

Introduction

This book is part of the series on Management of Technology (MOT) that presents trends and advances in MOT research and practice. This volume consists of selected papers from the 16th Annual Conference of the International Association for Management of Technology (IAMOT) held in Miami Beach, Florida, USA, from May 13–17, 2007. The main topic of the conference was “Management of Technology for the Service Economy.” Following two rounds of reviews 156 papers out of the 413 proposals received for the conference were retained and published in the CD of the conference proceedings.

It has been an IAMOT tradition to share some of these papers with a wider audience and 2007 was no exception. However in the interest of disseminating the greatest amount of information about recent work in MOT research and practice, IAMOT Executive Council decided to publish the selected papers into two volumes: A special issue on Management of Technology in the Service Sector to be published in IAMOT’s official journal *Technovation*, and papers in diversified areas of MOT research to be included in this volume. Thus, 25 papers were selected for publication in this book. The final selection was guided by the authors’ readiness to further improve on their contributions based on the comments provided in the conference and afterwards.

The book consists of six major sections. The first is on the general context of the knowledge economy and includes two chapters. Hidalgo and Albors attempt to predict the way management of technology will change due to the growing contribution of knowledge in the design and development of products and services. Their paper presents the results of a balanced survey highlighting the respondents’ views on the business relevance of various techniques currently in use. They also give several suggestions for companies to improve their preparedness and take advantage of the opportunities ahead. Kuittinen et al. contribute to the discussion on inter-firm cooperation by bringing together two factors: decision under uncertainty and industry dynamics. Using three industries

with different degrees of maturity, the authors show how the type and degree of uncertainty affect the cooperative arrangement and its governance.

The next section contains 5 papers dealing with the complex relations among R&D intensity, innovation, productivity and economic performance. Kuittinen et al. show that these relations are sector-related, i.e., they are not the same across industries. In particular, R&D investment decisions should consider the difference in the nature of R&D activities and the variations of the time lag between the investment and the returns. Ouchi and Watanabe study how Canon has been consistently profitable compared to other members of its peer groups. Using a System Dynamics model, they show the dynamic relations among technological diversification, learning by doing and new functionality development. Tou's paper supports the same argument for Japan's electric machinery firms. In other words, the benefits from R&D investment in terms of quality improvement and market evaluation depend on the corporate institution and the degree that its governance structure induces information sharing and institutional learning. Yanagisawa presents ways to calculate the benefits from studies that Japan Atomic Energy Research Institute (JAERI) had conducted over 45 years concerning various types of nuclear reactors. The last paper of this section proposes a method consistent with the accounting principles of the International Accounting Standards Board (IASB) to value intangible technological assets throughout the whole life cycle.

The third sections deals with the vital subject of green technologies and sustainable development. Matsumoto et al. use multi-agent modeling to analyze the diffusion of clean energy vehicles in Japan under various scenarios of oil prices. Nunes and Bennett draw on three major fields of research (environmental management, operations management and automotive production) to show how environmental concerns could be integrated in a company's decision process through the modification of the traditional SWOT analysis. Pätäri et al. argues that biofuel can help the Finnish forest sector, which is facing tough competition from emerging suppliers. In the same vein, Chéry and Marcandella present a methodology to evaluate the sustainability of a product before the actual design starts. This would allow managers to evaluate product innovations

taking into account environmental factors. All these considerations have to be reflected in new practices in the management of technology that capture the dynamic interactions between nature and society, which is the subject that Brent and Pretorius have addressed in their contribution.

The largest section of the book is Section 4, which deals with the commercialization of knowledge for economic development. Ortt et al. study the cases of the photocopier, the videocassette recorder and the microwave oven. Their conclusion is that successful companies adapt their strategy according to the phase of the technology life cycle. Buys presents a method for introducing a new technological system and which was used in South Africa's program for a new generation of nuclear reactors. In the following paper, He and Fallah track the mobility of inventors in two clusters in New Jersey and Texas, respectively. They show that changes in the network properties can predict future regional economic and social conditions. Of course, development depends also on the availability of unique competencies that can be commercialized. Trumbach et al. make an inventory of the intellectual capital in the states of Louisiana, Mississippi and Alabama along the so-called I-10 Corridor as a pre-requisite for economic recovery after Hurricane Katrina of 2005. When intellectual assets are lacking, they have to be developed one step at a time. In her paper, El Fakir examines how South Korea was able to create the appropriate learning spaces at each phase of its catching-up process from assimilation to adaptation and then improvement of imported technologies. She suggests that another institutional transformation is needed to give South Korea the ability to contribute to radically new knowledge. Tang et al. depict how the Chinese pulp and paper manufacturers have learned from global players that invested in China and are now positioned to increase the scale of their production and export aggressively to meet the global demands. The final two chapters of this section give two different, but complementary, perspectives on technological innovations in Brazil. Rodrigues et al., explain how Petrobras developed its R&D capabilities in four phases so that it is able to build on its competence in deep-sea exploration to establish an international collaborative network for innovation. Zawislak et al. track the overall R&D expenditures in Brazil over three decades and arrive at the conclusion that the "Brazilian Way" of doing business is

not conducive to radical innovations because it puts more emphasis on operational management practices to extract the maximum amount of revenues from what has been mastered in the past.

The papers of Section 5 underline the importance of organizational capabilities. Shah et al. identify three key elements for a successful venture: a thorough necessity analysis, clear objectives and the right environment. Their conclusions are based on an analysis of venturing initiatives and in particular the successes within Shell, Nokia and IBM. Grimpe and Sofka explain how a persistent R&D engagement or a highly dynamic environment (but not both) can encourage the development of a “rapid response” capability, in the face of technological volatility. Finally, Morel and Boly define two kinds of technological audits to evaluate the innovation processes in a given firm. The first is a self-assessment that gives a basic view of a company’s innovative capabilities. The in-depth evaluation is conducted by a consultant and is based on a multi-objective optimization function.

The sixth and last section of the book is on foresight and forecasting. Weissenberger-Eibl and Speith explain how a firm could anticipate forecast disruptive technologies that have the potential of harming its business by combining technology roadmapping and indicator-based forecasting. Tseng adds fuzzy relationships to the traditional logistics and Gompertz models to estimate future volume sales.

In closing, the editors would like to express their appreciation for each of the individual contributors who graciously accepted to make the many revisions that were requested.

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