

# Managing Technological Advancement with Strategic Management to Gain Competitive Advantage

Ms. Faroza A. Kazi

*Department of Business Administration,  
SSBT's COET, Bambhori, Jalgon.*

Dr. Richa A. Modiyani

*Department of Business Administration,  
SSBT's COET, Bambhori, Jalgon.*

## *Abstract-*

Technological advancements have helped businesses and organizations save time and cost of production, which has been an advantage to all business, they manage these advancements to gain competitive advantage. This paper discusses the importance and need of technology and innovation strategy into business strategy to achieve overall competitive advantage for the company. The use of technology and innovation in value creation system is highlighted in a way that it plays a pivotal role in productivity, economic growth, increasing wealth in socioeconomic environment, and evolution of entire industries. In the globalized business, companies require strategic thinking and only by evolving good corporate strategies they can become strategically competitive. Strategy formation and execution in the context of technology is discussed that technology strategy should be aligned to corporate strategy competitiveness for the company. Moreover, what benefits companies can get from these are highlighted and discussed in relation to corporate business strategy. As an example, RFID Deployment in INDIAN RAILWAYS: A case study of E-Transport Initiative in India becoming a market leader using technology strategy has also been discussed in this paper.

**Keywords:** Technology, Innovation, Strategy, Competitive Advantage & RFID.

## I. Introduction

Our personal life is highly dependent on the technology that people have developed. Technology has advanced with years and it has changed the way we purchase products, the way we live, the way we communicate, the way we travel, the way we learn and so many changes have been brought about by these continuous technological advancements. Technological advancements during the past century have made economy and social environments very complex and competitive. Technological advancements have brought about drastic changes in evolution of industries over time. Especially in highly technology oriented industries, technological competition on global scale makes a significant managerial challenge for firms or organizations. The basic and absolute question is how firms can manage strategically their product offering, value chain system, product strategies and technology, competences and capabilities in complex changing business and technological environment.

Technology plays a pivotal role in managing environment for better productivity, innovation and business model development. Companies do struggle in adapting to new technological trends, and investments optimization process to cater for new opportunities in the market place. Therefore, fundamental need for companies is to be capable of creating and executing business and technology level strategies side by side to achieve sustained competitiveness and value creation. In order to achieve high return on investments and better performance as a whole, enterprises need to have strategic management capabilities. The term 'strategic' in relation to technology management emphasizes the linkage of strategic management with technology management. Furthermore, strategic refers to strategic technology management as being separate own discipline itself apart from other managements like innovation management and R&D management which surrounds technology management activities. Thus, strategic technology management is placed or considered apart from other types of management in practice.

## II. Strategic Management

Strategic management is concerned with the policy that a company adopts to create, enhance and sustain its capabilities based on its environment and in achieving its objectives. The concept of strategy and strategic management has evolved and matured over the years. Strategic management covers aspects such as the current environment, society, organization, enterprise, management, people, knowledge, outcomes and value creation.

a) The use of technology and innovation in value creation system play a pivotal role in productivity, economic growth, increasing wealth in socioeconomic environment, and evolution of entire industries. The companies have to plan, define, and execute strategy in a way to develop required capabilities to meet customer and stakeholders' desires. The strategy creation and execution would eventually define the position of a company in the market and its value chain. In both micro and macro levels, use of strategic technological management is concerned with the proactive use of technology of an enterprise to achieve sustained value creation and survival amongst business models changes and the industry evolutions enabled by advancements in technology.

b) Technology strategy should be aligned to corporate strategy in order to reap out benefits like performance and competitiveness for the company, or the other way, technology strategy is to be derived from corporate strategy. Companies' main concern in strategy formation related to technology is to deal with complex and dynamic nature of technological developments. Another challenge faced by companies is management control of firms' technological evolution in such fast changing and unpredictable technology and business environment. Considering the expansion of technology and innovation, as well as strict involvement of these in every business process of a company, conduct and role of strategic technology management is inevitable.

c) Considering the importance and relation of technology with the firms' broad competitive strategy, technology should be connected and aligned to business strategy. In current era, technology strategy has become a key factor in devising business strategy and to sustain a competitive advantage. Which competences and technologies are to be adopted for competitive advantage, what should be the investment level on technology development, and how to organize technology development and its management etc.

Although, scope and importance of technology strategy is defined in companies, but the extent to which such strategy is incorporated into business strategy and the existence of an explicit technology strategy varies even in technology oriented firms. Moreover, there exist forces, both internal and external that do shape the formation and execution of technology strategy and these forces are integrative and generative in nature. In this regard, Determinants of technology strategy are presented in the Fig. 1, showing different forces affecting the formation and execution of technology strategy.

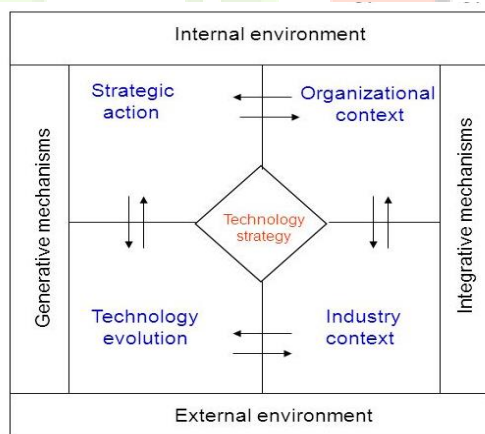


Fig. 1 Determinants of technology strategy

### III. Management of Technology and Innovation

A. *Technology management*: It is essentially concerned with the interface of the organization and the external technological environment. Technological items include licensing, acquisition, technological status, R&D and technological policies. While innovation management areas are new product development, new process development and innovation policies.

Technology Management defines technology as “technology refers to theoretical and practical knowledge, skills and artifacts that can be used to develop products and services as well their production and delivery systems. Technology can be embodied in people, materials, cognitive and physical processes, plant, equipment, and tools”. Fig. 2 demonstrates the various disciplines that can influence the management of technology and innovation.

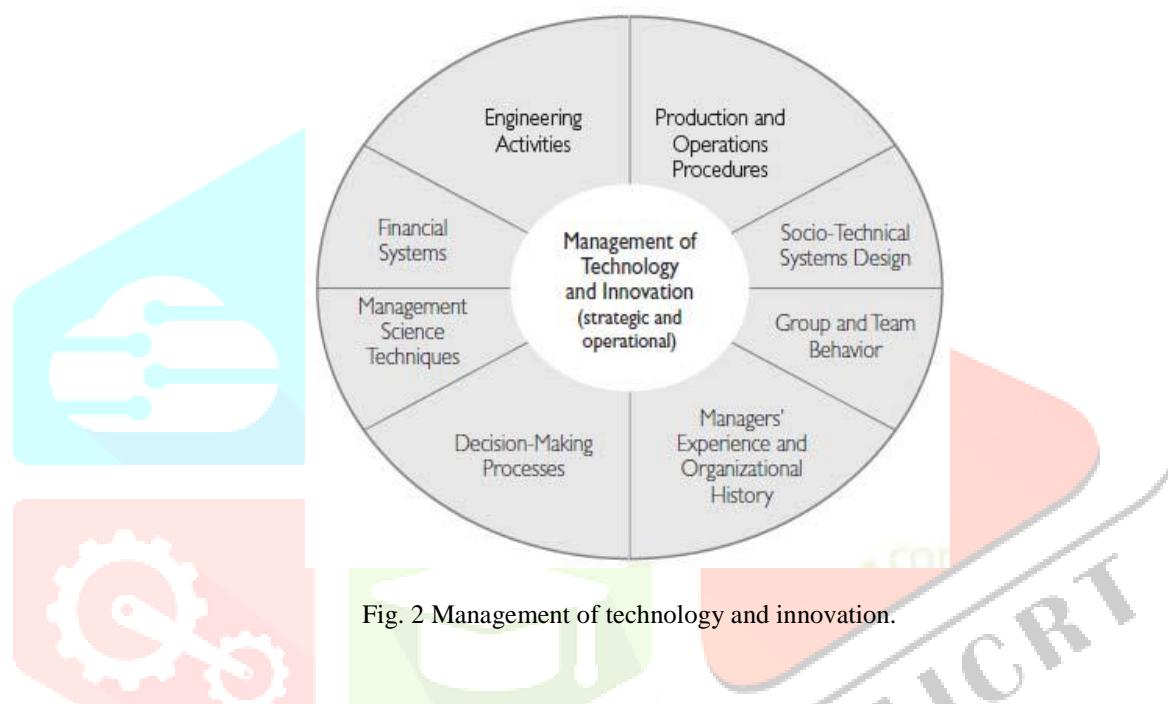


Fig. 2 Management of technology and innovation.

B. *Innovation management*: It is defined as a “comprehensive approach to managerial problem solving and action based on an integrative problem solving framework, and an understanding of the linkages among innovation streams, organizational teams, and organization evolution”. It is about implementation— handling politics, control, and individual resistance to change. The manager is an architect/engineer, politician/network builder, and artist/scientist.

Effective innovation management depends on the organization’s top management inclination to commit the resources to respond accordingly. This commitment requires their recognition of several realities such as Management of technology incorporates the management of innovation, It requires encouraging an environment where innovative thought and work are encouraged, It involves leading a firm from existing processes and products to something that is “better” and more valuable and It is proactive and encourages creativity and risk taking.

### IV. Importance of Technology and Innovation to Business

In many industries technological innovation is most important driver to gain competitive advantage. The companies are adopting new technology advancements and innovations due to the globalization of markets. Not only are innovation and technology imperative to the economy, but they are clearly worth arguing over. This can be illustrated by fact ten years ago pricing on many machinery and commodity products were done very inefficiently. However, new technological advancements have eliminated this inefficiency. Especially the Internet has resulted in more transparent and efficient means of pricing for both capital goods and

commodity products. Advancements in technology have made consumers more knowledgeable and they are more aware of opportunities to obtain and use products. This leads to greater demand and precise information leads to pricing being more systematic. As a result, technology leads to better pricing. A similar cycle has taken place in other markets, people use internet to buy automobiles, books and other products. This leads to greater number of buyers but also building pressure on firms in terms of lower prices

#### V. Indian Railways: Case Study

“Indian Railways, having the largest networking, it contributes a lump sum amount of revenue in terms of freight and passengers, using information technology to improve its operations and to gain competitive advantage. Information technology plays an important role in the success and they pay continual attention to technological advancement to sustain competitive advantage. Indian Railways looked into RFID technology to improve its operations and make further progression such as reducing cost. The vastness of railways – cars, cargo, track, countries and conditions – presents a massive challenge for management of rolling stock and rail operations. This largest railway network is on the verge of undertaking a pilot project on “RFID Deployment” for automatic identification of railway wagons across the whole of India.

Since the railways represent one of the best modes of transport available to the common people, it would be impossible to just keeping increasing the fares to meet the costs incurred due to maintenance, the large workforce and the expansion activities. The Railways should therefore, consider upgrading itself to cutting-edge technologies for better efficiency and cost reduction. One such up gradation is the role of information technology which is achieved with the help of RFID technology. This RFID technology has been extensively used in the identification process with the help of a card and a reader. The idea has evolved from a systematic study of the computerization of railways, higher demand for Freight and Passenger transport, with planned economic growth. Technological upgradation for better maintenance of railway assets and upgradation of the Railway Production units for improved efficiency and productivity.

##### A. RFID Solutions:

1. Through RFID technology, a variety of things can n be automatically identified, wagon located, wagon/coach number tracked, weight information, monitored and protected.
2. The things that at can be RFID tagged include: personnel, assets, vehicles, inventory, etc. as well as their conditions and the environment around them.
3. RFID can operate around the enterprise in a local area, indoors or outdoors.
4. Assets can be automatically protected giving the owner the freedom to come and go on from a secured location with the assets.
5. Wagons and coaches can be provided fast, “rolling access” to yards.
6. Wagons/Coach Trailers/ Containers a and personnel can be automatically identified and coordinated, resulting in dramatic efficiencies in personnel and asset utilization, all of which can enable increased revenue.

#### VI. Conclusion

Companies would have to take technology and innovation as a strategic objective of the company to sustain their competitive advantage. Organizations do have to undergo technological developments and innovations to cater for economically complex and dynamically changing social environments. In order to achieve such objectives, need for strategic technological and innovation management becomes inevitable.

Technology strategy in being a key ingredient in technology management has become a primary factor in devising business strategy and to sustain a competitive advantage, so companies do need to connect and align technology strategy with business strategy. Companies have to plan, define, and execute strategy in a way to develop required capabilities to meet customer and stakeholders’ desires. This would allow companies to better understand concepts and intermediary steps, required to formulate a

technology and innovation framework for them to develop and sustain technological capabilities. With this, organizations will be able to benefit from their internal strengths, overcome their weaknesses, exploit external opportunities and minimize their external threats.

The paper gives an overview of the current state and trends of RFID technology. Practical RFID systems are involved in real time tracking and monitoring of events. The system performs appropriate actions in response to events based on certain conditions.

#### References

- [1] Ansoff, I. 1979. Strategic Management. London, UK, McMillan.
- [2] Ansoff, I. 1987. Strategic management of technology. The Journal of Business Strategy 7(3): 28–39
- [3] Burgelman, RA., Maidique, A. & Wheelwright, SC. 2001 Strategic Management of Technology and Innovation. New York, USA, McGraw-Hill.
- [4] Management of Technological Innovation: Strategy and Practice; UK, Oxford University Press.
- [5] Kropsu-Vehkaperä H, Haapasalo, H. & Rusanen, J. 2009. Analysis of technology management functions in finish high tech companies. The Open Management Journal 2: 1–10.
- [6] Margaret, A. W., & Garry, D. B. 2007. The Management of Technology and Innovation: A Strategic Approach.
- [7] Mintzberg H, Ahlstrand B & Lampel J (2005) Strategy Safari: A Guided Tour through the Wilds of Strategic Management. USA, Free Press.

