

## Chapter 9

# Technology Intelligence Systems in Industry and Academic Networks

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### ABSTRACT

*High technology firms are under many competitive pressures, which necessitates ongoing innovation and new product development. In this chapter, the early stages of the innovation process, where it is unclear which technologies have the potential to prevail and take hold in a sector, are examined. Technology intelligence systems, which support innovation in two contexts, are assessed; firstly, industry networks which are under pressure to produce successive innovations on a commercial basis, and secondly, academic networks which address innovation on a less commercial basis. This chapter outlines three different technology intelligence systems based on industry and academic networks and describes the implications in terms of technology management. The first system is based around industry based R&D centres, the second around trade associations, and the third around academic centres.*

### INTRODUCTION

The effectiveness of assimilating new information from industry is affected by absorptive capacity. Absorptive capacity is the ability of an organisation to identify useful new information, obtain it and exploit it for commercial gain (Newey and

Shulman, 2004). The relationships in a network can affect the knowledge that can be obtained as an input of absorptive capacity, ‘potential capacity’, and the transformation and exploitation of the innovation and new product development, which is referred to as ‘realised’ capacity. The implications of absorptive capacity for technology

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management are that there not only needs to be effective management of knowledge but also of organisational boundaries, which are constantly changing.

The 'what's-in-it-for-me-syndrome' (Phillips et al, 2007) is important to consider in the management of organisational boundaries as a pioneering research institution that has an innovation will need to demonstrate commercial value in order for a company to realise its capacity. Absorptive capacity is a cumulative process and in a network the knowledge build-up is greater than that of any one partner involved. For these networks to be more effective it is imperative that partners do not see things in dissimilar ways – a state of heterogeneity (Lichtenthaler, 2004). Therefore, the way a Technology Intelligence System manages this influences its success.

Technology intelligence is the systematic and informal implementation of activities that gather timely and reliable information to support decision-making for management of technology and general interests (Savioz, 2004, p45-49). There is an increasing tendency for emerging technologies to be cross-disciplinary which challenges those involved in innovation and new product development. The increasingly multi-disciplinary skill set needed by researchers and managers with product responsibility necessitates that they access and utilise innovation networks that are crossing traditional discipline boundaries.

A term commonly used for the method of gathering information and making it available to others is Knowledge Management (KM). Intellectual Capital (IC) is possession of the knowledge that results from experience and learning, which can provide an organisation with a competitive edge, and hence making it an important thing to possess. Furthermore, KM and IC management can play significant roles in producing innovation that creates value, and subsequent wealth, for the organisation. Innovation can contribute to increas-

ing the market value of a company. To gain wealth an organisation must leverage its resources, or IC, to produce innovation. In addition, organisations must prevent IC loss (Hanrahan, 2006).

Technology foresight is the method of forecasting emerging technologies and assessing and communicating the emerging technologies to suppliers, consumers and stakeholders (Kameoka et al, 2003), or the member companies of a Trade Association. Good technology foresight can assist the early stages of a firm's innovation strategies during the difficult project selection stage by providing decision making efficiency and greater creativity for new product development. Both of these are important for addressing the issue of sustainability of competitive advantage necessary for market performance. A technology innovation process can help reduce the likelihood of underinvestment in key emerging technologies in the short term. Early spotting of key technology trends is a key part of information analysis that will assist a firm's technology strategy and product development (Haour, 2004). Faster renewal of resources and products is achieved which is necessary to counter changes of markets, competitors and technological advancements.

Given that technology intelligence systems are not widely discussed in the extant literature and even those that are tend to be based on case studies and hence are context specific. This chapter will develop conceptual frameworks for better understanding the early stages of innovation and new product development in the context of industry networks and compare these to academic networks. The technology foresight activities affected by these networks are examined drawing on technology management cases from a number of emerging technology sectors to highlight the different approaches taken. The results should aid vendors facing the challenge of the increasingly multi-disciplinary nature of research along with the shortening of product lifecycles.

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