Abstract
The paper delivers the main findings of a research project we recently completed on the relationship between the use of foresight and the design of firm business strategy, which is intrinsically linked with a “foresight” analysis about the future of the industry in which the firm competes.

Today many companies, in all industries, continuously monitor the emerging technologies and investigate the likely futures of themes in the economy, institutions and society. The analysis of these domains may encompass different levels: the macro one, focussing on a broadly defined industry (e.g. energy industry); the meso one, focussing on a business area or a narrowly defined sector (e.g., the gas industry); the micro one, focussing on an investment project.

What still seems to be lacking is a comprehensive framework of analysis, that clearly defines how all the foresight activities carried out in a firm could be integrated and coordinated in a synergistic and organic way.

Some key questions arise: how can emerging trends, potentially able to reshape an industry, be identified? How can their implications for business strategy be drawn? How should the investigation be carried out in order to provide really useful information for decision makers? How should this information be generated and spread throughout the organisation?

These are the main questions we give an answer, through an on-field research based on interviews to top managers of some companies that have established an organizational unit dedicated to foresight (Shell, BASF, Nokia, Philips, Siemens, Morgan Stanley) and a literature analysis of several cases of firms able to foresight disruptive changes in their industry and to design appropriate strategies.

At the end, some general guidelines on how to integrate and coordinate foresight activities within a firm are provided.

Keywords: Industry Foresight, Corporate Organizations, Business Environment, Industry Trends
1. Introduction

Strategy is a set of relevant and largely irreversible decisions, taken with the aim of governing the development and growth of a firm in the medium and long term, by strengthening its position in the industry/industries where it competes (Porter, 1980; Porter, 1985; Hamel and Prahalad, 1990). The formulation of the strategy basically consists of deciding the scope of a company, that is in which industries it has to compete (corporate strategy), and where it has to be positioned within an industry, that is what kind of competitive advantage it has to pursue and by which means (business strategy; Grant, 2002). Therefore, strategy is strictly intertwined and linked with the analysis of the likely future evolution of the industry, i.e. “foresight”, which aims at foreseeing the opportunities to be exploited and the threats to be faced. The key questions to which foresight is used to provide an answer, are: what emerging factors are likely to affect and to shape the industry? what implications do they pose for formulating the strategy of the firm?

At the beginning foresight was mostly used in the public sector and it dealt with the perspectives in the field of science and technology (technology foresight: Jantsch, 1967; Martin, 1995).

Afterwards foresight was used in other areas of the economy and society (thematic foresight) and its approach evolved from an exploratory one to a prescriptive one (supporting the policy making process).

While scientific literature on foresight has mostly dealt with methodologies, cases of applications, output and outcomes, relationships with policy making in the public sector (i.e. governments at supranational, national, regional level: Grupp and Linstone, 1999; Georgiou, 2001; Gavigan and Scapolo, 1999) few studies are available on the use of foresight in the private sector (i.e. firms: Schwartz, 1991; Edler et al., 2002; Kostoff and Schaller, 2001; Van deer Haiden, 1996; Von Reibnetz, 1988; Becker, 2002). In this paper we report the main findings of a research project which analysed the general approach, the themes, the methodologies, the management organization of industry foresight in a sample of large international companies in different industries and countries. These cases shed some light on the relationship between the foresight implementation model and the industry related strategy of a firm.

This paper is structured in the following way:

- firstly, a general framework of industry foresight in relation to the business environment of the firm is set up;
- secondly, some cases of the foresight models (domains, methodology, organizational process, outputs and outcomes in supporting the design of a coordinated multilevel and multiunit strategy) implemented in a sample of large international companies are described;
- thirdly, some general features of the industry foresight models are drawn from these cases and some guidelines are provided regarding the implementation of industry foresight.
2. Defining and investigating the business environment

The basic definition of a “business area” takes into account three dimensions: customer needs, customer groups, and technology (Abell, 1980). In this way, an industry can be identified by its products, that is by the specific needs they are meant to fulfil and the specific technology used to make these products: see the examples of the automotive industry (that satisfies the need of mobility through the basic technology of fuel engine), the PC industry (that satisfies the need of data processing through the basic technologies of microelectronics and software), the film photography industry (that satisfy the need of making pictures through the basic technology of photo film).

The business microenvironment of a firm is made up by all the companies which operate for fulfilling the same specific customer needs by means of the same specific technology, by their suppliers, by the consumers and by the providers of complementary goods. In some cases a further relevant element is made up by the regulations that public authorities conceive in order to govern the industry operations.

This set of players and of their forces, is illustrated in Figure 1 and provides the essential framework for detecting the emerging “industry trends”.

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Figure 1 – Business microenvironment

Industry
Customer needs

Industry Technology

Customer groups

Competitors

Suppliers

Complementary products

Industry Regulation
By “industry trend” we mean a change either in customer needs or in the technology used to match them, which requires, at least potentially, new patterns in the way products are designed, manufactured, delivered, used, dismissed and recycled.

The industry customer needs and the industry technology affect each other by evolving in their life cycle. Usually, the establishment of a technological paradigm fosters the level of customers’ awareness, which in turn boosts the further development of the technology itself. In the PC industry the establishment of the IBM standard accelerated the rate of development of microelectronics and software and increased customers’ knowledge and sophistication; in turn, the latter ones boosted the demand for network externalities and for more powerful microprocessors.

Historically, foresight activities within corporate organizations were mostly concerned with technological changes; even today there are many companies that adopt this approach, with the essential aim of anticipating future opportunities not only for new and better performing products in their traditional business, but also for new potential business areas. In particular, this is the case of providers of basic and pervasive technologies that are still at an initial or growing stage of their life cycle, such as semiconductors manufacturers.

The business microenvironment is actually embedded in a larger ecosystem, that lies at the intersections of five major forces: politics, economics, ecology (natural environment), society and technology. This set of landscapes (PEEST) makes up the business macroenvironment (Kotler, 2003).

Dynamics in the PEEST landscapes can strongly affect the business microenvironment, by providing new opportunities and posing new threats for its players, because of their impact on the industry customer needs, technology and regulations.

Strategic literature provides a lot of examples of technologies that were initially developed outside an industry, for purposes other than satisfying and matching the industry specific customer needs, but that were at last able to do it better. Moreover, in any industry macro changes in society may give a new meaning to the customer needs it has traditionally fulfilled; so they modify the way customers conceive the industry products, their pattern of consumption, the performance features which they used to require and to which they gave the most of value. So newcomers may be allowed to enter the industry and to establish themselves as relevant players, by setting up different rules of competition, and substitute products may come up at the forefront and undermine the industry attractiveness, by improving their price-performance ratio.
Figure 2 – PEEST landscapes and Industry Business environment
For this reason in the past decades foresight activities in corporate organizations have gradually enlarged their scope beyond science and technology in order to cover every PEEST landscape.

A key question arises at this point: how can trends in the business macro environment be timely detected?

The answer for this question refers to the trade-off between the level of comprehensiveness and the level of complexity of the perspective analysis. On one hand, in order to carry out an investigation as sound and complete as possible, the business macro environment should not be limited a priori, since disruptive trends may come from any corner of the PEEST landscapes. On the other hand, a firm, whatever large its human and financial resources are, cannot be able to manage the analysis of the huge mass of data and information on the dynamics of the whole business macro environment.

A filter is necessary, which helps a firm to identify and to focus on just the areas of the PEEST landscapes that are likely to affect its business more seriously. This filter is provided by the general functions performed by the industry products and therefore by its customer needs and wants. For instance, at Daimler Chrysler foresight activities target the mobility industry, not only the automotive one; at Nokia, they focus on the information and communication industry, not only the mobile phone one; at Shell, the energy industry, not only the oil one. On this regard, it is worth mentioning the evolution of scenario planning and of the themes covered in it at Shell throughout three decades (Cornelius et al., 2005). The first scenarios built in the early ‘70s concentrated mostly on economic growth, oil supply, oil price: even if these scenarios included some analysis of the geo-political context, their main focus was on the key variables of direct impact for the oil industry. In the following scenarios, the scope of the analysis gradually widened, by examining closely the geo-political and macro economic environment, then the ecology and social trends able to affect the basic demand for energy, of any sources.

As Levitt pointed out (Levitt, 1960), the market definition of a business area is superior to the product definition, since it helps to escape the myopia of the technology that is currently used to match customer needs. Products are transient, but consumer needs are far more lasting: an horse-drawn carriage company went out the business soon after the invention of the automobile; a transportation company able to reinvent itself as a car-maker would have lived far longer. A market definition therefore enables the promptly detection of potential substitute products and newcomers.

However: how should consumer needs be defined? A too narrow market definition may be an extremely selective filter that brings to underestimate or to not identify potential substitute products, particularly in the long term; a too broad definition, on the contrary, may be not suitable to highlight what threats are the most critical.

To clarify this concept and to make an appropriate choice, let’s consider the example of a manufacturer of pens: is it in the “writing” business? or in the “communication” business? Of course, writing has very specific features, which differentiates it from every other form of interaction, first of all “talking”. Writing responds to the quest for a repeated use of the information that is communicated, for disseminating this information to other people, for an afterwards analysis and elaboration. Talking has mirror advantages, as it is more direct and immediate: oral communication is easier to be carried out, but it does not leave any physical mark.

So writing and talking have different performance attributes and respond to different needs; even if talking may partially reduce the overall need for writing, it seems exaggerated to classify...
“talking” tools as a strong threat for pen manufacturers. On the other hand, if the development of microelectronics, displays and software (for every form of data entry interface, including voice recognition) improves the price-performance ratio of palmtops and tablet PC, the latter ones should be considered more seriously as potential substitutes for pens.

The lesson we can draw from these examples, is that a very broad definition is required for a comprehensive analysis, which allows to detect all potential substitutes and newcomers. However, this kind of investigation may be too complex and expansive to be carried out in great detail, and even ineffective: a more specific definition of customer needs, which underpins the main features of their quest, should be used to figure out the most serious threats in the business environment on which a close examination should focus.

Once they have been properly defined, consumer needs provide the cornerstone for the analysis of the business environment of a firm, with the main aim of figuring out how they can evolve, how they can be widened and enriched. The first driver of change may rely in the industry technology, especially in the case it is still in the first stages of its life cycle and therefore may strongly improve its performances. More than this, the investigation of the science and technology field has to be extended to all emerging technology areas, even of other industries, that are potentially able to fulfil the customer needs with a different price-performance ratio. As Utterback and Linsu pointed out (Utterback and Linsu, 1986), discontinuous innovations in products almost always come from outside the industry.

In general the technologies that bring the most serious threats to established companies are the ones that follow this pattern of evolution: first, they have a different set of performance attributes, some of which may initially not be appreciated by traditional customers or are not affordable for most of the market. Afterwards, the performance-price ratio is improved at a fast rate, so the emerging technology ends up invading the market by making products with a larger set of functions and comparable prices available to traditional customers (Bower and Christensen, 1995).

Together with the evolution of the technology landscape, the investigation for changes of customer needs has to look for macro trends in politics, economics, culture and social values, as these may give a new meaning to the needs, or may add complementary ones.

A remarkable example is provided by the trend of “transitive consumption”: the tendency of customers to fill some of everyday products with an emotional meaning, an affective memory and attachment, so establishing a sort of privileged relationship (Future Concept Lab, 2002). Typical products that have been affected by this trend are clothing accessories. Let’s consider the watch industry: Swatch turned around it when it recognised that the customers need for time keeping was evolving towards the need for personal time keeping, as customers started conceiving the watch as a sort of charm linked with the important moments of their life, which it was expected to mark. So Swatch redesigned the watch as a fashion accessory, with colourful bright products for every occasion.

A major shift in society, politics or economics may affect several industries, apparently without any links and relationship one with each other. The analysis of the impact that a macro trend has generated in an industry may therefore help to understand what kind of effects the same trend may have on the business area that is concerned.

Let’s consider the case of transitive consumption: more or less a decade after the Swatch company entered the market, Nokia became the world leader of mobile phone makers as it
perceived the quest for communication was going to become the need of personal communication: so mobile phones were becoming a sort of repository of the individual emotions and feelings related to phone calls and text messages. That was the reason why Nokia added changeable covers, ringing tones, innovative and rounded looks to the traditional mobile phone.

Grasping the deep meaning of consumer needs and of the performance attributes they value more, helps to set the borders of the industry where a firm has to compete, and to identify the relevant competitors. After Swatch showed its customers that the watch could be conceived as a fashion accessory, its strongest competitors turned out to be the fashion houses (Armani, D&G, Versace) which entered the market with their own brands.

As a general rule the evaluation of the impact of an emerging trend on the structure of an industry requires the analysis of all the business areas that may be affected by the trend, as this may increase the attractiveness of a business area and, at the same time, may decrease that of another industry or it may affect sources of competition, such as economies of scale, that underlie several business areas.

3. Some models of industry foresight in corporate organizations

The PEEST domains (politics, economics, ecology, society, technology) are the first axe which characterizes industry foresight.

The second axe is related to the level of the perspective analysis, as it derives from the “market” definition of the business environment of a firm: here we have the macro level, which considers different related segments of a broadly defined industry, such as the “energy” industry (oil industry, gas industry, renewable sources); the meso level, which focuses on a specific business area or a specific industry segment, such as the natural gas industry; the micro level, which focuses on a specific organizational or operational unit, or a specific investment project.

The third axe is related to the time horizon, ranging from short to medium and to long term. As a general remark, properly defined foresight activities have a medium and long term horizon, while activities with a short term horizon are more concerned with tactics than with strategy. It is worth noting also that “long term” strongly depends on the area and the industry to be investigated: in the energy industry, it is usually over 20 years; in the ICT industry, it usually falls between 5 and 10 years. This is due to the rate of relevant changes, the difficulty in making reasonable assumptions, the payback time of large investments in capital expenditures.
Figure 3: General classification of Industry Foresight
The analysis carried out on some large international companies (Shell, BASF, Nokia, Philips, Siemens, Morgan Stanley, Daimler Chrysler) regarding the ways they implement industry foresight, shows that even if a basic approach to foresight is rather common, many differences exist in methodologies, organizational process, outputs and outcomes.

In fact, on one hand, Shell has developed and is currently applying a very attractive scenario methodology. A corporate foresight unit has been established and charged of the analysis of PEEST landscapes, in order to select trends that are potentially able to affect the energy industry at an international level (Cornelius, 2005). The team in charge of this activity relies on the contributions of knowledge from experts of different disciplines and from managers of the various organizational units of the group. The perspective analysis aims at providing a comprehensive assessment of Shell business environment and of its alternative paths of future evolution. The outputs are framed as Shell Global scenarios. Starting from these Global scenarios, a wide range of more detailed and focused scenarios are derived: they take into consideration the specific energy industries (such as oil, gas and power, renewable sources) and geographic areas. In this way the implications of Global scenarios are drawn at business and country level, so that the general and global trends in the PEEST landscapes are combined with more specific trends and issues, which regard also the strategic behaviour of Shell competitors, suppliers, customers. At the end of this process the Shell Focused scenarios are built.

Based on the outputs of the Focused scenarios, their likely impacts at project level (Project scenarios) are figured out by gathering and processing more detailed information on competitors, price, profitability, technical and managerial risk. Focused scenarios and Project scenarios are built by specialised teams independent from the Corporate Foresight unit, even if the latter one may cooperate with them by providing methodological support and deeper insights.

Global scenarios are designed in a way that supports decisions about corporate strategy, as they foresee and evaluate the future attractiveness of the different business areas of the energy industry. Focused scenarios and Project scenarios aim at supporting country and business strategies and specific investment decisions respectively.

Every strategic planning unit of Shell has to demonstrate the robustness of its strategy against both Global scenarios and Focused scenarios. In this way the relevant proposals of investment projects are taken up again at a corporate level and considered all together from a portfolio viewpoint.

An example can illustrate this process: it regards the decision about an investment project that Shell recently evaluated with reference to a natural gas reserve in Sakhalin (Far East Russia). Some of the most relevant indications from the global scenarios were the rising of the worldwide aggregate demand for energy and the spreading of deep concern for environmental sustainability. In this context the demand for natural gas was expected to grow fast, leading to the search for new sources. Country focused scenarios were developed, by taking into account long term trends in the political situation of the target countries and the neighbouring ones, in their economy and their potential role as relevant customers. At the end of the assessment Sakhalin was selected and analysed with more details through both focused and global scenarios.

Also at BASF scenarios are used and built by means of a top-down process: at the beginning scenarios for the world economy are elaborated: they take into account demographics, consumption patterns, regulations, natural resources and state of the environment, GDP and
rate of growth of the main regional areas where the firm competes and of the main industries that the firm supplies (Heinzelbecker, 2005). The Global scenarios are then translated into Country specific scenarios, on one hand, and into Business area scenarios. These are the outputs of a more detailed future oriented analysis, which takes into account a large set of more specific variables, such as national regulations. Based on these scenarios, investment options are assessed.

The methodological and organizational framework used at Shell and BASF can be described by the flow diagram at Figure 4.
Figure 4 – Framing Industry Foresight: the Shell and BASF model
This approach to industry foresight has many positive features. Since the information about the business environment generated at macro-level is transferred to the strategic business units, it fosters their integration and coordination, by providing a common background of knowledge to all of them; it promotes a shared understanding of the basic drivers of change affecting the whole business. The different levels of analysis (macro: broadly defined industry; meso: business units; micro: investment projects) are closely intertwined and bring about a gradual narrowing of strategic funnel. Scenarios built at one level are synergistically appropriated and developed at the lower one, to which they provide a sound informative basis for foreseeing and evaluating strategic options. In this way coherence and integration of the strategies of different organizational levels and units is achieved. This approach to industry foresight is suited to companies in which several strategic business units are strictly linked. But, most of all, it is effective when the identification of emerging trends able to affect the sources of competition of strategic business units is relatively easy (i.e., environmental concerns of citizens in industrialised countries and the related regulations set up by governmental bodies), and when the critical problem is the assessment of the uncertainty affecting the alternative paths of evolution of these trends, and of their future possible outcomes (i.e., the intensity and rigidity of environmental laws and the price premium customers are willing to pay for green products).

These features are common to such global industries as energy, chemicals, banks and financial services, insurance and, more generally, to those for which the drivers of change fall into the economic and political landscapes. In this kind of industries, where investments projects are huge and have to be assessed on a very long time horizon, the methodological framework and the organizational process for industry foresight applied by Shell and BASF turns out to be very effective to cope organically with the uncertainty of emerging trends throughout the whole firm.

It’s worth noting that also at Daimler Chrysler and Morgan Stanley foresight activities are mostly based on scenarios, tackling the many themes of mobile societies, markets and customers in the former case and the many and different themes such as European Monetary Union, global derivatives, Japanese market in the latter one.

In many companies that we investigated scenario writing is combined with the formulation and analysis of strategic options, to which scenarios provide a sound basis for selection, evaluation and decision making about when they have to be exercised. More than Shell and its investment project in Sakhalin, remarkable cases are provided by BASF, as it decided to make large investments in China in the early ‘90s, far before its competitors, thanks to the confidence about the future of the country it acquired by means of scenarios; and by Morgan Stanley, as it promptly exited from retail financial services in Japan at the time of its merge with Dean Written, so avoiding the huge losses that other competitors ran into.

So framing and integrating the perspective analysis of business environment at corporate level (macro), at business unit level (meso) and at operational unit level (micro) is appropriate in the case of multi-business firms, that pursue a horizontal diversification strategy.

On the other hand, when an industry is driven mostly by technological and social forces, the identification of the most relevant trends turns out to be extremely difficult, because of the fast rate of new trends and the difficulty of grasping their potential impact on the industry structure, its value chain and its sources of competition. In this case the identification itself of emerging trends and the assessment of their impact should be the main focus and concern of industry foresight, with the aim of highlighting white spaces and new business opportunities and, at the same time, of assessing the long term attractiveness of existing business areas. Global – and
focused – scenarios may be unsuited and inappropriate when it is necessary and prior to be flexible and react quickly to weak market signals. What it does matter are the results of the trend investigation at a macro level of the business environment, as broadly defined: the output of this analysis has then to be spread within the organization, so it is made available to every business unit and it gives them the information basis, by which the implications of emerging trends on the specific business areas and investment projects can be assessed with more details.

This approach to industry foresight is adopted by firms like Nokia, Philips and Siemens. Nokia elaborates every year the “Nokia World Map”, which identifies about ten topics selected as the most relevant ones from a wide range of emerging trends likely to affect the whole ICT industry. “Nokia Foresight and Insight team” is the corporate unit in charge of this perspective analysis and of foreseeing the impact of the drivers of change on the industry value chain. This foresight team may be called for facilitating and supporting the various business and organizational units, that have the task of designing their own strategies within the framework set up by the Nokia World Map.

Also at Philips foresight activities aim at identifying disruptive trends by means of an interactive process in which social researchers, technologists, designers, managers from marketing and business units of all product divisions are involved. Insights about socio-cultural, technological, market and business related trends are exchanged and made coherent so that a common informative basis is defined, that allows to identify new business values and opportunities for new products and services (Green, 2005).

Similarly at Siemens foresight is conceived as a trend scanning process, with the aim of figuring out the most relevant ones for the company business units. The businesses units are defined in a very broad way: Information and Communication, Automation and Control, Power, Transportation, Medical, Lighting. For each business unit, a huge number of potentially relevant trends from the PEEST landscapes are selected and prioritized on the basis of their capability of affecting the target industry.

In all these firms, the list of emerging trends that come out from the foresight analysis of the business environment may be further elaborated, by means of methods like roadmaps or scenarios. The latter ones, in particular, even if they are not built in a such a structured framework as at Shell and BASF, may be used to dealt with a specific issue, or to cope with specific drivers, in case of high uncertainty, with the aim of disseminating throughout the organization a common understanding about its alternative paths of evolution.
4. Concluding remarks

Some general considerations can be drawn from the case studies of industry foresight, a few of which have been previously described.

Even if these considerations cannot be the basis of a general model of industry foresight, anyway they shed some light on the features of the design and implementation of industry foresight in specific industries and firms.

These features relate to:

a) methodology;
b) organizational process;
c) output and impact on strategy and operations.

Regarding the methodology, the case studies show a polarization on two types of methodology: scenario building and trend analysis. Other Strategic Policy Intelligence tools, such as Benchmarking, Technology Assessment, Technology Audit and, most of all, Roadmaps, are often used in combination with these main methodologies, that set up the general model for carrying out foresight.

The choice between scenarios and trend analysis seems to be related to some features of the business of the firm, namely its technology and social basis, its economic and political environment.

On one hand, firms with a rather focused business and a rather homogeneous technology basis, the activities of which are strongly affected by uncertain economical and political issues, like Shell (energy industry) and BASF (chemicals), rely on scenarios for exploring the overall future structure of their business environment. As this environment is very uncertain, scenarios allow these firms to explore the likely alternative paths of evolution of relevant drivers.

On the other hand, firms with a very large number of relevant drivers of change (technologies, consumers’ values, economics, etc.), find the building of global scenarios very difficult; so they focus on trend analysis and try to evaluate the likely impact of each of them.

Anyway, this methodology may be associated with roadmaps and scenarios at any level of the organization (corporate, business, operational units) in order to achieve a better understanding of the future paths of evolution of some relevant drivers.

Regarding the organizational model used for carrying out the foresight process, we found either a top down and a bottom up approach. A top down approach is used, first of all, by firms that frame their foresight activities around scenarios, by starting from the global ones at the top, which concern the whole company, down to business scenarios, which concern the various divisions, till, at the lowest level, the project scenarios, which concern specific investment activities.

This hierarchy of scenarios is mirrored by a similar hierarchy of foresight units, which are charged of building the scenarios. Information about the future flows down from the top and is progressively enriched, detailed and focused on specific themes and issues. This approach is coherent with the features of the business of these firms, which is rather homogeneous and
focused in terms of range of products or/and technologies and is affected by geopolitical and social drivers at global scale.

A top-down approach is used also by firms that carry out trend analysis, when they compete in a set of correlated business areas that may be affected by the same drivers.

On the contrary, the bottom-up approach is used mainly by firms with a wide range of differentiated business areas, which are affected by a huge numbers of different drivers. The identification of these drivers cannot be carried out at the top of the company (which is really a group of companies), as a large set of specialized knowledge is required, which exists mainly at the lower levels of the organizational structure.

One can combine these results about methodology and organization process of industry foresight with the features of the firm, in the following diagram, where the most frequent correlations among these items are shown.

Figure 6: Correlations among methodology and organization process of industry foresight

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<th>Methodology</th>
<th>Organizational process</th>
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<td>Bottom-up</td>
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<td>Scenario</td>
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<td>(political/economical drivers of change)</td>
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<tr>
<td>Trend analysis</td>
<td>Conglomerate firms/ firms with a wide range of (un-related) business areas</td>
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<td></td>
<td>Focused business/technology firms</td>
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<td>(social/technological drivers of change)</td>
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Whatever the methodology and the approach used for industry foresight, there is always the need of acquiring, integrating and elaborating a very large amount of information and knowledge concerning many different themes and issues. In order to cope with this need a multidisciplinary and multidivisional approach is common to the cases of industry foresight.

More than fifteen disciplines are represented in the Society and Technology Research Group at Daimler Chrysler (Ruff, 2004); similarly at Philips Design and Nokia Insight and Foresight team the investigation of society, for instance, is broadened and rooted in such disciplines as history, anthropology, psychology, design. Useful information, however, has to be taken from sources outside the firm, through publicly available materials and reports. Many countries today carry out
foresight exercises aimed at exploring the different technology areas underlying their industrial system, thus providing an outlook of emerging technologies. University and public research centers spread new knowledge by means of conferences and publications. Cultural events, such as cinema festivals, are also a privileged mirror on emerging trends in society. In particular, lead users are a key source of information: Nokia took great benefits of its local customers, as Finnish schoolboys started soon using SMS to ask girls for dating, when they were too shy to ask directly.

More than people with heterogeneous competencies and expertises covering all the PEEST landscapes, people from business units with a deep and comprehensive knowledge of the industry are involved in the selection of the most relevant trends. The participation and integration of both these groups of people at the very beginning of a foresight exercise is essential, as not only they can give a relevant contribution to the perspective analysis, but also this fosters a sense of ownership and commitment on the results, and therefore an effective and profitable use.

Regarding the relationship of the output of industry foresight and the decision making process of the firm, a common feature is the use of this output for the strategic coordination of the various business and functional units of the firm.

Whatever the methodology and the organization process used for elaborating the perspectives and the vision about the future, these perspectives and vision provide a common and shared framework of information and knowledge, which allows the coordination and the integration of the strategic decisions that are taken in the various organizational units of the firm.

The participative approach adopted for building perspective and visions, with the active involvement of the many decision makers within the firm, allows not only the integration of different sources of information and knowledge, but also the building of consensus on the alternatives of the future business environment of the firm, on the basis of which strategy decisions are to be taken.

No clear and general conclusions can be drawn on the way the output of industry foresight influences and supports the final decisions about policies and strategies of the firm. There are many cases which show that the perspectives provided by industry foresight were translated into strategy decisions. It’s enough to mention the case of Philips that on the basis of the Ambient Intelligence vision it built in the late ’90, developed its technology portfolio and its core competences around displays, connectivity and storage.

It should be stressed that there cannot be generally a strict and binding relationship between the output of industry foresight and decisions about strategies, as this output is affected by uncertainty and it is usually structured as a set of alternative options, among which strategy decision makers have to make a choice, which is strongly affected by personal views, subjective perspectives and objectives.

Anyway this relationship is an important research area for future studies and investigations.
References


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