Editorial: Technology management in a competitive context

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Technology management has become a major managerial concern because of globalization and innovation driven competition [1]. As the world is moving to a knowledge-based economy, knowledge creation and knowledge utilization are becoming the key concerns [2]. This along with the tightening of intellectual property rights has made it necessary for both manufacturing and service firms to focus more sharply on corporate technological innovation. The major technology management concerns arising out of the simultaneous onslaught of emerging global competition, convergence of media, computing and telecommunication, evolution of electronic commerce, globalization of the capital market are:

- reducing the time frame between the initial idea and the customer cycle;

- inducing strong brand based competition;

- facilitating rapid technological change;

- enabling technological learning in manufacturing and service firms;

- generating new generic knowledge that can be used for creating and serving many market segments, and

- evolving new technological opportunities through technological alliances.

The challenge has been to link technology development, commercial exploitation of innovations and marketing in an integrated manner. The currently prevalent innovation system has been termed the "fifth generation innovation system" [3], which involves:

- reducing the time frame between the initial idea and the market cycle through concurrent engineering;

- deriving economies of scope through reuse of knowledge in a variety of ways;

- evolving competence for managing virtual R&D teams or innovation groups, and

- strengthening innovation capabilities in the corporate sector including firms in the small and medium enterprises sector.

This has become imperative because of the convergence of technological capability, economic performance and knowledge infrastructure [4]. The emerging global changes will require that more attention be given to critical concerns, such as:

- stimulating innovations;

- reducing the time frame between the initial idea and the customer cycle;

- capturing and meeting changing customer needs;

- aligning technological systems and business strategy for sustaining competitiveness, and

- managing organizational knowledge.

This will require building capability in technology management at various levels namely, national level, firm level and functional level. To this end, a number of papers have been selected and brought together in this volume. The focus has been to sharpen the capability for meeting the twin challenges of globalization and competition. The papers selected below cover various issues as well as approaches for technology management.

1   'Technology management: a knowledge ecology perspective' attempts to use the ecosystem theory for understanding technology management concerns. Firms have to focus more attention on leveraging existing knowledge and creating new knowledge rapidly. The use of knowledge ecology concepts permits a number of deductions to be made.

2   'High technology product development: technical and management review system' highlights the need for having a comprehensive review system to ensure that both technical and cost specifications are achieved without sacrificing quality, while implementing high technology programs.

3   'Industry evolution and competence development: the imperatives of technological convergence' argues that strategies have to be focused towards coping with technological convergence. The emerging technological convergence presents a set of challenges as well as opportunities. This will require that technology management implementation focuses its thrust continuously on developing new competencies.

4   'Market analysis of mathematics based software in expert-founded venture' attempts to codify procedures for high technology venture management. The paper attempts to infuse an expert system approach to venture management. The paper highlights the need to reduce the gap between technique-based and reality-based ways of judgement and the biased behaviour of experts.

5   'Software development management: critical success factors' highlights issues in software development management. It identifies that critical success factors vary while developing different types of software. The identification of the critical success factor holds the key to competitive advantage in software development, as embedded software is becoming an intrinsic part of every major high technology system.

6   'Three generic resource-based strategies' shows that performance of a firm is a function of the competitive value of its resources, using case illustrations. The four generic strategies for competence development have been identified and the model has enormous normative value.

7   'New product development: challenges of globalization' highlights the need for strengthening the product design and development competence in a context of a developing country. The imperative to use the concept of 'virtual organization' is evident from the emerging characteristics of the context. The managerial issues need further research and attention. Though virtual organization is a useful concept it is fraught with many practical obstacles.

8 'International coordination of technology flows and knowledge activity in innovation' provides a new perspective on coordination management. Knowledge management is evolving as a new lens which can provide insights into technology management.

9 'Flexibility: an emerging meta-competence for managing high technology' shows that flexibility is emerging as a meta-competence. This is a concept to be considered up front and the need for flexibility is increasingly felt in all industries. The framework presented is useful in reducing cycle time and coping with the changes in demand characteristics.

10 'Dynamics of managing technology in a growing economy: a national perspective' highlights the experience of efforts towards enhancing technology management capabilities in a developing country. An integrative approach has been used for knowledge enhancement and facilitation.

11 'Technology management at Toshiba corporation: a knowledge evolution perspective' uses a knowledge evolution perspective for analysing the various strategies used by Toshiba. Toshiba has been simultaneously using a variety of techniques for leveraging knowledge and creating new knowledge.

On behalf of IJTM, I would like to thank all the contributors to this volume for meticulously and clearly presenting their views, in particular Dr. B. Bowonder who has been my closest colleague for many years and has given me valuable assistance in my editorial work. Finally, I would like to thank Dr. Dorgham, the Editor in Chief, for providing the necessary support. He has been a guiding spirit behind this issue and is a pioneer in diffusing the concept of technology management as a dedicated evangelist.

References

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