Managing science and technology intelligence: different perspectives

Pascal Savioz*

Swiss Forum for Technology,
Innovation and Management (SFTIM)
In der Deisten 15, CH-8125 Zollikerberg, Switzerland
E-mail: pascal@savioz.info
*Corresponding author

Yoshio Sugasawa

Nihon University Graduate School of Business
4–8–24 Kudan Minami
Chiyoda-ku, Tokyo, 102–8275, Japan
E-mail: yoshio@gsb.nihon-u.ac.jp

Abstract: This paper is an introduction to this special issue on managing science and technology intelligence. While the benefits of intelligence activities for making better decisions are recognised in an increasing number of scientific papers, most researches focus on single and isolated aspects of intelligence. This special issue aims to bring together some different perspectives related to the management of science and technology intelligence, in order to provide researchers and practitioners with a more comprehensive understanding of this important topic.

Keywords: science and technology intelligence; strategic management; decision-making; value chain networks; intelligence systems; tools and techniques; risk management.

Reference to this paper should be made as follows: Savioz, P. and Sugasawa, Y. (2006) 'Managing science and technology intelligence: different perspectives', *Int. J. Technology Intelligence and Planning*, Vol. 2, No. 4, pp.325–328.

Biographical notes: Pascal Savioz is a Lecturer at the Swiss Federal Institute of Technology Zurich (ETH Zurich). His teaching and research activities are directed towards the management of technology-based enterprises, in particular technology intelligence, the early phases of innovations and strategic management in technology-based SMEs. He is the author of numerous scientific articles and books in the field of technology and innovation management. Today, he works as General Manager of a Swiss technology company in China. He also presides over the Swiss Forum for Technology, Innovation and Management (SFTIM), a network committed to the successful design, direction and further development of innovation-driven technology-intensive enterprises.

Yoshio Sugasawa is a Professor of Technology Management in the Graduate School of Business at Nihon University. His teaching and research field is in the area of strategic and competitive analysis and technology commercialisation. He is a member of Council of the Ministry

of Economy, Trade and Industry and the New Energy and Industrial Technology Development Organization. He is an editorial member of the *Pacific Economic Review* and a member of the *Institute of Electronics and Communication Engineers of Japan*. He is a member of the Society of Competitive Intelligence Professionals.

1 Introduction

The risks that inevitably accompany decisions on technical innovation projects and company development strategies can be significantly reduced by deliberately managing the inflow and processing of external information about trends in the competitive and technical environment (Gassmann and Kobe, 2006). Science and technology intelligence is understood as activities that organisations perform in order to observe and evaluate technology trends and developments, which in turn make the decision-making process more effective.

While science and technology intelligence activities have been carried out in practice and examined in management research for some decades, the approaches of how to perform these activities, how to organise them and what tools to use have changed. Lichtenthaler (2003) observed that these changes closely followed the changes in the organisation of research and development and of innovation management, and he calls for the third generation of technology intelligence processes.

The aim of this special issue on Science and Technology Intelligence is to expose the latest knowledge about how companies make successful use of intelligence activities, and for what purpose. The selection of papers covers a variety of different perspectives to provide a most comprehensive picture of this topic.

2 Integration of intelligence activities at the strategic level

In order to remain successful in the turbulently changing business and technological environment, companies can no longer afford to follow uniquely a static, extensive and long-term-oriented strategy. Strategy itself should rather be considered as a bundle of strategic decisions and actions that together form a semi-coherent strategic direction (Brown and Eisenhardt, 1998). Such strategic decisions and actions are best supported by a deep understanding of the company itself, as well as of its environment.

Fyrstén and Prittimäki introduce business intelligence as a promising approach to systematically integrating external information into the process of strategic management. They provide a model of how a typical business intelligence process is integrated into the strategic management process, rather than being a separate and stand-alone process. A human-source intelligence network is suggested as a prime asset, as people are able to process information based on tacit knowledge, which is particularly important for strategic issues. While a human-based intelligence network does not necessarily need to be a formal network, Fyrstén and Prittimäki still suggest a systematic management of activities with defined roles of key players, which are central connectors, boundary spanners, gatekeepers, information brokers and bridges, and peripheral specialists and experts (Cross and Prusak, 2002; Awazu, 2004). Both aspects, the integration

of the business intelligence process in the process of strategic management and the human-based intelligence network, are examined with an in-depth case study in a technology-based company.

3 Technology intelligence to support new value chain networks

In response to an increasingly challenging competitive environment, companies adopt more and more a cross-firm and cross-industry value chain network model (Polczynski, 2004/2005). Based on each partner's core competencies, such collaborations allow the development of improved products within a shorter time and at lower costs. In order to find the best partners and the best configuration of a value chain network, information about the complete competitive environment is essential.

Sugasawa and Takahashi analyse new value chain networks based on case studies of four leading electronic firms. It is shown how software and hardware companies are linked into an interdependent cooperation network in order to create new value for the customers. One of the most successful cases serves as a model of how activities related to technology intelligence are important when building up a value chain network.

4 Practices and models of technology intelligence systems

The integrated coordination of intelligence activities at different company levels and for different purposes is the key to success (Lichtenthaler, 2004). As coordination of activities apparently calls for a systematic approach of intelligence, *i.e.*, to establish structures and procedures and to decide on tools by taking into account the organisation's specific situation, the question remains, what are the most efficient organisation forms, and to what extent should intelligence activities be formalised?

Savioz provides insight into how leading multinational, technology-intensive companies, as well as medium-sized and start-up companies, organise and run a technology intelligence system. Based on many case studies and action research, he identifies and discusses important elements of a technology intelligence system. In confirmation of the insight from Fyrstén and Prittimäki, the human roles and the linkage to strategic decision-making and planning processes are very important elements. Furthermore, a critical requirement for a successful intelligence system is its organisational and cultural fit. A special focus is also given to the question of the organisation's size; while former studies point out a lack of resources for smaller companies, and therefore a reduced capability to run an effective and efficient intelligence system, it is shown in this study that smaller organisations nevertheless organise their intelligence activities in a similar way to large organisations.

5 Assessment and integration of intelligence tools and techniques

The use of tools and techniques accompany the people involved during all activities of the intelligence process, in particular during the analysis stage, *i.e.*, when transforming information into specific intelligence. Although there exists a variety of such tools

(Fleisher and Bensoussan, 2003), the choice of the appropriate tool to meet the specific requirements remains difficult, yet very important for the decision-makers to create value through reliably generated intelligence.

Fleisher examines the most popular tools and techniques used by analysts to examine innovation, science and technology factors in meeting the critical intelligence needs of decision-makers in their companies. As no single tool can meet specific intelligence needs, it is important to understand what combination of tools is most effective. Fleisher suggests the application of an evaluation scheme for assessing the adequacy of tools and techniques, called *FAROUT©*. This scheme uses six criteria that help the analyst in making his choice, *i.e.*, future-orientation, accuracy, resource-efficiency, objectivity, usefulness and timeliness.

6 Tools for risk management in development projects

Large investments are made in new development projects, and a smooth project execution is important for time-to-market. However, there are many external and internal risks that may lead the project to failure. In particular, software development projects underperform significantly, mainly because of the complex soft risks rather than technical risks, as for example with more traditional engineering development projects.

Kim and Park describe the characteristics of the major risk factors in different software development phases. Furthermore, they explore the relationships among the risk factors by using association rule mining. It is shown that the nature of risks vary significantly from one project phase to another. However, the understanding of the risk factors and their relatedness allows the project management to better manage the risks, and therefore to be more confident of avoiding project failure.

References

Awazu, Y. (2004) 'Informal roles and intelligence activities: some management propositions', *Journal of Competitive Intelligence and Management*, Vol. 2, No. 1, pp.16–24.

Brown, S. and Eisenhardt, K. (1998) *Competing on the Edge: Strategy as Structured Chaos*, Boston: Harvard Business School Press.

Cross, R. and Prusak, L. (2002) 'The people who make organizations go – or stop', *Harvard Business Review*, Vol. 80, No. 6, pp.105–112.

Fleisher, C.S. and Bensoussan, B. (2003) *Strategic and Competitive Analysis: Methods and Techniques for Analyzing Business Competition*, Upper Saddle River, NJ: Pearson Prentice Hall.

Gassmann, O. and Kobe, C. (2006) *Management von Innovation und Risiko*, Berlin, Heidelberg, New York: Springer.

Lichtenthaler, E. (2003) 'Third generation management of technology intelligence processes', *R&D Management*, Vol. 33, No. 4, pp.361–375.

Lichtenthaler, E. (2004) 'Coordination of technology intelligence processes: a study in technology intensive multinationals', *Technology Analysis & Strategic Management*, Vol. 16, No. 2, pp.197–221.

Polczynski, M.H. (2004/2005) 'Protecting intellectual property in a global environment', *Intellectual Property Journal*, Vol. 18, pp.83–96.