Facilitating Foreseeing and Innovation in SMEs

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Abstract: **SMEs operate in business environments that not only change rapidly but also unexpectedly. The need to improve foresight and strengthen the dialogue between foresight, planning, and innovation processes in SMEs is noted. This paper examines what enhances and what hinders the absorption of foresight knowledge in the innovation processes in SMEs. Based on the empirical data gathered by participative observation in 3 workshops and 8 expert interviews, the lack of weak signals or foresight tools are not disincentives. Instead, inherent human features of SMEs seemed to be the main barriers to foreseeing and innovation in Finnish SMEs.**

Keywords - **Foreseeing, Innovation, SMEs**

I. INTRODUCTION

In contemporary, rapidly changing business environments, companies' ability to utilize emerging innovation potential is crucial for their competitiveness. SMEs operate in business environments that not only change rapidly but also unexpectedly. The need to improve the effectiveness of foresight and strengthen the dialogue between foresight, planning, and innovation processes is noted. However, it is also noted that especially for established organizations and organizations with scarce resources, it is highly challenging to perceive new information, ideas or situations which do not fit their existing knowledge structures. As the ability to innovate demands the ability to value and absorb new external information, ways to enhance this capacity are of supreme importance. SMEs need their own methods to understand and respond to changes in the external environment [1]. This paper examines how to facilitate SMEs to absorb foresight knowledge for innovation. The research questions of the paper are: what enhances and what hinders the absorption of foresight knowledge in SMEs?

II. THEORETICAL BACKGROUND

This paper builds on the premises of practice-based innovation [2] and absorptive capacity [3, 4, 5] to explore ways to facilitate absorption of new knowledge for innovation in SMEs. The social nature of practice-based innovation implies that knowledge production takes place within groups of heterogeneous people having a common interest [6, 7]. Knowledge production is thus based on combining heterogeneous knowledge in a multidisciplinary manner [8].

Lots of resources are used to collect foresight information, both at national and regional levels e.g. [9]. However, these knowledge resources do not always reach SMEs with the challenge being how to acquire and process future-oriented knowledge so that it could be exploited in a proactive manner [10]. Future-oriented knowledge is very hard to outline and even more abstract than tacit knowledge [11]. Future-oriented knowledge is typically individual, difficult to articulate and communicate, as well as very sticky and resistant to knowledge-transfer efforts [12]. It has been suggested that creating future-oriented knowledge resonates with decision-making to the extent that there are many possible futures, the realization of any of which depends in part on the choices and decisions made in the knowledge creation process [13]. Visionary capability is needed to make full use of future-oriented knowledge [14]. In this context, it means the ability to outline potential development directions based on paths already travelled and the ability to utilize opportunities emerging from changes in the environment.

III. METHODOLOGY

In order to enhance understanding about the absorption of foresight knowledge in SMEs, the empirical data was gathered by participative observation in 3 foresight workshops and by 6 semi-structured expert interviews.

A. Foresight workshops

The workshops focused on absorbing foresight knowledge in the context of international business. They were initiated by an intermediary organization.

Case 1 was a two-day workshop focusing on studying how collected weak signals could be categorized, analyzed and presented so that they would be accessible for SMEs. The signals of energy technology development in China were collected by Chinese specialists. During the time period June – October 2011 they collected 315 signals and concentrated on opportunity recognition. The signals were scattered, therefore the companies did not have much interest in the signals. The aim of the workshop was to screen the signals and find out how they could be presented to SMEs. Five people from three different development organizations participated in the workshop. They worked

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in one group during the workshop and the work was observed and documented by one researcher. The two days each had a different observer.

Case 2 consisted of two workshops organized for SMEs interested in cleantech business in Russia. The aim was to facilitate social interaction and collective interpretation of weak signals and new ideas. In the first workshop of Case 2 there were 4 participants from 3 SMEs operating in the cleantech industry, and 5 participants from intermediary organizations in Finland and Russia. The workshop lasted one day and was facilitated by a Finnish intermediary organization. The participants in the workshop were divided to work in two groups. Both groups were observed by one researcher. The second workshop of Case 2 was organized six months after the first one. The workshop lasted half a day. Compared to the signals collected in Case 1, in Case 2 the timeline was shorter and the signals were more familiar to the companies. As an outcome of Case 2, the participating companies started a joined development project in Russia [15].

TABLE I

DATA COLLECTION

Participants	**Working methods**	**Date**
Case 1: Expert panel		
5 experts from 3 intermed. organisations, 1 facilitator	Facilitated discussion, 2 researchers as observers	Dec 2011
Case 2: SME workshop		
4 participants from 3 SMEs operating in cleantech industry, 5 participants from intermed organisations, 1 facilitator	Facilitated participative methods, 2 researchers as observers	Day 1: Oct 2011
8 participants from 3 SMEs operating in cleantech and energy industries, 4 participants from intermed organisations, 1 facilitator	Presentations, a researcher as observer	Day 2: April 2012
Interviews		
1 Consultant 2 Director of Information Society Developm. 3 Foresight Manager 4 Industrial Counselor 5 Leading Specialist, Strategic Research 6 Ministerial Adviser 7 Senior Researcher 8 Senior Research Scientist		Jan-March 2012

B. Interviews

To get another perspective to the capacity of SMEs to absorb foresight knowledge, some of the Finnish leading authorities (in using foresight for innovation) were invited for an interview. The sample of experts was purposive as the first interviewees were chosen, and further pyramiding [16] was used to identify other experts.

Semi-structured interviews covered open questions about foresight in Finland in general, how foresight knowledge and signals are collected, the methods that are used to facilitate organizations to absorb foresight knowledge and the follow-up on the absorption of foresight knowledge. As a crossing theme, the SME connection was asked. The interviews were recorded and transcribed. The length varied from 50 to 100 minutes.

C. Analysis

The gathered data was analyzed through the following procedure: 1) read through interviews and workshop report, 2) underline interesting passages and write them on sticky notes and 3) organize the sticky notes according to emergent themes. Results of analysis are shown in raw form in Figure 1. Yellow notes resemble facts, green notes correspond to opinions and yellow notes hold the emergent themes.

Fig. 1 Analysis of interviews.

Researcher triangulation was used to validate the interpretations made out of data. Three researchers read the same interview transcripts and workshop observation diaries and made interpretations. Then they discussed about their findings and searched for mutual understanding, as well as differences in interpretations.

IV. HOW DO SMES DO FORESIGHT?

The findings from interviews and observed workshops can be summarized as follows. There appears to be two alternative approaches to foresight: a relatively formal foresight process facilitated by intermediary organizations and informal, continuous foresight activities embedded in everyday activities in companies. The two approaches are contrasted in table II.

TABLE II
COMPARISON OF FORMAL AND INFORMAL APPROACHES TO FORESIGHT.

Formal approach	Informal approach
- Intermediary organization collects weak signals - Intermediary organization produces reports - Workshops and other forums - Attracting participants from companies is challenging - Little evidence of effects	- Activities embedded in normal operations - Informal discussion is foresight, too - Foresight is responsibility of an individual - Companies reluctant to share foresight activities: foresight part of strategy

A. Formal approach

Formal foresight in Finland is usually a government-subsidized activity. Typically, an intermediary organization collects weak signals, writes a report and organizes a workshop for representatives of SMEs to discuss, interpret and distribute the foresight knowledge. Three out of six interviewed experts mentioned a lack of interest from SMEs to participate in workshops. The same was true also with the observed workshops: attracting participants was challenging. According to interviews there is not much evidence on the effects of foresight workshops in SMEs, at least partially due to difficulties in measuring the effects. The situation was similar with the observed workshops. In the Case 2 the companies were familiar with each other and had collaborated before. The foresight knowledge was mostly concerned with near-term future and it was partially familiar to the participants. Maybe this was also the reason why new and radical opportunities were not found. Still, companies started a collaborative project in St. Petersburg as a result of the workshops. In the Case 1 the companies did not know each other. The foresight material was broad and heterogeneous. As a result, companies were not interested.

B. Informal approach

SMEs do not have time and resources for foresight (at least not for the formal approach) due to heavy operational burdens. Instead, foresight activities are built in normal activities: according to two interviewees even informal discussions can be considered as foresight. A few experts share a viewpoint that foresight is foremost a task of an individual: some people just are more capable of absorbing new knowledge with an open mind. Furthermore, if the new knowledge requires transformations, organizational resistance is to be expected. In such a case, a champion driving the change would be useful and, especially in SMEs, the CEO is the most natural choice for this role.

V. WHAT HINDERS THE ABSORPTION OF FORESIGHT KNOWLEDGE IN SMES?

Based on the interviews of experts we identified a number of possible factors having an influence on absorption of foresight knowledge in SMEs. The factors are listed in table III and implications are discussed below.

TABLE III
POTENTIAL FACTORS HINDERING ABSORPTION OF FORESIGHT KNOWLEDGE IN SMES.

Theme	Quotes
Collecting weak signals /interviews 1,3,4	"Lots of effort put into the world of signals" "Lots of resources are used to collect weak signals in Finland" "VTT gave up their signal bank"
Availability of reports /interviews 1,5	"Everyone has noticed there's many good reports talking about future, but the implementation is a different issue" "People do lots of reporting in Finland"
Implement ation /interviews 1,3	"Many people say they do not know what to do with the reports of foresight researchers" "We foresight researchers have a bad habit of painting different scenes of the future, but leaving it open what it means in decision making"
Foresight activities in Finland /interviews 3,1,6	"According to EU report foresight is done in different parts of government, municipalities, and everywhere" "A strength in Finland is that foresight is done in different forums" "On the research side the Finnish foresight is of high quality"
Focus of foresight /interviews 2,3	"Focus of the politics is too low, it should be on ecosystem level" "Maybe it is wrong to think about foresight from the perspective of one company… rather the viewpoint of the ecosystem"
Tools and workshops /interviews 4,5	"2011 reached 3000 companies, not only with Future Sessions" "Methods used in foresight: scenarios, brainstorms, SWOT analysis, roadmaps, Delphi surveys."

Effectiveness of foresight /interviews 5,6	”We have very little evidence on how knowledge is really used and what are the effects” “It’s very difficult to measure how something influences”
Resources of SMEs /interviews 6,3,4	“The main issue in SMEs is the limited resources” “I’ve managed a couple of SMEs myself, and there’s no time for abstract thinking about the future due to heavy operational pressures” “SMEs can’t use time to follow the environment”
Heterogeneity of SMEs /interviews 5,1	“SMEs are difficult to support; there’s lots of heterogeneity” “...also our challenge, we have SMEs across the board…”
Foresight and strategy /interviews 6,5	“I’d imagine companies do foresight on their own, don’t want to share it” “Just my own experience, but companies keep the strategy in their own hands”
Role of individuals /interviews 5,3,3	“Companies are straightforward and dictatorial…CEO dictates the direction” “Idea of champions is still valid: organizations resist radical changes, some individual must drive it trough” “Utilization of real weak signals depends on the individual”
Motivation /interviews 1,3	“We can get SMEs to participate once, but if they can’t find their thing they won’t come again” “Very difficult to bring companies along”
SMEs’ foresight knowledge /interviews 4,5	“SMEs don’t understand the word foresight” “Unfortunately some companies feel they do not need foresight, especially if they are strictly subcontractors”

A. Weak signals

Lots of effort is currently put on collecting weak signals in Finland by various intermediary organizations. There is also plenty of reports available aiming to distribute the collected knowledge, but some of the experts question their utility: getting knowledge to companies is reasonably easy, but figuring out what to do with the knowledge and implementing the decisions is the real challenge. Companies often do not know what to do with the results of foresight. Lack of weak signals or information about future events does not hinder the absorption of foresight knowledge in Finnish SMEs.

B. Support for foresight and foresight tools

Government and regional actors do quite a lot foresight all around the Finland and the quality of the work is not questioned by the interviewed experts. However, the political focus of foresight might be off: instead of dealing with single companies it might be better to focus on the ecosystem level. One of the interviewees mentioned Silicon Valley in California as an example of good ecosystems in this regard: an abundance of events facilitates learning about current trends and weak signals at the ecosystem level. Various tools are available for foresight, both for independent use and in the form of workshops organized by intermediaries. Much of the material is also available in Finnish. The number of regional foresight activities and tools seem to be adequate. Insufficient resources for regional foresight activities or tools are not hindrances. The question however, is their quality. The accessibility of the foresight tools for Finnish SMEs seems to hinder their absorption of foresight knowledge.

C. Features of SMEs

The resources of the SMEs are limited and as a result they often do not have time to do foresight. SMEs’ are not particularly interested in participating in workshops. SMEs are also very diverse, which makes supporting them through external foresight activities challenging. Foresight is closely related to strategy, and companies are therefore reluctant to discuss it openly. On the other hand, many SMEs are not familiar with foresight and consider it to be a function of sales. If implementing decisions resulting from foresight requires transformations, the organization is likely to resist. A strong individual or champion might be required to drive these decisions trough, which may not be available in all SMEs. Inherent features of SMEs hinder absorption of foresight knowledge in Finnish SMEs.

VI. CONCLUSIONS

It was challenging for SMEs to perceive new signals which do not fit their current operations or existing knowledge structures. The deviating signals were easily judged, without deeper investigation, as not relevant. The main challenge in facilitating foreseeing and innovation in SMEs is to broaden their horizon to be able to see ‘unexpected’ signals in the external environment.

The signals selected to absorption were close to the participants’ existing knowledge bases. The findings suggest that SMEs tend to try and assimilate foresight knowledge even though such knowledge would actually need transformation before being put into action. The language of foresight mainly is such that it needs processing. Interpretation of generated information is the most crucial step in a foresight process, but still poorly understood. This paper proposes that new kinds of brokerage functions focusing on human sides of new knowledge absorption are needed to enhance SMEs’ absorptive capacity.

REFERENCES

[1] A. Atherton & P. Hannon (1995) *Thinking About Strategic Awareness Capability*. Small Business centre, Durham University Business School.

[2] H. Melkas & V. Harmaakorpi (eds.) (2012) *Practice-based Innovation: Insights, Applications and Policy Implications*. Springer.

[3] W. Cohen, W. & D. Levinthal (1990) Absorptive capacity: a new perspective on learning and innovation, *Administrative Science Quarterly*, Vol. 35, pp. 128–152.

[4] S. Zahra & G. George (2002) Absorptive capacity: a review, reconceptualization, and extension, *Academy of Management Review*, Vol. 27, No. 2, pp. 185–203.

[5] G. Todorova & B. Durisin (2007) Absorptive capacity: valuing a reconceptualization, *Academy of Management Review*, Vol. 32, No. 3, pp. 774–786.

[6] M. Berg-Jensen, B. Johnson, E. Lorenz & B. Lundvall (2007) Forms of knowledge and modes of innovation, *Research Policy*, Vol. 34, No. 5, pp. 680-693.

[7] V. Harmaakorpi & H. Melkas (2012) Epoilogue: two modes of practice-based innovation. In Melkas & Harmaakorpi (eds.) *Practice-based innovation: insights, applications and policy implications.* Heidelberg: Springer, pp. 437- 452.

[8] M. Gibbons, C. Limoges, H. Nowotny, S. Schwarzman, P. Scott & M. Trow (1994) *The new production of knowledge*, London: Sage

[9] R. Popper, M. Keenan, I. Miles, M. Butter & G. Sainz de la Fuenta (2007) *Global foresight outlook*.

[10] T. Uotila, M. Mäkimattila, V. Harmaakorpi & H. Melkas (2012) Combining foresight and innovation: Developing a conceptual model. *Practice-based innovation: insights, applications and policy implications.* Heidelberg: Springer, pp 29-48.

[11] T. Uotila, V. Harmaakorpi & H. Melkas (2006) A method for assessing absorptive capacity of a regional innovation system. *Fennia*, No. 184, pp. 49 - 58.

[12] E.J. Major & M. Cordey-Hayes (2000) Engaging the business support network to give SMEs the benefit of Foresight. *Technovation* Vol. 20, pp. 589 - 602.

[13] J. Kettunen, S-K Ilomäki & P. Kalliokoski (2008). *Making sense of Innovation Management*. Teknova Oy, Helsinki.

[14] V. Harmaakorpi, (2004) *Building a competitive regional innovation environment*. Doctoral Dissertation Series 2004/1. Helsinki University of Technology, Espoo.

[15] A project report from Intermediary organization (Signal sessions, LSBP) not published.

[16] E. Von Hippel, N. Franke & R. Prügl (2009) Pyramiding: Efficient search for rare subjects. *Research Policy*, Vol. 38, pp. 1397-1406.