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Mastering Technology Enterprise

Insights

Technology Intelligence: Choosing the Approach that Fits Your Business



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Technology Can Make or Break your Business

In discussions of the camera business in the fifties and sixties, conversation inevitably centered on German manufacturers. Enterprises such as Leica, Zeiss, Rollei in the high price segment and Voigtlaender and Agfa in the mass segment dominated the industry. This picture, however, changed considerably in the late sixties and early seventies with the advent of Japanese companies. With simplified product design and process automation, the new entrants focused on the mass market first, driving the German manufacturers into the high price segment.

A comeback of the erstwhile leaders might have been feasible, given the existence in Germany of new technologies such as microelectronics. Leica even held patents on a new technology later labeled "autofocus". But neither the threat presented by the new entrants to the market nor the possibilities of new technologies were adequately recognized by leading firms. Bit by bit the Japanese companies entered and took over the high price segment by marketing exactly those technologies the inventors had dismissed in the belief that "the customer does not need this". In the end only Leica and some brand names such as Rollei survived.

Similar tales can be told about most mature industries. Emerging technologies have the potential to trigger dramatic changes to these industries' landscapes. Gene technology, for example, has reshaped the pharmaceutical industry: suddenly small laboratories found themselves leading the way while large conglomerates were still trying to understand what the technology was even about. This goes to show that despite high entry barriers to the market place, the competitive situation within an industry can change due to developments in the technological environment.

The Rise of Technology Intelligence

With this in mind, companies have for some time now been running campaigns aimed at reducing uncertainty in this area. In the seventies a large number of companies implemented so-called technology forecasting programs. These were either run by large strategic planning units or carried out in R&D departments. Using methods developed by researchers such as Harvard's James Bright, they were, however, overly technology-oriented and failed to produce results for general management. At the beginning of the nineties, management boards around the world began to realize how important timely information had become within the competitive environment. Competitive intelligence, and with it a new brand of technology intelligence, was born. **Technology intelligence (TI) aims to identify relevant information in the technology environment of a company by collecting, analyzing and communicating the best available information.**

Two Contrasting Examples

Scouting, long-range TI, and information channeling at Daimler-Benz



Technology intelligence (TI) aims to identify relevant information in the technology environment of a company by collecting, analyzing and communicating the best available information.

One good example of the variety of technology intelligence activities and systems may be found at Daimler-Benz. Surprised by the successes of Japanese car manufacturers in the late eighties, CEO Edzard Reuter himself ordered the comprehensive monitoring of global developments which went even beyond the auto-mobile industry. With his backing, a network of Technology Liaison Offices was installed in places such as Tokyo, Moscow and Palo Alto. The staff at these locations monitors local developments and acts as door-openers for Daimler-Benz researchers at local research institutes. This type of technology intelligence activity is often referred to as technology scouting. These activities were later enhanced by a network of external experts called the Circle Member Group. This group assembles about once a year to discuss recent developments. In 1997 about 150 renowned researchers participated. With the goal of anticipating long-range changes in tomorrow's technological environment, this activity falls under the label of long-range TI.

On another level, document based research was institutionalized. Searching, sorting and retrieving large numbers of documents such as patents, newspaper articles, research papers and internal communications required leading-edge information technology. The system Daimler-Benz installed allows information retrieval from multiple external and internal sources such as the Internet, database services such as Knight-Ridder, and also internal reports and email. Information is stored centrally, allowing easy access and retrieval. This type of technology intelligence activity can best be described as information channeling.

Daimler-Benz represents an example of a company with a very broad spectrum of technology intelligence activities. Other companies use a different set.

Networking at Novartis

Novartis, by contrast, relies to a large extent on the natural networking of its researchers. Each researcher is expected to keep up-to-date with scientific developments in his/her field. The rationale for this is the belief that informal know-how transfer among scientists within their field is more effective than large staff programs can be.

This networking is supported by the central unit Group Technology. It has installed an internal knowledge marketplace in order to promote interdepartmental knowledge sharing. Researchers from all parts of the company as well as selected external scientists may participate in moderated discussions in a large variety of research areas. While most of the discussions occur virtually, within a Lotus Notes environment, periodic seminars and social gatherings are arranged to promote easier communication within the virtual network later on.

These two examples illustrate different approaches to technology intelligence. But which is most suitable for your particular business? Is it better to sponsor networking activities, or should you invest in information technology in order to build up Information Channeling resources? How important is it to anticipate long-range change?

Understanding the Underlying Differences

The design of a company-internal technology intelligence function depends largely on the type of competition the company faces in the technological arena. A pharmaceutical enterprise encounters different challenges than does a machine manufacturer. The technology competition of the former may be described as science-based, the latter may be described as technology-based.

On a second level, the technology strategy a company pursues presents another differentiating factor. Thus, the approach taken to technology intelligence will also depend on whether the company is a technology leader or follower.

Science-based versus technology-based competition

Science-based competition exists where a company's source of innovation is dependent upon advances in basic science. Patents in such industries are directly linked to scientific publications, and progress is often discontinuous, characterized by leaps and bounds rather than steady progress. Technology-based competition, on the other hand is marked by incremental progress. The focus is on development activities instead of research. The industry's landscape is also undergoing a process of concentration as cost reduction becomes a primary goal.

These two types of technology competition require different approaches to technology intelligence. In science-based competition, gaining knowledge of developments as they occur is crucial: the time lag between a discovery and the publication of papers and patents can determine whether an enterprise will become a market leader or an also-ran.

Because of this, science-based companies need to monitor scientific communities very closely. Here close links to centers of scientific progress are essential; these may only be maintained by scientists working in the same field. Such personal networks and the sharing of information between company researchers and external scientists are factors of tremendous importance.

All in all, science-based competition requires highly manpower-intensive technology intelligence, as most relevant information is in the minds of people rather than on paper. This calls for a networking-based approach to technology intelligence.

By contrast, companies involved in technology-based competition have no need to analyze basic science developments, as the consequences of the latter only touch them years down the line. For these companies, keeping abreast of their competitors' activities and general developments within their industry is sufficient. For this, secondary documents such as patents, papers and press briefings are usually enough, and the information channeling approach may be implemented.

Leading or following technological development

The question as to whether to invest in long-range technology intelligence (such as Daimler-Benz's Circle Member Group) is to a large degree independent of the type of technology competition in which a company is involved. However, it does hinge on the choice made in respect to the role played in this competition.

Companies with a technology leader strategy have decided to stay ahead of the competition in technology terms, and thus need to anticipate future changes in the technological environment. It is in their interest to engage in some form of long-range technology intelligence even though the results of such activities are bound to be uncertain.



The design of a company-internal technology intelligence function depends largely on the type of competition the company faces in the technological arena.

Organizing Technology Intelligence

The organization of technology intelligence within a company depends largely on the type of technology intelligence activities planned.

Long-range TI activities are best organized centrally, as the field of interest and the time frame call for central coordination at a level near to the board of management. Long-range TI may even be carried out in cooperation with other companies and public agencies, as most of its results will not be relevant to business in the short term. For most companies it is not even feasible to carry out long-range TI on their own. Their approach should be to participate in public foresight initiatives such as the Foresight Program in the UK or the Delphi studies in Germany.

Networking TI as called for in science-based competition is, due to its informal nature, hard to 'organize'. Here supporting activities such as knowledge management solutions based on groupware or conferences are helpful. These supporting measures may be carried out by a central unit. Information channeling TI is most effective if all information is brought together in one place, under one central coordinator. Information collection, however, must be decentralized so as to make use of all sources of information. Therefore local technology intelligence agents need to encourage information sharing.

Technology scouting, finally, is an activity in which the collection and analysis of information items are carried out in response to user requests. The organization of scouting activities depends on two determining factors: geography and technological expertise. As seen in the example of Daimler-Benz, it may be advantageous to invest in geographically scattered scouting units. In order to provide a single point of contact for the rest of the company, these are best managed centrally. If, on the other hand, a company consists of units with a variety of different technology areas, the scouting units are best set up decentrally within the respective center of competence.



More important than the proper organizational setup of technology intelligence units are the involvement and backing of senior management.

Technology Intelligence as a General Management Concern

More important than the proper organizational setup of technology intelligence units are the involvement and backing of senior management. As technology intelligence activities seldom provide short term returns, they often lack line management support.

Technology intelligence must be seen as a long-term investment. While it may not guarantee a steady return on investment, to go without it is to drive blind. To prepare their enterprises for tomorrow's competition, management need to recognize how, technologically speaking, the face of tomorrow may look – and how they, themselves, can shape their technology future.

Alliance for Technology-based Enterprise

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