

Benchmarking Report

Strategic Foresight in Multinational Companies

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Executive Summary

This report presents the findings of the international Benchmarking Study on Strategic Foresight in multinational companies conducted by the Chair for Technology and Innovation Management at the Technische Universität Berlin, Deutsche Telekom Laboratories (T-Labs) and the European Center for Information and Communication Technologies (EICT GmbH). It aims at understanding to which degree multinational companies have implemented Strategic Foresight processes. Additionally, SF activities conducted by top performing companies are analyzed in order to identify good practices and to be able to suggest improvement potential. In total 83 companies participated in the study and provided information on the activities and systems they employ to detect “weak signals” of discontinuous changes and on how they trigger reactions.

Key findings:

- Strong capabilities for collecting and interpreting information are in place. However, **insights from Strategic Foresight activities are not disseminated and used efficiently.**
- There remains to be a strong emphasis on scanning the technological and economic environment. However, companies still lack foresight capabilities for detecting changes in **customer needs as well as emerging regulatory and legislative issues.**
- Concerning information sources, the companies, to a large extent, still rely on openly accessible sources such as magazines or the Internet. **Top performers have built capabilities to access restricted sources, such as personal networks or specific databases** that offer them a competitive advantage.
- Concerning methods for information interpretation and identification of appropriate actions, companies continue to rely on a limited set of methods that have been employed in the past. It is advisable to build a more diverse method portfolio and **select methods deliberately according to the context and problem at hand.**
- Only top performers actively **encourage their employees to develop personal networks.**
- **Scanning processes are still most frequently initiated by top management.** In addition, a bottom-up process should be build in which employees can bring emerging issues to top management attention.

Introduction

In 1997, a study conducted by De Geus revealed that the average life span of large companies ranges between 20 and 30 years. By 1983, over one-third of the 1973 Fortune 500 companies were either acquired, split or had merged with other companies. These findings are surprising and refute often-held beliefs that large companies hold strong enough market positions to adjust to discontinuous changes in their environment and survive crises.

The current global financial crisis once again shows the increase in volatility and complexity in the economic environment that most companies find themselves in today. Major technological shifts continue to substantially reshape industries and markets or create completely new business fields. Innovation cycles are shortening and product and service life-cycles decrease, two developments that challenge companies' abilities to quickly generate new products that are in accordance with customer needs.

The forces of globalization heighten the number of potential market participants. At the same time, the decrease in companies' depth of added value calls for more intensive international partnerships of outsourcing and offshoring activities, which contribute to the growing complexity of today's business environment. Changes in legislature constantly influence companies' activities, especially in highly regulated business fields.

In his research, De Geus revealed that companies with an above-average life span show a strong openness to innovate by tolerating new ideas. Surviving companies are sensitive to the world around them, which allows

them to adapt to major and minor changes in their environment, such as the entry of new rivals to their markets, shifts in technologies, new regulations and demographic changes.

The challenges multinational companies face, are even more complex, since they do not only have to respond to these changes in their corporate environment, but also have to address cultural and legislative differences among the markets they operate in.

In order to prepare for these more frequently occurring shifts, many companies have come to implement foresight groups over the past 30 years. Strategic Foresight (SF) aims at detecting developments in the corporate environment by observing "weak signals" that indicate upcoming changes and aligning their decision-making processes to the outcomes of environmental scanning practices. SF therefore represents a system that supports companies in maintaining the previously mentioned sensitivity to their environment.

The present study was conducted by the Chair for Technology and Innovation Management of the Technische Universität Berlin between August and November of 2008. Its primary goal is to analyze SF activities implemented by multinational companies, identify strategies employed by top performers and detect areas for improvement in companies' SF capabilities. The study was substantially supported by Shaping Tomorrow - a network of foresight professionals and future insight portal - and the innovation manager best-practice network Pure Insight.

Study

Building on data from 18 case studies in multinational enterprises, Rohrbeck and Gemünden (2008a) developed an SF Benchmarking Framework. This model allows examining companies' foresight processes by separately analyzing activities conducted in five benchmarking areas: Information Usage, Method Sophistication, People & Networks, Organization and Culture.

The questionnaire used for this study resulted from applying the Benchmarking Framework proposed by Rohrbeck and Gemünden. It queried information concerning the companies' contexts, activities in the five identified benchmarking areas and the value contributions SF yields to the firms.

Sample

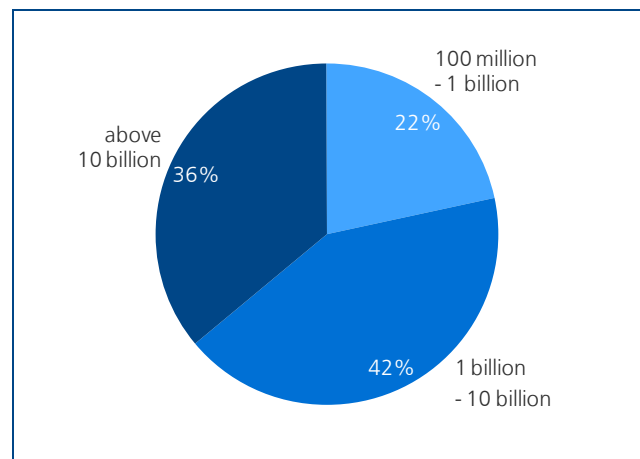
Since only large companies were expected to have enough resources at their disposal to implement SF systems as opposed to small and mid-sized firms, only companies with annual revenues of at least 100 million EUR were contacted. Responses were generated from companies that operate in different industry sectors, in order to reflect diverse contexts.

Potential participants were found through databases of past research projects and professional networks, with the main criterion for inclusion being a sufficient company size. Prior to sending out the survey, potential respondents were contacted by telephone in order to assure the questionnaire would be filled in by people who operate in positions that offer them a sufficient overview of the processes in place. Respondents mainly operated in the departments strategic planning, corporate development and innovation management. In addition to the paper-based / email questionnaire, an online survey was created to facilitate the participation in the study. A link to this survey was distributed through a SF online community.

In the course of four months, 467 companies were contacted and invited to participate in the study, out of which 135 completed and returned questionnaires, representing a response rate of approximately 29%. 56 of the participants completed the paper version of

the survey, of which 54 were included in the sample. Additionally, the online questionnaire generated 81 responses of which only 29 met the required criteria to be included in the sample, therefore the sample size was reduced to 83 participants. Respondents operated in companies located in Europe, North America, Asia and Australia.

Figure 1: Participating companies clustered by revenue in 2007 (in EUR)

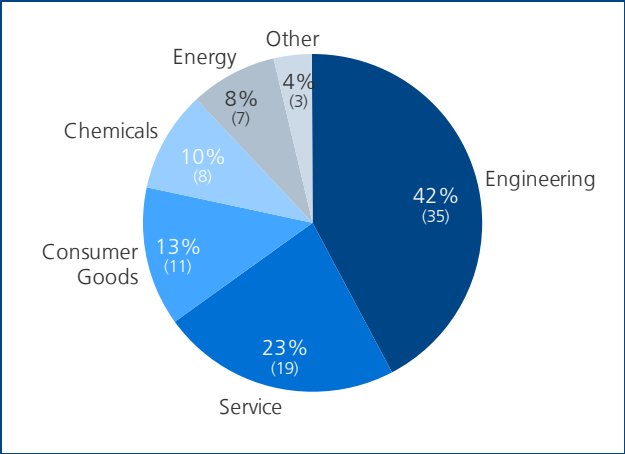


As Figure 1 displays, the goal of reaching large companies was met since 78% of the respondents are employed by companies with revenues of at least 1 billion EUR in 2007 (36% of the represented companies even have earnings greater than 10 billion EUR).

Due to the fact that participants' industry sectors were queried in an open question, the stated industries were assigned to clusters in order to allow for an inter-sectoral comparison. The resulting clusters were labeled Engineering, Service, Consumer Goods, Chemicals and Energy. Three companies were added to the cluster Other, because they operated in multiple industry sectors or within very specialized fields that were not covered by any of the other industry clusters.¹

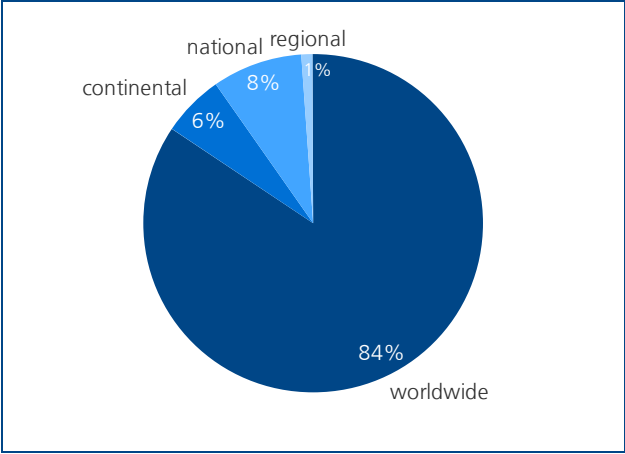
¹ For details on the clusters, see Table 1 in the Appendix

Figure 2: Participating companies clustered by industry



As Figure 2 shows, most of the participants operated in the Engineering sector (42%), followed by Service (23%), Consumer Goods (13%), Chemicals (10%) and Energy (8%).

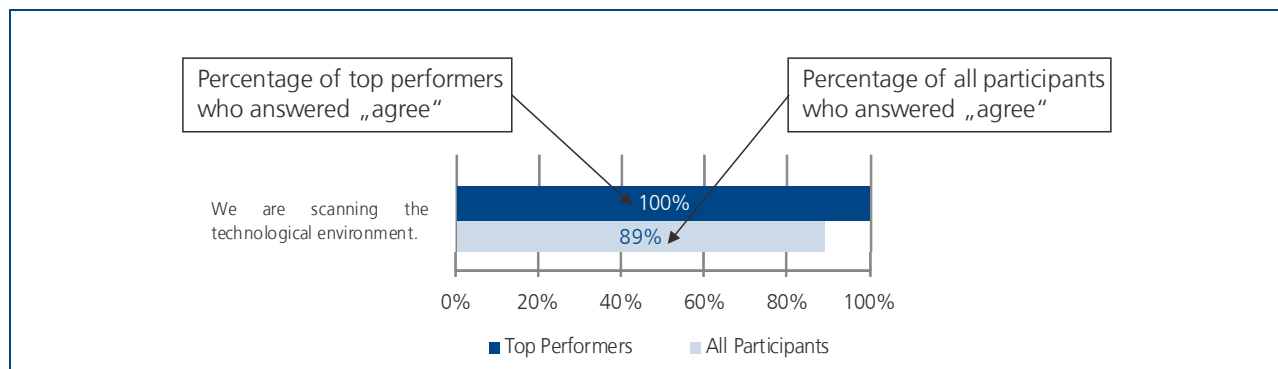
Figure 3: Participating companies by business activity



Since large companies often operate on a global level, mainly companies with business activities in multiple countries participated, as shows Figure 3.

How To Use The Report

Figure 4: How to read the graphs



In this Benchmarking Report, SF activities employed by a very successful group of participants, the top performers, are compared to those of the total sample of participating companies.

The graphs provided in the following sections therefore give an overview of the responses given by both of the groups.

Top Performers

The top performer group was created to identify SF activities conducted by the most successful companies in the sample.

According to Kaplan and Norton (1996), sales growth indicates the level of a company's success because, among other factors, it refers to expanding product and service offerings, reaching new customers and markets and changing the product and services mix toward higher-value-added offerings. Therefore the companies' sales growth was used as the measure to separate top performers from the total sample. Sales data from the participating companies was obtained through internet research, company publications such as financial reports and by directly contacting the respective firms.

The chosen approach for determining the participants' sales growth was by calculating their Compound Annual Growth Rate (CAGR) between the years 2005 and 2007.² Eight companies (representing approximately 10% of the total sample) with the highest CAGR were grouped together. The resulting group of top performers consisted of companies from the sectors Service, Energy, Engineering and Chemicals with sales growth between 19% and 35% in the regarded time span.

² For a description of the formula applied to calculate the CAGR, see Table 3 in the Appendix

Strategic Foresight Capabilities

In order for companies to be able to survive in times of radical changes, it is essential for them to have specific capabilities that help them oversee market shifts and react accordingly. In the Benchmarking Framework by Rohrbeck and Gemünden (2008a), five areas for the assessment of companies' SF activities are proposed:

(1) In Information Usage, we analyze where and how companies search for future oriented information.

(2) In Method Sophistication it is examined, which methods are applied to anticipate future developments and how companies choose these methods.

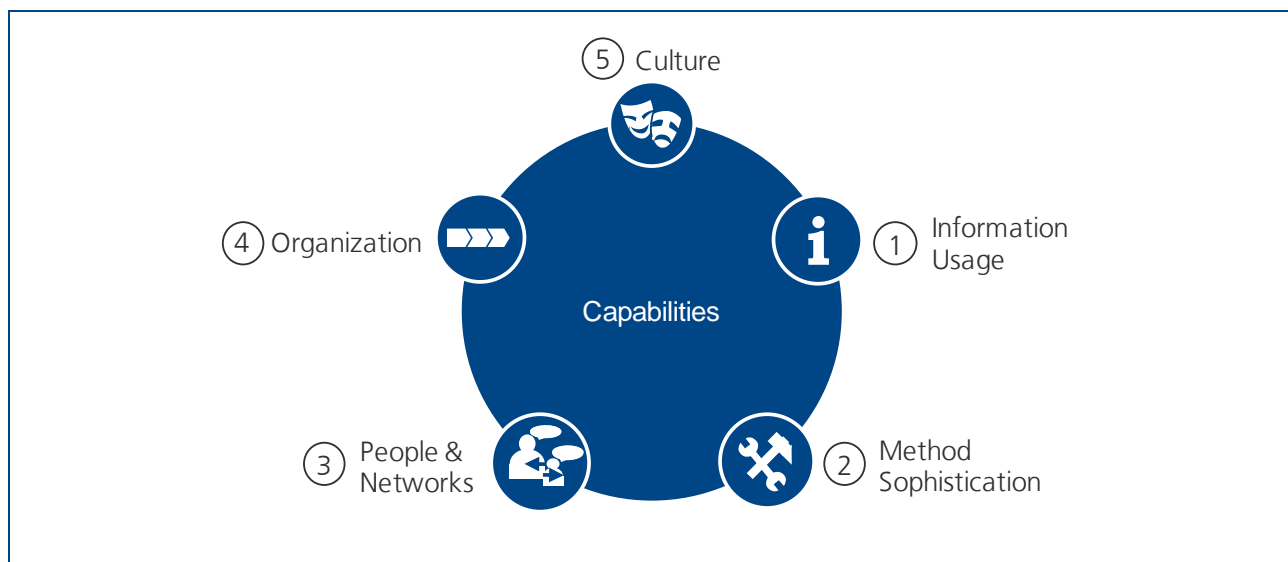
(3) The part People & Networks explores, which characteristics foresighters in the companies have and how foresight insights are collect and diffused.

(4) In the section Organization we identify, how companies initiate SF activities, where they are situated, and which organizational units have links to SF activities.

(5) In the cultural dimension, we analyse whether the corporate culture is supportive to the SF activities.

Additionally, we analysed the value contributions, which companies gain through their SF activities, and whether they use their full potential.

Figure 5: Strategic Foresight capabilities



The following sections will provide the results for each of the five benchmarking areas and SF value contributions. In each of the sections, a brief literature review will point out major previous findings concerning the respective capability/value contribution. Subsequently, the participants' responses, separated by the responses of top performers and the total sample, will be presented.

Finally, implications for companies' SF activities will be drawn.

In the section "Benchmarking Results", a scoring system will be applied, to combine the results of all analyzed sections and to allow for a comprehensive comparison of SF activities conducted within top performing companies and companies in the total sample.

Key Findings

Information Usage



In the following it is analyzed, which information sources companies use to detect weak signals that indicate changes in their business environment and how these scanning processes are conducted.

Literature on environmental scanning discusses factors that determine the type and amount of information foresighters should gather in order to receive relevant insights. Day and Schoemaker (2004) distinguish the scope and intensity of scanning. The scope describes the amount of fields scanned (i.e. technology, customer, competitor and political environment) and the intensity relates to the degree to which these areas are scanned.

According to Thomas (1974), large companies conduct scanning activities on four levels: in the economic, technological, political and social environment. Depending on the industry sector a company operates in, scanning areas are of different relevance. In his study involving U.S. companies in the 1980s, Jain (1984) identified the political and economic spheres as the environments most frequently scanned, since government regulations and continued inflation were the reasons why firms built up SF systems. Interviews conducted by Becker (2002) revealed that the more importance socio-economical and political influences have for a company's business activities, the more emphasis is laid upon scanning these environments in foresight processes.

Krystek (1989) differentiated scanning activities focused on the own company, in current businesses, and scanning in adjacent businesses. Scanning external businesses may be especially relevant for detecting threats that market partners will have to face, which ultimately influence the own company.

A study conducted by Thomas (1993) concluded that higher information usage positively correlates with a company's performance. However, decision-makers are often confronted with an information overload, which makes it difficult for them to select relevant information to focus on for detecting weak signals.

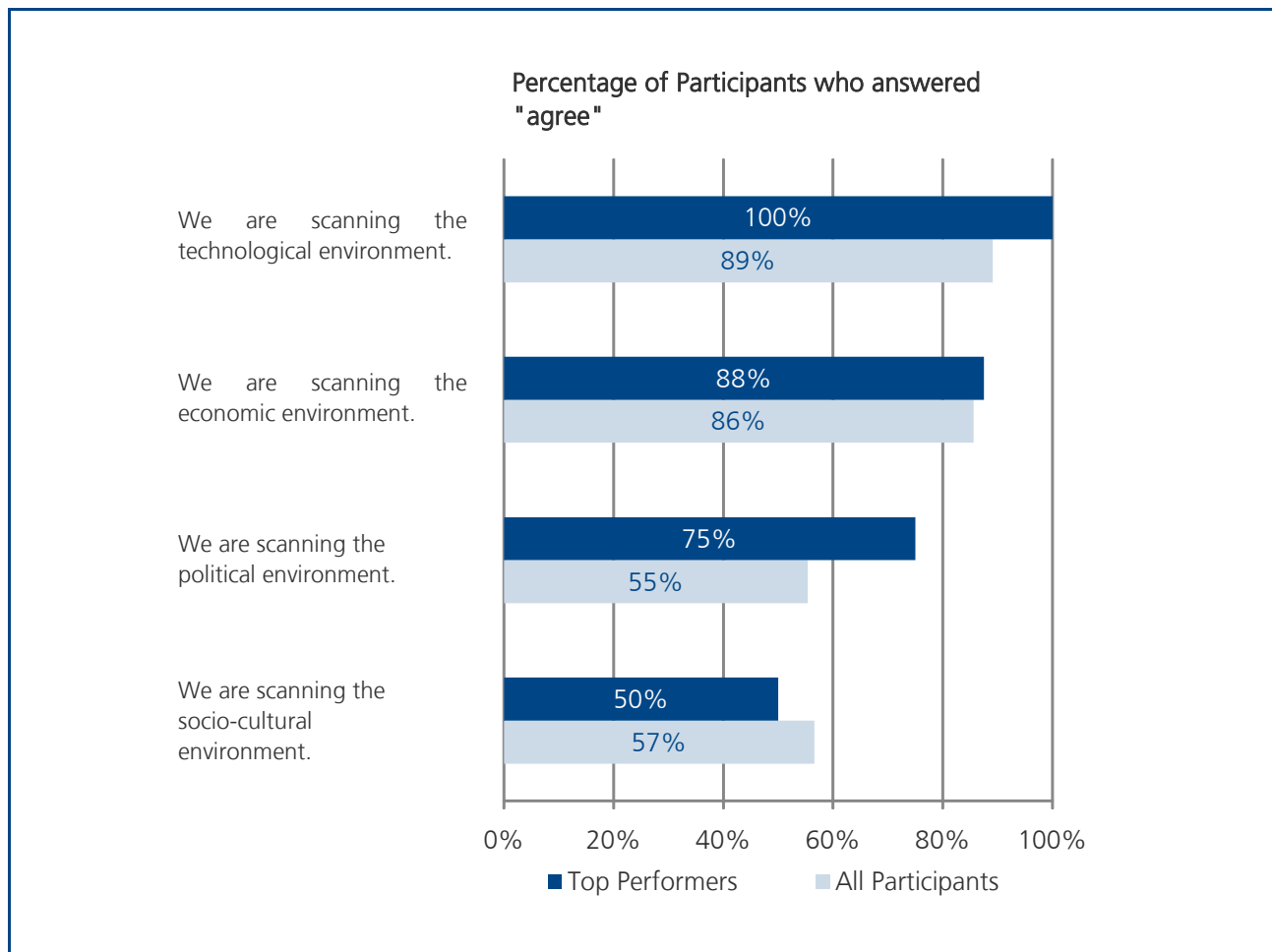
Day and Schoemaker (2005) argue that companies with too much peripheral vision may end up neurotic and tend to waste resources. Thus, scanning activities must be adjusted to the companies' specific needs, instead of investing extensively in a high number of information sources. Hambrick (1982) found that a firm's strategy does not influence the intensity of scanning activities, yet successful companies scan the periphery more intensely.

Two types of information sources are distinguished. While in formal sources information is usually written down and made publicly available, informal sources contain tacit knowledge that is predominantly spread through direct communication. Past research has shown that, as strategic uncertainty increases, decision-makers increasingly want to base their decisions on information gained through direct contact with key sources. Becker (2002) even identified a general predominance of personal information over information that is publicly accessible.

Furthermore, in his research Becker identified a higher relevance of externally generated information as opposed to internal information. Examples for external sources are contacts with government officials and politicians, discussions with managers from other companies, trade magazines and the attendance of association meetings. Internal sources are reports, memos or discussions with internal managers and employees, concerning the external environment. The importance of gaining information from external sources was also examined by Elenkov (1997), who found that the higher the perceived strategic uncertainty is the higher is the use of external information sources by decision-makers.

Concerning the frequency of utilization of sources, Jain's survey revealed that, regardless of the quality of their SF process, companies used newspapers as their primary information source, followed by publications of business groups and business periodicals.

Figure 6: Information Usage - Where companies scan



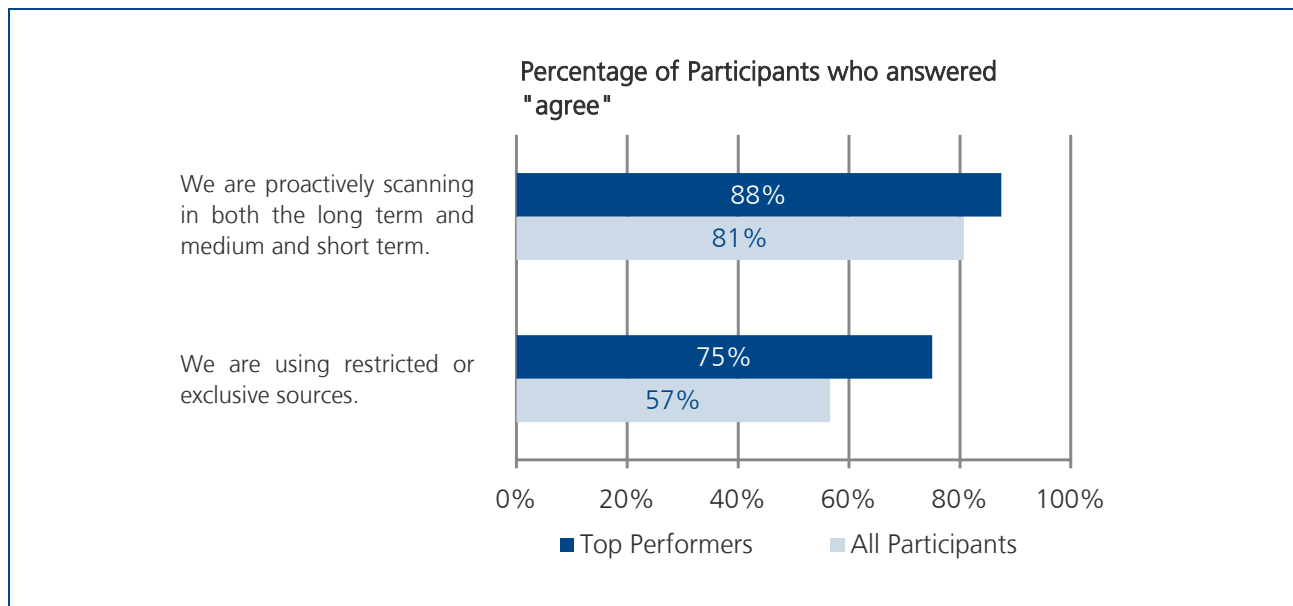
Concerning the areas in which companies search in order to detect changes, the technological and economical environments are the fields most frequently scanned. Figure 6 shows that all of the top performing companies scan the technological surroundings while only 89% of all respondents do so.

Fewer resources are dedicated to scanning the political environment. Top performing companies however, direct significantly more attention towards scanning their political surroundings (75%), than companies in the total sample do (55%). Vast changes in the technological environment that have occurred since his study was published may be the reason, why decision-makers' attention has shifted from the political to the technological environment. Observing changes in the political environment is particularly important for companies that operate in

strongly regulated industries, for example the Energy or Telecommunications industry.

In the total sample, 57% of the all companies and 50% of the top performers stated that they scan the socio-cultural environment. Especially companies that operate in B2C markets should not underestimate the importance of detecting changes in this field. In fact, companies in the Consumer Goods industry, which are intensely in contact with private customers, scan the socio-cultural environment more strongly than the total sample does. 64% of the respondents from the Consumer Goods industry scan this field; however, this figure still shows a need for improvement. The low numbers for top performing companies that scan this part of the environment may be due to the fact that the top performer group did not include any companies from the Consumer Goods industry.

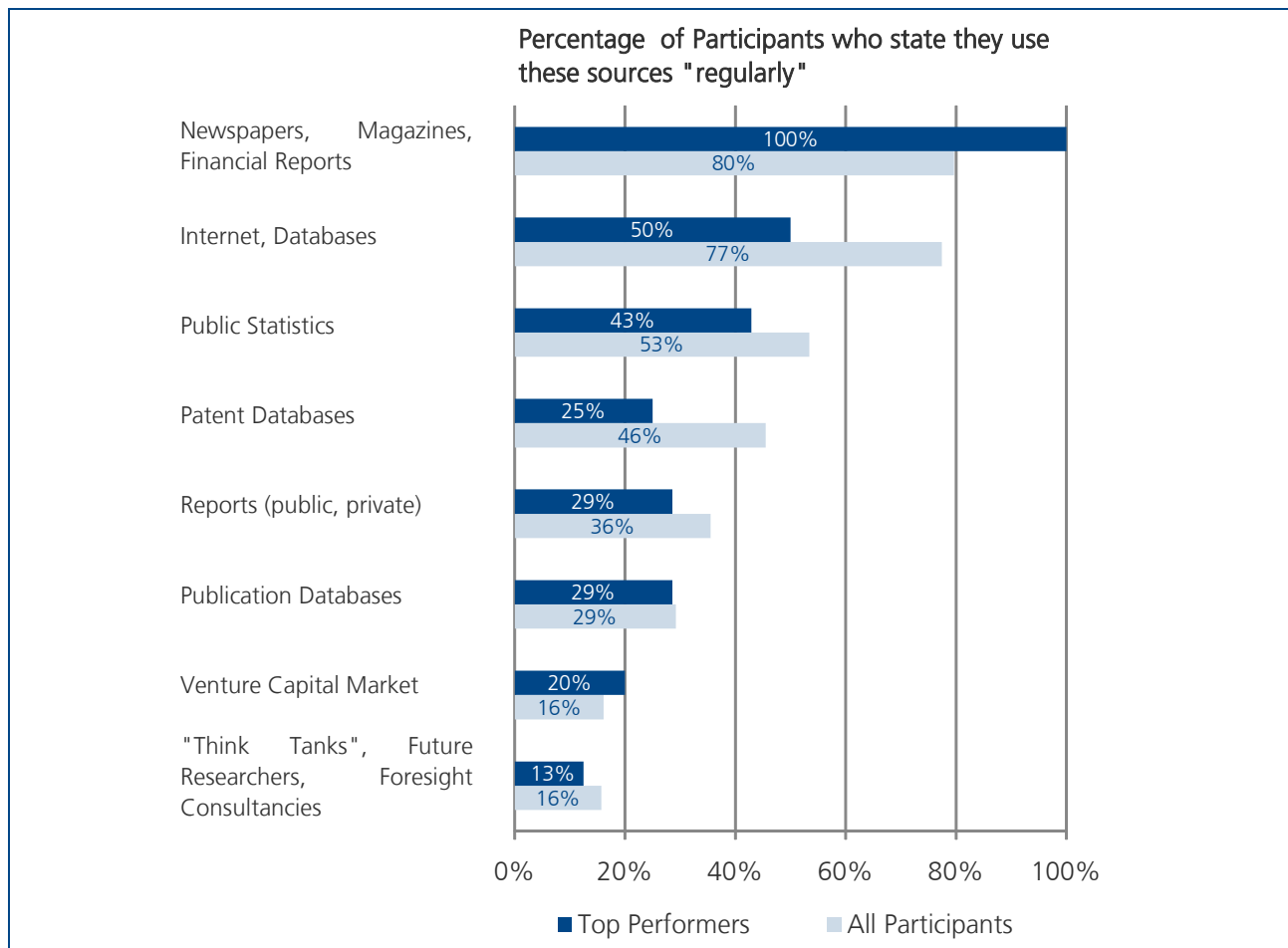
Figure 7: Information Usage - How companies scan



Regarding the ways in which companies scan, most of the respondents in the total sample (81%) and the top performers (88%) scan proactively for different time horizons, which Jain previously identified as a very sophisticated way of scanning. Scanning for different time horizons creates the possibility for firms to detect changes at different stages of their development, which facilitates building comprehensive strategies to react to them.

Only few companies in the total sample take advantage of restricted sources, which are not freely accessible by all competitors because they are constrained (e.g. by financial barriers). This is not the case in top performing companies, since companies in this group utilize restricted sources far more often. 75% of top performers use such exclusive sources as opposed to only 57% of all companies.

Figure 8: Information Usage - Formal sources



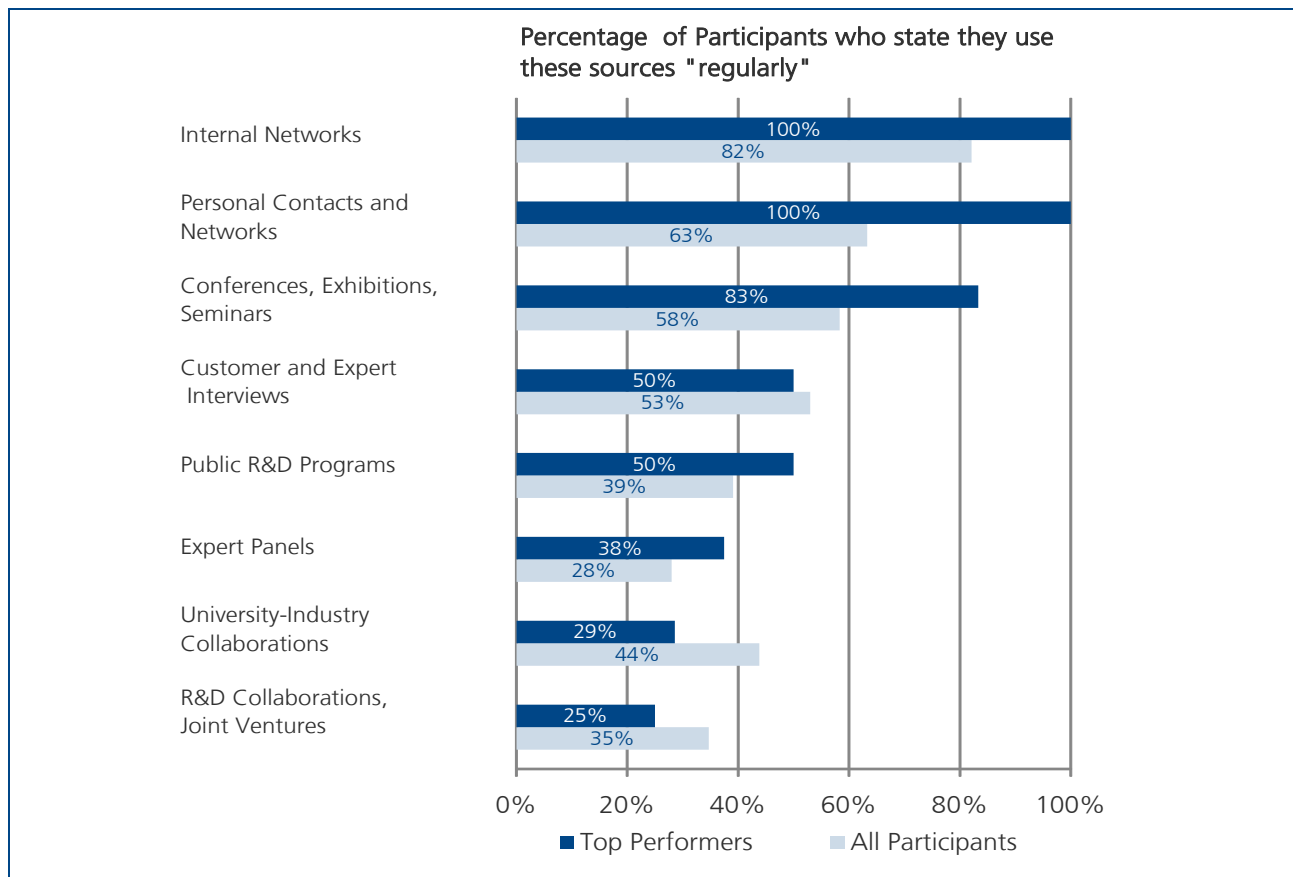
To enhance their knowledge in fields that may be relevant for future developments, companies tap a broad range of formal and informal information sources (see figure8).

The results show that, in relation to the total sample, top performers access formal sources less frequently. Information sources, which are rather easily accessible, are most commonly used in both of the groups. However, the use of Information sources that are difficult to access can provide valuable information that is not spread widely and might therefore offer competitive advantages.

Top performers rely on newspapers, magazines and financial reports even more strongly than companies in the total sample. These results are in accordance with Jain's findings, in which newspapers, publications of industry groups and business periodicals were identified as the most frequently used sources.

Apart from the Venture Capital Market, top performers use all of the other queried formal information sources less frequently than companies in the total sample do.

Figure 9: Information Usage - Informal sources



It is apparent that top performing companies utilize informal information sources more frequently than the total sample does. Internal networks and personal contacts are even tapped by all top performers regularly. Representing a source that supports the creation and strengthening of external networks. Attending conferences, exhibitions and seminars creates opportunities for personal contact, an effect that is frequently taken advantage of by top performers (83%).

However, companies in the total sample access informal information sources more often than formal sources, too, confirming the findings made by Becker. The results also indicate that none of the firms rely on single sources but always combine a number of them.

Summarizing the findings of this section, companies scan the technological and economic environment extensively, however scanning activities in areas that are less obvious to them should not be neglected since these strongly influence their business activities.

Top performing companies invest significantly more resources in receiving data from restricted sources. One successful approach to restricted sources is the creation of scouting networks, which regularly provide firms with exclusive information. Such data can be of very high quality because they are personally transmitted and gathered by individuals who have the needed expertise to identify changes in the field that they report on.

In terms of information sources used, it could be seen that the more easily accessible formal information sources are, the more frequently they are tapped. Informal information sources are, on average, used more frequently than formal sources. This tendency specifically applies for top performing companies.

Method Sophistication

The responsibilities of SF units are not limited to collecting and disseminating information about the periphery. Furthermore, SF divisions are accountable for providing methods that allow generating alternative future trends and scenarios. Method Sophistication describes a company's ability to choose and apply SF methods with regards to the firm's context. In this section it is analyzed how methods are selected, whether SF insights are disseminated within the company and whether used methods allow for an integration of market and technology perspectives and different time horizons.

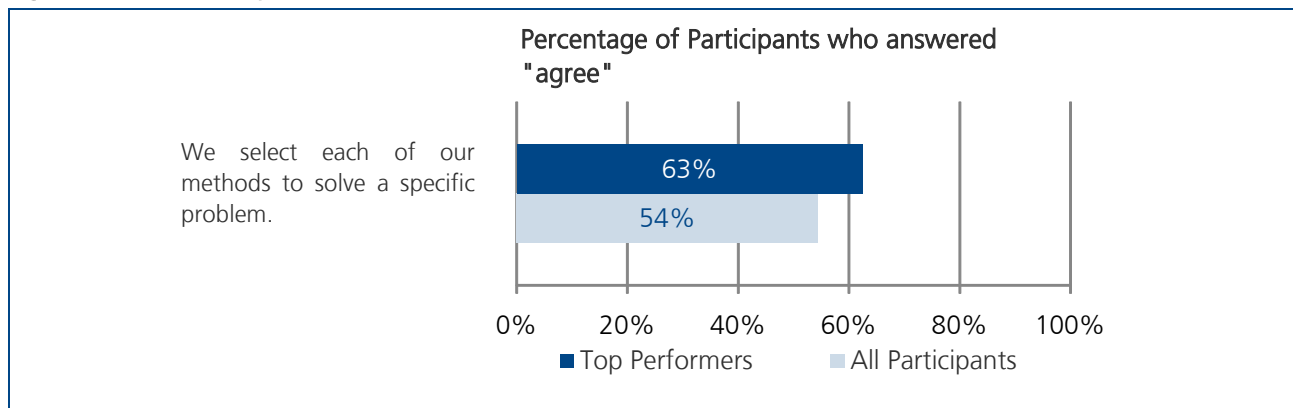
Many managers tend to regularly apply a pre-specified set of SF methods that has proved useful in the past. In their research Yasai-Ardekani and Nystrom (1996), showed however, that companies with effective SF systems adjust their systems to context factors more often. Therefore, it is assumed that firms, which choose SF methods in accordance with specific problems, have more effective SF systems in place.

Subsequent to gathering and interpreting information, the insights need to be communicated throughout and beyond the company. An example for a communicative SF method is SIEMENS' Pictures of the Future, in which insights are both communicated within the company and in a different edition, made available to the public. This internal communication makes it possible for employees within the various business units to base their work on the same assumptions about the future, and therefore direct their activities towards the same aims. External communication can foster debate about findings and may therefore yield further insights as well as contacts to experts in the field of interest.

According to Becker (2002), the main thematic areas of foresight are technology and market trends. In the development of new technological products, companies are challenged with the need to connect information on new technologies with the market demand they will have. Activities of the Marketing and R&D departments are often poorly aligned and a lack of communication leads to the development of products that do not comply with customer needs identified by market research. Methods that support the integration of marketing and technology perspectives enable gaining future insights that are founded on both of these perspectives and therefore contain information that is more comprehensive.

The set of methods managers choose from within an SF system is large. A study by Meyer (2002) revealed that more complex methods are relatively seldom known and in use within companies, while simple methods that are rather easy to apply are used more frequently. This may be due to the higher costs required in the application of complex methods. Becker (2002) found that qualitative (communication- and interaction-based) methods are used more often than quantitative ones (based on numeric indicators), but that rather simple tools predominate in both groups of methods, supporting Meyer's findings. Daheim and Uerz (2006) also came to the conclusion that, in comparison, creative and participatory methods, representing relatively complex methods, are rather seldom in use. A Delphi Study conducted by Schwarz (2008) revealed that most companies employ Environmental Scanning, the Scenario Technique, Quantitative Forecasting and methods that support creative thinking.

Figure 10: Method Sophistication - Selection of methods

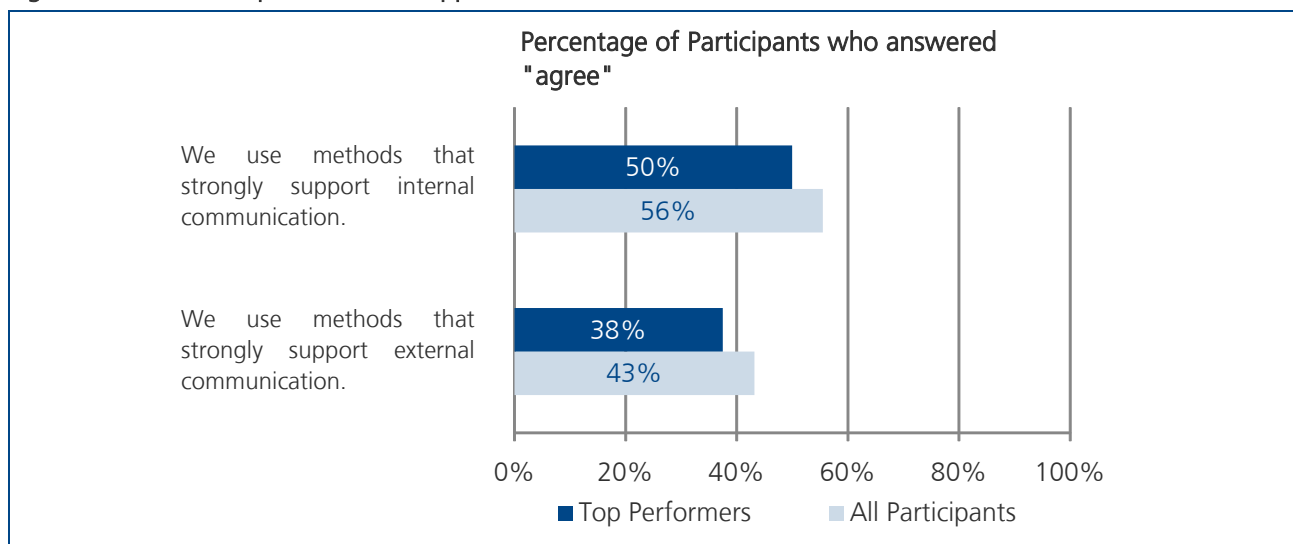


In order for SF activities to yield the information needed, methods must be chosen deliberately. However, the results of the study show that only a low percentage of the total sample (54%), select their methods for specific questions, which implies, that managers tend to utilize a fixed set of methods, rather

than building up competencies in the application of various methods.

This value is also low for top performers, yet managers in top performing companies more frequently choose methods deliberately (63%).

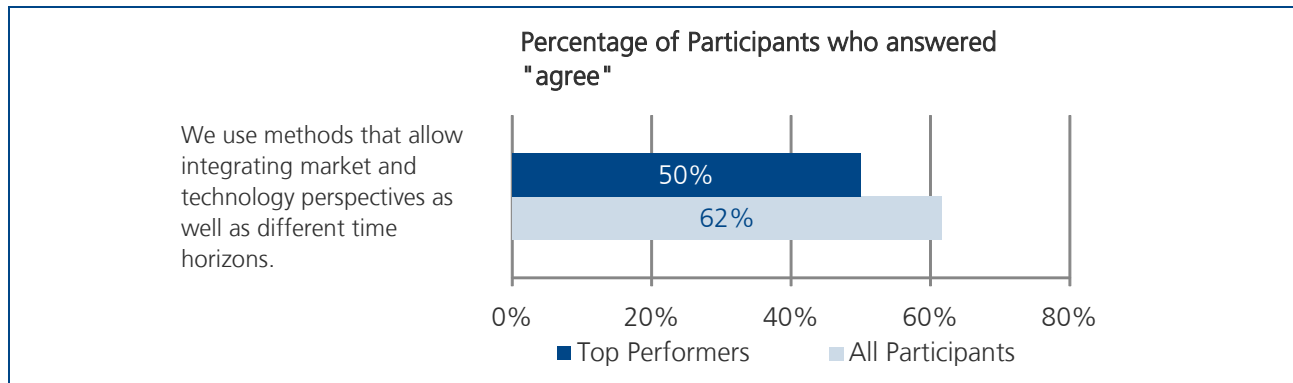
Figure 11: Method Sophistication - Support of communication



Deficits were also detected in the communicative capacity that utilized methods have. 56% of the total sample state they use methods that strongly support internal communication, while only 43% of the firms employ methods that strongly support external communication.

In both categories, top performing companies have even lower implementation rates (50% and 38%, respectively). Examples for communicative methods are Creativity Workshops, Delphi Studies and Business War Games.

Figure 12: Method Sophistication - Integration of market and technology perspectives



62% of all respondents state they utilize methods that possess an integrative capacity, meaning they allow integrating perspectives from the technology and the market side. Examples for methods that possess these characteristics are Roadmapping, Scenario Analyses and Simulations.

Top performers however, pay less attention to implementing integrative methods, since only 50% stated they use methods that have an integrative capacity.

Figure 13: The five most frequently used methods by top performers

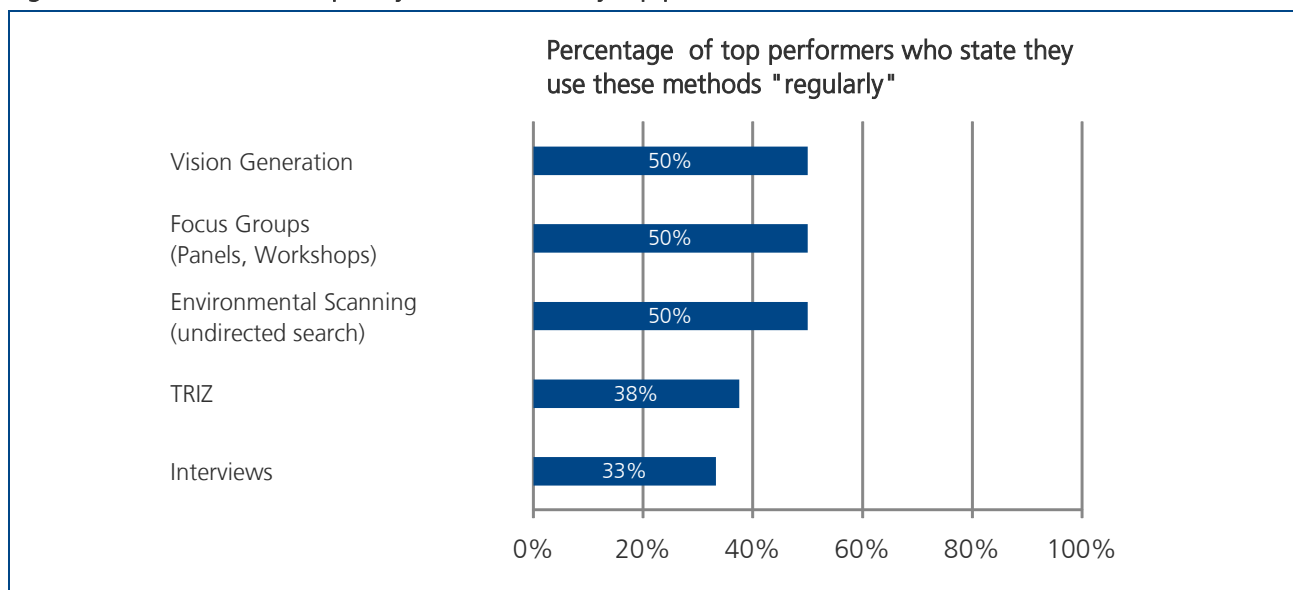
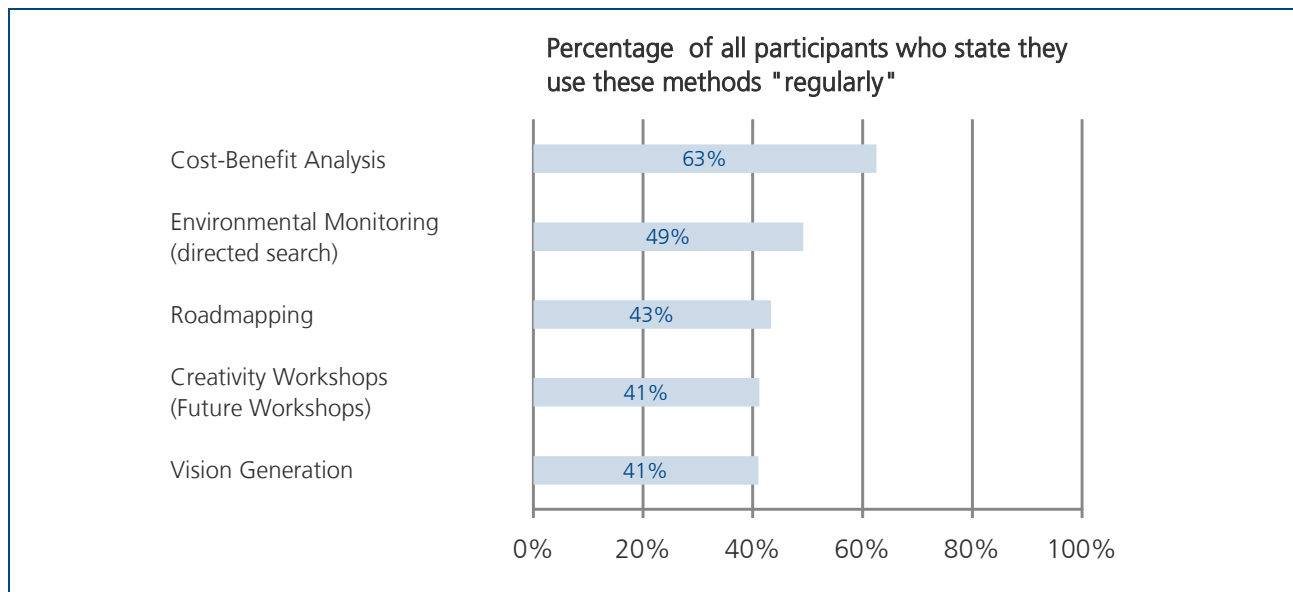


Figure 14: The five most frequently used methods by all participants



Regarding which methods are being used, it can be seen that top performers put a stronger focus on employing methods with a qualitative character than the rest of the sample does. The Cost-Benefit Analysis, a method that is rather easy to apply but only yields quantitative results, is most frequently used by companies in the total sample (63% of all participants). This method however is not among the five most used in the top performer group.

This leads to the assumption that companies regularly use methods that are relatively easy to apply but that are not capable of giving information adjusted to the respective context of strategic questions, which supports the findings of Meyer, Becker as well as Daheim and Uerz.

Recapitulating the findings made in this section, only few of the participants choose their methods with regards to the specific problems they are trying to solve, suggesting that managers tend to have a set of preferred methods they utilize regularly. Experience-effects may improve the efficiency in the utilization of methods employed; however foresighters should

regularly redefine their own context and prove whether alternative methods might give them valuable insights, that the ones presently in use cannot offer. Top performing companies select methods to solve specific problems more regularly, implying that they have more experience in the application of various methods.

With regard to the characteristics of methods chosen, companies should consider their methods' communicative and integrative capacity. Concerning the communicative capacity foresighters specifically need to enhance their external communication through SF methods in order to build stronger networks. A higher number of companies have realized the need to integrate market and technology perspectives through the use of their methods.

Many foresighters regularly employ methods which require a rather low amount of time and effort in their application. A stronger focus should be laid upon acquiring competencies in methods that yield more qualitative results and reflect the context of the situation more adequately.

People and Networks



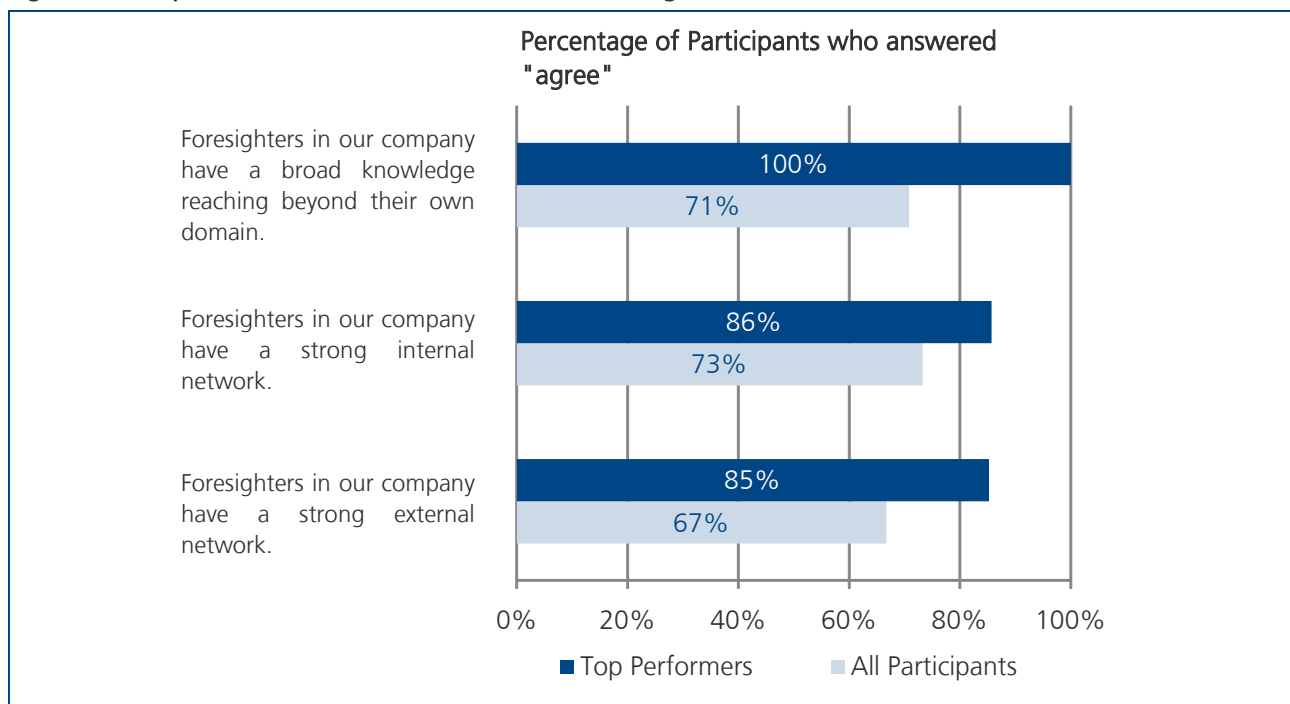
To create value from information gained through SF processes, collected data needs to be interpreted. Since employees channel the information that is eventually used for decision-making, the capability People and Networks considers specific characteristics foresighters should possess that enable them to assess detected developments adequately.

Communication among employees and individuals outside the company fosters debate about SF insights and thereby creates meaning to collected information; therefore, it is important for foresighters to possess strong internal and external networks. Internal networks are needed by foresighters in order to be aware of the information need individuals have within the company. Foresighters need to have strong external networks to be able to access restricted and exclusive sources, which enhance the quality of information used in foresight processes.

According to Wolff (1992), it is desirable for foresighters to have a broad knowledge in a number of fields, enabling them to quickly understand the contexts of a wide range of topics. Specialized knowledge can be tapped into through internal and external experts, and by members of the SF teams.

However, past research by Daheim and Uerz (2006) has shown that only 10% of the companies in their sample agreed strongly that foresight is a participative communication process, indicating that oftentimes communication is not regarded as important for SF processes. Communication, however is not only important in conducting SF activities, but can also contribute to disseminating the insights gained through SF and trigger action.

Figure 15: People and Networks - Characteristics of foresighters



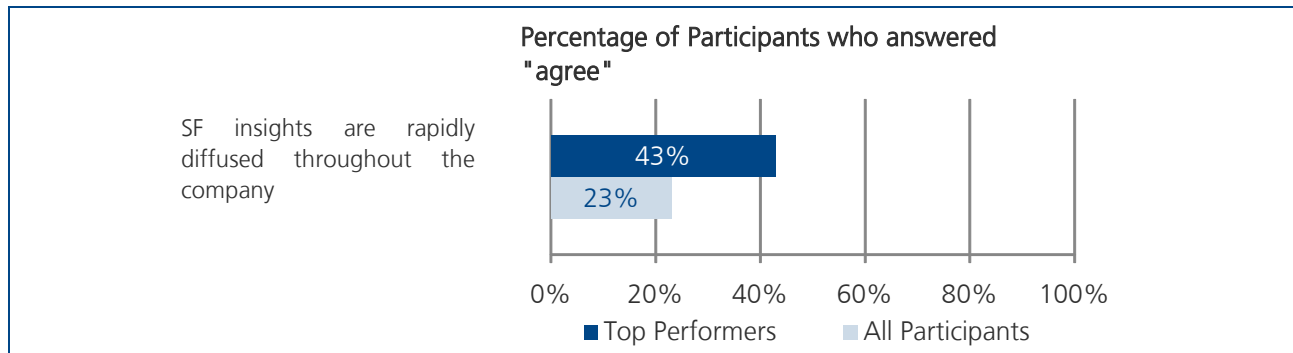
As Figure 15 shows, top performing companies employ foresighters with an ideal profile more

frequently than companies in the total sample do. In the total sample foresighters specifically lack a strong

external network. These are essential for foresighters to have in order to not only gather external information from publicly accessible sources, but also from restricted sources.

Once foresighters have collected information, these new insights need to be disseminated throughout the company. Internal networks are an important aspect for supporting this diffusion.

Figure 16: People and Networks - Networks



Concerning the dissemination of information, only 23% state that SF insights are rapidly diffused within their company. Even top performing companies show large deficits in the transmission of intelligence. Especially regarding the high amounts of investments companies incur to obtain information about relevant developments in their surroundings, these results show that internal diffusion of SF insights has a strong need for improvement.

In an open question, the participants were asked to identify obstacles foresighters are faced with in their organization. The resulting statements have been grouped into four clusters:

Non-receptive corporate climate: Many of the respondents stated that their SF efforts are impeded by a lack of acceptance and attention within their companies. The corporate / innovative climate and the cultural heritage were named as barriers, suggesting that practical constraints hindered the implementation of actions from the gained SF insights.

Lack of communication: One participant stated that a lack of corporate visibility created a barrier for foresighters. Strategy changes that were not thoroughly communicated by management represented another obstacle.

Lack of time/budget: In companies where no dedicated department is responsible for strategic

foresight, employees often conduct SF activities along with other responsibilities. This leads to a lack in communication of insights and few actions being taken, because other urgent responsibilities get in the way of performing SF activities.

Lack of experience: One of the participants felt his company displays weaknesses in the application of SF methods, suggesting it does not have enough experience and knowledge on how to conduct SF activities efficiently and effectively.

The results show that foresighters within multinational companies have built-up strong internal and external networks and have a rather broad knowledge. Top performers do more frequently employ foresighters who fulfil these requirements, than do average companies.

However, companies do not invest strongly enough to disseminate the collected information within the company. The results suggest that foresighters collect plenty of information, but the insights gained remain with these individuals and are not made available to the entire organization. In order to build comprehensive strategies that are pursued by all employees it is important to make all corporate decisions based on the same assumptions about future developments, which can only be done if information is disseminated.



The need for information often determines organizational characteristics of the implementation of foresight processes. While some firms have continuous processes in place, others conduct SF activities only when information is explicitly demanded.

SF activities can be triggered bottom-up, for example by employees within the business units, individual researchers and members of the foresight teams or they are initiated top-down, by top management and executives. The initiation of SF processes by employees within the business units has the advantage of being more closely linked to present customer demands and therefore more market-oriented. Top management support enhances visibility of SF projects and gives them a higher perceived relevance within the company, which facilitates the implementation of their results. According to Becker (2002), SF can take place at three organizational levels: at the corporate level, by the divisions or by assigned task forces, which overlay the other two levels by a virtual structure. For companies with a rather broad product range it is advisable to have decentralized SF activities, conducted by the business units. Daheim and Uerz (2006) added the outsourcing of foresight activities to external organizations, consultancies or think-tanks as a fourth organizational form. Findings made by Jain (1984) indicated that scanning activities are most frequently initiated at the corporate level and are eventually conducted by the business units. His results also revealed that a company's various divisions are oftentimes responsible for scanning different parts of the corporate environment.

Results from Becker's study suggest conflictive results to those made by Jain, since in his sample SF activities were most frequently initiated bottom-up. In order to profit from the benefits of both approaches for initiating SF projects, Rohrbeck and Gemünden (2008a) suggest a combination of top-down and bottom-up approaches.

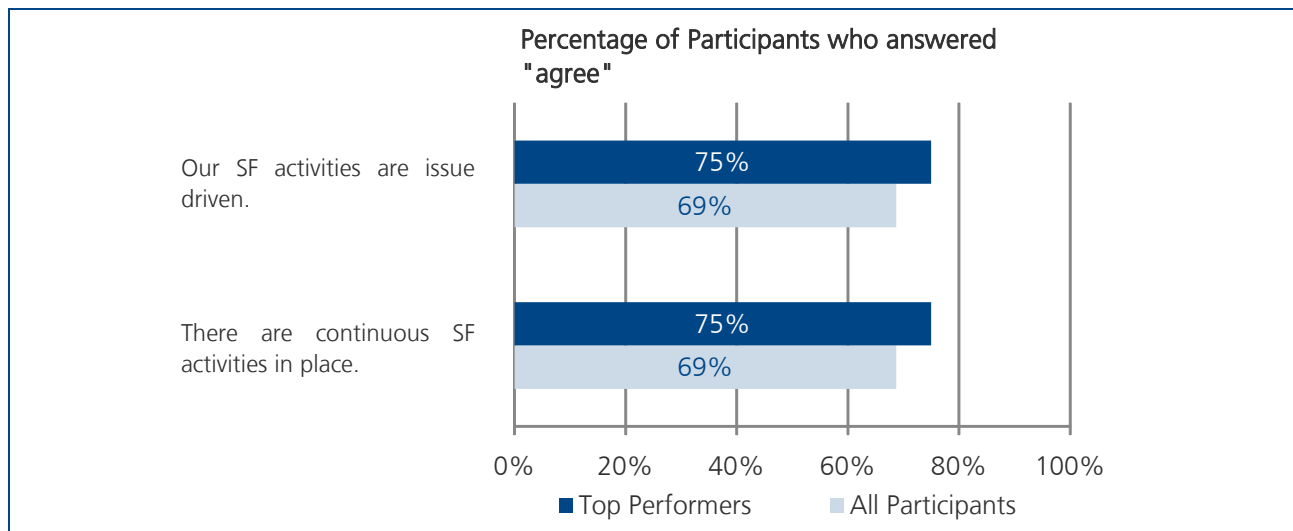
Findings made by Becker suggest however that in many firms SF processes lack a formalized structure.³ Jain's analysis showed that companies with more sophisticated foresight systems in place do most frequently prefer to commission a separate organization for scanning. Daheim and Uerz identified a trend to establish specialized internal foresight units. These units have the advantages of being highly networked and very visible within the company. In their study, more than half of the companies had SF activities conducted by internal foresight units.

By assigning all employees within a company to scanning activities and supporting its SF through incentive schemes, the information input of companies can be increased.

One important characteristic of SF is its cross-functionality. Various organizational departments contribute to the detection of environmental changes, which enhances the amount and quality of information the company has at its disposal. Previous research revealed that within the organization of multinational companies, SF is most extensively linked to Innovation Management, Corporate Development, Strategic Management and Strategic Controlling, with the strongest link being to Innovation Management.

³ In his sample, approximately half of the respondents stated they do not have a formalized process implemented at all.

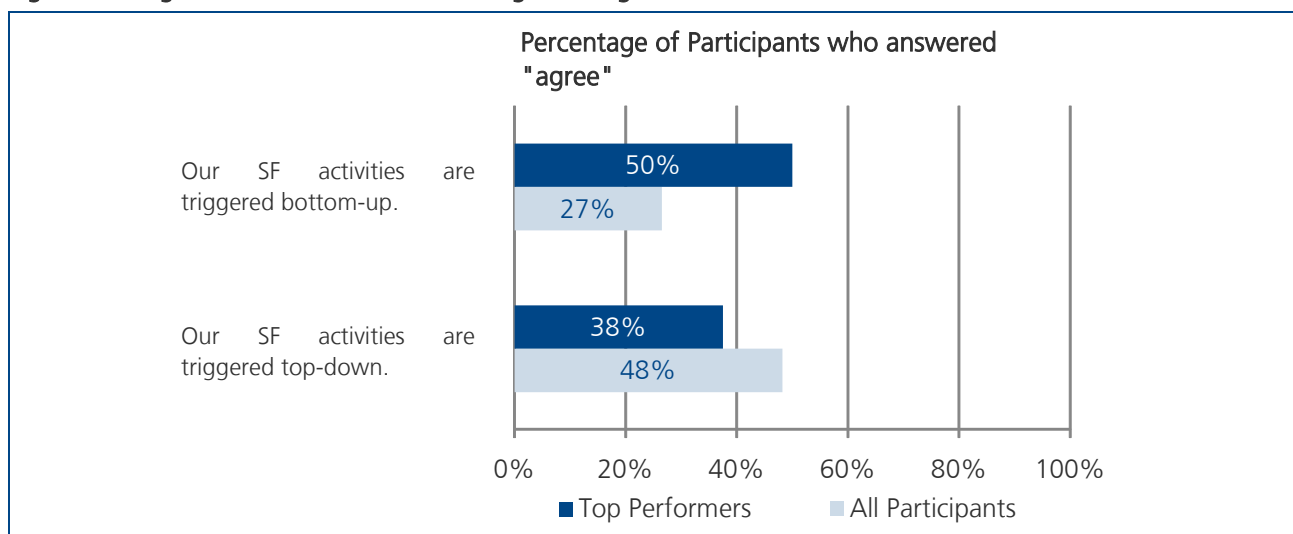
Figure 17: Organization – Mode of Strategic Foresight activities



As Figure 17 shows, the responses given by the participants indicate that companies do both, scan continuously and issue-driven. Implementation rates for both modes are higher in top performing companies; however, the values of the total sample are high as well.

These results indicate that, in addition to having a continuous SF system, multinationals initialize project-based SF processes when needed.

Figure 18: Organization – Initiation of Strategic Foresight activities

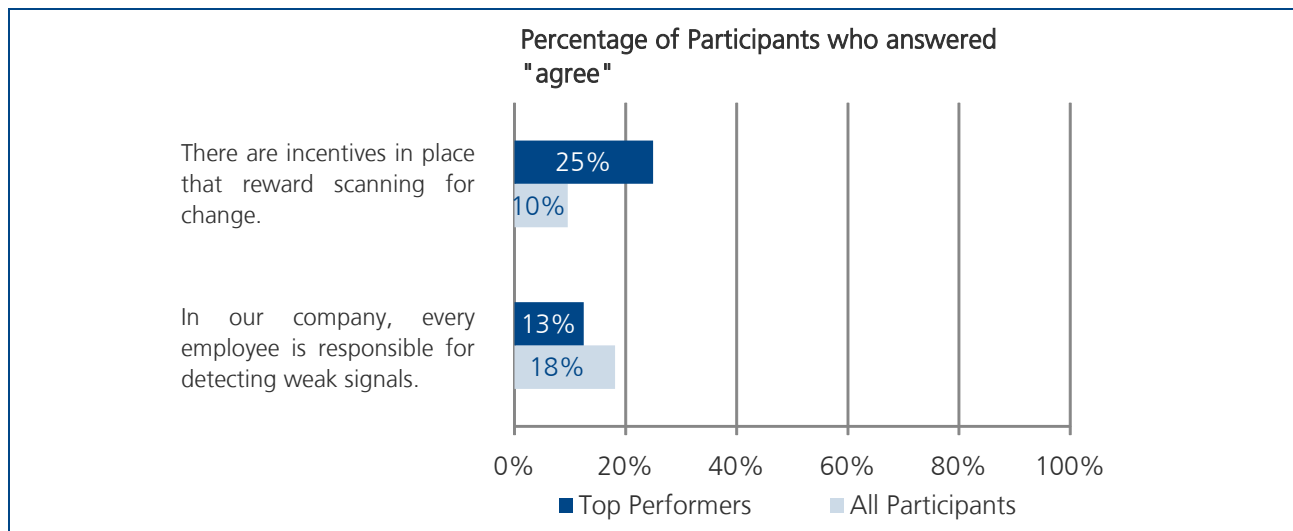


Concerning the initialization of SF activities, only a minority of all companies (27%), state their scanning activities are triggered bottom-up, e.g. from employees within the business units, while 48% of the participants' SF activities are initialized top-down. These results oppose the results made by Becker and

support Jain's finding that SF is most often initiated by top management.

This picture is different for top performing companies, where 50% of the respondents have bottom-up triggered SF activities while only 38% initiate their SF top-down.

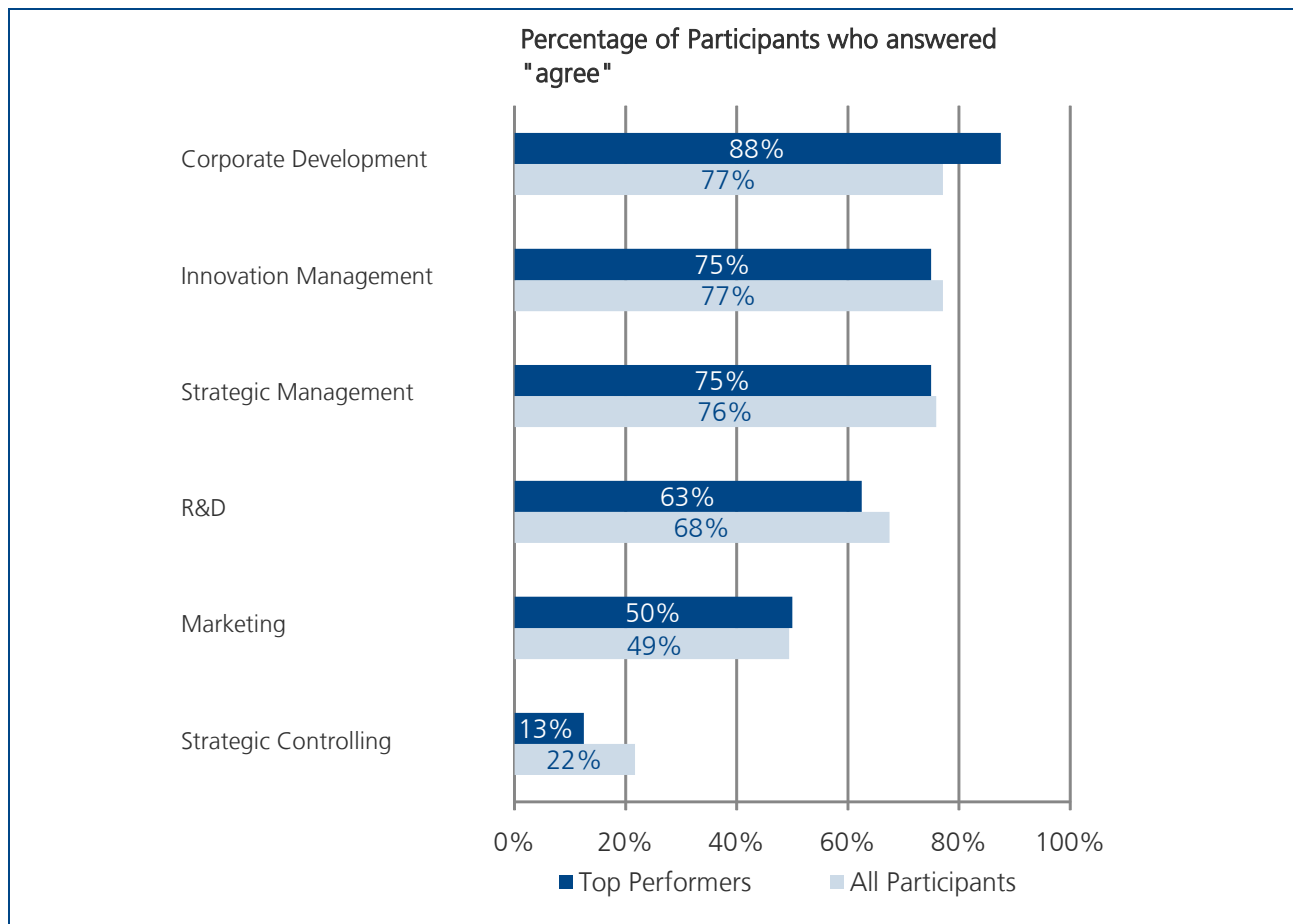
Figure 19: Organization - Accountability and incentives for scanning



In order to receive a high amount of information on weak signals it is advisable for companies to implement an incentive system that rewards employees for successful scanning. The survey revealed that only a very low share of multinational companies takes advantages of the motivational function such systems have. While only 10% of the total sample encourage their employees through reward systems, top performing companies do significantly more frequently have incentives in place (25%).

Only within a low share of the companies, every employee is accountable for detecting weak signals. Figure 19 shows that this responsibility is even lower in top performing companies than in the total sample. This might be due to top performers having more structured SF processes in place, within which scanning responsibilities are clearly assigned to specific SF departments or task forces and therefore are not conducted by all of the employees. However, entrusting all the company's staff with scanning for changes increases the amount of information flowing into the firm.

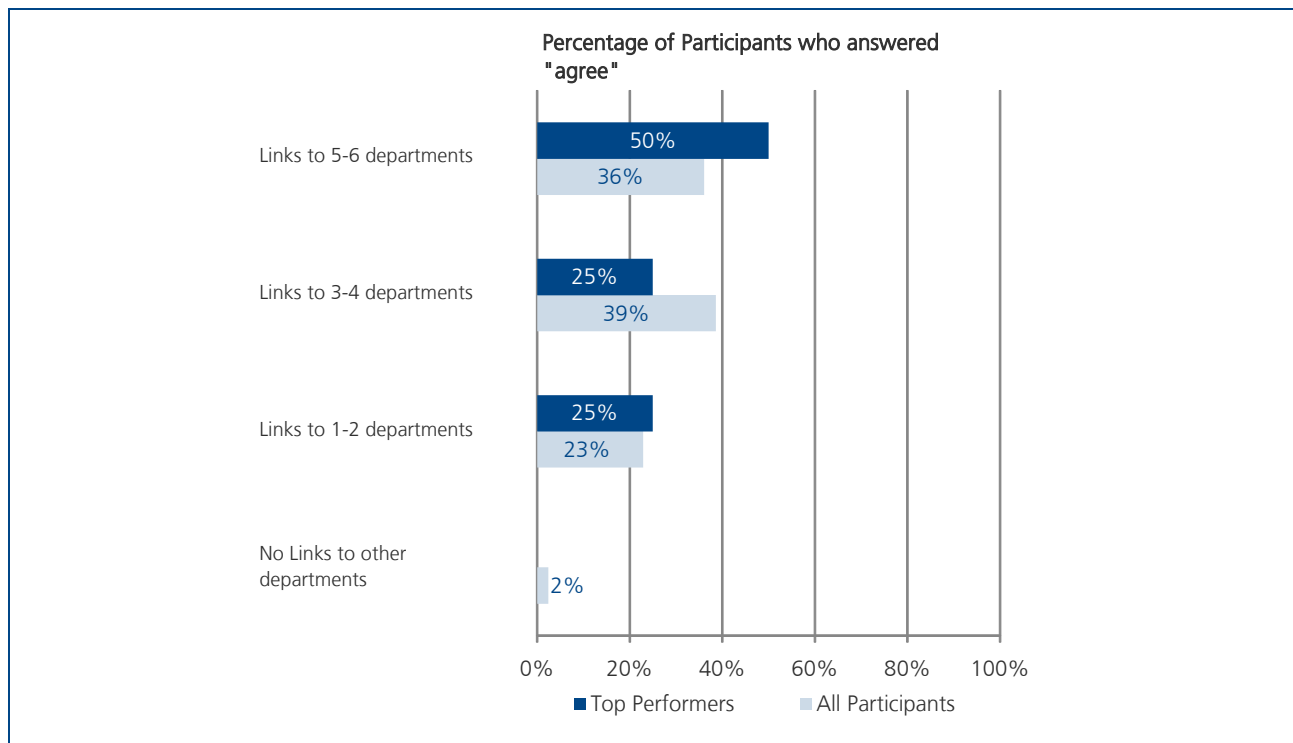
Figure 20: Organization - Links of Strategic Foresight units to other departments



The Benchmarking Framework by Rohrbeck and Gemünden emphasizes the importance of strong links to multiple organizational departments. The most frequent follow-up processes are to Corporate Development, Innovation Management and Strategic Management, supporting the case study-based research results by Rohrbeck and Gemünden.

In top performing companies, SF is most frequently linked to Corporate Development (see Figure 20).

Figure 21: Amount of links Strategic Foresight has to other departments



The results show that SF is strongly integrated within the participating companies, since in 75% of the total sample SF has links to at least three other departments.

The SF units of top performing companies are even more strongly associated with other departments within the company, since half of the participants from this group reported SF has 5-6 organizational links.

Concerning the organization of SF in multinational companies the results reveal that SF activities are not only conducted when required for specific projects, but are also in place on a continuous basis. This combination ensures that companies permanently scan their environments, but also collect information for specific issues when needed.

Weaknesses have been displayed concerning the initiation of SF processes, since the majority of participants have SF activities in place that are triggered by top management, creating difficulties for the distribution of information gathered on lower hierarchy levels. Without proper support for the diffusion of information collected on lower levels, companies are in danger of not letting relevant information reach the level of their decision-makers.

Only few companies enhance the information inflow their SF units receive through the implementation of incentive systems or by assigning all employees to scan

for weak signals. Involving a multiplicity of employees in information gathering is likely to improve the results of scanning processes, because they are likely to have a higher awareness of developments in their field of expertise and have access to external networks in their subject areas.

Analyzing the amount of linkages SF units have to other organizational departments presented a very positive image of their integration within companies. SF permanently needs to be in contact with other divisions to enable gaining a comprehensive overview of new developments and to be in exchange with experts in the respective areas within the company.



A company's culture can play an important part in supporting the acceptance of SF activities and results. In order to support a frequent and free dialog within the firm, companies require a corporate culture of trust, respect and curiosity and a recognition that information sharing is crucial, rather than merely sharing information upon request.

The culture can offer support to a firm's SF capabilities by fostering an open attitude towards changes, encouraging the establishment of internal and external networks and making the results of foresight processes available to everyone within the company.

Information that originates from external sources is often regarded suspiciously. Since most of the changes that impact business activities come from outside the company however, the corporate culture must support the collection and application of intelligence gained from sources outside of the company. Reger (2006) identifies the existence of external networks, such as cooperation with universities, associations and visionary customers as a key success factor for foresight processes.

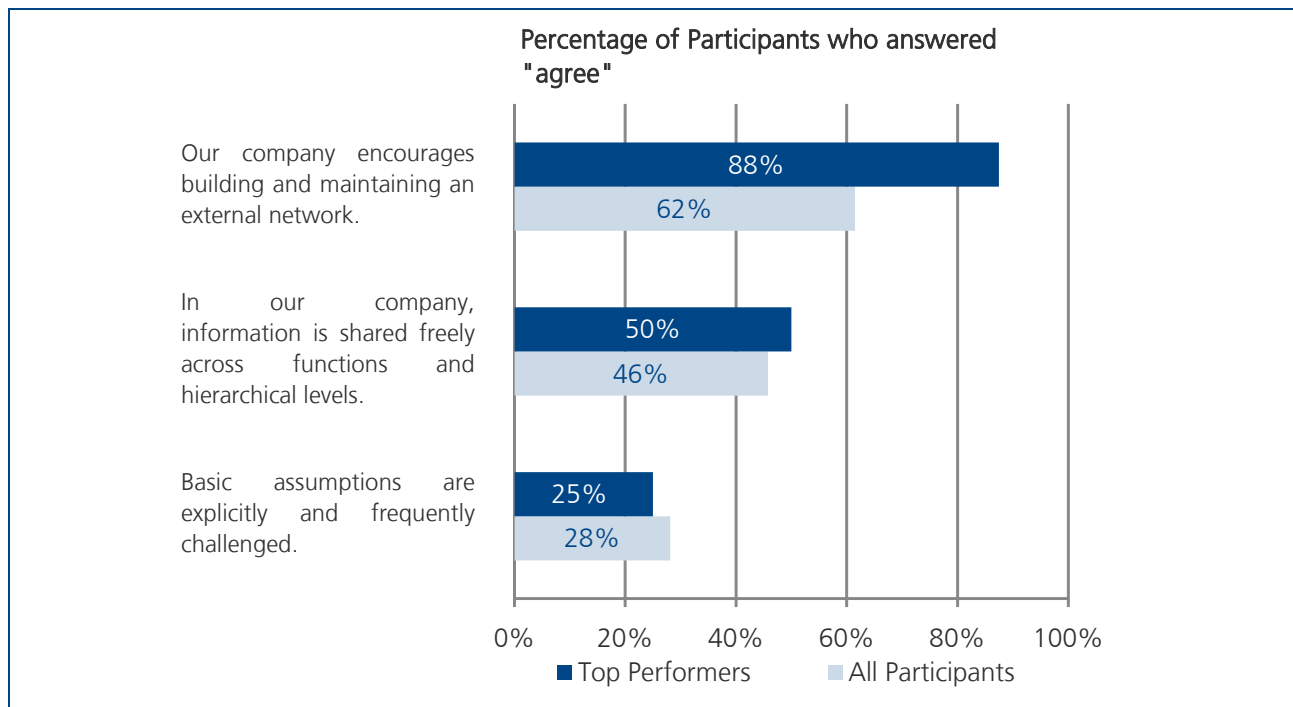
Concerning the extent to which information gained through SF is made accessible across corporate functions and hierarchy levels, Becker (2002) identified three groups of practices: While in some firms results are only accessible by those directly associated with SF processes, others make this information freely available to everyone within the

firm upon request. The third group he identified puts no restrictions on the dissemination of SF results within, and in some cases even outside the company. According to Day and Schoemaker (2005), a culture that supports SF (1) encourages its employees to listen to reports from scouts about developments in the periphery, (2) has customer-contact personnel, that is willing to forward market information and (3) encourages sharing information freely across functions. Additionally, a company culture should support a positive attitude towards the periphery and be willing to test critical premises or widely held views.

Being open to frequently test basic assumptions and long-held beliefs that underlie the company's business operations is specifically critical for large incumbent companies. These companies often try to solidify their market position by introducing only incremental innovations instead of being the first to bring radical innovations to the market, which leads to the missing of new business opportunities.

Only 62% of the respondents in the total sample stated their company encourages building and maintaining an external network. Since most of the influences affecting companies originate from outside the firm, strong external networks are needed to detect changes at early stages. Top performers address this importance, more adequately, since 88% of them support the creation and maintenance of external networks.

Figure 22: Culture



Only in 46% of the total sample and 50% of top performing companies, information is shared freely across functions. A lack of willingness to share information creates major obstacles for SF since communication and intra-organizational debates support the interpretation of SF insights and ensure that the actions of all of the company's divisions are based on the same expectations of future developments.

Concerning the companies' readiness to give up long held beliefs and assumptions, only 28% of all firms state this behavior as prevalent in their firm. Even top performers display weaknesses here since only 25% of them agreed to this statement.

As the results show, top performing companies encourage their employees to build and maintain external networks significantly more often than

companies in the total sample do. A corporate culture needs to provide support to SF and foster openness for applying new concepts.

Concerning the degree to which information is shared across functions and hierarchy levels, as well as the extent to which basic assumptions are challenged, no significant differences could be identified between the total sample and top performers. Both groups show weaknesses in making critical information available to all employees and testing critical premises and wide held beliefs. Since the section Information Usage revealed that companies invest strongly in scanning their environments, the results suggest that companies detect intelligence about future developments; however, these insights are not embraced by the corporate culture, which may lead to missing critical opportunities and threats.

Value Contribution

According to Becker (2002), conducting foresight activities usually has one of two motives: Observing fields with an inherent long-term orientation for the company's strategy, as is the case in industries with products that have long product life-cycles, or on the other hand, supporting the company in proactively coping with uncertainties in the business environment, to guard themselves from surprises occurring in the markets they operate in.

Rohrbeck (2008b) aggregated various statements made by respondents in case study-based research concerning the different value contributions SF has for companies: (1) Reacting to opportunities and threats, (2) reducing uncertainty and (3) shaping the future.

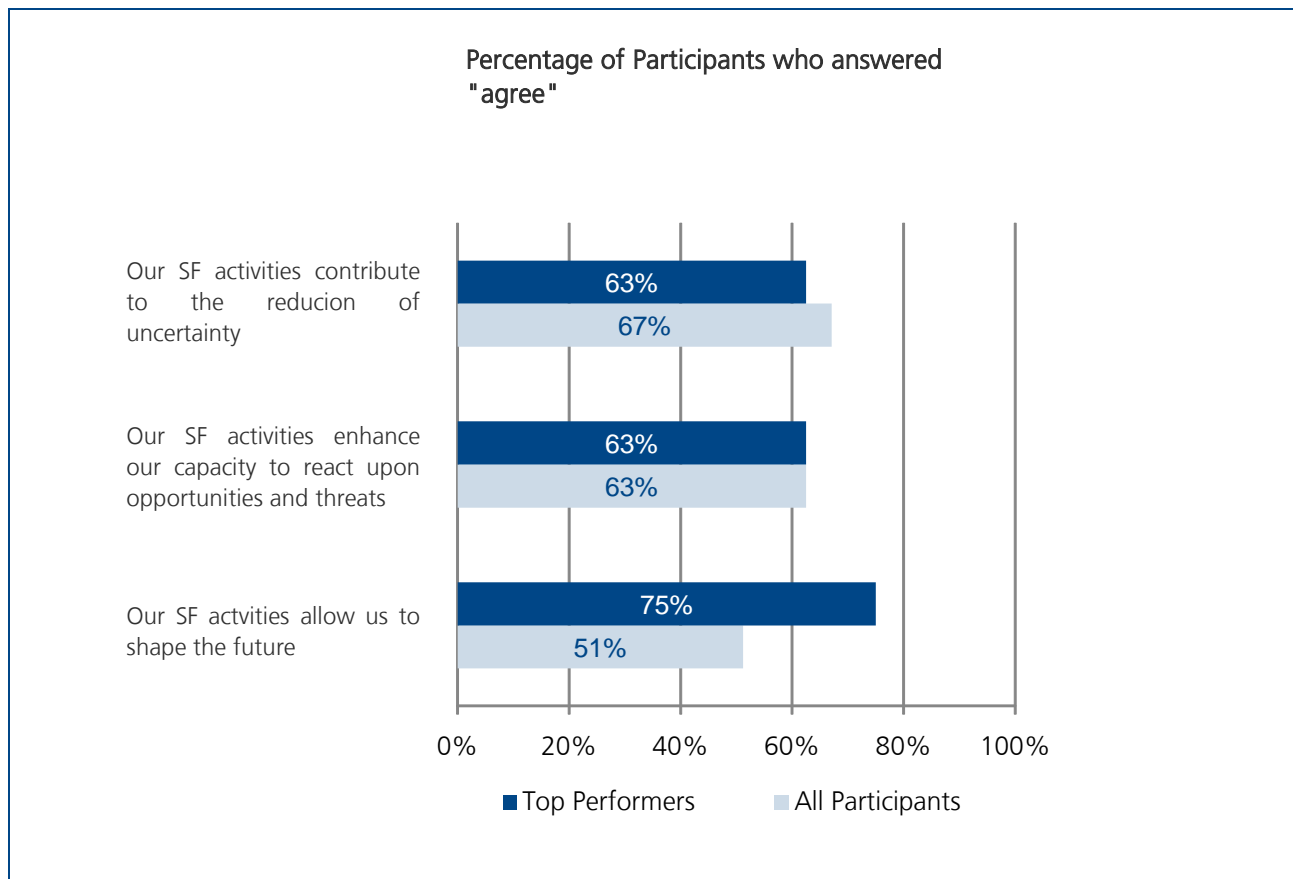
According to Ashton (1996), an effective monitoring program can avoid redundancies in research, enhance companies' abilities to react to competitors' moves and enhance the company's overall business competitiveness. Daheim and Uerz (2006) identified that foresight activities are used to provide input for the area of strategic planning, research, technology development and innovation but also for corporate communications and corporate identity.

Fast market changes pressure companies to engage in activities in research, technology, development and innovation. In the face of high complexity and resulting uncertainty, foresight offers a way to navigate a company through this increasingly dynamic environment. Having an SF system in place helps companies to learn from the past, observe the present and envision new futures. It supports the identification of potential future competitors and consumer demands.

According to Daheim and Uerz, foresight has gone through an evolution in the past, in which the characters of foresight processes, its perspectives and outputs have changed significantly. In its initial phase, foresight processes relied on the beliefs and assumptions made by experts. Outputs yielded by SF were Delphi Studies, Roadmaps and Scenarios. Later, quantitative foresight models gained in importance and an emphasis was laid upon trying to predict future changes by applying different models and matrixes. In its third phase, foresight processes were focused on attempting to react to changes. In order to do this, companies observed trends and weak signals which indicated future developments. The researchers assume that in the future, a model which they refer to as "open foresight" will be predominant in corporate practice. This process will be increasingly participatory and will direct more attention towards understanding and shaping changes. In this theory, a development from generalized processes across companies, to individualized approaches that are adjusted to each company and its context can be observed. SF therefore has been in the process of evolving from trying to foresee the future to actively shaping it.

The highest share of respondents in the total sample benefits from SF's contribution to reduce uncertainty (67%), as can be seen in Figure 23. In past case study research by Rohrbeck, most of the interviewees stated that SF reduces uncertainty by predicting the future development of trends.

Figure 23: Value Contribution of Strategic Foresight



63% of all participants stated their SF activities enhance their capacity to react upon opportunities and threats. Such opportunities include new products, new businesses and a change in business logic as the previously conducted case studies revealed. SF can help identify possible new features and even new potential partners for the research and the development of new products, e.g. cooperation with research institutes. Being able to react to threats and opportunities is of especially high importance for companies that operate in highly volatile environments and have experienced major disruptions in the past.

51% of the total sample stated that SF activities allow them to shape the future, which Rohrbeck recognizes as the ultimate goal of SF. This value contribution encompasses actions that influence external entities in the company's favour.

Top performing companies take advantage of this capacity of SF significantly more frequently. In fact, the largest share of top performers actively influence

future developments with the help of input gained through their SF processes. Generating visions helps companies to become aware of the changes they will face in the future and helps them to realize the possible steps they can take to act upon them. Case studies by Rohrbeck revealed that SF allows firms to influence policymaking and yields important input for their marketing and sales departments.

Top performing companies do not only use their SF insights to anticipate the future, but they strongly take actions in actively shaping it. This enables companies to become trendsetters in their industry sectors by creating conditions in their environment that are beneficial for their own business in the future. In regarding the evolution of foresight practices proposed by Daheim and Uerz it can be concluded that top performers do more frequently take advantage of the whole range of capacities foresight processes can offer, since they state more often than the total sample that SF activities help them in shaping the future.

Result overview

Figure 24: Comprehensive benchmarking results – Comparison with the total sample

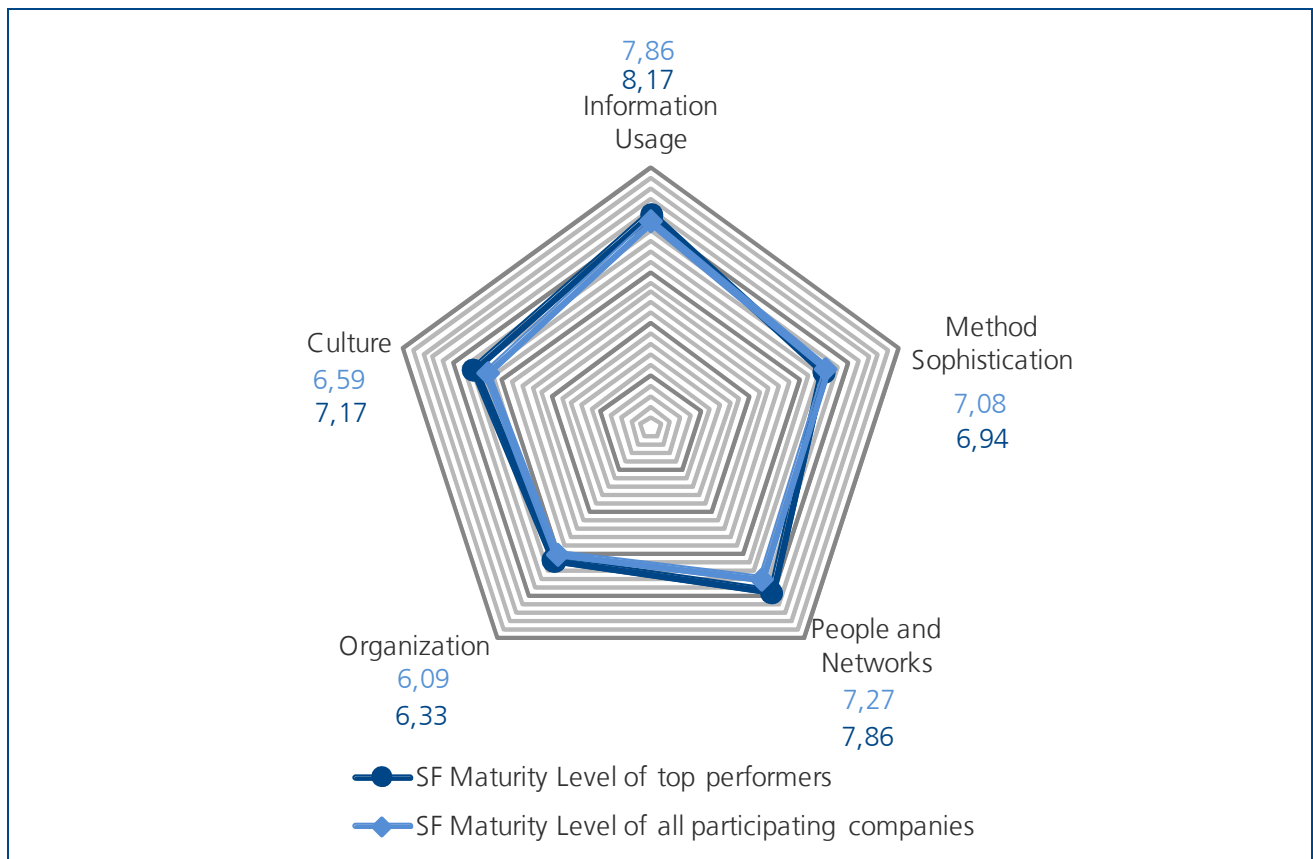


Figure 24 presents the comprehensive results of both, the top performers and the total sample, in each of the five benchmarking areas. The scores for the sections result from assigning the provided answers - strongly disagree, disagree, partly, agree, strongly agree - to the scores one through five respectively, and subsequently calculating the average score in

each of the sections.⁴ These responses were standardized to reach scores ranging from one to ten. At this, a score of 10 in one of the sections would mean that all of the participants answered "strongly agree" in each of the questions within one

⁴ For a detailed list of all the questions included, see Table 2 in the Appendix

benchmarking area. Figure 24, displays top performing companies' strengths and allows to compare them to the average score of all other companies.

The comprehensive results reveal that top performers only have slightly more sophisticated SF activities in place. Regarding the results in each of the sections it can be seen that the participating companies in the total sample have built up strong scanning capabilities since with 7,86 out of 10 the average score for Information Usage is highest in both groups. The profiles of foresighters in the participating companies

are likely to meet the best practice standards, as can be seen in the comprehensive results for the benchmarking area People and Networks. Here both groups have the second highest scores.

The lowest scores have been reached in the section Organization, which is mainly attributable to most companies' lack of the implementation of incentive systems that reward employees for detecting weak signals, and the low share of participants who state each of their employees is responsible to scan for changes in the corporate environment.

Conclusion

The results of this study indicate that companies have built strong capabilities for collecting information. However, their ability to interpret information, disseminate gained insights and trigger management reactions leaves room for improvement:

Only 23% of the participants state that SF insights are rapidly diffused, which implies that future insights might not reach relevant decision-makers.

Only 54% of the analyzed companies choose methods deliberately. This indicates that 46% of companies take the risk of having inadequate method portfolios, endangering their ability to interpret information.

Only 28% of companies regularly challenge basic assumption, implying a low level of alertness towards discontinuous change.

The comparison of top performing companies with all participating companies shows that top performers invest significantly more resources in gathering data from restricted sources, utilize more qualitative methods, and more often select methods deliberately.

Furthermore, top performing companies engage in more bottom-up triggered foresight activities, which should raise the overall level of alertness as well as their scanning reach and scope.

Compared to findings from previous studies a continuing enhancement of corporate foresight systems can be attested. However, towards the ubiquitous installment of systems that allow systematically detecting discontinuous change and triggering appropriate actions, there is still a long way to go.

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Appendix

Table 1: Composition of the industry clusters

Engineering	<ul style="list-style-type: none"> • Automotive • Aerospace • Engineering • Construction • Electronics • Medical Devices / Health • Optics
Service	<ul style="list-style-type: none"> • Transport / Logistics • Travel and Transport • Telecommunication • Finance / Insurance • IT / Software
Consumer Goods	<ul style="list-style-type: none"> • Consumer Goods • Retail
Chemicals	<ul style="list-style-type: none"> • Chemicals
Energy	<ul style="list-style-type: none"> • Energy
Other	<ul style="list-style-type: none"> • Consultancy • Corporate • Real Estate

Table 2: Statements included in the comprehensive benchmarking graph

Capability	Statements included in the benchmarking graph
Information Usage	<p>We are scanning the technological environment.</p> <ul style="list-style-type: none"> We are scanning the economic environment. We are scanning the political environment. We are scanning the socio-cultural environment. We are proactively scanning in both the long term and medium and short term. We are using restricted or exclusive sources.
Method Sophistication	<p>We select each of our methods to solve a specific problem.</p> <ul style="list-style-type: none"> We use methods that strongly support internal communication. We use methods that strongly support external communication. We use methods that allow integrating market and technology perspectives as well as different time horizons.
People and Networks	<p>Foresighters in our company have a broad knowledge reaching beyond their own domain.</p> <ul style="list-style-type: none"> Foresighters in our company have a strong internal network. Foresighters in our company have a strong external network. SF insights are rapidly diffused throughout the company
Organization	<p>Our SF activities are issue driven.</p> <ul style="list-style-type: none"> There are continuous SF activities in place. Our SF activities are triggered bottom-up. Our SF activities are triggered top-down. There are incentives in place that reward scanning for change. In our company, every employee is responsible for detecting weak signals.
Culture	<p>Our company encourages building and maintaining an external network.</p> <ul style="list-style-type: none"> In our company, information is shared freely across functions and hierarchical levels. Basic assumptions are explicitly and frequently challenged.

Table 3: Calculation of the Compound Annual Growth Rate

To calculate the Compound Annual Growth Rate, the following formula was applied, with the variables Z_t =revenue in 2007, Z_0 =revenue in 2005 and t =amount of years:

$$CAGR(t_0, t) = \left(\frac{Z_t}{Z_0} \right)^{\frac{1}{t}} - 1$$

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