Paper 4 : Society and Technology Foresight in the Context of a Multinational Company

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ABSTRACT

In the last three decades several large enterprises in such diverse sectors as energy, automotive, insurance, telecommunications and information technology have established foresight groups and strategic planning processes, which analyse the long-term prospects of new technologies and their impact on markets and corporate strategies. Daimler Chrysler’s Society and Technology Research Group (STRG) is one of the first future research groups to be established within a company. Since 1979 it has investigated, in close cooperation with its customers, the factors shaping tomorrow’s markets, technologies and products. Its focus is social science-based futures and business environment research to support strategy and product development processes.

The field of “technology foresight” has evolved from an earlier narrower focus on technology forecasts to a broader definition, which takes political, economic and societal factors and their interactions into consideration. The failures of technical forecasts and prognostics have also led to a rediscovery of complexity and uncertainty in futures studies and to a further extension of the set of methods deployed. With this modernized understanding of “foresight”, a variety of research concepts come into play. It is argued that a broad set of foresight concepts is of relevance to corporate strategies, especially in large multinational companies.

A comparison of the major characteristics of foresight studies in the public and private sector reveals some shared objectives, features and methods but also some specific differences, which have to be taken into account when considering collaboration between public and private players.

The premise of the work at STRG is that it is not possible to predict the future, but it is possible to prepare for an uncertain future by thinking through a variety of possible developments and analysing the forces that influence them. Finally, preparation for the future involves an understanding of the way we shape it. In order to deal with the uncertainty inherent in technological and societal developments it is imperative to study the interactions between societal and technological developments. For this purpose STRG takes a close look at social trends and changes in market environments that are relevant to the diffusion of new technologies into the marketplace. Thus, STRG’s foresight activities regarding future technologies are always embedded in a broader analysis of developments in the societal and economic business environments.
1. INTRODUCTION

With the spread and implementation of strategic planning processes since the 1960s large companies with special external risks in their business (e.g. the oil industry, insurance industry) or high investments in innovation and research (e.g. the automotive industry) have become interested in long-term planning and foresight. A few foresight groups within companies exist now for more than two decades (e.g. Shell, DaimlerChrysler); several new groups were founded in the 1990s (e.g. at Philips Design, Siemens, Toyota). DaimlerChrysler is one of these early founders of a company-based futures research group, which was set up in 1979. Deviating from the then widespread mainstream path of most technology forecasting, the Society and Technology Group of DaimlerChrysler (STRG) started with two basic premises. Firstly, before focusing on technology, a broader view of the external business environment, including societal factors, has to be taken if a company is looking into the future. Secondly, to accept and learn about complex and dynamic environments, foresight within a company has to concentrate on an “outside-in” perspective. Thus the mission of STRG is social science-based futures and business environment research to support strategy and product development processes for DaimlerChrysler and its business divisions. The key question of this mission is: what business environment trends shape future markets and contexts for the automotive industry and the mobility business, and what key questions do these pose for DaimlerChrysler? (cf.: figure 1). The business environment is defined broadly and comprises technological, economic, political, societal and ecological domains. The analyses are conducted on macro, meso and micro levels and are oriented in a medium and long-term time horizon (5-15 years).

Figure 1: Basic approach of the Society and Technology Research Group
To accomplish this mission, STRG has five main fields of activities:

(a) Development of scenarios for future products, services and business processes;
(b) International and future-oriented analysis of the company’s business environment;
(c) Analysis of future customer needs and the derivation of requirements for future products and services;
(d) Identification of opportunities and risks for existing and new products, services and processes;
(e) Prospective generation and evaluation of innovations in the context of future customer needs.

The research group unites about 40 research scientists from a diversity of disciplinary and regional backgrounds. The headquarters are in Berlin, and there are branch offices in Palo Alto (United States of America) and a network node in Kyoto (Japan). For its international projects STRG maintains an international network of partners in Europe, the United States, Japan, Eastern Europe and parts of Asia.

The following chapter (2) of this paper highlights some general features of foresight in a business context. Chapter 3 shortly portrays the research focus of STRG at DaimlerChrysler. Chapter 4 reviews some lessons learned with foresight in a business context.
2. LANDSCAPE OF FORESIGHT IN A BUSINESS CONTEXT

2.1 FIELDS OF FORESIGHT ACTIVITIES OF RELEVANCE TO COMPANIES

Technology foresight is defined today as a “process involved in systematically attempting to look into the longer-term future of science, technology, the economy, the environment and society with the aim of identifying the emerging generic technologies and the underpinning areas of strategic research likely to yield the greatest economic and social benefits” (Martin, 2002). This contemporary definition has largely extended the scope of earlier definitions, which in the literal sense of the concept restricted the meaning to a study of technological developments, as reflected for instance in the initial national technology foresight exercises. It is a matter of opinion whether the “post-modern” extension of the definition is still properly reflected by the name “(new) technology foresight” or if the concept should be renamed “society and technology foresight”. At any rate, with such an extended definition, technology foresight encompasses a diverse range of approaches to research into the future (see figure 2).

Figure 2: Fields of foresight activities of relevance to companies

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24 This chapter is drawn from earlier publications on this topic (Ruff 2002, Ruff 2003). The selection of the described approaches of foresight and futures research for companies is not theoretically derived, but result of many years of observing foresight practice in technology-oriented big companies. The description is cumulative and considered as a general „map“. There are only few companies who practice or use all or many of the depicted fields. Also the organisational and institutional settings vary from company to company. Only few big companies have their own internal unit conducting foresight or futures research. Frequently “corporate foresight” or “industrial futures research” are labelled differently and for instance part of an established technology and innovation management, of strategic marketing or a staff function of the board of management (e.g. as part of a corporate strategy unit). Mostly only foresight activities considered as a “core activity” are institutionalized within companies. Activities with less continuity and priority are often worked on in the form of temporary projects or with external support. The positioning of the foresight fields in the topical and time scale in the graph are “ideotypical” and only mark focuses. The boundaries are in reality more blurred than the graph suggests. In practice varying time scales (e.g. branch dependent) and various mixes of technological and business environment-oriented approaches can be found.
The various approaches can be positioned with four criteria:
(a) Major focus of the foresight;
(b) Time frame and scope;
(c) Major actors,
(d) Relevance for corporate foresight in a business context.

The various approaches to foresight and their major features are characterized in more detail in table 1 (see below). Despite the variety, the overview is still not complete, and the focus here is on approaches and concepts that are directly or potentially relevant for companies and long-term business strategy.

Historically, foresight activities were triggered by the prospect of the accelerated pace of science and technological innovations and the goal to anticipate potential future technologies and opportunities for their application. Thus, most foresight projects in the public and private sector until the early 1990s focused on technological developments (Technology Foresight, Technology Forecasting, cf. Coates et al. 2001, Martin 2002). In many industrial countries public institutions regularly conduct studies regarding the long-term prospects of science and technology. Delphi-studies scanning the assessments of experts regarding technology developments are a typical example for this approach (cf. Cuhls, Blind, Grupp 2002).

These approaches have mostly only a limited relevance for companies, because interactions with societal and market developments are rarely considered. Also the results are usually too abstract to offer a benefit for technology and business issues in companies.

With the growing awareness of the relevance of political and societal factors, more and more foresight studies have integrated the impact of the economic, political and social environment in the analysis. This change is also reflected in the changing definition of technology foresight. Further evidence of this “societal evolution” of the understanding of technology foresight is the extension of the technology Delphi studies from a pure technological focus to include economic and social topics (Cuhls, Blind and Grupp, 1998) as well as the shift from Delphi studies (with more or less closed expert circles) to a broader public involvement of experts, stakeholders and citizens, for instance in the current FUTUR project initiated by the Federal Ministry for Research and Technology in Germany (Cuhls, 2000).

In a related historical root of technology foresight, there was a growing interest in the political domain to anticipate the effects and side-effects of new technologies. This field of Technology Assessment emerging from the early 1970s in the United States and from the 1980s in most Western European countries is a research concept dealing with the likely or already observable effects of new technologies, with special emphasis on secondary and tertiary effects (Büllingen, 1993). Technology assessment has typically focused on new “big” technologies such as nuclear technology, analysis of the human genome or space exploration, and on regional or local environmental issues. In different time scales and institutional settings offices for technology assessment have been extensively institutionalized as preparation and support for political decisions by national governments (Bröchler, Simonis and Sundermann, 1999).

In the late 1980s and early 1990s a few companies have also adopted the technology assessment approach and adapted it to the needs of companies as “product impact assessment” (see Minx and Meyer, 1999). As companies mostly deal with
products, i.e. integrated instead of “pure” technologies, the focus of “product impact assessment” is oriented more towards applications and the impact of product usage. It also varies in terms of scope and time frame compared with typical technology assessments in the public sector.

Many technology-oriented companies conduct Technology Monitoring. Although this field is mentioned rarely in publications on foresight and futures research, in its essence it is a typical foresight activity in a company context. It is a core part of a technology-related early warning system and of an integrated technology and innovation management.

Technology monitoring consists of the continuous monitoring and scanning of emerging technologies including an evaluation of which technologies could and should be integrated into the technology roadmaps of research and development units. Usually technology monitoring is pursued in a short to medium-term time horizon. Some companies, especially innovation leaders in technology, have extended the time frame of these monitoring activities to a long-term horizon (Strategic Technology Monitoring).

In business practice technology monitoring is often closely linked with Strategic Competition Analysis. However, beyond the technological scope, competition analysis also encompasses the monitoring of observable strategies and market positions as well as suspected strategic intentions of competitors thus taking the non-technical business environment and markets factors into account.

Analyses regarding economic developments (Prospective Economic Analyses) have been a standard functional element in most large multinational companies for quite a time (e.g. large companies in the energy, banking, chemical or automotive branch). Most of these companies have an economic research unit, which analyses indicators and data on economic development (e.g. economic growth, financial markets, exchange rates) and projects likely future paths of economic development. The relevance of this field of foresight for companies is evident. Multinational big companies are held accountable not only for the balance sheet of the current fiscal year but have also to deliver estimates of future financial performance and related risk-management measures. For this purpose economic research is important.

A field of future-oriented analysis that is very important in a business context is Strategic Market Research. Here the challenge is the short and medium-term anticipation of customer needs, of sales volumes in differing regional markets as well as the forecast of brand images and other marketing-related performance criteria.

A special extension and complement of conventional or strategic market research in companies is the field of Advanced Marketing and Trend Research. Here long-term developments in market environments that have an impact on future customer needs and demand-related factors are analysed. In the field of consumer goods (e.g. cars for private customers) examples for relevant topics are demographic changes, changes of lifestyles and consumer behaviour. In the domain of industrial goods (e.g. commercial vehicles) long-term developments in markets and branches are analysed. This field of Advanced Marketing and Trend Research differs from market research especially regarding the more extended time horizon (ca. 5-10 years). Also an extended perspective on societal, socio-cultural, economic and branch-related developments is taken. As a consequence this field has developed its own set of methods (e.g. market scenarios, trend analyses, segment forecasts, market models).
Examples of companies with specialized groups in this field are Philips with its Design unit or DaimlerChrysler with its Society and Technology Research Group.

A relatively young field in the corporate context is *Future oriented Organisational Research* that explores the prospective change of organisations, institutions and enterprises. This field is conceptually a merger of social science organisational research (e.g. models of knowledge organisation in networks), concepts from business administration on the change of business processes (e.g. models on value creation) and of concepts which postulate a paradigm change in economic processes by new technologies (e.g. new economy). This field is driven by the following key question: which new business potentials and organisational models are enabled by new technologies like information and communication technologies and which organisational transformations in enterprises and business models may result from that?

Another relevant field of foresight is future societal change (*Societies of the Future*). The focus here is on long-term societal changes (e.g. in social structures and lifestyles) and on the generation of scenarios regarding future societies. This type of foresight is mostly conducted by international or national think tanks and research institutes (e.g. Organisation for Economic Cooperation and Development, the European Union’s Institute for Prospective Technology Studies, foundations by political parties) or public and private social research institutes. Only a few companies take a look at this field, because social change is still very often regarded as a non-business topic. But multinational companies are becoming increasingly aware of the relevance of this research field as they experience the impact of social changes on their corporate strategy portfolio and corporate image.

A further field of futures research deals with *Global Trends*, covering a broader scale of economic, political, societal and ecological issues with global scale and relevance (e.g. depletion of water resources, international migration, international security). These studies are usually conducted by specialized think tanks in the political or private sector or by non-governmental institutions. In the field of global trends, a broad diversity of institutions are involved including the World Bank, the Worldwatch Institute, and the United Nations University with the Millennium Project, to mention just a few. Only a few companies deal systematically with this field of advanced global foresight. But a few think tanks in the energy industry (e.g. Shell), the financial and insurance industry (e.g. Swiss Re) or the automotive industry (e.g. DaimlerChrysler) address this field, because their international business may be affected by such global developments.
**Table 2: Selected fields of foresight and their relevance for companies**

<table>
<thead>
<tr>
<th>Field of foresight</th>
<th>Major focus</th>
<th>Time frame and scope</th>
<th>Major players</th>
<th>Relevance for corporate foresight in multinational companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term Technology Foresight</td>
<td>Projections of likely scientific and technological innovations in the long-term future (e.g. Delphi studies on future technologies)</td>
<td>Medium- to long-term (5-30 years). Frequently national scope (because of national institutional funding)</td>
<td>Public and private research institutes</td>
<td>Low to high relevance: relevant for companies with high potentials for shaping markets by “technology push” strategies (e.g. life science industry, ICT industry)</td>
</tr>
<tr>
<td>Technology Assessment/Product Impact Assessment/ Innovation and Technology Analysis (ITA)</td>
<td>Analysis of observable or likely effects of new (basic) technologies, and products, focus on secondary or tertiary (side-) effects, early warning regarding risk and opportunities of new technologies</td>
<td>Medium- to long-term (5-25 years) Regional, national, local or market-area related scope</td>
<td>Offices for technology assessment (support for national governments) Public and private research institutes, few projects in companies</td>
<td>Low to high relevance: relevant for companies with high or uncertain risk potentials and dependency on few basic technologies (e.g. mobile communications industry, chemical/pharmaceutical industry)</td>
</tr>
<tr>
<td>Technology Monitoring</td>
<td>Monitoring of short- to medium-term technological innovations in science, research and industry, analyses of patents/licences</td>
<td>Short- to medium-term (1-3 years) Specific technology fields and markets</td>
<td>Private business intelligence (e.g. business consultancies) Corporate units or projects</td>
<td>Very high relevance: standard feature of most corporate strategy processes in high-technology companies</td>
</tr>
<tr>
<td>Strategic Monitoring</td>
<td>Monitoring of long-term technological innovations in science, research and industry, analyses of research topics and strategies in science and industry</td>
<td>Medium- to long-term (5-10 years) Specific technology fields and markets</td>
<td>Private intelligence (e.g. business consultancies) Corporate units or projects</td>
<td>Very high relevance: highly relevant for companies with long product development cycles and high investment risks</td>
</tr>
<tr>
<td>Strategic Analysis</td>
<td>Monitoring and prospection of technological and market positions of major competitors (corporate strategies, innovation paths)</td>
<td>Short- to medium-term (1-5 years) Specific technology fields and markets</td>
<td>Private intelligence (e.g. business consultancies) Corporate units for competition analysis</td>
<td>Very high relevance: standard feature of most corporate strategy processes in highly competitive industries</td>
</tr>
<tr>
<td>Prospective Analyses</td>
<td>Projections of economic growth, macro-economic and sector-specific forecasts (GDP, interest rates, sectors, etc.)</td>
<td>Short- to medium-term (1-5 years) Regional and global scope</td>
<td>Public and private economic research institutes Corporate economic research units</td>
<td>Very high relevance: relevant for investment and finance policies, projections of earnings/returns</td>
</tr>
</tbody>
</table>

**KEYNOTE PRESENTATION**

51
Table 2 (continued): **Selected fields of foresight and their relevance for companies**

<table>
<thead>
<tr>
<th>Field of foresight</th>
<th>Major focus</th>
<th>Time frame and scope</th>
<th>Major players</th>
<th>Relevance for corporate foresight in multinational companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Market Research</td>
<td>Modeling and forecast of market factors (e.g. sales volumes, images customer needs)</td>
<td>Short- to medium-term (1-3 years)</td>
<td>Market research institutes</td>
<td>Very high relevance: relevant for product, marketing, market introduction strategies and innovation processes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Focused on market-segments (e.g. market area, target group)</td>
<td>Corporate market research units</td>
<td>Adamant to very high relevance: relevant for product strategy, innovation process, early warning systems; highly relevant for industries with long product development cycles and high investment risks</td>
</tr>
<tr>
<td>Advanced Marketing and Trend Research</td>
<td>Analysis of long-term developments and trends in market environments (e.g. values/lifestyles, customer needs, consumer behaviour, demographic and socio-economic developments)</td>
<td>Medium- to long-term (3-10 years)</td>
<td>Strategic marketing and trend research units</td>
<td>High to very high relevance: relevant for product strategy, innovation process, early warning systems; highly relevant for industries with long product development cycles and high investment risks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Related to societal groups, market areas, customer groups, branches</td>
<td>Corporate think tanks</td>
<td>Very high relevance: relevant for product strategy, innovation process, early warning systems; highly relevant for industries with long product development cycles and high investment risks</td>
</tr>
<tr>
<td>Future oriented organizational research</td>
<td>Analysis of organizational change in organisations and enterprises (e.g. organisational models, value creation, internal and external business models)</td>
<td>Short-, medium- and long-term (1-10 years)</td>
<td>Privat Business intelligence (business consultancies)</td>
<td>Medium to high relevance: for strategic planning, for companies with high momentum of organisational change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Related to branches, single enterprises, organisational units</td>
<td>Special units or task forces in companies</td>
<td>Medium to high relevance: for strategic planning, for companies with high momentum of organisational change</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Corporate think tanks</td>
<td>Medium to high relevance: for strategic planning, for companies with high momentum of organisational change</td>
</tr>
<tr>
<td>Societies of the Future</td>
<td>Driving forces of social change/scenarios of future societies, mostly national or regional focus (e.g. European Union)</td>
<td>Long-term (5-20 years)</td>
<td>Public and private social research units (e.g. political think tanks, Institute for Prospective Technology Studies of the European Union)</td>
<td>Medium to very high relevance: relevant for long-term strategic planning; highly relevant for companies with high sensitivity to societal changes, e.g. social issue management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sociocultural units (cultures, nations, subcultures)</td>
<td>Few corporate think tanks</td>
<td>Medium to very high relevance: relevant for long-term strategic planning; highly relevant for companies with high sensitivity to societal changes, e.g. social issue management</td>
</tr>
<tr>
<td>Global developments/trends</td>
<td>Broad-range analyses of future developments in economy, politics, societies, ecology on a global or macro-regional scale. Focus on global issues (e.g. globalisation, environmental issues, migration, security issues)</td>
<td>Long-term (10-50 years)</td>
<td>Public and private future research units (e.g. political think tanks, World Bank, Worldwatch Institute, Millennium Project of the United Nations, OECD Research)</td>
<td>Medium to very high relevance: relevant for long-term strategic planning (e.g. change of core business); highly relevant for multinational companies with issue-sensitive business (e.g. energy industry, resource-dependent industries)</td>
</tr>
</tbody>
</table>
2.2 Major characteristics of foresight in the public and private sector

In science and technology policies, the appeal for closer collaboration between the public and private sector in the fields of foresight is regularly encountered. Usually both sides affirm this general objective and some shared premises in the basic approach. However, for a realistic appraisal of opportunities for collaboration awareness of the differences in interest, time frames and the process requirements regarding foresight in the public and private sectors is also required.

The major shared premises and differences in foresight activities are shown in table 2. Within the private sector, the focus is on large multinational companies, which basically have the resources to initiate corporate foresight activities on their own.

**Table 2: Foresight in the public and private sector—major characteristics**

<table>
<thead>
<tr>
<th></th>
<th>Foresight in the public sector</th>
<th>Foresight in the private sector</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General objective</strong></td>
<td>Anticipation of future developments in science, technology, economy, politics and society</td>
<td></td>
</tr>
<tr>
<td><strong>Specific objectives</strong></td>
<td>• Generating ideas and visions for technology and innovation</td>
<td>• Identifying opportunities and risks in markets, technologies and the business environment</td>
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<tr>
<td></td>
<td>• Identifying/prioritizing related policy measures</td>
<td>• Identifying strategic options</td>
</tr>
<tr>
<td><strong>Major players</strong></td>
<td>• Governmental bodies</td>
<td>• Strategic planning units</td>
</tr>
<tr>
<td></td>
<td>• Expert communities</td>
<td>• Research and Technology units</td>
</tr>
<tr>
<td></td>
<td>• Non-governmental organizations</td>
<td>• Corporate think tanks</td>
</tr>
<tr>
<td><strong>Time frame</strong></td>
<td>• 5-20 (30) years</td>
<td>• 2-15 years</td>
</tr>
<tr>
<td><strong>Duration of typical projects</strong></td>
<td>• 1-3 years</td>
<td>• 3 months to 1 year</td>
</tr>
<tr>
<td><strong>Major methods</strong></td>
<td>Technology monitoring/scanning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Environmental monitoring/scanning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Analysis of patents/licences</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expert panels/interviews</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delphi studies</td>
<td></td>
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<tr>
<td></td>
<td>Participatory methods</td>
<td></td>
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<tr>
<td></td>
<td>Technology sequence analysis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time series forecasts</td>
<td></td>
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<tr>
<td></td>
<td>Trend research</td>
<td></td>
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<tr>
<td></td>
<td>Trend impact analysis</td>
<td></td>
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<tr>
<td></td>
<td>Systemic modelling</td>
<td></td>
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<tr>
<td></td>
<td>Scenario construction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(and others)</td>
<td></td>
</tr>
</tbody>
</table>

The basic common feature of public and private sector activities is in the general objective, which is to anticipate future developments in science, technology, economy, politics and society.

In the more specific goals some differences in priorities emerge: whereas public sector activities by their very nature focus more on collective visions for technology, consensus-building and creating legitimacy for technology policies, companies focus primarily on market-related opportunities and risks. Of course, both the public and...
private sector can subscribe to these other objectives as well. When seeking to conquer new markets, companies rely on the “social capital” of the legitimacy and societal acceptance of technological innovation. Similarly, the public sector fosters societal discourse on technology for the sake of creating innovations, economic and social benefits. But beyond this reciprocal consensus, there remains a basic difference in terms of perspectives and the prioritization of specific goals.

Another difference lies in the organizational contexts and cultures of the major actors involved in foresight. In the public sector there is a more heterogeneous set of players, ranging from governmental or administrative bodies to (scientific) expert communities, non-governmental organizations and other collective or single stakeholders. Companies usually institutionalize foresight activities in strategic planning units, research and technology laboratories or corporate think tanks and thus have a more homogeneous set of actors and less organizational complexity to handle.

A major difference lies in the time frame. Public sector activities mostly consider a time frame of about 5 to 20 years ahead, in some cases even up to 50 (e.g. the project “Visions for a sustainable Europe”, Rotmans, Van Asselt and Anastasi, 2000) or even 300 years (e.g. the Millennium Project of the United Nations University). In the private sector a 10- or 15-year perspective is already considered “very long-term”. Even among strongly capitalized large multinational companies, only a few take such a perspective.

Another difference, which is probably the greatest stumbling block to collaboration between public and private players in the field of foresight, is the duration of typical projects. Projects in the public sector often run for a couple of years until final results are presented and implemented. In the business context results including at least the first steps towards implementation are usually expected within less than a year or even after a couple of months. In some sectors, like the information and communications branch, typical time allocations for strategic projects are sometimes even shorter. This difference in the time logic of public and private activities is the main reason why only a few public-private collaborations in the field of foresight have come about to date and why companies even reject an active role in public funding programmes on a national or regional (e.g. European) level. Sometimes, the length of the application phase for public funding already exceeds the strategic planning cycle of the company for which the results are urgently needed. More fast-track funding for public-private collaborations would boost the involvement of companies.

In terms of methods deployed, there are only minor differences between the public and private sector. Delphi studies are more typical for publicly funded research, as they entail considerable costs and, because of their iterative character, are also time-consuming. Expert interviews, technology monitoring/scanning, scenarios and sensitivity analyses are major elements of the generic pool of methods. Because of their interest in exploiting economic opportunities, companies usually deploy a more differentiated set of methods regarding the evaluation and structuring of intellectual capital (e.g. patents/licences). Also the strategy and implications phase of foresight activities is methodologically more developed and differentiated in corporate foresight.

To sum up, public and private sector activities in foresight share some basic features but are also characterized by a number of crucial differences, which have to be taken into account and resolved if collaboration between public and private players is to be put into perspective.

**KEYNOTE PRESENTATION**
3. Research Focus of Foresight at the Society and Technology Research Group

The Society and Technology Research Group conducts research in three fields of foresight:

1. Mobile Societies of the Future
2. Markets and Customers of the Future
3. Enterprises and Value Creation of the Future

Mobile Societies of the Future

The motivation for this research field is rooted in the premise that success or failure of the products and strategies of an automotive company depend on their long-term fit with the societal business environments. Passenger and commercial transport and consumer behaviour are shaped by social mega-currents and various political, economic and social conditions. Also the diffusion of new technologies always takes place in the interrelation of technology (push) and societal change (pull). Because of the international orientation of the company the social science based foresight has to take place, just like the respective company strategies, with reference to regional issues.

There are three main goals of this research. Firstly, knowledge and images of the mobile societies of the future shall be supplied. Secondly, socio-demographic groups, trends and hot spots in the societal macro-environment shall be identified. Thirdly, fundamental opportunities and risks and options for action shall be explored.

Typical questions in this research field are:

- Which societal factors will drive the mobility patterns of the future?
- Which relevance and which forms will the mobility of persons and goods have in the future?
- Where are fundamental changes and escalation risks recognizable?

Project example: Future perspectives of mobility and transport in Asia

In this project the goal was to create long-term projections of vehicle markets (passenger cars, vans, trucks) in different regional clusters in Asia. In a first step the regional clusters were identified according to their stage of modernisation and their level of organisation in transport. In a subsequent step of analysis, relevant influential factors in the macro environment (economy, politics, society, transport/traffic infrastructures, information/communication) were identified and with the scenario method three alternative macro scenarios were generated. In the next step more specific scenarios for the mobility environment (meso level) were generated. In a final step path-dependent projections of vehicle markets were derived. These results are the focal interest of the internal customers of the research work, strategic planning and marketing units, whose task is to generate and validate long-term strategies for regional markets regarding prospective market demand, investment opportunities and product portfolios.
Figure 3: Perspectives for emerging vehicle markets

Markets and Customers of the Future

The motivation for this research field is rooted in the increasing complexity of markets driven by changes in target groups and customer needs. An important driver is the proceeding fragmentation of target-group segments. Also the information seeking behaviour and communication habits of increasingly critical consumers are changing. A further challenge is the increasing similarity of product qualities and a higher brand density in the premium segment.

There are three main goals of this research: Firstly, new markets, segments, market-niches and non-articulated future needs shall be identified. Secondly, the opportunities and risks regarding the treatment of future markets shall be described. Thirdly, market potentials and product requirements shall be derived.

Typical questions in this research field are:

- Where and how will the future (private) customer live?
- Who will transport which goods how and where (commercial customer)?
- Which requirements will customer groups in changing business environments have?

Project example: Needs of new customers regarding a new product segment

Starting from the realisation that volume segments in passenger car markets are nearly saturated, a research team explored “blind spots” and market niches in a scenario process

**KEYNOTE PRESENTATION**
that focused on future lifestyles and urban mobility. This research bolstered the decision to create a new product segment (Smart ForTwo). In a subsequent research project potential target groups were identified as well as relevant long-term societal and consumer trends affecting these target groups. The trends were used to “project” these target groups into a future market situation (5-7 years ahead). Finally, the research team, together with the marketing department, jointly derived product requirements and conclusions regarding the marketing strategy from these future images of target groups.

Figure 4: Projection of target groups for a new product

Enterprises and Value Creation of the Future

The motivation for this research field is rooted in the realisation that corporate value creation and business models are subject to continuous change, which is strongly driven by changes in the external business environment of companies. A relevant driver in this context is the integration of technologies and services from other industry branches (e.g. mobile services) into the product (e.g. passenger car). Another driver are radical changes in the access to the customer, e.g. by new communication channels and services (e.g. Online Sales). A third driver is the increasing cross-sectoral competition about customers and customer potential.

There are three main goals of this research: A first goal is to identify changes in the business environment of the automotive branch, e.g. convergences and power shifts of other branches of industry. A second goal is to identify the impacts of new
technologies on the external and internal business models of the company. A third goal is to identify risk and success factors and new business and organisational models for the company.

Typical questions in this research field are:

- Which market developments in other branches could have an impact on the automotive industry?
- Which technologies affect future developments that are relevant for future value creation?
- How can the collaboration in innovation management be improved?

Project example: Informed Employee Workspheres

In a research project conducted for the information technology management department of the company it was suggested to complement the mostly technology-driven penetration of white-collar workplaces by information technology (e.g. by employee portals, computer-based workflows) by an organisational perspective. This organisational perspective reflects the qualitative structural change of the workplace driven by technology but also by “non-technical” societal changes and organisational imperatives. In the context of this expanded perspective a scenario process was conducted and relevant influential factors in the societal, economic and organisational environment were identified. The scenario process resulted in three scenarios describing different future workspheres and user profiles. In a final step the project team, together with the information technology management, evaluated the scenarios in terms of worksphere features and organisational risk potentials. Finally implications for organisational change and human resource policies were derived.

Figure 5: Scenarios for Informed Employee Workspheres
4. FINAL REMARKS

As discussed in the previous chapters, a variety of foresight concepts and approaches are of relevance to long-term strategy processes within companies. Because of the focus in companies on risks and opportunities for business and on innovations, markets, branches and competitors, foresight studies in a business context have different conditions for a sustainable success, which distinguish them from public foresight activities.

Briefly summarizing the 25 years of practice of the Society and Technology Research Group at DaimlerChrysler in corporate foresight, some lessons learned can be highlighted.

Business model

Corporate foresight has to be embedded in and closely connected to core processes of the company it is working for. From the different models of institutionalizing foresight within a company only those models have kept legitimacy and longevity, that fulfil at least three criteria: Firstly, a distinguishable impact on corporate decisions has to be evident and appreciated by the top-management. Secondly, the foresight agenda and the transfer of results has to be closely connected with core processes of the company (e.g. research and development, strategic planning). Thirdly, a funding model which mixes elements of (indirect) corporate research funding with contract-based (direct) assignments by internal customers results in a healthy balance of “thinking forward” and “being relevant”.

Diversified customer portfolio

A direct, strongly interactive relationship with a diversified portfolio of internal customers is vital to maintain demand for a corporate foresight unit within a company. Besides the widespread enthusiasm for foresight and futures issues, even in a lot of management ranks, one has to consider that the demand for foresight is neither continuous nor always growing. We are living in a partly saturated “knowledge society” in the sense, that a lot of issues have already been (over-) analysed. So corporate foresight has to anticipate the life cycle of relevant topics at the boundaries of the company, proceed to unravel new relevant topics and access new customers with these topics.

Corporate foresight and science

Corporate foresight projects draw on knowledge resources and methods from a diversified portfolio of disciplines (e.g. economics, social science, business administration, engineering). Foresight practitioners have to keep close connections to the scientific communities. But, except for a few branches and companies that are science-driven (e.g. biotechnology) and a few managers with affinity to science, in business-practice most managers are just not interested in science. Thus, corporate foresight is confronted with the demand for “transferable”, “feasible” results not for scientific knowledge. This implies that foresight in a company is not about doing science and basic

KEYNOTE PRESENTATION
research but about creating and brokering *specific knowledge types* (content) and by designing and conducting *structured interaction* about business and corporate issues (process).

Methods

Because of its multi-disciplinary context and – from a traditional scientific view - its questionable epistemological status, foresight has to invest strongly in the development and validation of methods. This also applies for corporate foresight. A relevant share of foresight practice in companies is dedicated to the development of new methods and tools. One has to be aware that methodological pluralism and activity is essential but not a selling proposition in itself, because corporate customers (mostly) don’t want methods but solutions.

Make or buy corporate foresight

The growing demand for extending the perspectives of corporate strategic planning has entailed a booming external market of “foresight consulting”. By face value, the model of supplying foresight consulting services to companies is the dominant model. The alternative model of institutionalizing foresight within a company is rather the rare case. It is evident, that a lot of companies neither need nor can afford their own corporate foresight unit, because of size (small or medium-size enterprises) or business portfolio (limited amount of external risks, limited need to capture long-term uncertainty). In such cases, project-based and externally assigned foresight is a reasonable option.

On the other hand multi-national companies with an internal foresight unit can leverage a competitive edge over external services. Firstly, a corporate foresight unit delivers the generated knowledge exclusively to its own company and not to the competitors as well, as is often the case with business consultancies. Secondly, such a think tank is a continuous part of core processes, thus does not consume “start-up” costs and also has a deep and continuous understanding of the business logic of the company. Thirdly, a corporate think tank is able to integrate a deep and broad scope of knowledge about business environments and take it across business units, which is usually not possible with selective assignments to foresight consultants.
REFERENCES


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Society and Technology Research Group

Locations

- Berlin
- Palo Alto
- Kyoto (cooperation with Ritsumeikan University)

Network partners

- Europe
- USA
- Japan
- China
- Russia
- Latin America

Since 1992 RIC/Y was internationalized gradually:

- Permanent staff from:
  - Germany
  - USA
  - Russia
- Temporary staff:
  - South East Asia
  - Latin America
  - Europe

KEYNOTE PRESENTATION
The relationship between the company and the external environment determines the future of the company.

**Mission**
Social science based futures and business environment research to support strategy and product development processes.

**Core competencies**
- Development of future scenarios
- International business environment analysis
- Analysis of future customer needs
- Identification of opportunities and risks for products, services and processes
- Prospective evaluation of innovations

**Domain**
- Markets
- Business Unit
- Sales
- Procurement
- Human Resources
- Capital

**Level of analysis**
- Micro level
- Meso level
- Macro level

**Time horizon**
- Medium term
- Long term

**Domain**
- Technology
- Economy
- Politics
- Society
- Ecology etc.
**Agenda**

A. Futures Research at DaimlerChrysler

B. Landscape of Foresight Activities in a Business Context

C. Focus of the Society and Technology Research Group

D. Some lessons learned

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**Landscape of Foresight Activities**

- **Focus on Markets and Business Environments**
  - (economic, political, societal, ecological)
  - non-technological driving forces

- **Short/medium term perspective**
  - Strategic Market Research
  - Prospective Economic Analyses
  - Competition Analysis
  - Innovation and Technology Analysis

- **Advanced Marketing and Trend Research**
  - Future oriented organizational research

- **Technology Foresight**
  - Technology Assessment
  - Societies of the Future
  - Global Trends

- **Long term perspective**
  - + 15 years
  - + 10 years
  - + 5 years
  - Today

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**Keynote Presentation**
### Foresight in the Public and Private Sector

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<td><strong>General objective</strong></td>
<td>Anticipation of future developments in science, technology, economy, politics and society</td>
<td>Identification of opportunities/risks in markets, technologies, and the business environment</td>
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| **Specific objectives** | • Generating ideas and visions for technology and innovation  
• Identifying/prioritizing related policy measures | • Identification of opportunities/risks in markets, technologies, and the business environment  
• Identifying strategic options |
| **Major actors**        | • Governmental bodies  
• Expert communities  
• NGO’s | • Strategic planning units  
• Research and Technology divisions  
• Corporate think tanks |
| **Time scope**          | 5-20 (50) years  
1 to 3 years (periodically repeated) | 2-15 years  
3 months to 1 year (periodically repeated) |
| **Duration of typical projects** | | |
| **Major methods**       | Delphi-Studies  
Expert interviews  
Technology Monitoring/Scanning  
Analysis of patents/licenses  
Scenarios  
Quantitative models  
Trend research (and others) | |

### Agenda

- **A** *Future s Research at DaimlerChrysler*
- **B** *Landscape of Foresight Activities in a Business Context*
- **C** *Focus of the Society and Technology Research Group*
- **D** *Some lessons learned*
Research agenda: three focal questions

„How will we live tomorrow?“
„What will our customers of tomorrow expect?“
„How will we develop, produce and sell tomorrow?“

Mobile Societies of the Future

Customers and Markets of the Future

Enterprises and Value Creation of the Future

Mobile Societies of the Future

Typical questions
- Which societal factors will drive the mobility patterns of the future?
- Which relevance and which forms will the mobility of persons and goods have in the future?
- Where are fundamental changes and escalation risks recognizable?
- ...

Example: development of mobility and transport in Asia

Organisation of transport modes

Modernisation Stages

Pedestrians
Car/Rickshaw
Motorcycles/Tuk-Tuk/Electric
Buses/Used Cars/Passenger Vans
New Cars
Rail-based
Intelligent Transportation Systems

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Dr. Ruff/ Foresight
**Mobile Societies of the Future**

**Contextual approach to market foresight**

- From the outside in
- From macro to micro level
- Analysis of market development paths

**Analytical framework**

- Economy
- Politics
- Society
- Environment
- Transport/Traffic Infrastructure
- Information/Communication

**Scenarios for a regional cluster**

**Macro Environment**
- Motorization

**Mobility Environment**
- Modal split of public/private transport
- Road infrastructure quality/quantity
- Institutional capabilities

**Market Environment**
- Path-dependent projections of vehicle markets (passenger cars, vans, trucks)

---

**Markets and Customers of the Future**

**Typical questions**

- Where and how will the future (private) customer live?
- Who will transport which goods how and where (commercial customer)?
- Which requirements will customer groups in changing business environments have?
- …

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**KEYNOTE PRESENTATION**
Markets and Customers of the Future

Qualitative Trend Research

Societal Trends
- Resourcing
- Experience orientation
- Patchwork biographies
- Searching for meaning
- Savvy consuming
- Balancing self design
- Qualitative trend research

Trends in Consumer Behavior
- Brand sampling
- Usage patterns

Trends in Mobility
- Distinction
- Incentives
- Market development
- Mobility models

Projections of Target Groups

Quantitative Market Forecasts

Forecast Tool Vans: Western Europe, NAFTA and Japan

Forecast of Market Segments

Enterprises and Value Creation of the Future

Typical questions
- Which technologies affect future developments which are relevant for value creation?
- Which market developments in other branches could have an impact on the automotive industry?
- How can the collaboration in innovation management be improved?
- ...

Impacts of other industries on automotive Information Technology and organisational change:
- business models
- The future of informed employee workspheres

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Enterprises and Value Creation of the Future

Informed Employee Workspheres

Relevant developments

Individual

Work

Technologies

Organization Society

Today

2007+

Scenarios

Elusive Identities

Outperformance

Communities of Practice

Implications for Information Technology Management

Societal Business Context

Organisational Context

Employee Workspheres

Agenda

A Future's Research at DaimlerChrysler

B Landscape of Foresight Activities in a Business Context

C Focus of the Society and Technology Research Group

D Some lessons learned

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Dr. RufForesight
### Some lessons learned in 25 years of foresight

- **Business model**
  - The business and funding model for a corporate foresight unit determines its research portfolio, impact on corporate decisions, legitimacy, and “longevity.”

- **Relevance of customer relationships and a diversified customer portfolio**
  - A direct, strongly interactive relationship with a diversified portfolio of internal customers is vital to maintain demand for corporate foresight and to circumvent the always emerging risk of being used and abused as a “prolonged workbench” (by the product development) or as a “PR unit” (by the corporate headquarters).

- **Corporate foresight and science**
  - Foresight in a company is not about doing science and basic research but about creating and brokering specific knowledge types (content) and by designing and conducting structured interaction about business and corporate issues (process).

- **Methods**
  - Development of new methods and methodological pluralism is essential but not a selling proposition because corporate customers (mostly) don’t want methods but solutions.

- **Make or buy corporate foresight**
  - The growing external market of “foresight consulting” is especially relevant for small and medium-sized companies but also big companies; big multinational companies with an internal foresight unit can leverage a competitive edge over external services (exclusive know-how, continuous part of core processes, deep and broad scope of knowledge about business environments).

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**Thank you for your attention!**

Questions and discussion?