Technology and Business Integration

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The papers in this special issue of Technology Analysis and Strategic Management are all derived from selected papers presented at the EuroMOT 2006 conference on Management of Technology, organised under the auspices of the International Association for Management of Technology (IAMOT), and for which the overall theme was “Technology and Global Integration”. The conference was hosted and organised by Aston Business School.

Today’s businesses are driven both by ‘pull’ from customers and technology ‘push’. On one hand organisations try to satisfy increasingly strenuous demand, while on the other hand they must ensure the adoption of new technologies to maintain efficient operations within the value chain. These operations involve identifying customer needs, designing and developing new products, planning production, procurement, manufacturing, warehousing, and distribution of finished goods to customers. Additionally, in order to remain competitive, organizations must continuously assess the changing business environment and analyze their capabilities, which will lead them to develop appropriate competitive strategies.

As well as using their own internal staff resources organizations today undertake production and implement projects with the involvement of many other stakeholders, including consultants, contractors, suppliers and strategic partners, many of which are international.. Therefore the key to successful integration of a company’s activities in lies in coordination and managing effective relationships with all these stakeholders. Today managing the value chain is not only a question of managing supplier relationships; it is more holistic. It comprises customer relationship management, internal supply chain management and supplier relationship management, so embracing both demand and supply management within the company. Accordingly, the greatest business challenge today is to develop synergies between competitive strategy and supply chain strategy by continuously making decisions at all organisational levels. This means that trade-offs will be made between efficiency and responsiveness with respect to supply chain drivers (facilities, transportation, inventory, information, pricing and sourcing). Figure 1 demonstrates the relationship between technology management and other business functions such as operations management, project management, strategic management, and supply chain management. When organisations are faced with changes in demand (in terms of quality or quantity) there are two options open to them. The first is to change competitive strategy and the second is to change supply chain strategy.
The papers selected for this special issue each address various aspects relating to the integration of activities and trade-offs between the drivers described above. They cover a number of important topics including how new technologies and strategic activities are related, how university – industry research projects achieve success, how smaller developing countries can compete with China, how India can enter the remanufacturing market, how supply risks can be reduced, and how project complexity can be assessed. The following paragraphs introduce briefly each of the papers.

The first two papers deal with new technologies. In their paper titled “The Relationship between New Technologies and Strategic Activities”, Lawlor and Kavanagh develop a model relating technology to strategy. Their model generates four distinct domains, which are ‘development’, ‘capitalisation’, ‘creation’ and ‘cultivation’. They then apply it to a case history of the stent industry. This case indicates, first, that new technologies lack the ‘revolutionary’ characteristic with which they are normally associated, second, that the courthouse rather than the marketplace is an important if not primary domain where new technology firms compete, and third, that new technology firms are much more aggressive when interacting with other new technology firms than they are with firms from the existing industry.

In their contribution Bernardos, Barbolla and Corredera identify critical success factors for university – industry research projects using interviews with qualified university researchers who have been involved directly in collaborative projects with industry partners. Their analysis reveals that there are some features (beyond technological ones) related to the corporate partner’s
strategic and functional characteristics, which become decisive for success. A company’s real interest and involvement during the technology transfer process, its capacity to assimilate new knowledge, and a confident attitude towards the university research group are identified as being key elements for attaining an effective technology transfer.

The next two papers deal with technological and strategic issues for developing countries. Leseure, Hurreeram and Bennett in their paper titled “Playing Catch-up with China: Challenges and Strategies for Smaller Developing Countries” consider how such countries can compete by examining the cases of two examples; Mauritius and Morocco. In order to supplement their more traditional extractive and agro-based industries they have developed important textile and apparel sectors, supplying principally the EU. However, these industries in both countries have come under intense competition from China with its much lower production costs and huge capacity. As well as exploring the challenges they now face from China and the ways in which they have reacted to them this paper examines the wider industrial policy of both countries and the extent to which they have acquired the capability to meet the threats that now face them. Strategies and actions are also described and evaluated with a view to providing advice and guidance for other smaller developing countries that face similar challenges in these and other industries.

In their paper entitled “Analysis of issues relating to remanufacturing technology – a case of an Indian company”, Mukherjee and Mondal state that remanufacturing is an attractive business option involving the process of value recovery and reuse of used products. Their paper includes a critical examination of relevant issues of managing remanufacturing in an Indian photocopier manufacturing company aided by an Interpretive Structural Model (ISM) methodology. It reveals that the key drivers for this remanufacturing business are the issues relating to the user’s environment (source of returns) and marketing of remanufactured products. Product design issues do not activate others, which may be explained by the fact that the company itself is managing remanufacturing of its own products. However, experience shows that in most of the reported cases of remanufacturing, factors related to product design play an important role and trigger activation of other issues.

The last two papers deal with more conventional management issues but also highlight the importance of integration in businesses. In “Life Cycle Profit - Reducing Supply Risks by Integrated Demand Management” Reiner, Natter and Drechsler propose a new model with stochastic elements (demand) in order to investigate optimal service levels. In particular, they calibrate a system dynamics model for the integrated analysis of alternative pricing strategies and their effects on service level. They show how their model supports the identification of the best service level in terms of customer satisfaction and life cycle profit. They also introduce a new approach in system dynamics modelling to ensure external validity of their model.

Then Geraldi, in the last paper which is titled “What complexity assessments can tell us about projects? Dialogue between conception and perception” explores the value of complexity assessment to evaluate key management challenges of projects. Her paper compares and contrasts the results of complexity assessments with rich qualitative data about projects from a multi-case study conducted with seven projects in a large plant engineering company. The results
suggest that, if used with caution, complexity assessment can uncover significant challenges of projects. It also shows that complexities are partly inherent and partly (self-) induced, and therefore managers and companies should consider complexity not as given but as negotiable, and actively engage on the shaping of complexity throughout the project. The assessment of complexity itself is a tool to enable such active management.

The papers in this special issue of TASM are disparate in terms of the subjects and specific problems they address. However, they all demonstrate the importance of integration between technology management and other business functions. This will undoubtedly become more important as businesses continue relying on networks of stakeholders to work within an increasingly competitive environment.

Finally, the guest editors of this special issue wish thank the Board of the International Association for Management of Technology for entrusting to them the conference on which these papers are based. They would also like to thank the editors of TASM for allowing them the opportunity of publishing these important key papers from the conference.