Applied Technology and Innovation Management

Insights and Experiences from an Industry-Leading Innovation Centre

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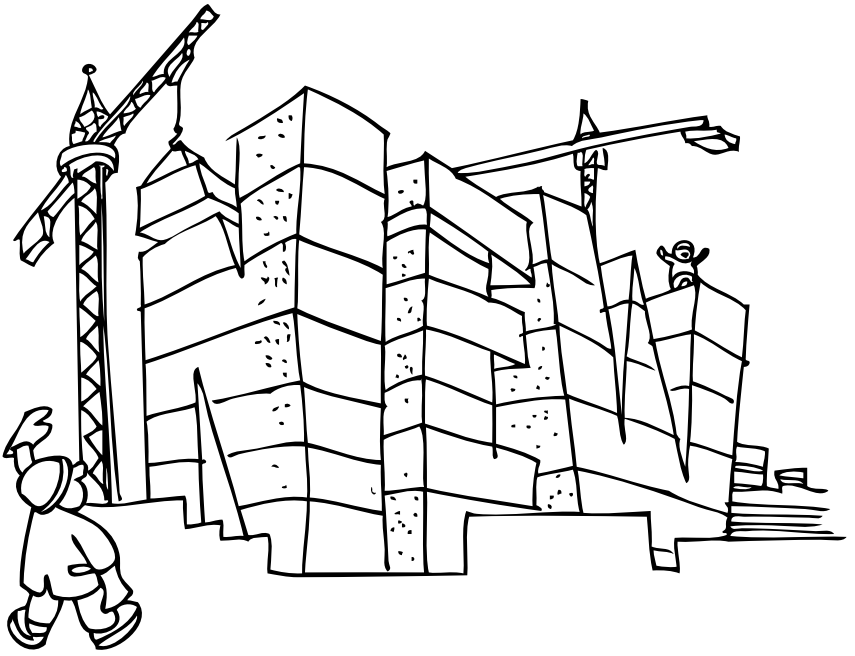
Deutsche Telekom Laboratories as a Testbed for Modern Technology and Innovation Management



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Deutsche Telekom Laboratories has been set up with the ambition to be one of the leading places for corporate research and innovation in the industry. Consequently, not only the topics that are being worked on must be leading edge but also the way in which work is done. Scientific research in innovation research and management science as well as operational specifics and practical experience are the foundation of applied technology and innovation management at Telekom Laboratories. Telekom Laboratories has completed its first five years of operation – sufficient time to validate which approaches proved successful and which not. In this sense, the implementation and innovation management oriented "Innovation Development" unit of Telekom Laboratories[1] has proved a very successful and extraordinary testbed for advanced methods in the management of technology and innovation coming from science (Yin 2008) and, as such, has already frequently been the subject of innovation researchers' investigations.

The methods and tools in this book are all described by the Telekom Laboratories experts themselves, who took findings from science, made them practically applicable as tools, methods, and instruments, and validated their applicability through years of use. In this sense, this work is the result of a participatory test of hypotheses on how modern technology and innovation management should work.

As the telecommunications industry is undergoing radical technological change, the approaches described here can be seen as howtos for dealing with technology shocks (Arnold 2003). Within the past decades, the introduction of the overarching All-IP system has changed the entire value creation process and structures of the industry. The network architecture has moved from single "stovepipes" to a delayered and modular production, leading to easier and faster deployment of new services involving more market players, whereas the standardization of interfaces is bringing in millions of additional innovators (e.g., web developers).

This shift is comparable to the modularization in the PC industry (Baldwin and Clark 1997; Christensen and Raynor 2003). The multiplication of innovators through technical delayering, the ingress of so-called over-the-top Web X.0 services into the telecommunication domain, and the convergence of communication, commerce, and content services as well as media, telco, and computer markets (Zerdick 2001) have created new competitors and competitive constellations in the industry. This puts innovation under particular stress as innovation and creativity are central keys to competitive advantage and sustainable growth for leading companies (Schumpeter and Röpke 2006) in knowledge-based economies (Leydesdorff and Meyer 2006). Globalized competition and the Internet clockspeed come along with shortened product life cycles and strong increases

in cost pressure. In addition to this overall trend, the ICT sector is facing further challenges.

As a result, major network operators have to compete in an open, standardized environment with a high degree of complexity caused by the large numbers of products and innovators, as well as the continuous uncertainty of future markets and technologies. The answer to how to create sustainable differentiation in innovation at times of technology shock, where many of the relevant innovators are outside of the companies' boundaries, cannot lie in competing in a closed way with the outside world due to the sheer imbalance of resources.

The answer must lie in the build up of a sustainable innovation system where not everything needs to be done but rather selected smartly. The setup interfaces and integrates with the huge community of innovators through applied innovation and management tools in an open way and differentiates smartly.

Thus one of the recurring themes in this book has to do with openness – how to build an open innovation system that still allows for distinct differentiation.

Telekom Laboratories has not only been at the forefront of a very recent development in corporate R&D by building on five years of experience in smart openness in research and innovation thus providing an environment suited to dealing with complexity and uncertainty. It has also been extremely thorough in implementing the principles of open innovation in a corporate core unit so close to top level corporate decision makers (Picot and Doeblin 2009).

One key element used by globally active companies to embrace openness is the creation of R&D laboratories in cooperation with world-class research institutes – e.g., Bell Labs, HP Labs, IBM Labs, etc. (Saez et al. 2002; Lambert 2003; Lam 2007).

Deutsche Telekom Laboratories has been established as a public-private partnership together with the Berlin Institute of Technology in order to enhance innovative capabilities in basic and applied research. Consequently, following the trend of open innovation, Telekom Laboratories provides a suitable context for collaborative research with external partners such as universities, non-university research institutions, and other companies (Rohrbeck and Arnold 2006). These joint research projects also aim at reducing the risk of innovation for the participating partners.

Telekom Laboratories consist of Strategic Research and Innovation Development. Strategic Research incorporates four chairs of the Berlin Institute of Technology. Innovation Development is organized in five focus fields of innovation. Highly innovative research is not directly controllable, while

innovation often results from serendipity (Mittelstraß 1994; Münch 2007). This is why Telekom Laboratories follows a two-directional strategy: On the one hand Innovation Development fosters innovation extending corporate roadmap, whereas Strategic Research follows a "grass root strategy" (Mintzberg 1989) by cultivating several ideas without directly referring to their use within Deutsche Telekom at all times.

Both departments enjoy – although to different degrees – academic freedom and the spirit of corporate entrepreneurship with flexible resources for innovative projects. This environment is essential for creative and innovative performance separate from the day-to-day business (Picot and Schneider 1988). These specific working conditions attract highly innovative researchers from all over the world.

The proximity to basic research allows Telekom Laboratories a fast and straightforward integration of state-of-the-art research results into new products and services. At the same time this context offers the flexibility to react to recent developments in markets and technologies.

The collaboration is an effective means of learning and knowledge transfer for both sides – academic researchers as well as the participating industry.

Therefore, the university and industry research collaboration at Telekom Laboratories is mutually attractive: On the one hand, it offers the results of pure academic research the real chance of becoming applied research and, even more, a real market product. It also bears a relation between university-driven questions and the practical relevance of problems of everyday life. This might sometimes prevent the often bemoaned sitting in the ivory tower, even though academic freedom is one of the cornerstones of research at Telekom Laboratories. On the other hand, industry has the opportunity to take an active part in state-of-the-art research and to put this "advantage of knowledge" to work developing innovative products with the best available technology. International partnerships complete the open-minded atmosphere.

Innovation happens at the edge of knowledge fields and disciplines. Telekom Laboratories takes into account the importance of interdisciplinary collaborative research within a multi-cultural organization. Interdisciplinarity is one of the structure-forming elements of organizational design. Within the project fields, computer scientists, economists, software and electrical engineers, designers, psychologists, and sociologists work closely together, leading to a strong, interwoven technological and socio-economic competence. This enables social trends to be identified and extrapolated, and scenarios to be developed for future product development.

Interdisciplinary work is fostered through shared office spaces, social integration (e.g., events and shared leisure time activities), central meeting

points, as well as cultural norms and values. The resulting communication patterns have already been the subject of empirical research (von Eggelkraut-Gottanka 2008 and 2009).

But all these expectations are hard to meet if the basic conditions of the collaboration don't establish the required social and legal agreements. At Telekom Laboratories, there are various settlements to ensure close teamwork, which leads to real "open innovation". In addition to flexible administration, there are also more than 10 different types of employment contracts, so that everybody can find the appropriate working conditions and Telekom Laboratories can commit the people it wants.

As one of Deutsche Telekom's core strategic aims is the delivery of superior user experience, innovation management has to integrate customers into the early stage of the innovation process. The customer perspective is incorporated by a user-driven approach, including customer clinics that gain deep insights into preferences, behaviors, and needs (Presse et al. 2008).

From an organizational point of view, Telekom Laboratories forms the exclusive and central R&D department of Deutsche Telekom and reports directly to the Chief Product and Innovation Officer. This positioning leads to a strong interaction with the product management and technical departments thus allowing results to be applied to new products and services quickly. This may sound obvious, but quite often high potential innovations are not incorporated by the organizations they originate from but are taken up elsewhere (Spiegel Online 2008). In this sense, the track record of successfully implementing Telekom Laboratories results into the operational business of Deutsche Telekom is an aspect that makes Telekom Laboratories distinct and reconfirms the strength of Europe-based research and innovation.

The book's logic does not aim at completeness, but rather dives into selected core topics of innovation management:

A. Detecting weak signals in the environment, acquiring information in a world of knowledge, and identifying the areas of differentiation through R&D.
B. Organizing to get the most out of openness with the appropriate structures as well as integrating research and business partners.
C. Integrating customer feedback as an essential aspect of early market research in the open innovation processes.
D. Methods of early stage new product development based on enterprise architecture, modularization, and the idea of building blocks.
E. Implementing and tracking the exploitation of innovation results in the business units and applying new alternative methodical routes of with venturing aspects.

This book results from the conviction that seclusion rarely leads to superiority and that it is for the better that the good constantly needs to be exposed and challenged by the state-of-the-art for it to stay at the leading edge. In this sense, we share our findings on applied technology and innovation management approaches as part of the ongoing discussion with our environment and invite your feedback on both research on the management of technology and its application in practical work.

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Endnotes

1 Deutsche Telekom Laboratories consists of two logical and organizational constituents: Strategic Research, for academic research, as an institute at the Berlin Institute of Technology; and Innovation Development, as the implementation-oriented corporate research and innovation unit.