Strategic Foresight in multinational enterprises – a case study on the Deutsche Telekom Laboratories

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Abstract: Strategic Foresight activities enable companies to use weak signals to identify opportunities and threats. Research on Strategic Foresight proposes different methods, discusses their implementation and gives recommendations on how to link Strategic Foresight with other functions in an organization. Based on a literature review, we define a generic framework for the management of Strategic Foresight activities on the strategic, tactical and operational level and identify and discuss actors, methods and systems of Strategic Foresight.

Building on an in-depth case study of the Deutsche Telekom Laboratories we shed light on the implementation of Strategic Foresight activities. In the discussion we focus on the interaction of methods from Consumer Foresight and Technology Intelligence. Taking an example project, we explore how Strategic Foresight is used on the operational level of innovation management. We conclude that Strategic Foresight can successfully contribute to coping with uncertainty and complexity and can feed the front-end of innovation from the market (customer needs) and technology (realization opportunities) perspective.

Keywords: strategic foresight, consumer foresight, technology foresight, technology intelligence, market foresight, trend analysis, future studies, future analysis, telecommunication industry.

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Jörg Heuer started his career at Deutsche Telekom working for an engineering subsidiary where he designed and led more than 30 projects for all divisions of the Deutsche Telekom group. Currently, Heuer is responsible for Technology Exploration and the publication of a periodical report on technology developments for CTO/ CMO level management and innovation departments of the Deutsche Telekom group. He specializes in AAA (Authentication, Authorization, Accounting) and is responsible for managing the 'Overarching AAA Programme' of the group's innovation department. Jörg Heuer holds a Masters Degree in Computer Science from Berlin Technical University and worked in research on massively parallel computers and software engineering at Germany's National Research Center for Computer Science before embarking on a career in the industry.

1 Introduction

As new technologies, new services and new customer trends emerged, companies in many industries had to watch their profits eroding and their entire business models being threatened. This is by no means a new phenomenon. The industrial revolution substituted millions of weavers with the mechanical loom, replaced horsepower with steam engines and made manual work in many places dispensable. In recent years, troubled industries include photography, which was largely unprepared for the technological discovery of the digital camera, print media, where for example the publishers of encyclopaedias were caught off guard by the impact of the Internet or the Wikipedia phenomenon, and telecommunications, which is faced with the threat of Voice over IP.

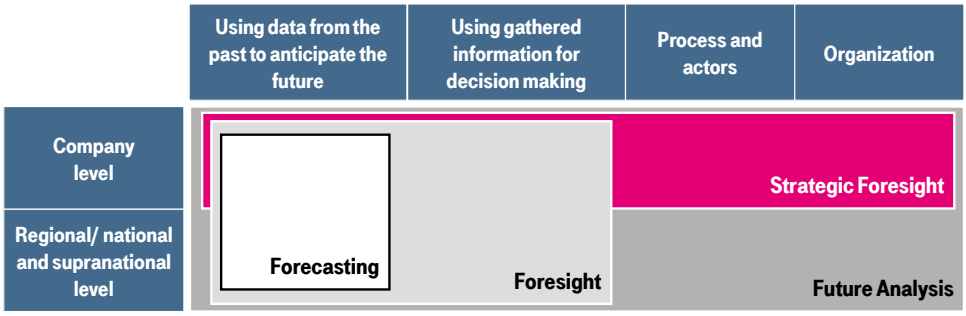
To discover threats in time, companies have to use weak signals in their periphery. Day and Shoemaker use the example of two breweries to illustrate the importance of weak signals. The first company – Anheuser-Busch – identified the health-living trend early on and successfully introduced a low-calorie beer, thus capturing 5-7% of the light-beer market. Its main competitor, Coors, not having understood the potential, was slow to react to the market shift and did not follow suit until two years later. [1].

2 Definition

Scientific classification

The research on the future and how to deal with it has evolved over time to include an increasing number of aspects. A classification of the research fields is shown in Figure 1.

Figure 1: Scientific classification of research on Future Studies



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In the 1970s, research conducted on the subject was termed *Forecasting* and focused on methods for predicting the future with modeling and econometric techniques, mainly using data from the past [2]. These methods included trend extrapolation, S-curves, trend curves, and patent and publication analysis.

Foresight broadened the scope of research to incorporate methods that enable networking for information gathering, assessment and interpretation, and methods that support decision making [3]. Furthermore, Foresight includes research on the capacity of organizations to cope with the future [4]. Both Forecasting and Foresight techniques have been investigated on a company level and on a regional, national and supranational level, such as economic areas.

In the 1990s, the scope of research was broadened by including the organization and the processes of the future investigation. The term *Strategic Foresight* was developed to refer to research focused on the company level. [5-7]. Today, to a large extent, *Future Analysis* has substituted Strategic Foresight as the preferred term [8-11]. In this article we use the term Strategic Foresight to emphasize the focus on the company level only.

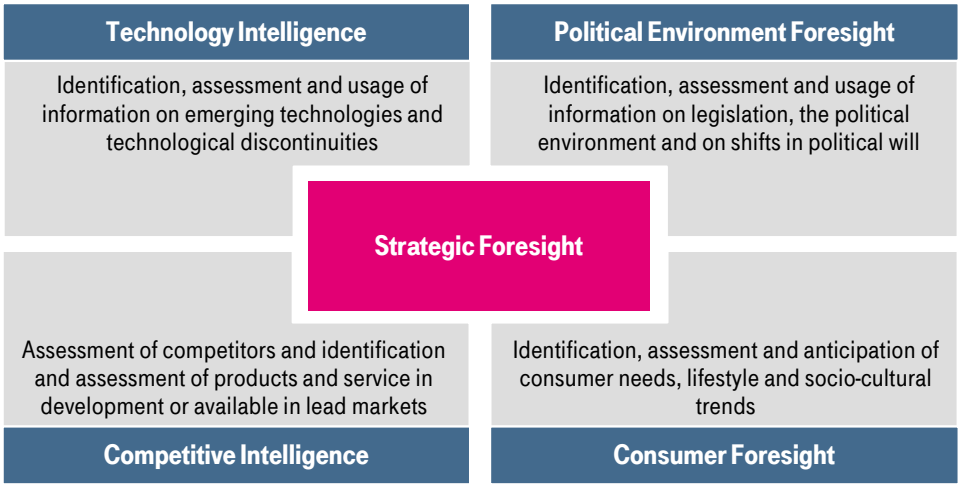
Elements of Strategic Foresight

Strategic Foresight uses weak signals from science and technology and from the political, socio-cultural and competitive environment. There has been extensive research on future-related intelligence activities in these specific fields and we would, therefore, like to point out the main research fields which have been incorporated into Strategic Foresight. These elements of Strategic Foresight are shown in Figure 2.

- *Technology Intelligence* deals with the identification, assessment and usage of weak signals and information about emerging technologies and technological discontinuities [12-15].

- *Competitive Intelligence* deals with the assessment of competitors and the identification and assessment of products and services in development or already available in lead markets [16-19].
- *Political Environment Foresight* deals with the identification, assessment and usage of information on legislation, the political environment and on shifts in the political landscape [1, 5]. This element is particularly critical in highly regulated industries such as the infrastructure of the food industry. At first, genetically modified food appeared to have a great deal of potential. However, the introduction of tight regulations led to a significant drop in sales.
- *Consumer Foresight* deals with the identification, assessment and anticipation of consumer needs as well as lifestyle and socio-cultural trends.

Figure 2: Elements of Strategic Foresight



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Definition of Strategic Foresight

Strategic Foresight deals with the identification, assessment and usage of weak signals to recognize and give warning about threats and opportunities at an early stage. Sources of weak signals are the political, socio-cultural and competitive environments as well as science and technology. Strategic Foresight defines the methods, the actors, the process and the system needed to enhance the competitive position of a company. Strategic Foresight can be directed (monitoring, issue driven) or undirected (scanning) [13, 20].

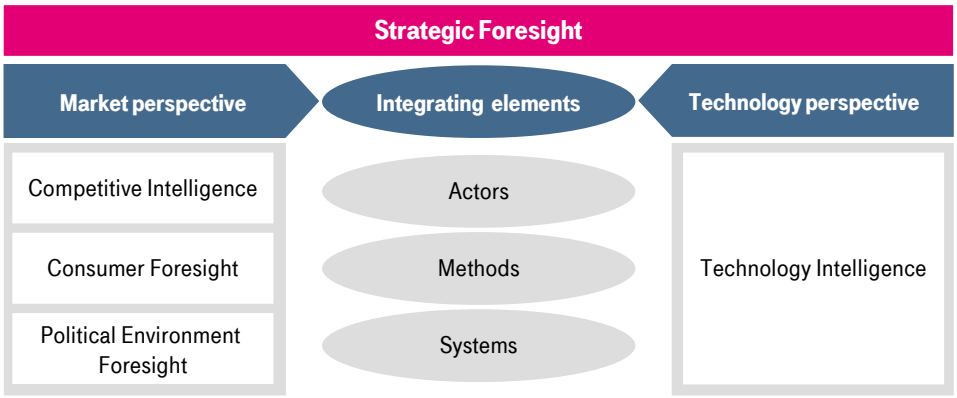
3 Coordination of market and technology perspective

The four elements of Strategic Foresight can be divided up further into two perspectives. The perspectives often correspond to the activities of the various actors involved in

strategic foresight. Therefore, the restructuring of perspectives is helpful when analyzing the coordination of different activities, actors and methods within the organization.

The two perspectives shown in Figure 3 are the *market perspective*, which incorporates the Competitive Intelligence, Consumer Foresight and Political Environment Foresight elements and the *technology perspective*, which consists of Technology Intelligence.

Figure 3: Integration of the two perspectives of Strategic Foresight



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The two perspectives can be integrated in three different ways. Firstly, by bringing the different actors together. Secondly, by applying methods designed to combine the data generated in the two perspectives. And thirdly, by using systems which integrate the perspectives. These systems can be IT-solutions or organizational systems such as staff units, which analyze the information generated in the two perspectives and compose an integrated report.

Numerous studies have demonstrated the expected gains from integrating the two perspectives. However, there are also barriers to overcome while attempting to do so [21-26]. In the end, the success of the integration will depend on bringing the actors together through tailored methods and systems adapted to company specific requirements.

4 Actors

In recent years, the individual actor has become the focal point of innovation management research. The two research streams have been the Champions of Innovation and the Promoters of Innovation [27]. This research has shown that the actions of a few individuals, rather than the innovation system itself, are crucial to the success of innovations.

The same applies to the Strategic Foresight activities of Deutsche Telekom AG and their successful implementation in order to give early warning signs and to stimulate innovation. Figure 4 shows the different Strategic Foresight actors at Deutsche Telekom AG. The Strategic Foresight activities conducted by these actors are mostly directed by specific issues, which need to be acted upon. In order to decide upon the course of action,

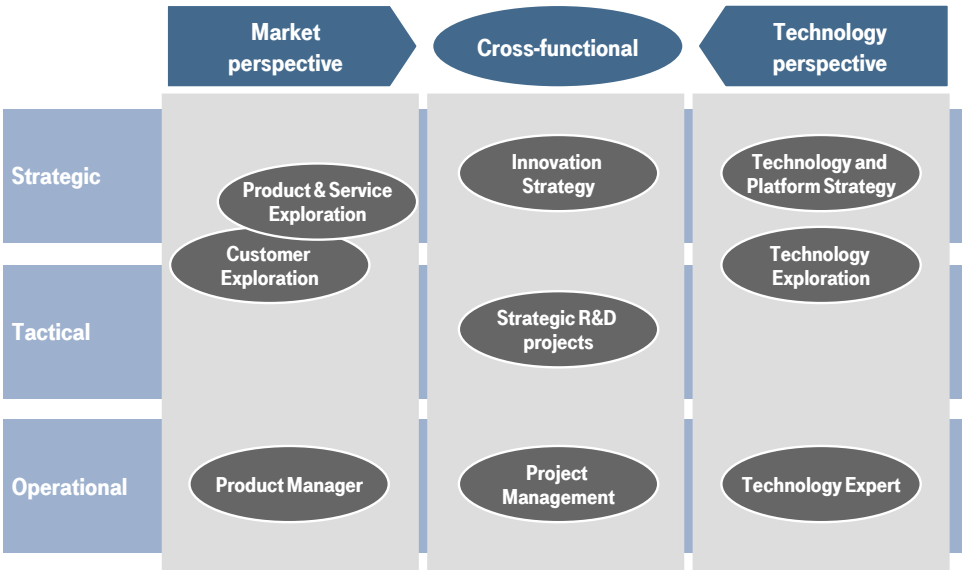
information is usually gathered, analyzed and, after a conclusion has been reached, the data is usually distributed.

On the other hand, there are three units which scan in an undirected way. These units are:

- *Product & Service Exploration*, which is dedicated to the identification of products and services available in lead markets,
- *Customer Exploration*, which uses methods such as ICT diaries, socio-cultural studies and trend analysis to identify latent and emerging customer needs, and
- *Technology Exploration*, which scans for emerging technologies.

All three units publish scanning reports, which are available throughout Deutsche Telekom AG. The way these reports are disseminated has a strong information-push character: readers cannot state what information they require or how comprehensive it should be. There are, however, some information-pull mechanisms in place. Deutsche Telekom AG business units can request workshops or interviews on the scanning results.

Figure 4: Strategic Foresight Actors at Deutsche Telekom AG



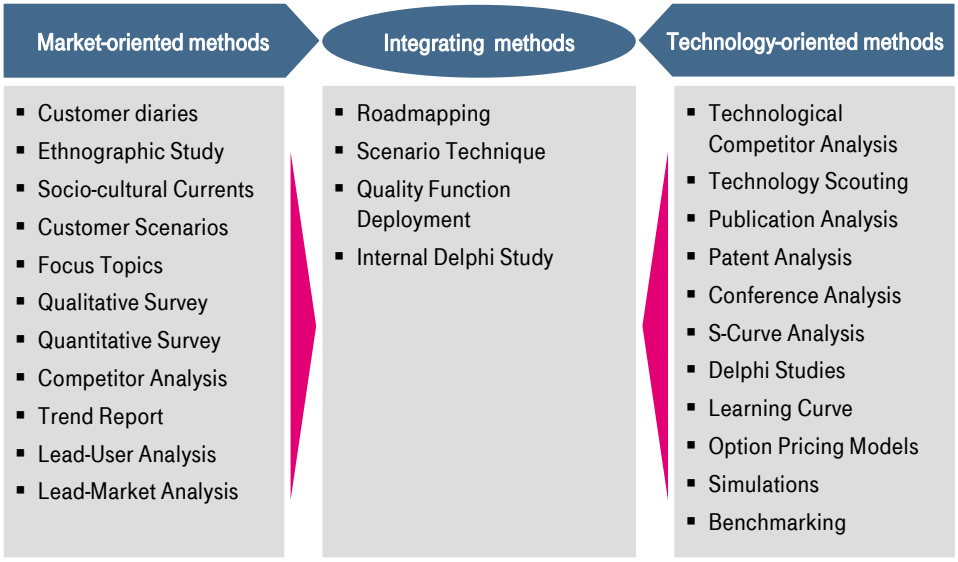
Source: Own figure based on case study

5 Methods

The methods of Strategic Foresight can be differentiated according to the areas in which they are applied, as shown in Figure 5. A case study of Deutsche Telekom AG and a literature review in the area of Competitive Intelligence identified the *market-oriented methods* [17, 18, 28]. The Deutsche Telekom AG mainly uses an international scouting network for Technology Intelligence [29, 30]. For this reason, the Technology Intelligence methods are mainly determined through the literature [14, 31-33]. as the Deutsche Telekom AG is using mainly an international scouting network for Technology

Intelligence [29, 30]. The integrating methods are discussed as a powerful means to overcome the barriers between market and technology perspective [34] as well as between strategic, tactical and operational planning [35]. The most commonly used integrating methods are roadmapping [36-39] and the scenario technique [40-42].

Figure 5: Methods of Strategic Foresight



Source: Own figure based on Rohrbeck, Gemünden (2006) [35]

6 Strategic Foresight for operational innovation management

Case setting

To identify how Strategic Foresight stimulates new innovation activities we analyzed a Deutsche Telekom Laboratories (T-Labs) project. T-Labs are part of the central 'Innovation, Research, and Development' unit of Deutsche Telekom AG. The T-Labs research and develop new information and communication technologies and services, allowing the Deutsche Telekom Group to generate new business and expand its existing operations.

Methodological Background

To identify the distinct activities which led to the successful launch of the project, we used the four steps for the front end of innovation defined in the barrier paradigm of Gemünden [43]:

- In the *idea generation* step an individual has to recognize the innovation potential of their idea.

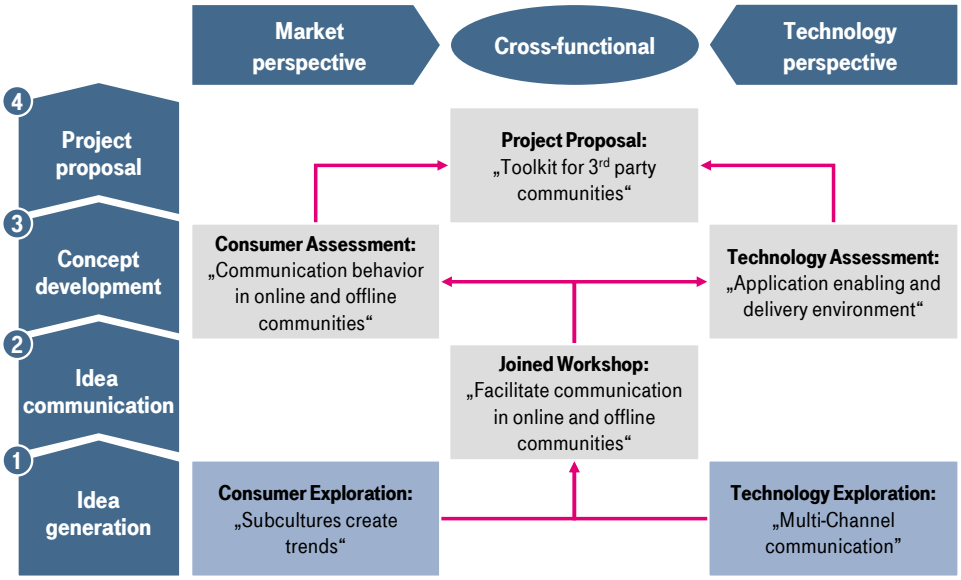
- In the *idea communication* step he shares the idea with co-workers, superiors or external friends or family.
- The next step is the *concept development* where usually the definition of the expected outcome, the project planning and the budgeting is taking place. Especially in this phase the contributions of promoters is essential [27].
- The final step to successfully incorporating the innovation impulse in the product development is the *project proposal* and its acceptance.

To deepen the understanding of the sequence of actions we differentiated them into market, technology and integrative activities.

Sequence of activities

The sequence of activities that lead to the project's initiation is shown in Figure 6. In the case study there were two simultaneous Strategic Foresight activities in the *idea generation* step.

Figure 6: Sequence of activities



Source: Own figure based on case study

Firstly, the consumer exploration unit published an opinion paper detailing the way groups of people get together on the Internet to solve their specific problems, thereby adding their solution to the portfolio of solutions available on the Internet and eventually causing a much larger trend (like the world wide web itself, which started as a solution for researchers at the "Conseil Européen pour la Recherche Nucléaire – (CERN)").

Secondly, the technology exploration unit issued a report on multi-channel communication. Different modes of communication such as telephoning, e-mail and text messaging require very different devices and services, are handled differently and involve different ways of addressing one's peers. So this trend was described as asking for more

than what Unified Messaging Services (UMS) could deliver: the integration of devices, addressing schemes, communication logic and finally products.

The *idea communication* step consisted of trend workshops, which are organized regularly by the technology exploration unit. Participants are innovation strategists, technology experts and product managers from different business units. During the one-day event, impulses from technology, customer and market exploration were combined to identify business requirements and long-term strategic visions.

An analysis of the impulses and the discussion led to the idea of investigating the potential and feasibility of a service that would "facilitate communication in online and offline communities".

Concept development was again divided into two sections: customer analysis and technology analysis. A sociological and market analysis was conducted in the customer analysis part. In the technology part, the feasibility was assessed, key enabling technologies, such as Session Initiation Protocol (SIP) were identified, and frameworks such as the IP Multimedia Subsystem (IMS) were analyzed.

The final project proposal was than refined into a "toolkit for 3rd party communities" that would deliver service building blocks designed to enhance communication within and between communities.

Outcome of the project

The project's first prototype was 'Saturday Night Swarming', a service enabling party communities to share photos and video clips and set up joint activities through an intuitive interface on their mobile phones. The second prototype, 'Sports Moms', allows mothers to co-ordinate sporting activities with household chores and parental duties in real time.

The exploration of potential business models and sociological patterns of communication has enabled T-Labs to take a strong position in the definition of requirements for future services platforms. These requirements are reflected in standardization work, discussions with vendors and attempts to influence the industry's mindset in conferences and talks within and outside the telecommunications industry.

7 Conclusion

Implications for practitioners

Our case study established one possible way to include Strategic Foresight in the front-end of operational innovation management. In this example, the innovation initiative came from an impulse originating in internal units which specialize in scanning for customer needs and emerging technologies. A second way to successfully use Strategic Foresight in this context would be to enable R&D managers or R&D project leaders to build up their own foresight capabilities. A third way would be to use external consultants to scan for impulses.

Regardless of the method chosen, companies must make sure that the front-end of their new product development is receptive enough to absorb these impulses.

Suggestions for further research

Much research has been done by scholars into the field of foresight. However, up until now, no consistent frameworks incorporating actors, methods and systems have been proposed. One question in particular, which remains unanswered, is how to structure Strategic Foresight activities in order to maximize a company's creativity and innovative capacity.

For this reason, we believe it is important and valuable to identify more successful cases, broaden the scope of research and incorporate the sophisticated creativity and collaboration tools emerging today within the Web 2.0 environment. Tools that could be used include social tagging, automated and collaborative information filtering, agent-based issue analysis and the usage of virtual worlds, such as second life for consumer foresight.

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