpret externally identified trends in terms of O2's specific business context. Once a year the group meets with the board to discuss and select ideas. Other DILab firms recognize that researchers and other employees attending professional

conferences can be idea hunters and have put systems in place for collecting the insights they gain.

2. Exploring multiple futures.

A second approach to finding innovation triggers is to consider alternative futures, especially those that do not follow current assumptions. One effective way of creating and exploring such futures is scenario planning, as pioneered by Shell. DILab firms emphasized that predicting possible futures is just the beginning of the search process. It is important to discuss actions that could be taken to make any particular future a reality.

The Danish pharmaceuticals company, Novo Nordisk, provides a good example. It uses a company-wide scenario-based program to explore radical futures around its core business. One very

interesting result: the company helped set up the Oxford Health Alliance. The Alliance is a non-profit collaboration bringing together key stakeholders – medical scientists, doctors, patients and government officials – who often have divergent views and perspectives. The goal is the prevention or cure of diabetes, which if achieved, would potentially kill off Novo Nordisk's main line of business. But, as CEO Lars Rebien Sørensen noted, that outcome might also create new opportunities.

Most companies are involved in activities that could generate ideas for radical innovation. It can be helpful to use them more systematically via scenarios.

3. Using the web.

In its simplest form this third search strategy is a passive information search – the web is an additional space into which the firm sends its scouts. Increasingly firms also use professional organizations that have search capabilities to help hunt for ideas in this complex environment. However, some DILab companies are more active. For example, BMW makes use of the Web to support its Virtual Innovation Agency – a forum where suppliers from outside the normal range of BMW players can offer ideas. The inputs sought are both product and process-related: a recent suggestion was for carbon-neutral recycling of factory waste.

4. Working with active users.

In a significant number of cases those encountered in a web environment become more active players in the innovation process. Companies using this strategy indicate that customers at the fringes of the mainstream tend to be more tolerant of early project limitations and more willing to work to discover something better. This makes them an ideal target group for beta testing. For example, a few days after LEGO launched Mindstorms RCX – the programmable Lego toys – advanced users had cracked the code and developed updated versions that were superior to the original. In 2006, LEGO launched a radical new Mindstorms product – the NXT. This time the company invited some leading users to participate directly in product development. In recognition of the success of this program, Lego stated in January 2006 that it was

looking for 100 more “citizen developers” (<http://mindstorms.lego.com>).

It was interesting to note that while the issue of intellectual property came up regularly, most companies did not view this as a major problem of involving outsiders. Being able to visit the company's design studio (BMW) or having one's name associated with a product (LEGO) were viewed by active users as incentive and sufficient reward for their engagement.

5. Deep diving.

A fifth powerful source of demand-side innovation triggers is to take a much deeper look at how people actually behave – as opposed to how they say they behave, or company insiders believe they behave. For example, to ensure that its new terminal at London Heathrow would address user needs well into the future, BAA (the company that manages 8 major British airports) commissioned research into what users in 2020 might look like, and what their needs might be. The aging population came up as an issue. Focusing on the behavior of people at their current airports, BAA managers noticed that older people tend to go to the toilet more frequently than other customers. As a result, they planned for more toilets at Terminal 5. However, the research also showed that many people going to the restrooms did not actually use the toilet – they went there because it was quiet and they could hear announcements more easily. This observation led to other modifications of the new terminal.

6. Probe and learn.

It is often difficult to imagine a radically different future, and even harder to predict how things will actually develop. In order to get a better understanding of promising but radical innovations some DILab companies have started to use an approach we call ‘probe and learn,’ which can be described as “trying something out and learning from the result, even if the result represents a failure.”

Novo Nordisk is making extensive use of probe and learn approaches in trying to understand the possible evolution of new diabetes-related services and care pathways, especially where very different conditions apply. For example, in Africa there is a need for holistic solutions involving education,

clinics and prevention methods – all delivered from a very low cost base. The company is involved in a process of prototyping and modification to develop responses that fit this environment.

7. Mobilizing the mainstream.

The seventh strategy deals with tension between the need to search for ideas that might support discontinuous innovations and the fact that most organizations are already stretched, lacking resources for new and different search activities. We found that some participating companies had developed ways to amplify their search capacity by making better or different use of existing resources. For example, at Bang & Olufsen a number of “inspiration clubs” have been formed, each with a chair who has the role of facilitator and driver. The setup ensures that ideas from across the organization are identified and elaborated.

8. Corporate venturing.

In contrast to strategy seven, the next strategy involves setting up special units with the remit and budget to explore new diversification options. Typically these efforts are ring-fenced, so that participants can explore new opportunities that may not be acceptable in the parent organization (perhaps because they are too small, reflect badly on existing brands, or do not relate to existing businesses). Most set-ups mentioned by DILab companies had provisions for acquisition as well as spin-outs. The degree of parent control varied from tight to a hands-off policy.

Large corporations also have multiple ventures, with different control policies. Unilever, for example, has three schemes for corporate venturing: 1) A fund 40% owned by Unilever (with the rest owned by banks and investment funds) to buy companies from entrepreneurs and see whether they can be scaled up and turned into a larger success; 2) Unilever Technical Venture (UTV), which is wholly owned by Unilever and takes a minority stake in early stage technology startups; 3) Unilever Venture, which invests in technical spin-outs and other businesses that are close to the company’s core activities.

9. Corporate entrepreneuring / intrapreneuring.

The ninth strategy is a different take on corporate venturing often referred to as corporate entrepreneuring or intrapreneurship. This strategy attempts to build a culture where new ideas are generated within and across the organization.

Many such schemes provide strong incentives for those willing to take the lead in moving ideas into marketable products from the company’s core. Intrapreneuring aims to nurture entrepreneurial energy and drive inside the organization. However, DILab participants pointed out that doing so often brought out fundamental tensions between creativity and control and between playing by the rules and creating new ones. Participants emphasized the importance of informal networking and other mechanisms to take ideas forward below the radar screen of formal corporate systems.

For example, BMW has a strong commitment to bootlegging – encouraging people to try things out without necessarily asking for permission or establishing a formal project. In BMW these are called ‘U-boot’ projects. A good example is the Series 3 Estate. The mainstream company thought the model conflicted with the image of BMW as producing high quality, high performance and sporty cars. However, a small group of staff worked on a U-Boot project to make a prototype, using parts cannibalized from other cars. The model was ultimately accepted and opened new market space for the company.

10. Use brokers and bridges.

A tenth search strategy is based on the insight that interesting innovations often develop at the boundary between one knowledge set and another. People who can see how ideas in one area might connect with another are invaluable. Organizations interested in more radical innovations are using social networking tools and other techniques to map networks and connections outside their normal knowledge zones.. For example, the UK engineering services company Arup has done extensive work on mapping networks inside and outside the business to better exploit potential connectivity. The result is a map of the Arup ‘brain’ which indicates where connections are made and could be made and who could engineer new links.

11. Deliberate diversity.

Many DILab participants indicate that ‘fitting in with the culture’ has been a recruitment criterion in the past, but some are placing greater emphasis on diversity (both in hiring and when setting up project teams) in the hope of supporting more discontinuous innovation. For example, the design and innovation consultancy IDEO hires people from backgrounds as diverse as medicine, engineering,

anthropology and physics to create teams with a strong track record in coming up with groundbreaking new ideas. The German auto-supplier, Webasto, provided a complementary discussion on the topic of “querdenker” (people who think against the grain). Not long ago managers in this company realized that they had stopped recruiting such people, one reason being that they can be quite demanding on resources. Today the company sometimes uses consultants or other external people to take on the role of querdenker as a less expensive alternative to full-time employment. A companion strategy in this and other companies can be to seek diversity through external alliances.

12. Idea generators.

The last of the twelve search strategies observed among DILab companies is to use creativity tools and techniques to increase the flow of radical ideas. They sometimes use external agencies to help with the generation of ideas with discontinuous potential, and point out that these external agents are not necessarily required to produce detailed concepts or ideas but rather to act as early warning systems for weak signals about changing trends. A particularly interesting combination of these ideas came from P&G; their P&G Encore program uses retirees to help act as gatekeepers and spotters.

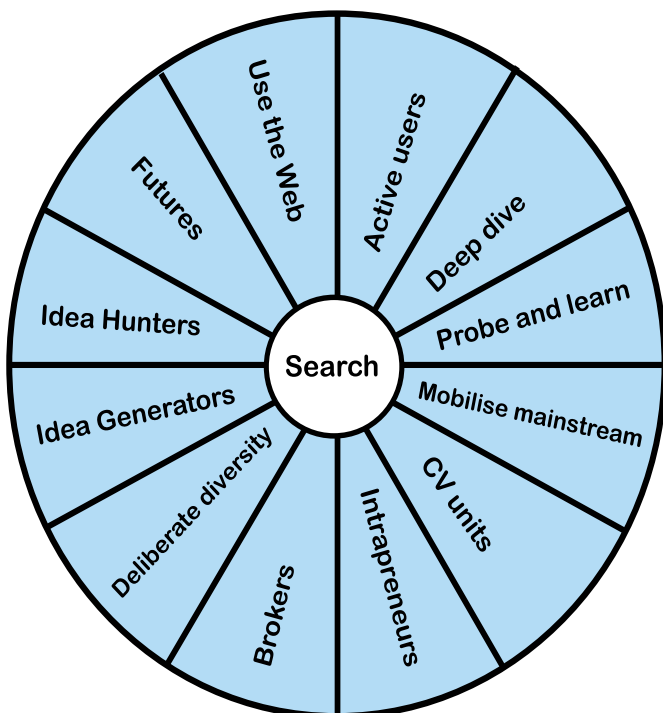


Figure 5: Multiple search strategies for discontinuous innovation

Learning Resources

The website www.managing-innovation.com offers additional resources, including tools and case illustrations.

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Challenge for Practice & Key Research Issue: Connecting New Opportunities to Company Routines

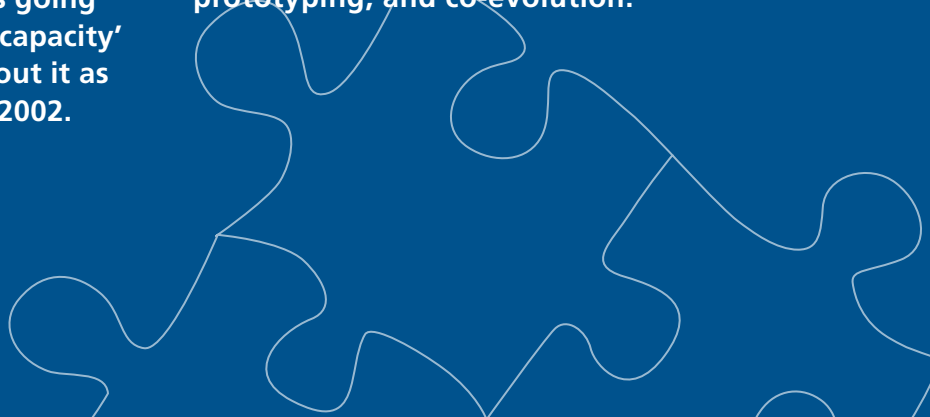
Companies from the Discontinuous Innovation Lab agree it is very important to consider the degree to which mechanisms are in place to transfer insights into the mainstream organization. Unless these mechanisms are in place new ideas are accessible to a few only, and generally not the ones able to decide whether or not to act on the information. Routines for experimentation emerge only if they are regularly deployed and reinforced – and for many DIL organizations the sense was that the connections are so far weak.

This is closely related to another obstacle, a lack of connectedness inside the organization. Unless different strands of information and insight come together in one particular area and can be combined to create a more persuasive and convincing picture, insights about potential discontinuities will be ignored. For example, suggestions from hired idea scouts may receive little attention.

A further problem identified is a potential lack of buy-in. By its nature, discontinuous innovation challenges and often undermines existing skill – and mind-sets. Therefore those at the core of the organization are inclined to reject insights and discount them as unrealistic or label possible ways forward as ‘not feasible.’ This reflects the gap identified by some researchers between ‘cognitive absorptive capacity’ – learning about what is going on – and ‘operational absorptive capacity’ – essentially doing something about it as outlined by Zahra and George in 2002.

Research by Hargadon and others also suggests an emerging challenge at the level of skills and human resource policy. Given the growing emphasis on cross-over between knowledge sets – whether internal or inter-organizational – the nature of bridging and brokering skills becomes a central question. What skill set is needed to act as a broker and can this be trained or recruited? The evidence collected by Kelley et al. is that in many cases firms are, at least temporarily, recognizing a skills gap and employing outsourcing approaches to a growing service sector with skills in design, creative concept generation, trend spotting, search, etc.

One aspect of interest is the way in which experiments can become routines through regular use and reinforcement. In order for this to happen, and to facilitate bridging to the mainstream of the organization, there is a need to codify and facilitate a scale-up or transfer from fringe units currently engaged in the process. This highlights the role of what could be termed ‘tool making’ – converting experimental approaches in, for example, futures work or prototyping into robust and communicable methodologies which can be transferred. Examples in the DILab research reported here include work on codifying and understanding lead user methods, prototyping, and co-evolution.



Interactive value creation with users and customers

Professor Frank Piller holds a chair of management at the Technology & Innovation Management Group of RWTH Aachen University, Germany, one of Europe's leading institutes of technology. He is also a founding faculty member of the MIT Smart Customization Group at the Massachusetts Institute of Technology, USA.

Author of numerous books and articles, he is quoted in The New York Times, Financial Times, The Economist, Business Week, and other publications as a leading expert in the fields of mass customization and customer centric value creation. His recent analysis of "Threadless" (with Susumu Ogawa) and its innovative crowdsourcing business model in the fashion industry is summarized below. It was recently elected one of the Top 20 articles in MIT Sloan Management Review.



Professor Frank Piller

In his talk with the Peter Pribilla Network, Professor Piller emphasizes that companies can actively involve users, often at relatively low cost, in the innovation process. Threadless is a particularly bold example: a company that has successfully outsourced the entire innovation process to users/customers – from idea generation to selection among prototypes for mass production. At the end of the talk, Piller suggests that government support can facilitate user innovation on a national level and thus create competitive advantage for German companies.

Professor Piller, can you start by summarizing the need for external sources of innovation?

I agree with John Bessant that a globalizing economy demands so many new products and processes that companies can benefit enormously from opening the innovation process to external sources. At the same time, the factors John mentions, including new technology and more sophisticated users, actually facilitate search and other innovation activities – which is the subject of my research.

Henry Chesbrough introduced the term 'open innovation' in 2003 to describe the systematic integration of external inputs in some (or even all) stages of the innovation process. One of his principles is that companies that adopt an open innovative approach have to recognize that "not all the smart people work for my company." One of my favorite examples of this statement's power is InnoCentive.

It was launched in June 2001 by Eli Lilly, the pharmaceutical company, as a research venture. Today InnoCentive is an independent enterprise that describes itself as the result of a new model of distributed research and development that is similar to the idea of distributed computing.

Distributed computing allows individuals to contribute idle CPU resources to collaborative projects, enabling cost-efficient access to massive processing power without fixed infrastructure investments. Similarly, InnoCentive provides a way to search for solutions to technological problems among existing resources outside of the conventional internal research and development structures of a firm. InnoCentive posts its clients' (called "seekers") problems on its web site, without any hint of the seeker company's identity, together with a financial reward for the best solution delivered within a given timeframe.

Seeker companies are mostly large R&D operations like Procter&Gamble, Dow, Eli Lilly, BASF, and others. They use InnoCentive when they are looking for brand new approaches and new ideas, especially when they are stumped in a particular research area. InnoCentive provides access to a global network of more than 100,000 scientists who offer solutions in the hope of winning the offered reward.

The company facilitates problem formulation and posting, solution screening, confidentiality, intellectual property agreements, and award payment. Using this approach of distributed or open innovation, seeker companies get access to the specialized talents of tens of thousands of scientists without adding to their fixed costs.

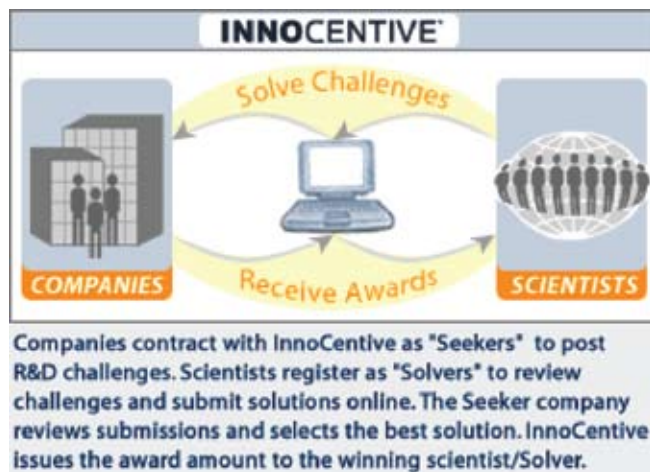


Figure 1: How InnoCentive works (Source: InnoCentive.com)

Recent research by Karim Lakhani for his dissertation at MIT shows that the InnoCentive model is not just different, but also highly efficient. He studied 166 problems that had been posted on InnoCentive.com by large corporations from the chemical and pharmaceutical industry. The corporations previously had spent between six months to two years trying to solve the problems internally, without success. Offering on average \$30,000 for a successful problem solution, these problems were posted on InnoCentive. In general, solutions had to be submitted within six months of initial posting.

Of the 166 problems Lakhani studied, 49 (29.5%) were solved by the InnoCentive community. This is an impressive percent, given that individual solvers were competing with organized corporate research labs. But even more impressive is Lakhani's finding that on average a winning solver spent just 74 hours to solve the problem -- compared to 6 to 24 unsuccessful months by the big corporations.

The reason for this almost unbelievable result is rather simple: winning solvers already knew the solution! InnoCentive helps seekers by leveraging preexisting knowledge distributed in their broad community of 100,000 scientists. In 72.5% of all cases, the winner just reused an existing solution from a previous task he or she had solved in a different context. In most cases, the solution was outside of the seeker's field of expertise, which means that the seekers would have been very unlikely to find the solutions on their own.

I believe that the companies using InnoCentive are pioneering an important new approach to the innovation process. It is based on problem broadcasting, not solution seeking. The new model (which is a significant innovation in itself) suggests that companies can benefit from making a severe break from the expectation that R&D should be closed and private. Useful sources for innovative ideas and solutions lie beyond their external borders and a problem broadcasting model may be much more efficient than trial-and-error. As an aside, this model is not only of interest for profit-seeking companies; one of InnoCentive's major clients is the Rockefeller Foundation, which offers rewards for solutions like the eradication of malaria.

Problem broadcasting instead of solution seeking is a new alternative to local search.

You may suspect that the efficiency of problem broadcasting is only realized for the toughest problems, but the efficiencies of open innovation apply to a much broader class of products and processes, and concern not only inputs from specialists, but solutions from innovative users, and even ordinary customers.

What are your ideas about involving innovative users as a source of new solutions for companies?

InnoCentive connects seekers with scientific experts in many different disciplines and countries. I have been particularly interested in experts closer to home – the individual innovators of products and processes that can ultimately be produced by companies for a much larger market, as shown in Figure 2.

Work by Professor Eric von Hippel and his associates has shown the importance of making this connection. His book *Democratizing Innovation* summarizes several decades of research about user innovation. A description of a videoed lecture based on the book provides a good overview:

If you have ever come up with a work-around or improvement for a balky product only to find that it performs better than the original, you are not alone. Eric von Hippel proffers multiple examples where an ordinary user, frustrated or even desperate, solves a problem through innovation. His research found innovative users playing with all manner of product: mountain bikes, library IT systems, agricultural irrigation, and scientific instruments. Often, manufacturers keep at arm's length from these inventions. He describes the Lego company "standing like a deer in headlights" when technologically adept adults discovered they could design their own sophisticated Lego robots. User communities arise, freely communicate with each other, advance ideas and sometimes even "drive the manufacturer out of product design," according to von Hippel. This widely distributed

inventing bug is a good trend, believes von Hippel, because users "tend to make things that are functionally novel." Not only is it "freeing for individuals" but it also creates a "free commons" of product ideas, parallel to the more restrictive world of intellectual property governed by less creative manufacturers.

The conventional approach to connecting with innovating customers follows the "lead user" concept von Hippel developed. Firms screen innovative solutions developed autonomously by leading-edge users facing a specific, un-solved problem. These users are potential customers who face a need that will become central to a more general market, well ahead of the majority of users. They solve problems because they expect to personally realize a high benefit.

Using different screening mechanisms to identify these users and a workshop methodology to interact with them, lead users can be integrated into the firm's innovation process.

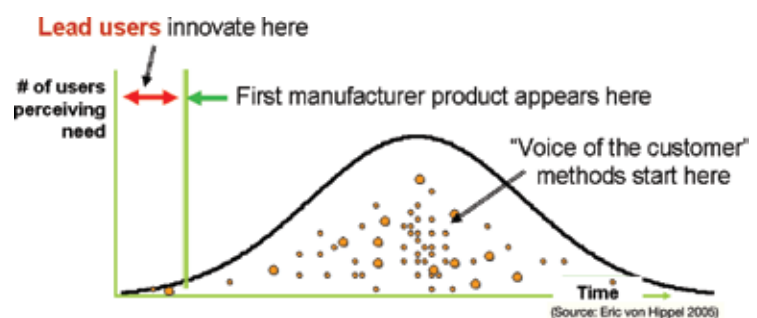


Figure 2: Distinction between lead user innovation and innovative ideas from customers

Can firms facilitate user innovation?

The existing literature on user innovation, as I've just described, looks for users motivated by their own needs. They perform their problem solving activities autonomously and without the involvement of a manufacturer. It is then the manufacturer's task to capture these ideas and transfer them into its domain. Firms that want to benefit from co-creating with their users have to go further. They must build new capabilities and infrastructures. This is an unfamiliar task for many firms, connected with non-trivial investments in terms of money, staff hours and managerial attention.

Nonetheless, manufacturers can assist and organize the process of user innovation, as John Bessant

has already mentioned. Interactions between a manufacturer and its users take advantage of a technological milieu (foremost the internet) to create an arena where user innovations evolve. This kind of co-creation also tends to demand a continuous interaction between the employees of the manufacturer and the innovating users.

I have been involved with efforts to systematically use the innovation potential of customers by helping manufacturers apply techniques such as design competitions, toolkits, and customer forums. These techniques are intended to stimulate a broader range of innovative ideas from the user domain. But there is an important question: How can the firm and co-creating users coordinate the joint value creating process? The coordination of user involvement in innovation activities cannot be described by conventional models of hierarchies or markets. Integrated users are neither paid to participate nor are they employed by the firm. In a joint book with Ralf Reichwald, we called this collaborative way of value creation “interactive value creation” – firms and users (or other external actors) jointly create value in a process of continuous interaction around a common goal.

When we developed our concept of interactive value creation, we built on earlier work by Yoachi Benkler, a professor at the Yale Law School. He studied how open source software works and found that there was a need for an alternative economic foundation to explain the nature of co-creation activities that are taking place in the open source developer communities. He summarized his ideas in a concept called “common-based peer production” to explain the coordination and motivation mechanisms behind the creation of open source software, namely the Linux operation system. Value creation in these user developer communities seems not to be based on a discrete allocation of property rights and formal contracts, but is dominated by self-selection and self-motivation toward tasks by participants. A core characteristic of peer-production in those communities is the joint value creation of a large, open network of participants. In these networks, tasks are broadcasted by individual users or a focal coordinating body, and participants self-select whether or not they will contribute to a task, to what extent and with what resources. Those who react on an open call for contributions are motivated by various incentives, but not by (market) prices, salaries, or hierarchical commands.

We developed our ideas about interactive value creation by expanding this thinking beyond software to an open co-creation process that should work in many industries. With a similar idea, but a much more catchy word, WIRED’s Jeff Howe later called this “Crowdsourcing”.

Definition of interactive value creation or “crowdsourcing”:

“An act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call. This can take the form of peer-production (when the job is performed collaboratively), but is also often undertaken by sole individuals.” (Howe)

Please tell us more about peer-production in practice.

Interactive value creation means that users are involved in the full range of activities that bring a product to market. In many consumer goods markets today, manufacturers are forced to create product assortments for increasingly small market niches, as these markets are the only source of growth that escapes heavy price competition. In this situation, new product development projects often require enormous investments and are highly risky. While new products or product variants have to be developed and introduced at a rapid pace, forecasting their exact specification and potential sales volumes is becoming more difficult than ever, as other producers are also creating niche products.

Newly launched products have shown notoriously high failure rates over the years, often reaching fifty percent or more. The primary reason for these flops has been found to be inaccurate understanding of user needs. In other words, many new product development projects are unsuccessful because of poor commercial prospects rather than technical problems. Researchers have found that timely and reliable information on customer preferences and requirements is the most critical information for successful product development.

Conventionally, heavy investments in market research are seen as the only way to access this information. But Threadless, a young Chicago-based fashion company, follows an innovative business model that allows it to create a high variety of products without risk and without heavy investments in market research. The company does not have sophisticated forecasting capabilities or a complicated flexible manufacturing system. Yet, it accesses customer preferences before production begins.

Examples of Threadless products appear on their website and also give a good idea of community enthusiasm.



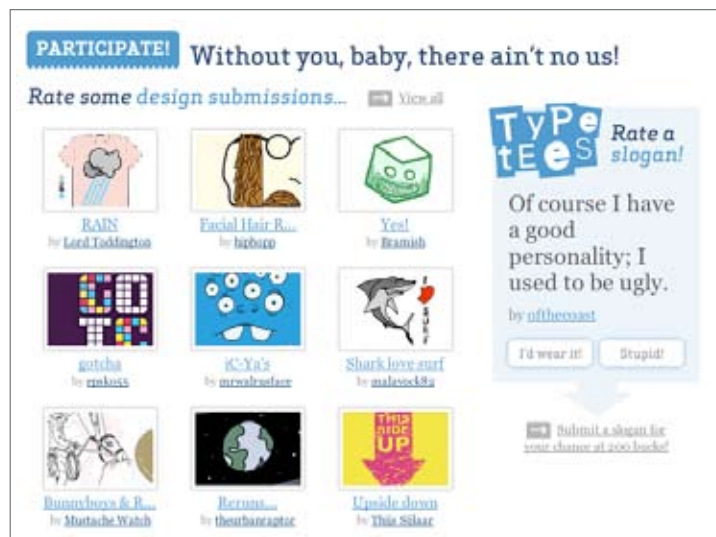
Started in 2000 by designers Jake Nickell and Jacob DeHart, Threadless focuses on a hot fashion item: t-shirts with colorful graphics. This is a typical hit-or-miss product. Its success is defined by fast changing trends, peer recognition, and finding the right distribution outlets for specific designs. Despite these challenges, none of the company's many product variants has ever flopped.

Success is due to the fact that all products sold by Threadless are inspected and approved by user consensus before investment is made into a new product. The garment is produced only after a sufficient number of customers have expressed their explicit willingness to buy the design. If commitment is missing, a potential design concept is dismissed. But if enough customers pledge to purchase the product, the design is finalized and goes into production. In this way relatively small market research expenditures are turned into early sales. New designs regularly sell out fast, and are reproduced only if a large enough number of additional customers commit to purchase a reprint.

Some customers are integrated more deeply into the new product development process. All new designs are submitted from a community that includes hobbyists, but also professional graphic designers. The company exploits a large pool of talent and ideas to get a much larger set of designs than it could afford if the design process were internalized. Creators of submissions that are selected by other users get a \$2000 reward, and their name is printed on the particular t-shirt's label. Since their opening, over 1000 winning designs have been chosen for print from more than 80,000 submissions. The Threadless community is thriving with over 200,000 votes submitted each day to evaluate.

The Threadless business model exploits the commitment of users to screen, evaluate and score new designs as a powerful mechanism to reduce new product failures. The method breaks with the known practices of new product development by utilizing the capabilities of customers and users to carry out the innovation process. Users can evaluate each week between 400 and 600 new designs on a scale from zero ("I don't like this design") to five ("I love this design"). On average, each design is scored by 1500 people. A good score corresponds to a value above 3.0. But in addition, customers not

only express their marked preference for specific designs, they can also opt-in to purchase the design if it is chosen by the collective. For this, they check a box "I'd buy it" next to the scale. From the designs receiving the top votes and largest commitment of users to purchase, Threadless is producing today between four to six new products each week.



To keep the competition interesting and encourage users to participate continuously, the number of designs at a given time has to be limited so that users don't get confused. Usually, each design gets seven days to be scored. But if a new design receives a low score within the first 24 hours of its posting (as identified by multiple variables, including the number of "I'd buy it" checks and the design's average score), it will be dropped from the running. This happens to about one third of the submissions. The early user feedback has proven to be a very strong indicator of the success of a design in the competition and enables the company to increase the usability and experience for users who vote.

The Threadless business model uses the capabilities of customers and users to carry out all aspects of the innovation process, from design to evaluation and selection of products for sale.

Motivated by its success in the fashion market, Threadless' founders have recently extended their categories to formal wear like ties or polo shirts (NakedandAngry.com) and music (15MegsofFame.com).

In a joint paper with Susumu Ogawa, we called the process of getting the exact feedback of customers before a firm starts production "Collective Customer Commitment." The process starts when an idea for a product is posted by an external designer who responds to an open call for participation. Second, reactions and evaluations of other consumers towards the posted idea are encouraged in internet forums and opinion polls. Based on the results of this process, the manufacturer investigates the possibility of commercialization of the most popular designs. If this evaluation is positive, the company decides on the minimum number of purchasers necessary to produce the item for a given sales price, covering its initial development and manufacturing costs (and the desired margin). The new product idea is then presented to the customer community, and interested customers are invited to express their commitment to the idea by voting for the design or even placing an order. Accordingly, only if the number of interested purchasers exceeds the minimum necessary lot size are investments in final product development made and sales commence.

It seems to be an impressive model. Are there other benefits of interactive value creation and collective customer commitment for a firm?

Studies comparing the broadcasting and self-selection approach with conventional methods of organizing the division of labor show that in many instances the peer-production system is more efficient. Consider Threadless: This small company is able to generate thousands of new designs with almost no staff. But there is more than just outsourcing work involved. Often, the input from an open call to a community to solve a given problem also results in better quality when compared to problems solved internally.

The economic benefits to contributors come from two things: Either they have lower costs in solving the task (for example, solvers already know the solution or have specific knowledge required to solve it) or they have higher motivation (involvement, challenge, joy) to work on the task.

To be more explicit:

- Interactive value creation is based on self-selection of a problem by potential contributors. That means no cost for screening, identifying and allocating tasks to actors is borne by the organization.
- Self-selecting actors are motivated either by their knowledge that solving the problem demands little effort or by regarding the task as challenging and worth solving.
- The open call for participation is not restricted. A broad network overcomes “local search bias” and taps into knowledge sources not known to the task’s originator.
- The open interaction also fulfills desires for social interaction.

An important prerequisite for peer-production to work as described for Threadless is that tasks can easily be distributed across a network of actors. For example, peer-production demands that a complex problem can be separated into smaller modules that can be solved independently and hence can be allocated easily to different actors (something called “granularity” in the academic literature). Also, the larger the number of peers (participants) in the network, and the more heterogeneous their individual knowledge stocks, the higher the probability that a task will be selected and then solved efficiently. Finally, the easier it is to re-use existing knowledge and the easier it is for others to use solved problems, the better and more efficient the production system.

A different kind of facilitator is the use of licenses for property rights that do not restrict sharing and using solutions within a network. Commons-based problem solving especially flourishes with efficient documentation of existing knowledge stocks in open repositories.

These conditions are met perfectly in open source software development where the model was initially developed. Experience to date has shown that an innovation system using elements of commons-based peer-production will work even in a corporate context.

Is it difficult to involve users and customers in innovation processes?

Motivating individual actors to make an appropriate contribution is an important management task, but often it is not difficult at all. The significant problems of innovation are solved only if all participants realize a sufficient value from their participation. Manufacturers thus must incentivize customers and other users to transfer their innovative ideas. Some companies promise cash rewards or licensing contracts for innovative ideas (like Procter&Gamble’s [YET2.com](#) platform). Others build on peer recognition (like LEGO’s mail-order catalogues which name customers whose creations are being produced as standard products). Obviously, these rewards or recognitions are not given to everyone submitting an idea, but only for the best of these submissions.

This leads to the idea of using a competitive mechanism as an explicit measure to foster and encourage user innovation. The idea of a customer idea contest (CIC) is to ask users to submit solutions to a given task within a given timeframe, as Dominik Walcher and I describe in a paper on the design of CIC. The nature of the competition should encourage more or better users to participate, to inspire their creativity and to increase the quality of the submissions. Submissions typically are evaluated by a panel of members from the solution seeker, and ranked accordingly to a set of evaluation criteria. Solvers whose submissions score highest receive an award from the seeker, which is often granted in exchange for the right to exploit the solution in the domain of the seeker.

The significant problems of innovation are solved only if all participants realize some reward from their participation.

In addition to generating a wide range of ideas, a CIC may also transfer ideas into concepts (solutions) with supporting documentation. This is important. In many organizations, ideas are not in short supply, but the selection of promising ideas and their conversion into useful concepts is problematic and expensive. A well constructed contest can support these steps, if the rules of the contest demand not only an idea, but ask submitters also for a first proof of feasibility, an evaluation of solution technologies enabling the idea, or even a corresponding manufacturing concept.

For example, P&G’s idea contests on [YET2.com](#) ask for ideas about very open problems, but

demand that the idea is supported by a solution concept that is highly elaborated and proven by a working prototype. Submissions to Threadless are similarly elaborated when designers use specific software that allows for an easy transfer of the chosen designs to manufacturing. The website also increases the specificity and transferability of design ideas by using the input and evaluations of other users to select between all ideas submitted. The product management of Threadless thus receives at the end of each contest not only a large number of design ideas, but also a short-list of promising design concepts selected by the customer target group, along with numerous comments and ideas about how to transfer the submitted designs into even better product concepts.

This all sounds very promising. Are governments supporting user innovation in order to enhance the competitiveness of their economies?

When academics and companies were first developing the ideas of open innovation, it was not yet a policy based initiative. Recently, however, the Danish government has lead the way, followed by the Australian government, and an initiative by the Nordic Council. In response to John's presentation, I'm happy to say that the UK appears to be next in this lineup. But, today I will focus primarily on the first initiative by the Danish government.

The Danish Government made support of "user driven innovation" a national priority in February, 2005. Substantial seed funding was taken up by several universities. To date, five dedicated professorships for user innovation have been established in three Danish public universities. In 2007, the Danish government committed to an investment of approximately 160M Danish Kroner per year for the next three years for programs to support user-centered innovation. In other words, in the short space of two years a significant change in government service to support innovation was signaled by 85M Euro.

The project is so significant that it was listed in the Harvard Business Review's list of Breakthrough ideas for 2007. The report said:

Denmark is the first country to bring government innovation policies into line with

modern understandings of how innovation really works. If this paradigm shift is successful, many other nations will certainly follow.

An important part of the effort is the Danish User-Centered Innovation Lab at Copenhagen Business School. Dedicated to helping make Denmark "a world leader," the lab does three things according to their website::

- (1) It brings together academic researchers and leading edge Danish companies in projects to develop, test and assess new methods and tools for user-centered innovation.
- (2) It organizes periodic face-to-face exchanges of information and experience between world experts specializing in new user-centered innovation methods.
- (3) It supports development of materials for widespread diffusion of "best practice" user-centered innovation methods to Danish managers in large and SMEs, MBA students, consultants and start-up firm personnel.

Six major Danish companies are involved. Bang & Olufsen and Lego are members, as well as the Ministry of Economic and Business Affairs and the National Agency for Enterprise and Construction.

I am waiting to see when Germany follows the lead of our European neighbors and creates a national policy of user innovation. The huge resource found among our customers is not yet systematically utilized by our local businesses. Yet, we know quite a bit about what might be done, as von Hippel summarizes in Figure 3.

How to start your own national user-centered innovation program

- **Staff some professorships in top institutes to make leading specialists in user-centered innovation available.**
- **Set up a program to fund research and diffusion efforts in user-centered innovation.**
- **Professors and firms should set up a collaborative academics/industry Lab that develops, tests and diffuses best practices in user-centered innovation.**
- **Adapt government innovation policies to support user-centered innovation:**
 - **Support development of collaborative innovation tools and standard setting.**
 - **Support users' rights to modify standard products.**

Figure 3: Eric von Hippel's recommendations to governments for starting a national user-centered innovation program (Source: Eric von Hippel 2007)



Learning Resources

- <http://userinnovation.mit.edu/>: A collection of working papers and additional resources
- <http://duci.dk/index.php>: Website for the Danish User-Centered Innovation Lab co-sponsored the Copenhagen School of Business, Aarhus School of Business and MIT.
- www.open-innovation.de: German website accompanying Ralf Reichwald & Frank Piller's book *Interactive Value Creation* with additional case studies and the possibility to download the book under a creative commons license.
- www.open-innovation.com: Frank Piller's website in English with additional information on topics discussed in this talk.

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Implications for Practice: How to identify and work with lead users

1. Create and prepare your lead user search team
2. Identify trends and needs
3. Search for lead users
4. Host lead user workshop

- Invite identified lead users and experts from analogous markets to workshop with internal experts
- Jointly develop innovative ideas and solutions
- Evaluate results
- Agree about Intellectual Property Rights and exploitation rights.



Key Research Issue: Overcoming NIH – the 'Not Invented Here' Syndrome

An important challenge of applying the peer-production principle and other ideas from open innovation involves the difficulties of integrating ideas and solutions created at the firm's periphery into the corporate context. Internal (proprietary) knowledge has to be connected with external generated knowledge. This process appears to one of the most challenging tasks for firms that want to utilize gains from open innovation.

Even as companies manage to search for and extract innovative inputs, perhaps investing in the installation of appropriate innovation-focused online platforms that collect customer ideas, the transfer frequently fails due to the "Not Invented Here" (NIH) problem. Katz and Allen defined the NIH syndrome some time ago as "... the tendency of a project group of stable composition to believe that it possesses a monopoly of knowledge in its field, which leads it to reject new ideas from outsiders to the detriment of its performance."

The NIH phenomenon has been shown to be an important barrier in many settings, and is proven to exist even between different domains within one enterprise (e.g., resistance on the part of R&D engineers to consider innovations suggested by the marketing department). Resistance to external knowledge is often even greater than resistance to colleagues' knowledge. The important warning: if the transfer of input from peripheral sources fails, investments in customer innovation platforms turn into additional costs.



Professor John Bessant

Unique Aspects of Service

Professor Bessant has been actively involved in many initiatives funded by the UK government. In this presentation he draws on research about legal services and experience in a wide range of other profession to discuss a new effort around service innovation.

Professor Bessant, do you think the problems of service innovation are unique?

Yes, I do, though there is much that can be transferred from experience with production. After ten years of government funding to understand service innovation, you in Germany seem to be ahead of other countries, including the United Kingdom, in understanding these issues. However, I've been helping one of the UK's research councils design a program targeted on innovation in services by giving presentations about the nature of services and what the agenda for research might be. I'd like to summarize some of our observations about the unique aspects of service.

Company executives know they face a very real innovation challenge. The chief executive of a company in our network speaks for many when he says "we are on the brink of change that is unprecedented, change of exponential magnitude. We must be willing and able to discard old paradigms and embrace change."

The required changes include implementing new customer centric processes and products, cutting costs, improving service through the application of IT and business process reengineering, then putting in place systems and a culture for sustainable innovation. Pretty grand stuff, pretty dramatic, but many in this audience might expect the CEO of a big company to be talking this way.

With a group of colleagues we are also looking at smaller UK companies and many of them are concerned about innovation. Again the strong need for innovation, but the key here is that often they haven't got the culture. They don't have a strategy to focus their efforts on innovation. They often are even more conflicted than larger firms between the

things they might do to create something new and the things they do to earn money. Work on service innovation is not always valued as a result of that.

It is a problem around the world. A survey in Germany conducted with 500 people showed that 78% of executives felt innovation was really important, but 57% thought they did not have a well defined strategy. Even worse, fully 80 % said they had no management system for innovation, 66% had no systematic measurement of innovation performance, 47% did not feel they were competent with innovation, and 12% believed that their culture did not support innovation.

The point about all of these probes is that you would expect to see them in stories about manufacturing, but these data come from service organisations. The executive who said "we must be willing and able to discard old paradigms and embrace change" is the chairman of the U.S. Bar Association, talking about the legal profession.

Service organizations are facing familiar problems of innovation, including the need to develop new customer centric processes and products, cut costs, improve service through the application of IT, reengineer business processes, and put in place systems and a culture for sustainable innovation.

The second survey was one that we did of UK law firms, organizations that are facing a real crisis. As a result of a prestigious national review it is only one year until the industry will be deregulated. At that point customers will be able to go to their supermarket, say Tesco in the UK, to get a divorce.

The challenge to the law profession, a classic example of a service, is almost unimaginable.

The survey from Germany was done by Price Waterhouse Coopers. Again they were asking questions in law firms. Again these service organizations are not prepared. Many of the people questioned do not feel competent to meet the changes they see around them now and in the future. "A paradigm shift," "the need to face radical change," we expect to hear these concerns in manufacturing, but they are coming from what many think of as a very stable, traditional, professional service.

The important question we have been looking at in the Advanced Institute of Management Research and the Engineering and Physical Science Research Council is whether researchers are any more ready. Those who fund research have been thinking primarily of manufacturing, while services account for most of our economic activity. What do we academics need to look at, if we are going to provide the research underpinning for service innovation?

I'll repeat a Figure I showed yesterday. It's a simple picture we use when we are teaching about innovation. I recently added service to products – very few of us talked about service innovation until recently. Still, the figure reminds us that there are many directions in which we can evaluate service innovation.

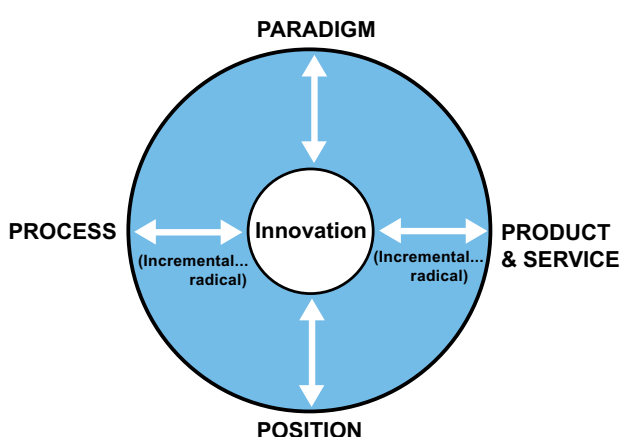


Figure 1: Including service in a firm's innovation space

So your ideas about incremental and discontinuous innovation apply to services?

Yes. What we offer to the world we can change. We can think of services as a product, and of course we can change that offering. First, we can do what we do better: we can incrementally innovate. that is generally quite easy to manage, because there is relatively little risk compared to really radical innovation. Alternatively, we can develop a discontinuous offering – a much better experience or a completely different offering.

But let's not forget, level is only one part of innovation. It is just as important to think about *how* we create and deliver a new product or service. All the back-office things in services, all the things that contribute to the costs, must be considered on multiple dimensions. To use a factory analogy, think of all the ways of putting a car or an airplane together. Services are also constructed in many ways and that provides scope for process innovations. Again: the innovation can be both incremental (doing what we do better) right through to the occasional radical change.

We can also think of what Figure 1 suggests about "position innovation." This is about potentially taking a product or a service and putting it in another context. You could move to a new market segment or a new geographical area or you could change the story you tell people -- working with the brand. There is huge scope here for innovation. The classic radical innovation would be the low cost airline. Essentially, what the low cost airlines did was change their position, the story they told and who they told it to. They did not begin by asking business customers to fly with them; they began by targeting students and backpackers and gradually changed the shape of the industry. These service firms did not change airplanes or airports; they changed their approach to the market.

Finally, from time to time there is what we call "p.i." or "paradigm innovation." This is business model innovation: reframing the game. The internet is offering huge possibilities for this kind of service innovation.

Overall, I want to stress that the innovation space organizations (and academics) consider has to cover all the quadrants shown in Figure 1, considering both incremental and radical changes. Perhaps one of our problems, both in manufacturing and certainly in services, is that we give too much of our attention to just parts of it.

What are the distinctive characteristics of the service innovation landscape?

I've been emphasizing 10 different ways in which services are distinct. We are at risk of taking old paradigms, meant for manufacturing, dusting them off and thinking they will suit services as well. I've been trying to keep that from happening by emphasizing the many ways that services are different. Though we don't have that much time, I'd like to give you a brief summary.

Innovation in services ...

- Services are big!
- Services are heterogeneous
- Services are mostly SME
- Services involve users
- Services are taking over
- Services are moving out
- Services are mobile
- Services need incremental innovation
- Services need radical innovation
- Services need innovation research!

Services are big!

So what do I mean by that? We still haven't grasped that most economies revolve around services. In Germany, the UK, and the United States, 75% or more of the gross domestic product is about services, and I've already said that most of what we know about innovation is based on manufacturing. But the implication is serious. If you did an analysis of the many thousands of books in any good library, most of what we have learned about innovation has a manufacturing focus. There is plenty of scope for transferring those ideas but we have to be careful about language. Of course services do innovate, and they try and organise and manage it, but they do it in rather different ways and with different words. There is also a long tradition of research on services. We shouldn't think this is completely new, although as I said, in the UK this is a relatively new public interest. But in terms of fields like operations management or hospitality there is a long tradition of innovation, particularly around service processes.

Services are heterogeneous.

In manufacturing we know there is a huge difference between the auto industry,

telecommunications and food. A very well established way of thinking about innovation is based on the characteristics and drivers of each sector. For example, high volume mass production has very different drivers than craft-based activity. Even though services are a huge part of the economy, they fall into similar patterns; we can map them in the same way. A bank is essentially a high volume mass production kind of business. Legal services are much more customised and craft-based and we wouldn't expect the kind of innovation that works in banks to necessarily apply to them. Not surprisingly, I suppose, banks have been quite heavily studied, while innovation in professional services are relatively untouched. And yet professional services are an increasingly important part of a knowledge economy.

Services tend to involve small firms.

We tend to think of big service players: insurance companies, banks and so on. But most services are actually quite small. And there are lots of local level service providers. In fact, service lends itself more to local production than manufacturing does. But again, much of the research is done on the big firms rather than on the small firms. And of course, when we are talking about small firms sometimes their innovation challenges are rather basic. They are asking: How do you put a system in place for managing innovation? How do you measure innovation? How do you manage the risk? Larger firms know how to do these things, but most small firms do not -- in manufacturing or service.

One of the challenges of academic research on service is to translate service concepts and make them available for the small firms that make up the majority of the sector. These firms have to master the basics of innovation before they worry about the radical outer edge of Figure 1. That means mastering some fairly fundamental stuff around project management and business development. There is significant potential for technology transfer, taking knowledge gained elsewhere into these firms. And indeed, one of the big thrusts of British government policy has been towards bringing knowledge to the regional level, to the smaller, weaker firms.

Services are about users.

You cannot deliver a service without a user. In a sense, the whole service sector is much closer to the user interface than manufacturing. Service firms already do a lot of what is classically called R&D, but

Towards mass customization ...

they tend to do it much more on the demand side than on the “technology pushing the frontiers of science” side.

That effort needs more support. There is a big discussion in England right now over the fact that manufacturing firms receive a tax credit for R&D, but service firms do not. It is assumed they do not do R&D. Most of them do not do it in the manufacturing sense, but you can see there is a potential challenge there, particularly since the UK economy is increasingly reliant on services.

It is common to separate so called “front office” services and “back office” services. The front bit is customer facing and the user interface is crucial. The back office is where IT and other systems sit, where process innovation is usually most important. Innovation is perhaps less about user related factors here, but patterns are changing. Mass-customization, where Frank Piller is an expert, is a case in point. There is rather nice work by Mintzberg and Lampel talking about the grade of mass customising in manufacturing. They say it is possible to do a lot of cosmetic customising to connect with customers, which is relatively straight forward. In the service sector the equivalent would be that I send you all a present from John Bessant. It will come with a beautiful wrapper with a note personalised from me and you think: “What a nice man, he thought of me.” In fact, I just ordered on the Internet, and Amazon did it all in a warehouse near London. It is simple customisation.

The kind of thing Frank is more interested in is more complicated. We all know that Dell assembles a computer to order. Personalized banking, certainly in the UK, is really a similar kind of customising. It involves some standard components, and it is actually fairly easy to predict what most customers will want. In the travel industry, service providers use the same logic to put your dream holiday together. They have connections with airplanes, hotels and so on; it is like Dell putting a computer together.

Making to order at a more fundamental level, as shown in Figure 3, is even more complicated. It requires what Chris Voss calls “experience based services,” really customising a highly personal, highly specific service. It is difficult to do, much more intensive, but some firms (like BMW) get a competitive edge by accomplishing this kind of innovation.

Type	Manufacturing	Service
Cosmetic	T-shirts	gifts via Amazon
Assembly	Dell - assemble to order	Personalized banking, insurance, hotels, etc.
Manufacturing	BMW - make to order	Experience-based services, customized holidays, etc.
Design	Co-creation – lead users, design your own xxx	Co-creation – open source, active users

Figure 3: Similarities in manufacturing and service innovations

Probably the frontier is at the point Frank was flagging yesterday: co-creation in either a manufacturing sense or a service. Of course service innovation at any level could lead to competitive advantage, but competitors can quickly catch on at the first levels of Figure 1. Competitive advantage in a service business, as in manufacturing, often comes from a more unique customer connection.

Services are taking over the world.

My point with this headline is to say that in the UK and many other places there is a huge discussion around an awful word: “service-ization.” It is happening in manufacturing, where the service component of products is increasing. But interestingly, services also are “productizing.” Many of you may be familiar with the Rolls Royce example. They make a beautiful product: a really well engineered aircraft engine made of shiny titanium by precision engineering. But the reality is, Rolls Royce earns 2/3 of its revenues from services: maintenance, leasing and all sorts of customer support. Because airlines don’t want a beautiful engine, they want airplanes in the air, “power by the hour.” So serviceization is not just a slogan, a nice new phrase to sell more engines, it is a fundamental change in the paradigm of business.

Essentially, we are moving towards the provision of total system solutions. From the customer point of view, all organizations have to respond to the demand of “solve my problem.” Customers essentially don’t care whether they get a product or a service. “Solve my problem” is where we are moving. It’s what Ulwick calls “outcome driven innovation” where customers have a ‘job’ they want done, not a clearly articulated set of needs that a market researcher can focus on.

This kind of demand poses big challenges and some big research questions about reframing

the business map. If your business model has been about products, how do you switch to something else? And what are the skills and what management structures do you use to underpin this shift from a product manufacturer to a solutional provider? The service provider has exactly the same questions to ask, in reverse.

Services are moving out.

Around the world there is a huge debate about 'transactional' outsourcing versus 'strategic' outsourcing. Companies are beginning to look at many things they do internally, like provide IT, and deciding that actually they are performing a standard set of processes. Once they have that idea, somebody else can do it for them; it becomes a target for an external service business.

Human Resources, for example, used to be an assumed part of an organization. Now, personal records and payments are often out-sourced with a smaller number of core functions remaining within the firm. This trend is affecting the public sector as much as the private sector in the UK. We are shrinking government services hugely, outsourcing contracts to a growing number of new players in the private service sector.

It is interesting that this growing service sector has attracted new entrants who think they can do things in a different way. They are often very innovative. One particularly interesting entrant is the firm that redraws their boundaries, or changes their position in the innovative space, when they say: "as the result of running our business we have learned how to do process x so well that we might as well sell that ability as a contractor."

That brings us to a phrase that is very relevant in the UK debate: strategic outsourcing. When you think about it, certain things that are outsourced are very simple transactions, just doing simple number crunching and so on. Some firms are making long term commitments around these activities. For example, the pension system has been heavily outsourced in the UK government on a 30 year contract. This is worth billions of pounds. Nobody knows whether savings will come or where service improvements will be made 30 years from now. This is a radical bet on the ability of the outsource company to continue to innovate. That is strategic outsourcing and a fundamentally different challenge, a much higher level of challenge than basic transactional outsourcing.

Services are mobile.

Related to that of course is that we are beginning to see that services are hugely mobile. They are not capital intensive; they do not require putting roots down in one particular place and staying there. The result is an increasingly politically issue: offshoring. For example, callcenters have been moving to India. The transfer has raised some very big questions about the quality of services. Labor displacement is equally important. Why are we giving up jobs in London so they can go to Bangalore and have we lost ground in competitive delivery? Answering these questions requires understanding about when and where it makes sense in a global and open economy to outsource. It brings back the question of what is a transactional outsourced deal and what is a strategic one. Of course at the government level, thinking in terms of holding on to a knowledge economy, it may make sense for transactional jobs to go abroad just like manufacturing assembly jobs are going to China. That may be OK, as long as the high value jobs stay home. But we have to look at and worry about whether knowledge based services are moving.

These are issues for individuals as well. Most of the mobile phones in the world today are not designed in Finland or in London. They are designed in India and in China. Companies like the German firm O2 are very knowledge based. If you are a young designer now, you might seriously think about moving to this kind of company, because that is where the action is. But where will you capture their attention? In sum, individuals, companies and governments have to see this mobility thing not just as offshoring or outsourcing but as part of a much bigger picture.

Can you summarize by pointing toward innovation and future funding for research?

I have been arguing in the UK that services do need innovation research. This hasn't happened that much in the UK. Traditionally the funding has been limited and on a project by project basis. It has very much been researchers saying: "Here is a question: I want to find an answer." Funding has followed a classic project model that can provide very, very little in terms of big initiatives for the service sector. We have had a big government push around manufacturing technologies, called the "factory of

the future,” but the assumption has always been that services can look after themselves. And of course, probably in the city of London they can, because the city creates very tradable services, but what about the rest?

In the UK, if you look at the big research councils that have deep pockets, the Engineering and Physical Sciences or the Medical Research Council, they fund some service research but the projects tend to be technology focused.

So new medicine that involves nanotechnology, yes, that has been funded. But many other medical service questions are not looked at. On the engineering side, grants are very, very hard to get by outsiders. You could argue that construction is a little bit like services, and they are getting funded, but if it is not physical, it probably will not get funded.

That is a criticism I make amongst friends here, but it is a criticism which I think is increasingly recognized and there is a lot more cooperation across research councils to try and do something about the need to understand a service economy. There also is growing interest in the government, in particular in the Department of Trade and Industry and in the Treasury, because the service sector is economically so important. They may be thinking some radical thoughts about policy changes as well.

So things are beginning to happen. It is also interesting that we have some new players on the scene. I am very excited about one in particular. You may know that we have a national lottery in the UK, so everybody gambles on Saturday night. The national lottery led to a fund called the National Endowment for Science, Technology and the Arts. The mission is worth looking at on their website, because amongst other things, they want to make a difference to innovation. But they are very concerned not to be a traditional funder. They want to be quite creative in the way they spend their money.

This endowment has just launched, for example, an innovation challenge program. The idea is to try experiments, prototypes, and other interesting things that might move innovation forward. These are risky projects from a venture capitalist point of view, but the endowment argues that they got money from high-risk gambling in the first place. Last week they launched the first of

their innovation challenges around the health sector, picking up the theme I flagged yesterday of chronic illness in long-term conditions: mental illness, diabetics, heart disease, and so on. They are responding to big challenges for the health sector, where service innovations must happen. In short: services need innovation and innovation research!

This has been a very brief walk through. We clearly have not done as much in the UK as you have in Germany. I have been very impressed by what I heard from Ralf Reichwald yesterday. You are making huge progress here. However, there are many more challenges to get hold of--in the UK, in Germany, and around the world.

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Research Funding for Service Innovation

Dr. Gerhard Ernst is head of the Department of Work Organization and Services at DLR (Deutsche Luft- und Raumfahrt), the project management organization of the German Federal Ministry of Education and Research. The department is responsible for the administration of the research programs “Innovation Capability in Modern Working Life,” “Innovation with Services” and “Innovationsforen.” Within two ERA-Net projects the department is also cooperating with project management agencies in Finland, Sweden, Norway, Poland, Ireland, Italy and Greece.

Dr. Ernst was a researcher in the Research Centre for Working Environment and Human Factors at the University of Dortmund and at the University of Oldenburg in the field of work design and the design of working time. From 1995 to 2006 he coordinated funding activities in service research.

Dr. Ernst, government attention and funding are clearly important to developing national innovation capabilities. What has been happening in Germany?

The Department of Work Organization and Services (PT-DLR) has been investing in research projects on service innovation since 1995. When you add that to efforts taking place in other government departments, it is quite significant. Figure 1 provides an overview of how our activities increase both innovation capabilities and innovation capacity in Germany.

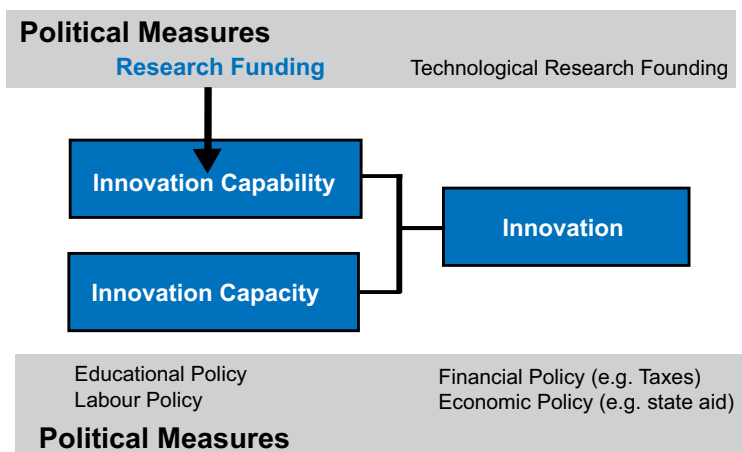


Figure 1: Two Foci of Innovation Research

Going forward, we are clustering our support for research in three major areas:

- Innovation Capability in Modern Working Life
- Innovation with Services
- Regional Innovation Capability

The program on Innovation Capability in Modern Working Life seems to be very relevant to this meeting of the Peter Pribilla foundation.

Yes, it is. Figure 2 outlines the sequence of past programs to support the development of innovation capability. Since 2000, 106.7 million Euros have been invested in eight areas of research.

In every case we are trying to close gaps in empirical knowledge and enable change processes, but also prepare for future political decisions. We also try to foster partnerships and make sure that researchers address people in the innovation process.

The overall aims of government research funding are to close gaps in current empirical knowledge, enable change processes and provide a foundation for future political decisions.

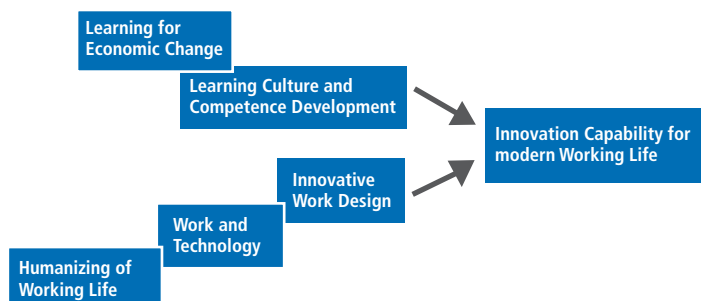


Figure 2: Predecessors to Innovation Capability Progress

Future funding will extend these efforts by emphasizing three things:

1. Innovation capability in a demographically changing workforce. We are very much aware that new working life careers are developing. For example, the work force as a whole is aging while younger workers are not motivated by the rewards that were effective for older workers. Further research will measure the effect of these and other changes on innovation potential, paying attention to regional aspects of demographic changes in working life, including success criteria for regional networks as instruments to handle demographic change.

2. Balance between flexibility and stability in changing working life. New strategies and new forms of organization are emerging. They often emphasize increased flexibilities, but that creates new uncertainties. Research and development to create new concepts, which can be tested in concrete application situations regarding their effects on horizontal and vertical relationships, is needed.

3. Strengthening innovation capabilities through value creating partnerships. Organizations are becoming entwined as the result of increasing cooperation. Cross-linking is occurring in regional as well as international and regional networks. In the area of services, traditional enterprise-based customer relations are being transformed by the creation of cross-company value partnerships. Again, innovation strategies beyond traditional management models are needed.

At a meta-level, we are pulling together interdisciplinary teams that can integrate disparate information. For example, what is the impact on politics and society of findings on how work is made meaningful at an individual level? How can the results of a project examining gender and age disadvantages in today's labor market be linked to a project that seeks future innovation ability in demographic changes?

The graphic in Figure 3 specifies the general principles that inform our program of research funding.



Figure 3: Central Principles of German Innovation

Could you say more about the initiative on Innovations with Services?

“Services for the 21st Century” ran from 1995 to 2006. It was designed to support the development of the German services sector. We wanted service research and development to reach the same level of R&D excellence that helps distinguish Germany in industrial production.

The aims of the program started with increasing service related skills. We also wanted to foster open-mindedness for research and development in this sector that would stimulate more innovative initiatives. We have been working in a holistic way so that consequences and implementation strategies are identified. Furthermore, we are attending to the integration of services with other sectors of the economy.

The first steps started in 1995-96 were to conceptualize key issues: we had to develop an overview of services in the future. Then in 1997-98 we prioritized the many possible directions that new funding on service innovation might take. Researchers considered benchmarking systems for service markets, explored increasing standardization in this general sector, then looked at work organization and the management of services. Some projects identified judicial barriers to service innovation, others focused on collecting statistics on services, including the importance of service innovation for employment growth.

Our definition of services is quite broad. One project simulated the development of innovation in handcrafts, for example, others looked at service engineering, service design and considered financial services.

The more intensive 3rd phase of this effort supported research from 2001 to 2006. While government support was 63 M Euros, with contributions from industry the project provided 125 M Euros of research funding. This substantial effort was clustered in three fields:

1. Management systems and methods in the service sector: 50 joint projects (35 M in public funding) considered knowledge management, management of cooperation & virtual firms, branding & customer contact, service engineering, benchmarking and other topics.

2. Growing industries and industry clusters: 35 joint projects (22 M in public funding) investigated public services, health services, facility management, crafts, and other sectors.

3. Transfer projects and cross-sectional projects: 6 joint projects (5 M in public funding).

Clearly the German Government, along with German companies, is making a significant investment in service innovation. Please tell us more about your next funding programs.

The next projects funded will attend to the need to transfer service research into the practices of service companies. This transfer is considered a necessary motor for innovativeness in the service sector. Germany has a strong tradition in utilizing science and technology to support business activities in manufacturing. Transfer of recent research on service innovation will not only support service companies but also promote industrial production more generally.

The central principles of this effort to develop new knowledge about services are compatible with those of the program for innovation capability in modern working life, as shown in Figure 4:

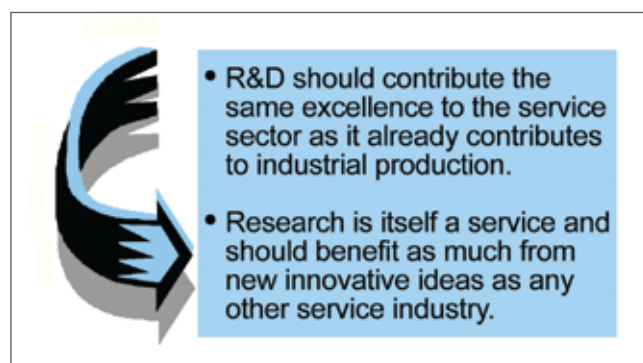


Figure 4: Central Principles for Funding in Service

More specifically, we now want to improve the market position of service providers through systematic development of quality standards. We expect that government support will help create new jobs in different aspects of services, at different levels. The general aim is to be sure that service research helps orient providers toward new economic, social, and technological trends and developments.

Let me just say a bit more about the important of responding to trends in the next round of funding. Priority will be given to research that considers:

- **Tertiarization**, which is increasing the rate of new product development.
- **Internationalization and Globalization**, which is increasing the possibilities for companies to cooperate, but also creates risks of dependences. Increasing scope puts pressure on service providers to modernize their internal organizations processes, as well as develop new business models.
- **Customer Relationship Management**, which is helping companies win new customers, especially in globalizing markets. Customer satisfaction and loyalty, along with comprehensive service provision, are primary factors in service success.
- **Human Resource Development and Knowledge Management**, which are essential to entrepreneurial success. Targeted development of human resources is especially important for the intensive use of ICT. In general, employees not only have to be well qualified but properly motivated to support the provision of services.

The program assures cooperation between theory and practical application. It also attends to public awareness. We are developing an interface between funding programs structured by content, and aim for continual early detection of new trends in a learning framework.

The Peter Pribilla network includes members from several different countries. We are not aware of any other government projects that are this far advanced in the area of service, yet clearly more can be done. What is the timetable for further funding?

We expect that future proposals will be explicit about the internationalization of services and we have already funded helpful projects outlining international connections in many areas, including finance, medical, environmental, and security services. Three calls for public research funding will further augment this work:

1. Services, technology and demographic change.

Issues like wellness and health, security, communication, education, and financial services are important, especially for the growing senior population. Ergonomic designs to meet the changing requirements of seniors are needed. Not only are there questions of needed micro-systems, but also questions of national and international standards that are transparent to all age groups. Services from different industries, relating to different areas of life, need to be bundled to meet specific needs. Research and development is needed to support networks. Needed new business models will consider not only business to private customers, but also business to business relationships.

2. Productivity of services. There is a different productivity logic in services, with fundamentally different beginnings. First, the creation of value requires customer integration in the development not only of services, but of related products. Then, productivity has to be integrated with other factors of success, like quality and pricing. We have already held productivity fairs to develop, test and evaluate new procedures for different types of services. These efforts include interaction with customers. We intend to continue these conferences, so that the impact of current research results on potential productivity can be more broadly understood.

3. Professional work in the service sector. A great deal needs to be done to increase professional competence in many services. For example, loans to support the development of service skills that are comparable to programs relating to the development of crafts skills in the commercial sector might be developed. It is important to appreciate the increasing service component in different industries, and to understand the unique qualifications required. We need to understand more about the emotional content of much service work. It is particularly important that developing professionalism be connected with innovation ability. One impediment is gender-based expectations for work in different service areas.

New strategies for recruiting, qualification, and personnel development are needed.

Since we are emphasizing broadening innovation as a management issue, can you say more about how your department manages these funding initiatives?

There is an Advisory Board of delegates from research, companies, labor and employer associations. The board is working out recommendations for the ministry around questions of development, design and the realization of different aspects of innovation, especially with regard to the validation of existing funding activities and the development of new programs.

It is important to say that results of separately funded activities are integrated into other existing projects. There are also regular international monitoring procedures, which are integrated into the validation of research activities from an international point of view. These become inputs for further discussion and the development of new programs of the Ministry of Education and Research.

Focus groups of funding recipients and other interested parties will be used to ensure that internal networking increases visibility and develops recommendations for future actions.

After the last five years of funding a more comprehensive evaluation of direct and indirect effects of the program also is being carried out. All these evaluation, validation and auditing activities are taking place to develop our service programs thoroughly and strategically.

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Open Innovation within the Firm – Interview with Professor Kathrin Möslein



Kathrin Möslein holds the Chair for Information Systems I in Innovation & Value Creation at the Friedrich-Alexander-University (FAU) Erlangen-Nuremberg. She is also a visiting professor at the Institute for Information, Organization and Management (IOM) at the TUM Business School, an Associate of the UK's Advanced Institute of Management Research (AIM), a member of the team of directors of the Center for Leading Innovation and Cooperation (CLIC) at HHL - Leipzig Graduate School of Management and a member of the advisory board of the PETER PRIBILLA FOUNDATION.

Dr. Möslein has been researching, teaching and consulting in the field of strategic innovation and innovation systems since the early 1990s. She is on the Executive Committee of the European Academy of Management (EURAM), a member of the Executive Committee of the German National Research Group for Computer-Supported Cooperative Work (CSCW) within the German Computer Society (GI), and a representative at large of the Special Interest Group on 'Innovation & Knowledge' of the Strategic Management Society (SMS).

In this interview Professor Möslein describes the importance of making sure that ideas about open innovation are applied within organizations. She is working with partner organizations and academics drawn from multiple universities in a way that models the ideals of open innovation.

Professor Möslein, you have been particularly interested in expanding innovation within the firm, how does this fit into the bigger picture of value creation?

Value creation in the 21st century is characterized by access to a variety of resources from multiple sources. The inherent challenge, however, is to know how to combine resources in innovative ways. Innovation must be measured not only in terms of product/service offerings, but also in terms of the processes used for creating and supporting these organizational outputs. I mention processes because we have observed a fundamental change in the way in which work is done over the last ten years – a change in the way companies search for and develop new ideas.

As we have discussed at this meeting, researchers and managers are beginning to develop a deep understanding of open innovation – which is typically defined as integrating external resources, i.e. customers and suppliers, in the innovation process. In contrast, I am looking within the firm for untapped sources of innovation and believe we can draw upon but refine what has been learned from opening the innovation process to outsiders. For us, open innovation with employees is the key factor to generate the next wave of value from innovation.



Service quality and service innovation almost always rely on employee involvement.

We are exploring how inputs from organizational members at the periphery of institutionalized corporate R&D and innovation management can enrich current activities. Companies that do not integrate their employees in the innovation process are not using all the resources they have available for value creation. We are partnering with companies that are interested in expanding their use of these internal sources for innovation.

Concepts now used to bring innovative ideas from outside the company can also help companies fully use resources found within the organization.

Do you have specific projects underway?

Yes, for sure! The “Open School Initiative,” which is hosted at HHL – Leipzig Graduate School of Management, is a research project that addresses the challenge of innovation across the boundaries of academia and business. It was funded in 2007 as a result of HHL winning a nationwide competition of the German “Stifterverband” and the German Federal Ministry of Education and Research. As you know from the interview with Dr. Ernst, an important focus of the ministry is on boundary-spanning innovation and knowledge creation.

We are also about to start a new research project titled “Open-I” which focuses on how to integrate and take advantage of the knowledge of employees who are on the periphery of current innovation processes. The project draws together colleagues from the University Erlangen-Nuremberg, HHL, TU Munich, and managers in a broad range of partner firms, from top-level service firms like the Munich Airport, to innovative software providers like DATEV (a company I will say more about in a minute) to innovative micro-organizations. Among other things we will analyze how organizational structures like leadership systems need to be designed to support open innovation rather than hinder it. That’s important: just as current laws often inhibit open innovation inputs from outside organizations, current practices often inhibit transferring ideas within a company.

One focus of our current research is to understand how leadership systems can support, rather than inhibit, the transfer of ideas within an organization.

Are there special issues for service versus product innovation?

In fact, an important challenge we have identified is that centralized innovation practices often focus on product innovations, but successful products are embedded in complementary services and customer experiences. These necessary support activities are often not included in attempts to increase organizational innovation. That means the employees involved in service delivery are not part of the R&D picture either.

Here’s another problem: as globally distributed customers are rapidly coming to expect attention to the experience of engaging with a product/service, the points of required innovation and contact are even more widely dispersed. The key issue is that centralized innovation management practices cannot develop the necessary reach. The people closest to growing complexity are important sources of information and breakthrough. Thus, the context of service innovation is at the core of our “Open-I” approach.

Paying attention to context is critical to improving service and experience.

Can you say something about what your partner organizations are doing?

Even though we are working with quite a lot of partner organizations in our projects, I would take this opportunity to highlight two partners in Open-I: unternehmerTUM and DATEV.

UnternehmerTUM gGmbH, the innovation and entrepreneurship center of TU Munich, is one of the leading centers for the development of entrepreneurial teams and economic chances in Europe. In fact their name means 'entrepreneurship' in German. With this organization's help, each year approximately 30 innovative project teams generate marketable products and services out of hundreds of prototypes. About 20 of them actually lead to the formation of a company. UnternehmerTUM has the help of a good network. Among other projects, we have been cooperating with them in the Discontinuous Innovation Lab (DILab), the interdisciplinary effort that John Bessant has already described. In Germany, we bring about 60 partner organizations together. Researchers and practitioners discuss topics that are already important and will be even more crucial for innovation in the future. In Open-I, unternehmerTUM will help pilot solutions for a broad range of micro-firms as well as the partner organisations of the Discontinuous Innovation Lab, transferring knowledge about prototyping and innovation strategies from their incubator experience.

DATEV e.G. offers software solutions and IT services for tax consultants, lawyers and companies in general. As a co-operative of tax-consultant, law-consultant and accountant professionals, DATEV supports its members with all the services and products needed in the domain of data processing, information and communication technology. Because they are operating in a fast changing business they are challenged to identify new, innovative solutions for their clients. The context of their business and their focus on IT-based innovative solutions makes them a very interesting partner for us. In Open-I we will learn in more detail about DATEV's way of designing highly innovative IT solutions.

What are key research topics for expanding understanding of open innovation within the firm?

Our research agenda in Open-I is primarily focused on two things. First, understanding the role of leadership for open innovation, and second, understanding the relationship between open innovation and IT tools used by companies.

Regarding leadership, we are looking at how to develop capacity to innovate within organizations that goes beyond the individual leader. The focus is on the role of leadership systems and we are exploring how current corporate leadership systems affect the ability of a firm to draw on the distributed potential of its employees. The intent is to isolate design principles for innovation-oriented systems, derive contextual predictors for the generation of distributed innovation capacity in corporate settings, and understand how this potential can be integrated into an effective development processes.



Our partner firms are piloting new ideas for service development and delivery. Research will say more about their effectiveness to help other companies adapt pioneering ideas.



We have already observed a few companies making huge strides in changing the ways that they work and are particularly interested in the results of investing in innovative technology tools. These tools are designed to support and facilitate knowledge sharing and innovation, and many have a very contemporary look. We are observing, for example, corporate innovation platforms that use blogs, wikis, and tags.

IBM's Innovation Factory is one exemplar of using IT to tap into ideas available company-wide. Using a social software solution that speeds cooperation as well as finding and testing new products and services, this company has accelerated a launch process that used to take years down to a much shorter time period, sometimes mere days. What we know so far is that a few other companies have designed similar highly sophisticated sets of IT tools. However, there is a need to get a better understanding of how to combine them in an efficient way. Thus, from an IT perspective we are analyzing the tools in use to identify how others might integrate a broader based innovation process.

Information technology is critical not only to service innovation, but to increasing organizational productivity via service.

A few companies like IBM show how to significantly reduce the time required to harness new ideas from across the company. We plan to help other companies identify, develop and launch new market offerings with the help of new organizational structures and new IT tools.

That's very interesting, particularly because IT has already been shown to be an important tool for increasing productivity.

You are absolutely right. Regarding the pressing issue of how companies can increase their productivity, a recent study by my former colleagues at the Advanced Institute of Management Research identifies five steps to increase productivity. These are: evaluate, set up, implement, ramp-up, and integrate promising practices associated with increasing productivity in a particular organization.¹

We argue that IT tools are important moderators in this process in Open-I. They can either support or hinder the successful integration of productivity-increasing best practices. We are emphasizing that these tools need to be adapted to the organization's individual circumstances. I expect that Open-I will contribute to deeper understanding of the role that IT tools play in increasing the innovative potential of organizations.

Do you think there are unique contributions to be made from the experience of German companies?

Interestingly, Germany is mainly recognized for its innovations in manufacturing. Companies like BMW are known worldwide for their products, but it is not always recognized that many are leading in service innovation as well. For example, we are working with SAP, a leader in the field of technology and service innovation.

Serving more than 41,200 customers worldwide, SAP is the world's largest business software company. To stay competitive the company has recognized the need to get access to the innovative potential of their people. However, the challenge of a large company like SAP is to manage creative ideas available company-wide. Being aware that it might be quite difficult to foster entrepreneurial thinking in its core business structures, they have gone beyond these structures to implement SAP INSPIRE, an SAP corporate venturing group.



A significant number of German firms are adding distinctive services to distinctive products.

SAP INSPIRE is a platform to cultivate ideas from employees as well as partners and customers and to manage the innovation process from idea to product. By implementing this technology platform they have provided employees with a tool to submit, share and discuss their ideas no matter where they are located. The success talks for itself: In a short period of time SAP INSPIRE developed about 60 business plans and 18 projects were initiated.² Perhaps this example is interesting because it is quite similar to the care with technology that often supports the success of German manufacturing.

Are you using specific theoretic approaches in your project?

The reason we are doing research in the action field of innovation and IT is that we are intrigued that the combination creates insight for both researchers and practitioners. As innovation researchers we are operating in a field where we don't know what will be the output of the phenomena under study. Thus, we mainly rely on Karl Weick's³ work in the field of "sensemaking." Sensemaking is often characterized as the ability or attempt to understand ambiguous situations. To put it more exactly, we see sensemaking as a process of creating situational awareness and interpretation. It is most needed in situations of high complexity or uncertainty. In these situations people have to create sense in order to be able to decide and to act. In today's organizations, it is a key task of leaders to create sense and to reduce ambiguity for their employees and teams.

Academic research can provide ideas to help leaders make sense of complex and uncertain situations for employees and teams.

In a context where you never know how the final service or product will look in the end, Weick's work helps us gain a deeper understanding of how to design organizational practices and processes to support open innovation within the organization.

We also build on the research done on design and innovation. In their recently published book 'Design-Inspired Innovation', James Utterback⁴ and his international group of colleagues discuss the crucial role of emphasizing consumer-experience when designing a new product. Building on knowledge about consumer-oriented design, we will analyze how IT tools need to be designed to support open innovation within the organization, i.e. we are looking for IT tools that motivate employees to share their ideas.

Research on design provides useful ideas for bringing customer and employee experience to innovation.

Thank you, Kathrin. Best wishes to your research group and your partner organizations as they explore these important ideas. We hope to hear more ideas from Open-I and the Open School Initiative in the future.

¹ For an overview see Leseure, M., Birdi, K., Bauer, J., Denyer, D., Neely, A. (2005). Making best practice stick: How UK firms can increase productivity by adopting leading-edge working practices. Advanced Institute of Management Research Executive Briefing. Available at: <http://www.aimresearch.org/publications/010705bestpracticereport.pdf>.

² Source: SAP Info, published on December 13, 2006 (<http://www.sap.info/index.php4?ACTION=noiframe&url=http://www.sap.info/public/DE/de/index/Category-28943c61b1e60d84b-de/3/articlesVersions-12453457fc728ad342>).

³ Weick, K. (1995). Sensemaking in Organizations. Thousand Oaks, CA: Sage.

⁴ J.M. Utterback, Vedin, B., Alvarez, E., Ekman, Sanderson, S.W, Tether, B. & Verganti, B. (2007). Design-Inspired Innovation. Hackensack, NJ: World Scientific Publishing.

Service Innovation Research in Germany – Interview with Professor Ralf Reichwald



Professor Ralf Reichwald is head of the Institute for Information, Organization and Management at the TUM Business School where he was also the first dean. In addition to earned degrees, he has an honorary doctorate from the Technische Universität Bergakademie in Freiberg, Germany and is Professeur honoris causa de l'Université de Tunis, where he also teaches.

Professor Reichwald and his research team have investigated many aspects of service, especially those influenced by information and communication technologies. He frequently consults with government and chairs the International Advisory Board on Human Computer Interaction funded by the German Federal Ministry of Education and Research and the German Federal Ministry of Economics and Labor. He also contributes to other groups helping to direct research, including the board on Innovation, Work Structure, and Services.

In this interview Professor Reichwald discusses the current and future state of government and company research on service innovation in Germany.

Professor Reichwald, what is the level of service awareness in Germany today?

For a long time Germany was well-known for its product and engineering excellence but sometimes called a 'service desert.' That began to change some time ago. Superior products had been supported by research and development in companies and in universities. Today leading German companies also are investing in service R&D. They can draw on the 12 years of government sponsored research in the service area described by Dr. Ernst. We believe this unique level of government support is beginning to show significant results.

Germany was called a 'service desert' but that has changed due to company efforts and government funding starting in 1995.



German companies have a unique resource to draw on -- over twelve years of research on service innovation.



What kinds of projects were funded by the government?

It is not easy to summarize, given the great diversity of service research projects and over 126 M Euros invested by government and industry in research on services. The Ministry of Education and Research started by setting up 13 parallel working groups nationwide to identify the most promising fields of inquiry. As Dr. Ernst also describes, they included service engineering and service design, service standardization and benchmarking of service systems, service culture and service mentality, as well as groups looking at particular sectors, like financial services and high-tech services.

Perhaps the most important result of the significant funding that followed can be seen in institutional development. We can now point to organizational skills in the service area that are the result of working on multiple projects. The creation of institutional capacity to do further research on service innovation is the most important achievement of over twelve years of funding.

Significant funding has resulted in institutions with the capacity to develop further service innovations.

The Fraunhofer Institutes are one example, and particularly unique to Germany. There are 56 of these organizations around Germany, with linking offices in Europe, the United States, Asia and the Middle East. They have long been responsible for applied research in design and manufacturing, working with well know German companies like Bosch, Siemens, VW, Daimler and others. It is quite a large effort, as described in their website (www.fraunhofer.de), with over 12,500 employees and an annual budget of over 1.2 B Euros.

Many of these research institutes now include service in their portfolios, often taking advantage of existing research capacity in product innovation. In the Stuttgart Fraunhofer Institute IAO, for example, a 3-D lab initially developed to help designers imagine new products has been expanded to help researchers imagine service in particular settings, like hotels or hospitals. It is easier to compare prototypes of different check-in procedures, for example, in this virtual environment.

One of the problems with services is that they have so many intangible aspects. This lab provides a setting in which service can be made more visible, which I see as an important component of many other research projects as well. My institute, for example, was involved a number of years ago in government sponsored research that helped companies consider the various implications of teleworking – which was not easy to imagine by companies just becoming familiar with the contributions of computing in the workplace.

An important goal of service research is to make opportunities for value creation more tangible.

What is the subject of the new grant you have just received from the Ministry of Education and Research?



Service innovation is interesting because it applies, at least to some extent, to all organizations.

CLIC, which is a research center hosted at HHL - Leipzig Graduate School of Management, and the TUM Business School, is hosting a series of highly focused conferences to showcase some of the champions of service in the German economy. In addition to the Fraunhofer in Stuttgart, which I have already described, we will look for example at interesting new service innovations in medical service. One project allows the transmission of medical information from remote locations to a central facility from easily used recorders. These devices can be installed in ambulances or regional health facilities. They are also being adapted for use in third world regions with less sophisticated capacity for medical diagnosis.

Can you point to German companies that now exemplify service excellence?

Again there are so many developments that it is difficult to summarize. Rather than talk about BMW or other well-advertised efforts, I would mention The Munich Airport, which has been named the most innovative airport in Europe for three years in a row. They are good at facilitating partnerships with airlines and with vendors. They have made excellent use of space, and focused on responsible use of energy.

A further sign of the Munich Airport's service orientation is that after moving from one terminal into two they realized they had developed a valuable skill. The company significantly diversified its service portfolio when it began consulting with other airports. For example, they have assisted London Heathrow's planning for a 5th terminal.

Of course, this company and all others must know that service awareness is increasing around the world. No company can relax in this environment.

What do you see as key issues for further service provision by companies?

An important trend involves networks. In service as in many other areas, gains are often made by companies working together. Professor Bessant mentioned the Discontinuous Innovation Lab in his presentation. The TUM Business School, CLIC and UnternehmerTUM, our organization that supports the development of entrepreneurial skills and new businesses, have sponsored DILab meetings in Germany. The network allows companies to learn from each other in face to face discussion with knowledgeable colleagues who help test new ideas. When companies work together to actually deliver services, networking can enhance capacity and promote flexibility.

The potential benefits of networks are rather well known. UnternehmerTUM supports these connections but offers something more – which I think is another important development in services. It provides support for prototyping, an important feature in our new Executive Program in Innovation and New Business Creation. Again the issue is that it is hard to imagine intangible offerings. Entrepreneurs who want to start new companies, along with innovators from established companies, will be taught how to use prototypes of various kinds to develop their ideas and communicate them to others.

I'm enthusiastic about the use of prototyping in the early stages of product and service development. Our new EMBA Program in Innovation and Business Creation uses it to help entrepreneurs develop new products and services and communicate their potential benefit to others.

Do you foresee new themes for research funding that might support further service development?

Projects that respond to demographic changes are underway. Around the world there is greater emphasis on health services, for example, and Germany is no exception. I would re-emphasize that in medical service, as in many other areas, service is often the driver for technological innovation.

New technologies enable new services, but the reverse relationship is increasingly important: ideas for new services generate new technologies.

Perhaps more unique, I believe we will see greater emphasis on service productivity. Dr. Ernst mentioned the need to further develop the professionalism of service; one result should be greater value creation. Services account more than 75% of economic activity in developed economies; yet we have considerable room for improvement. I believe that more research by companies and universities is needed to increase service professionalism and productivity.

My primary message is that Germany is currently a champion in exporting industrial goods, but at the moment more services are imported than exported. That situation is changing because of an industry-university partnership. I am particularly proud that during my time as the first dean of the TUM Business School we established two chairs in the service area: one in Technological Services and another in Service and Technology Marketing.

That's an excellent message. Thank you for telling us more about an exciting research initiative that you have been important in advancing. We look forward to hearing about the results of new service research in the future.



Germany is a leader in research on service after twelve years of significant government funding.



MEMORIAL FOR -HANNELORE PRIBILLA- ON 12 MARCH 2007

Prof. Dr. Ralf Reichwald

As chairman of the advisory board of the PETER PRIBILLA FOUNDATION and as a friend of the Pribilla family for many years, I would like to dignify the life and work of Hannelore Pribilla, who died on the 2nd of November 2006. She had her own intellectual agenda, and was an important contributor to the work that Peter Pribilla did at TUM. She was also the decisive influence on the objectives and style of the PETER PRIBILLA FOUNDATION.

Hannelore Pribilla was born on the 26th May 1942 in Dresden where she grew up and in 1961 received her Abitur (the equivalent of a high school diploma). In April 1961 she moved with her family to Stuttgart. After studies in mathematics she began to work as a member of the pioneer research and development group of the IT Department at Siemens AG in Munich.

I met Hannelore Pribilla for the first time in April 1967, during a visit to the research group. But after some time we lost contact and did not meet again until the 1980s when I started a research project on "office communication" in cooperation with Prof. Karl Heinz Beckurts, head of Corporate Technology Siemens.

At that time Peter Pribilla was a member of the Managing Board of Siemens Corporation as head of Siemens Private Communication, and a colleague of Hartwig Rüll, who joins us today. In the course of the joint research project I met Hannelore Pribilla again. We had common interests in the applications of new technologies within organisations, more explicitly in the acceptance and profitability of human-machine interfaces.

One of Hannelore Pribilla's main research fields involved the "Human and the Computer," organized around four questions:

- How might IT change office work?
- What will be the appearance of future workstations?
- Which modes of communication will be used in the future world of employment?
- What are the effects of technology on the quality of work?

Hannelore Pribilla established contacts between scientists at Siemens AG and researchers at different universities. Numerous projects were realised, of which I will mention just a few:

- In the 1980s, during my professorship at the Universität der Bundeswehr (University of the Federal Armed Forces) in Munich we carried out research projects on human-machine interaction, in particular on new forms of media in telecommunication.
- In the 1990's at the Technische Universität München, Hannelore Pribilla was one of the founders of the "Forum of Telekooperation" together with Kathrin Möslein and Johann Schlichter.
- In 1992 she initiated an important research project in cooperation with her husband, who had become the president of Rolm Communications (USA) while continuing as head of Siemens Private Communication. This empirical research project focused on "Application of new media in telecommunication and their effects on the working environment of top level management." As one output of this project in 1996 we published the book ***Telecommunication in Management – Strategies for a Global Competition***. The authors were Peter Pribilla, Ralf Reichwald and Robert Goecke – with Hannelore (though not formally mentioned) as an important contributor.

Hannelore Pribilla also was a member of my institute at TUM. As an academic family member she was interested in the research works of our doctoral students, advised doctoral theses, and supported the team in uncertain times. For example, she advised the thesis of Jörg Siebert on the subject of "Leadership Excellence" and was very supportive of the Habilitation of Kathrin Möslein. In fact she was so important that Kathrin Möslein dedicated her Habilitation to Hannelore Pribilla.

As mentioned at the beginning of this booklet, Peter Pribilla taught a regular course at TUM for 6 years (in addition to numerous guest lecturers) and became a TUM professor in 1997. He became a member of the faculty of the TUM Business School and a member of the Siemens Executive Board at the same time. It was Hannelore Pribilla who helped achieve this contribution. She had many wonderful ideas about science and young people and realised them in a calm but effective way.

It was the aim of both Hannelore and Peter Pribilla to promote the training of young people. Following Peter Pribilla's death, and based on the content and the style of his fruitful work, Hannelore Pribilla founded the PETER PRIBILLA FOUNDATION in August 2005. One result is an annual award for the best graduate of the TUM Business School – which began in November 2006.

The second purpose of the Foundation is to support the Peter Pribilla Network. The official launch was in May 2006 at the Schlossgut in Oberambach, with many of those here today in attendance. That meeting was Hannelore Pribilla's last official appearance. Being the center of that meeting, beside the American scientist Anne Huff, she was implementing one of her husband's important last aims: to promote research in "Innovation and Leadership."

There are so many things that Hannelore Pribilla achieved, it is hard to know where to stop. I will just close with the idea that the Peter Pribilla Network has assumed the obligation to continue her intellectual interest in science and people, young researchers in particular. We will carry on the aims and the work of Hannelore Pribilla and we will always keep her in our memory.

2nd Network Meeting of the Peter Pribilla Foundation – List of Participants:

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