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# Insourcing Creativity with Listening Posts in Decentralized Firms

Oliver Gassmann and Berislav Gaso

Technological listening posts as a means of technological knowledge sourcing were observed to be a widespread empirical phenomenon in centers of technological excellence and innovation clusters. Our research is based on 55 semi-structured interviews with 12 technology-intensive companies and 6 benchmarking-workshops on external knowledge sourcing with 11 companies. We reveal three archetypes of listening posts: "Trend Scout", "Technology Outpost", and "Match Maker". We describe their respective mission, organizational structure and critical success factors. Each type is illustrated with case studies.

## Introduction

In the last few decades, tremendous changes have taken place in the industrialized world, which strongly influence the management of R&D. In general, seven trends are transforming industry over the past few decades:

1. In order to fulfill customers' desires claim for more variety and individualization, companies are faced with dramatically increasing product complexity since various features and functions now have to be integrated into their products. Technology fusion fosters this trend due to the fact that innovations now cross industry boundaries. Hence, not only product architectures but also product development processes are highly interrelated and complex.
2. Even though complexity drives R&D expenditures to enormous heights, there is an increasing pressure on top management to reduce R&D budgets in times of market recession.
3. Additionally, the stress of competitiveness calls for shorter time-to-market and reduced innovation cycles.
4. On the other hand, the impact of new technologies, especially in the fields of software and information technology, opens up new and promising possibilities for companies. These new technologies allow companies to develop products utilising concurrent processes worldwide with a tremendous amount of available information. Nowadays, information technology acts as an enabler for decentralized knowledge sourcing, simulation and ubiquitous communication

through increased information richness and social presence.

5. Increasing globalization and worldwide competition due to significant political changes, accompanied by worldwide and open markets are forcing companies to rethink and act as global players.
6. The high level of technological and competitive uncertainty makes it difficult for companies to determine the real value of new scientific knowledge in today's competitive marketplace. Therefore companies must protect their intellectual property by early sourcing scientific knowledge.
7. Additionally, intellectual resource immobility, which is characterized through the fact that only a few "star" researchers are making the majority of commercially exploitable discoveries, and many of these stars are working in universities, coerces companies to gain access to such valuable external intellectual sources ([Liebeskind et al. 1996](#)).

These megatrends are forcing companies towards adopting a knowledge broker philosophy. Knowledge creation and basic research is being partially re-delegated to academic institutions and to highly specialized agents (e.g. university science parks and incubators). External knowledge sourcing and the attraction of bringing in outside-in innovations instead of reinventing the wheel are becoming the guiding principles.

Approximately 75% of world-wide business R&D is conducted within transnational companies ([Dunning 1993](#)). The OECD (2001) reports that the R&D activities of transnational

companies represent a large and increasingly growing share of overall R&D activities, which increased from 22.5 billion USD in 1991 to 36.1 billion USD in 1998. R&D by foreign-owned companies as a share of total business R&D in specific countries ranged from 14% in Finland to approximately 65% in Ireland. The larger OECD countries reported the following shares: US: 16% (1998), Germany: 17% (1995), France: 18% (1998), Italy: 23% (1992), UK: 32% (1999) and Canada: 37% (1998).

Research in R&D management has so far resulted in a better understanding of the determinants in international R&D and many R&D organizations are being transformed in order to meet the upcoming challenges. Recent research has focused on the existence and effects of external technological knowledge sourcing from transnational companies' host countries to the investing transnational corporation. Technological listening posts as a means for technological knowledge sourcing were seen to be a widespread empirical phenomenon in centers of technological excellence and innovation clusters. According to Porter (1990, 2001), we define clusters as regional concentrations and networks of companies, specialized suppliers, service providers, firms in related industries, and associated institutions (i.e. universities, standards agencies, and trade associations) that compete partially at the marketplace but also cooperate in pre-competitive fields. Silicon Valley in the United States is perhaps the best known example of a cluster, but there are many other examples, such as wireless technologies in Finland, chemical technologies in Basel, biotechnology in Boston and materials science in central Germany.

The regional character of tacit knowledge makes the presence in and access to these innovation clusters so important for leading companies since only ideas, knowledge and technology which are not widely available via internet and modern information technologies can provide sustainable competitive advantage. In the 1990s, several companies thus tried to establish listening posts in order to access a tremendous amount of embedded (tacit)

technical knowledge that could have a significant impact on the business processes of their company. For instance, BMW established several listening posts in the United States and in Japan. They gained successfully momentum in terms of several new innovations that are currently differentiating factors for this car manufacturer and originally stem from those listening post activities.

The establishment of listening posts and the management of an efficient flow of knowledge from innovation clusters towards R&D units can thus open new and promising opportunities for companies. We define a listening post (LP) as a *peripheral element of a decentralized R&D configuration with a specific strategic mission and sophisticated mechanisms for knowledge sourcing*. Nevertheless, all organizational units, such as purchasing and local sales, have the potential to be the eyes and ears of a company; the listening function is not necessary restricted to R&D outposts.

### State-of-the-Art in Research

There is a diverse body of literature on the topic of external knowledge sourcing by R&D organizations. We identified two literature streams. First, literature in the area of international R&D and second research that focuses on knowledge as the most important strategic resource of the firm (Table 1).

The continuous trend towards internationalization of industrial R&D over the past decades has *inter alia* been elucidated as the attempt of technology-intensive transnational companies to seek market closeness and exploit resources in regional centers of technological excellence, that is, regions characterized by a high rate of new technology output, in order to compete in today's global marketplace (Cantwell 1995, Hakanson 1992, Pearce and Singh 1992a & 1992b, Dunning and Narula 1995, Kuemmerle 1997, Patel and Vega 1999). In addition, the ability to generate entirely new technologies and products from foreign locations and the growing need to monitor new technological developments has fostered this trend.

Many companies now realize that the basis for their competitive advantage is their knowledge base, while innovation is of prime importance for the sustainability for these advantages (Johannessen et al. 1999). Nonaka and Takeuchi (1995) and Leonard-Barton (1995) argue that knowledge is a productive source for innovation and economic growth. Technology knowledge creation processes are increasingly sophisticated, broad and expensive and the "ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends is critical to its innovative capabilities" (Cohen and Levinthal 1990, p. 128) since many organizations lack the ability to listen to their external world and efficiently process the signals received (Allen 1977).

Recent literature shows strong evidence of technology sourcing as a motive for foreign direct investments. For instance, Kuemmerle (1997, 1999) distinguishes between 'home-base exploiting' and 'home-base-augmenting' foreign direct investments. The former is undertaken to support manufacturing facilities in foreign countries or adapt standard products to the demand there, while the latter is foreign direct investment undertaken to access and tap unique knowledge and resources from regional knowledge-intensive centers of excellence. Patel and Vega (1999) push this conceptual model further and suggest a 'revealed technological advantage' index with four

categories of international technological activity. Almeida's (1996) investigation of patent citations confirms the widely held belief that foreign firms make more use of sector specific knowledge than do domestic. He concludes that Korean and European multinationals source knowledge from US firms in order to upgrade their technological abilities in areas in which they are weak.

One way that many companies have exploited to tap tacit and embedded knowledge from regional centers of excellence, while reducing the need for huge financial investments is to launch technological listening posts (Patel and Vega 1999, Weil 2000, von Zedtwitz and Gassmann 2002).

From a historical perspective listening posts began as a typical Japanese phenomenon of the early 1980s when the Japanese Ministry of Economy, Trade and Industry (METI) had a very poor incentive system for fundamental research. Rather, METI nurtured a national push of fast-follower and imitation strategies which were accompanied by efficient product development methodologies such as systems engineering, kaizen, quality circles and rapid prototyping. Complementary they tried to tap and source knowledge about basic and applied research offshore. Several Japanese companies launched technological listening posts in centers of excellence first in the United States and England and later on in other foreign countries.

Table 1: Literature streams in international R&D and knowledge management

| International R&D  |   |
|--|---|
| Research Focus   | Authors   |
| Taxonomies and organizational trends                         | » Cordell (1973), Ronstadt (1977, 1984), Behrmann and Fischer (1980), Hewitt (1980), Pearce and Singh (1992a, b), Bartlett and Goshal (1990), Hakanson (1990), De Meyer (1993), Grandstrand et al. (1993), Pearson et al. (1993), Chiesa (1996), Kuemmerle (1997, 1999), Gassmann and von Zedtwitz (1999), Gerybadze and Reger (1999), Niosi and Godin (1999), Patel and Vega (1999), Zander (1999), von Zedtwitz and Gassmann (2002) |
| Location Decision in international R&D                       | » Hakanson and Zander (1988), Wortmann (1990), Gerpott (1991), Hakanson (1992), Grandstrand et al. (1993), Pearson et al. (1993), Gassmann and von Zedtwitz (1998), Patel and Vega (1999)   |
| Managerial Aspects in international R&D                      | » Rubenstein (1989), Perino and Tipping (1989), De Meyer and Mizushima (1989), Grandstrand et al. (1992), Asakawa (1996), Brockhoff and Schmaul (1996), Asakawa (2001)  |
| Knowledge Management   |   |
| Research Focus   | Authors   |
| Absorptive Capacity and the Knowledge-based view of the Firm | » Cohen and Levinthal (1990), Kogut and Zander (1992), Grant and Baden-Fuller (1995), Kogut and Zander (1996), Conner and Prahalad (1996)   |
| Knowledge Creation and Innovation                            | » Nonaka (1994), Nonaka and Takeuchi (1995), Kusunoki; Nonaka and Nagata (1998), Pitt and Clark (1999), Johannessen et al. (1999), von Krogh et al. (2000)  |
| Knowledge Sourcing and Transfer                              | » Kanter (1988), Almeida (1996), Wathne; Roos and von Krogh (1996), Liebeskind et al. (1996), Ensign (2000), Birkinshaw et al. (2002)   |
| Environmental scanning                                       | » Aguilar 1967, Ansoff 1975, Hambrick 1982, Sheen 1992, Ghoshal and Westney 1991, Gerybadze 1994, Ashton and Klavans (1997)   |

Despite a number of different typologies of international R&D and considerable academic research on the topic of knowledge sourcing a comprehensive description of listening posts as peripheral elements of transnational R&D configurations is still missing. Since listening posts gain increasingly importance for large technology intensive companies their establishment and strategic mission deserves more attention. Moreover, there is little differentiation between various types and roles of listening posts. Our knowledge about critical success factors of listening posts is also very limited. Thus, research that contributes to a deeper understanding of the different facets and types of listening posts and their success factors would offer new insights into this particular field of international R&D research. This article aims at contributing to this gap.

### Research Methodology and Data Sample

Previous research on the management of transnational R&D (290 interviews with companies with more than 1000 R&D locations) stimulated the topic of listening posts (see Gassmann 1997, Gassmann and von Zedtwitz 1998, 1999, von Zedtwitz and Gassmann 2002).

Since our research focused on listening posts, their strategic missions and mechanisms for external technological knowledge sourcing, we applied a case-based research design (Yin 1998) and chose the listening post as the unit of analysis. In order to determine how listening posts were integrated and managed within the wider R&D organization, we developed a semi-structured interview guideline focusing on functional and hierarchical linkages, the role of regional embeddedness, establishment and ramp-up of listening posts, as well as the management of such outposts.

We conducted 55 semi-structured interviews with 12 technology-intensive companies, which have their homebase in Germany and Switzerland. Additionally, we conducted six benchmarking-workshops on external knowledge sourcing with 11 companies. Our interviewees were R&D directors and senior R&D managers. In some companies we were able to participate in workshops and R&D project meetings. Combined with internal documentation on R&D organization, presentations by R&D personnel as well as memos from R&D managers, these data helped us to determine the

reasons and patterns of how companies tap tacit and embedded knowledge from regional centres of excellence. Finally, we reported our findings to the interviewed companies and sought their feedback to correct erroneous interpretation and classification.

### Organizational Concepts for Listening Posts

Based on our interviews on external technological knowledge sourcing with listening posts we identified the trend scout, technology outpost, and match maker as different organization forms. We have classified these three different archetypes according to the type of processed knowledge, and the alignment of the listening post (Figure 1).

The alignment of the listening post describes either the access to *Direct Knowledge Sources* or the use of *Indirect Knowledge Intermediaries*. The access to direct knowledge sources refers to the firsthand, personal process of gaining information on and knowledge of changes in the technical environment (Aguilar 1967, Ghoshal and Westney 1991, Hambrick 1982, Sheen 1992). This occurs on a daily basis through scouts reading newspapers and journals, attending conferences, fairs, seminars, venture capital events or talking with friends, suppliers, customers and competitors.

Indirect Knowledge Intermediaries intend to source unique knowledge assets through either the exchange of information on a market basis, or the establishment of relationships with specific partner firms or specialized agents, i.e. the listening post acts as a broker among experts from his own (often central) R&D and

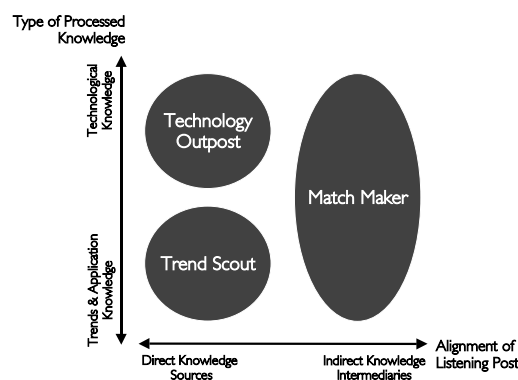


Figure 1: Three archetypes of listening posts

specific partner firms. The establishment of such relationships can include consortia of competitors (Hagedorn 1993, Chiesa and Manzini 1998), partnerships with suppliers

and/or customers (von Hippel 1988, Hakanson and Johanson 1992), university collaborations (Bailetti and Callahan 1992), and co-developments, joint ventures and alliances (Kogut 1988, Hamel 1991, Leonard-Barton 1995, Mowery et al. 1996). These partnerships are usually characterized by an intensive period of interaction over time and a high degree of mutual learning (Hamel 1991).

The type of processed knowledge can be distinguished in *Trend & Application Knowledge* as well as *Technological Knowledge*. On the one hand, trend knowledge refers to both macro- and microtrends. Macrotrends are significant, marketplace-shaping trends, that take time to evolve and have the potential to dramatically affect the way consumers live and work, as well as their relationships and decisions. Microtrends are

briefly describe the three archetypes, and some examples of those companies that are implementing each particular mode of listening post activity.

**Trend Scout**

Trend Scouts focus on technological megatrends, new application areas and future potential, triggered by a changing society. Trend Scouts are located in trendy locations, lead markets or innovation clusters mostly. They often take over remote business development functions. Their mission is to gather and transfer trend and application knowledge from Centers of Excellence, lead users or other stakeholders to the company homebase R&D. Trend Scouts exhibit a small degree of regional embeddedness; resource

Table2: Profile of a Trend Scout

|   |  |
|---|--|
| <b>Mission:</b>   |  |
| To gather and transfer trends and tacit knowledge from Centers of Excellence, lead users or other stakeholders to the company homebase R&D center.  |  |
| <b>Configuration:</b>   |  |
| <ul style="list-style-type: none"> <li>» Small degree of regional embeddedness</li> <li>» Central coordination and control over resource allocation</li> <li>» Job rotation programs</li> </ul>       |  |
| <b>Strengths:</b>   | <b>Weaknesses:</b>   |
| <ul style="list-style-type: none"> <li>» Low investment for a steady presence in the target area</li> <li>» High sensitivity to local markets and trends</li> </ul>                                   | <ul style="list-style-type: none"> <li>» Hard to integrate in local communities if not regionally embedded</li> <li>» NIH-syndrome, Home R&amp;D centre is reluctant to accept "new" ideas from outside, even though they themselves set up the listening post.</li> </ul> |
| <b>Examples:</b> BMW's Palo Alto Technology Office, BMW's Designworks in Los Angeles, Daimler-Chrysler's listening posts in Tokyo and Daimler-Chrysler's research and technology centre in Palo Alto. |  |

specific trends which range from what's "hot" and what's "not" in lifestyle, culture, and attitudes, to shopping habits, brand and media preferences, and online and offline activities. On the other hand, application knowledge entails information about future products, i.e. applications which are deployable through the migration and/or recombination of existing technologies.

Technological Knowledge in this context enfolds certain classes of complex and sophisticated tacit knowledge. This knowledge is usually unique and therefore hard to imitate; it is often embedded within Centers of Excellence.

Each of these listening posts has a specific mission and a sophisticated mechanism for knowledge sourcing and therefore needs a different set of capabilities. The next sections

allocation and coordination takes place centrally and job rotation programs with the homebase R&D are often used to transfer tacit knowledge efficiently. While the advantage of this configuration is the low investment for a steady presence and the high sensitivity to local markets, barriers to integration in local communities and NIH-syndromes at the homebase R&D constitute major weaknesses.

A good example of a trend scout is the BMW Palo Alto Technology Office (PAYTO) in Silicon Valley. It was founded in 1998 and is staffed with 16 employees. Its mission is to be permanently on the look-out for new trends, highly specialized and unique technical knowledge and technologies and to seek and establish contacts with potential external partners. The combination of advanced technologies with product visions, market

research, prototypes and customer responses often yields in breakthrough innovations.

At PAYTO, teams of three people have 90 days to identify, explore and develop new projects. The teams are often cross-functional, so that every project has the perspective of a marketer, an engineer and a scientist. If the team determines that the technology has a chance, the engineers begin to create a component and later on a prototype and test it in the interior of a production car. If the technology survives the rigorous testing procedure it goes to Munich and is showed to BMW's senior management.

As a recent innovative example, the new BMW car control mechanism in their 7-series – iDrive – marks BMW's entry into the era of intelligent cockpits by combining the overall control of more than seven hundred functions

showed up in the newly launched 7-series sedan.

### Technology Outposts

Technology Outposts focus on specialized technological knowledge. Typically, their location is determined by technological excellence of an academic institution (i.e. MIT, Boston) or accumulation of academic and company high-tech players in innovative regions. In some cases excellent infrastructure has been the industrial attractor of such players (i.e. CERN, Geneva). A technology outpost's mission is to gather sophisticated technological knowledge and transfer technologies from centers of technological excellence to the homebase R&D. Outposts usually exhibit both a high degree of regional embeddedness in the particular scientific community and a high

Table 3: Profile of a Technology Outpost

|   |  |
|---|--|
| <b>Mission:</b>   |  |
| To gather sophisticated technological knowledge and transfer technologies from "Centers of Excellence" to the homebase R&D centre.  |  |
| <b>Configuration:</b>   |  |
| <ul style="list-style-type: none"> <li>» High degree of regional embeddedness in the scientific community</li> <li>» High degree of independence</li> </ul>   |  |
| <b>Strengths:</b>   | <b>Weaknesses:</b>   |
| <ul style="list-style-type: none"> <li>» High top management commitment</li> <li>» Adaptation to local markets</li> <li>» Exploitation of local resources</li> </ul>  | <ul style="list-style-type: none"> <li>» Can often become "engineer playgrounds"</li> <li>» Central directives from the homebase R&amp;D centre can suppress creativity and flexibility</li> <li>» NIH-syndrome</li> </ul> |
| <b>Examples:</b> Hitachi in Dublin and Cambridge, Daimler-Chrysler's joint research lab in Shanghai and research centre India in Bangalore, BMW's Car IT in Munich, BASF's biotech outposts close to Boston, Schering's outpost in Tokyo. |  |

within one system with brilliant simplicity. When visionary customers began complaining that the dashboard was taking away their attention from the road, marketers, engineers and designers started thinking about a possible redesign and reduction of all the numerous knobs on the dashboard. BMW's Innovation Strategy Board relied on PAYTO, which delivered after 90 days a first draft of iDrive. In addition to suggesting a new technology, PAYTO found a small software company (Immersion) that could provide the technology, evaluated it, and showed it to BMW's senior management. Munich engineers continued to work with Immersion staffers on the iDrive device and after all, the new iDrive hit the street in a Z9 study vehicle at the 1999 Frankfurt Motor Show. BMW licensed the technology from Immersion and partnered Immersion with Japanese electronics component supplier Alps Electric to develop iDrive. Finally, iDrive

degree of independence and autonomy towards the central R&D. While they usually have top management commitment, they can often become "engineer playgrounds".

For instance, Hitachi installed technology outposts in Dublin (Ireland) and Cambridge (UK) in 1988 to participate in the fundamental (and to some extent applied) research of leading universities. The Hitachi Cambridge Laboratory (HCL) focused on research in future 'revolutionary' innovative semiconductor devices which could open and lead the main world industry into the 21st century. Research on quantum devices is vigorously pursued, especially involving challenges such as use of the quantum „particle“ nature of electrons, as well as ultra-high speed transmission of signals by using the probabilistic transmission of „quantum wave function“. Hitachi's Dublin Laboratory (HDL) was established within the campus of Trinity College Dublin, in the building of Innovation Centre – TCD-industry

collaborative incubation centre – researching advanced computing, especially ultra-parallel computing, and advanced recognition, including opto-neural networking. Both laboratories put great importance on the collaboration with universities, especially with on-site ones. HCL has been collaborating with the Microelectronics Research Centre of the Cavendish Laboratory, Cambridge University, while HDL has been extending partnerships with Trinity College Dublin, Imperial College London and Oxford University.

A good example of the synergy between Hitachi's Cambridge Laboratory (HCL) and Cambridge University was the discovery of the "Femto-Second Ultra-Fast Quantum Device" in 1995. Femto-second ultra-fast quantum device is the challenge of using the „wave" nature of an electron, to achieve future ultra fast switching devices for both high-end telecommunication and ultra-fast computing in the 21st century – an integrated information network age. This challenge requires extremely demanding and disciplined patience in accumulation of repetitive experimentation using extremely accurately controlled laser systems. In August of 1995, Hitachi HCL team, however, succeeded in creating and demonstrating the coherent „Femto-second" pulses, by the innovative scheme named „Coherent Destruction" and „Coherent Construction".

After this success, the European government, invited the HCL team to participate in the ESPRIT network named "Phantoms" for future mutual research communication.

**Match Maker**

Match makers have pure diplomatic functions

*Table 4: Profile of a Match Maker*

|  |   |
|--|---|
| <b>Mission:</b>  |   |
| To act as a mediator towards leading regional technology suppliers, research institutions and future relevant partners through the establishment of multidimensional relationships within the regional scientific community. |   |
| <b>Configuration:</b>  |   |
| <ul style="list-style-type: none"> <li>» High degree of regional embeddedness</li> <li>» Often autonomously organized</li> <li>» Huge informal network</li> </ul>  |   |
| <b>Strengths:</b>  | <b>Weaknesses:</b>  |
| <ul style="list-style-type: none"> <li>» Access to new and/or complementary areas of knowledge</li> <li>» Enables sharing of costs and risk</li> <li>» Often breakthrough and radical innovations</li> </ul>                 | <ul style="list-style-type: none"> <li>» Often no ownership and control over the knowledge asset in question</li> <li>» Knowledge losses through externalization</li> <li>» NIH-syndrome</li> </ul> |
| <b>Examples:</b> Technology Scouts of the German ministry of economics, Daimler-Chrysler's listening post in Moscow, BMW's Technology Office in Tokyo, Siemens in Beijing  |   |

and act as ambassadors of a company. Their processes and skills are similar to external political institutions (i.e. Swisshouse in Boston). Core competences of these match makers are the initiation, leverage and establishment of contracts and cooperations. They exhibit a high degree of regional embeddedness, are often organized autonomously and possess a huge informal network.

Daimler Chrysler's listening post in Moscow is such a match maker. Its mission is the establishment of links between the central research centre of the company, with 90% of the researchers located mainly in Germany, and Russian scientists (especially in the field of algorithms and material sciences).

The German ministry of economics and labor set up in close collaboration with the German Chamber of industry and commerce (DIHK), the Fraunhofer-Gesellschaft (FhG) and the German Federation of Industrial Cooperative Research Associations (AiF) 18 match makers in 18 different worldwide innovation clusters.

These offshore contact offices offer German small and medium sized enterprises important support in international activities, since SME's often don't lack competencies, rather they lack capacities for maintaining listening posts abroad. Match makers interfere cooperation partners for research and development, they advise cooperations with foreign research institutes, organize seminars and experience exchanges as well as meeting of entrepreneurs, R&D directors and scientists from the area of applied research. Match maker analyze the research landscape in the host country, especially seeking for new technological developments.

With their activities and services, Match



Maker, which are mainly citizens of the home country with a deep technological understanding and huge informal network, aim opening up foreign innovation sources and matching foreign R&D-partners with German SMEs. The best way to achieve that is through constant contact to German small and medium sized companies that try to exploit a foreign market.

### Hybrid Listening Post Configurations

A company does typically not have only one type of listening post. Instead there is a variety of combinations possible, depending on the strategic orientation and particular mission of each listening post. A good example is BMW, which has a rather large centralized R&D in Munich. Central FIZ (Forschungs- und Innovationszentrum) has become well-known because of its open and process oriented architecture which allows external suppliers to work directly within R&D. In order to overcome ethnocentric centralization and enrich external input BMW has started to establish all three types of listening posts (Figure 2).

BMW launched the following listening post activities:

1. BMW's Technology Office in Tokyo, which operates as a match maker, was founded in 1981 and comprises 30 employees today. Beneath the gathering of trends and application knowledge, mainly Japanese employees act as door openers towards the Japanese scientific community and competing as well as non-competing companies with the aim to tap tacit and embedded knowledge.
2. BMW's Designworks in Los Angeles was founded in 1972 and acquired in 1995. Today, 70 employees are working in this

trend scout on the gathering of future trends and development of new car designs.

3. BMW's Palo Alto Technology Office, another trend scout in the Californian Innovation Triangle, was found in 1998 and employs constantly 16 staff members that are primarily concentrating on six strategic topics: 'Human-Machine Interfaces' for handling technology more simply; 'Mechatronics', for integrating sensor, actuator technology, and electronics; 'Information, Communication, and Entertainment' issues in automobiles; 'Driver assistance', through Telematics, for example 'B2X' for new portals and new opportunities for business communication; 'Materials and Production', e.g. form-memory alloys.
4. BMW's Car IT, a technology outpost in Munich, was founded in 2002 and enfold 15 employees which are working in close relationships with suppliers and local universities and research centres on the definition and implementation of software systems and applications for the automotive industry.

Additionally, the innovation management department at BMW started an internet interface for the attraction of outside-in innovations called Virtual Innovation Agency (VIA). This can be understood as a non-institutionalized e-listening post aiming to source technological knowledge from outside the company. Thereby VIA has both a passive and active strategic alignment. The passive alignment refers to attracting outside-in innovations, whereas the active characteristic supports the external search for suitable innovation suppliers.

Through this Internet portal BMW is seeking for development of new relationships

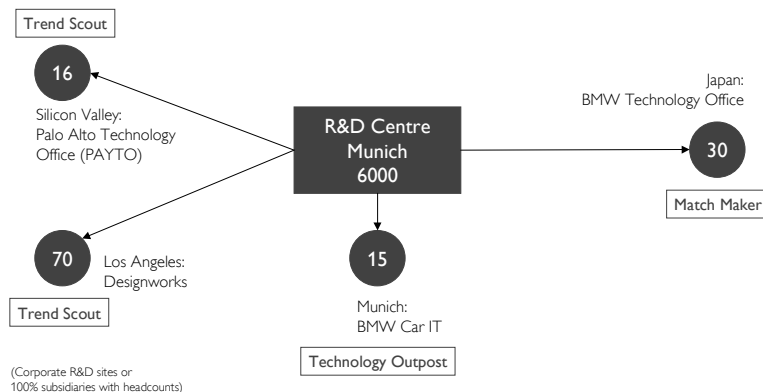


Figure 2: BMW's listening post network

with any potential external innovators: individuals, small companies, and large companies from other business centers and research centers. Those who have developed an idea that could increase BMW's competitive advantage can go to the website, where the company promises to support them and maintain the confidentiality of their idea (<http://zulieferer.bmw.de/en/via/>). If BMW is interested in implementing the idea, it provides personal contacts in the appropriate special departments and reimburses the innovator for his idea.

BMW institutionalized filters and self-assessment procedures to help select innovative solutions which were best suited to go through the VIA. This way, the novelty, technical feasibility, and economic viability of the idea can be assessed effectively and quickly. VIA associates, acting as the first filter, assess the survivors ideas, register them, and report their findings to the appropriate center of competence, which then analyzes the idea and the associates' reports. If the center of competence thinks the idea has merit, a contract is signed to begin a market assessment.

### Managerial Implications and Conclusions

This paper has indicated the existence of three different types of listening posts: trend scout, technology outpost, and match maker. Each of these archetypes has a specific mission and a highly sophisticated mechanism for knowledge sourcing and therefore needs a different set of capabilities. Despite of its recent emergence, the diversity of conceptualizations, methodological approaches, and research settings on external knowledge sourcing neglects the development of a comprehensive understanding of the problem in the context of listening posts. A better understanding of these mechanisms is needed since the establishment of listening posts can open new and promising opportunities for companies.

Much of the success of a listening post depends on a clearly thought through mandate for such a center, and the appropriate managerial culture "back home" to optimally use such an listening post, and be responsive to the signals emanating from it. Home management must be clear on what is required from such an listening post, and personnel at the home center must also be apprised of the importance of supporting and 'listening to' such an outpost.

It is not by chance that the Not-Invented-Here-syndrome is mentioned as a potential weakness for listening posts. It may be alleviated or exacerbated depending upon which of the different listening post models is adopted, though our interviews indicate that the intensity of NIH and the prevailing reluctance to act upon the results of listening posts is strongly influenced by their operational involvement in R&D activities.

Managerial implications have to impact the listening post and the interaction to the home base in order to increase effectiveness.

- Much depends on the knowledge-sharing culture of the home base organization. The home management team must be prepared to be open (on an ongoing basis) and share information with their listening post staff. Mutual understanding is crucial.
- The company should be clear on what technologies it is seeking (focus). All too often there is no clear policy on these questions, and the company addresses them at the last minute in response to an initiative raised from the listening post. Reasons are often indicated by too reactive, short-term management.
- Job rotation programs between the listening post and operational units increase mutual understanding and help building up redundant knowledge. Allen's (1977) early statement that 'the best way to transfer technical information is to move a human carrier' is more valid than ever. An assignment of maximum three years seems to be practical in several firms.
- Involvement in direct development projects enlarges the acceptance of a listening post since the value of the contribution is recognized. Especially in the ramp-up phase a part-time direct involvement in important projects increases internal recognition (e.g. Schindler's outpost in Shanghai 1999).
- It is important to consider who the listening post reports to and what communication channels it uses. The best medium seems to be face-to-face briefings and not *fire-and-forget* written newsletters.
- It is not uncommon to find situations where if the competitive intelligence unit reports things already known to the management, they will be regarded as unnecessary, since they are merely confirming what management instinctively already knew, whereas, if they report something previously unknown to the senior management, they are

liable not to be believed or listened to. This paradox of 'shoot the messenger' is often mentioned by CI professionals.

- Other issues deal with how the listening post is integrated with whatever the mother organization is probably doing in any case in that part of the world or market. There will typically be a number of different sources of information and these need to be integrated. A listening post makes use of the company's marketing people – those who are 'out there' making 'primary' contact with customers etc. or direct the mother company's Business Development personnel to act, or merely recommend action, or report on possible courses of action.

Another perspective is that of the technology involved, for example, is the company seeking more immediate and tactical inputs for development or longer term inputs at the research level. Note that R&D is not a homogeneous activity – just as research has a different dynamic from development – depending on the company, industry, technology, stage in product life cycles.

Listening posts need to be managed dynamically: what is appropriate when setting up an listening post is not applicable once the listening post personnel are an integral part of their surroundings. It is necessary or wise to rotate people, while retaining a core of those who develop relational and social expertise in particular geographical locations and markets. If the work of an listening post becomes routinized, people may no longer notice the signals they are supposed to be looking out for.

Future research is needed to confirm these findings on a wider basis. This includes the efficient and effective management of strategic listening posts, especially regarding their flow of knowledge, performance measurement and relationships with regional institutions and local knowledge pools (regional embeddedness). Future research should try to overcome existing limitations and deliver an enfolding concept and framework for understanding knowledge sourcing mechanisms.

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