Proceedings of GLOGIFT 07
November 15-17, 2007
UP Technical University
Noida, pp. 571-580

TECHNOLOGY STRATEGY FOR TRANSFORMATION: CASE OF SONA KOYO STEERING SYSTEMS

Jyoti S. A. Bhat*, S. K. Breja and K. Bhattcharjee*****

ABSTRACT

Globalization has created new opportunities and made the organizations compete harder. In today's times, technology is a competitive advantage. World over, firms are crafting sound business and technology strategy, and innovating for establishing competitive edge in the global market place. The paper presents the case of an auto-component manufacturing Indo-Japanese venture, transforming for globalization.

Keywords: Technology, Strategy, Transformation

Introduction

The current decade is witnessing an increasing demand for all kinds of vehicles. It has been predicted that passenger car sales would grow in the next three decades to the number of 250 million vehicles. While a number of companies are planning to enter the economy segment, medium segment is also registering appreciable growth. This is leading to the development of increasingly sophisticated designs, and automobile manufacturers are continuously investing in innovative technologies that produce environment friendly vehicles with fuel-efficient engines, which can be safely driven. One important feature that is coveted in a modern automobile is the power steering system, especially in the medium car segment.

Strategies for Sustaining The Growth

Factors like Globalization of markets, adaptability of companies to bring out products to serve local markets, rapid change in technologies as well as dispersion of multiple technologies in each complex system are forcing automobile and auto-component manufacturers to review their business strategy and ensure its implementation through respective functional objectives and strategies.

Technology strategy plays an important role among the various functional strategies, when aligned appropriately with the business strategy. In comparison with the rest of the world as well as other sectors of the economy, globalization of innovation networks in the automobile industry is limited in India and diversification of trans-border technology is moderate. Although the companies in the automotive sector are presently in the growth mode, development of global networks in this sector is known to be constrained by communication difficulties, pressures for regional autonomy, predominance of applied research and mechanical specialization. Under

* DSIR, Ministry of Science & Technology

** Group Manager-TQM,National Council for Cement and Building Mateials, New Delhi

*** Assistant Registrar (IRD), India Institute of Technology, Delhi

the circumstances, the importance of effective strategy cannot be over-emphasized.

Sona Koyo Steering Systems Ltd. - The Case Organization

A study was undertaken to study the effectiveness of technology strategy of a company competing in the global market place. The company selected was Sona Koyo Steering Systems Ltd. (SKSSL). This company is India's leading auto-component manufacturing company. It is located in Gurgaon (India) and has a second plant near Chennai which is a 100% EOU. It is setting up more plants in the states of Haryana and Uttaranchal. SKSSL is a major supplier to Maruti Udyog Limited. In recent years, SKSSL has widened its customer base to include Hindustan Motors, Hyundai, Eicher, Daewoo and Toyota. It has weathered many crises through effective implementation of well-crafted strategies.

Key Objective of the Study

The key objective of the work has been to study the technology strategy of SKSSL and analyze its impact on company's business performance and global competitiveness.

Methodology

Initially data and information about SKSSL was gathered from the company's website and through the net. A visit to the Gurgaon plant of the company was paid on 10.04.2007 to collect first-hand information about the company. There discussions were held with company's senior management, responsible for strategy, and the management interviewed to gain insight into company's business strategy and technology strategy. Thus, the study relies on primary data and first-hand information basically, in addition to the secondary data.

Company Profile

Sona Koyo Steering Systems Ltd. (SKSSL) is a technical and financial joint venture company of JTEKT (earlier known as Koyo Seiko company, Japan), the global technology leader in steering systems. The company's head quarters are located in Delhi.The company has a market share of 45% in volumes and is the largest manufacturer of steering gears in India. It is the leading supplier of hydraulic power steering systems, manual rack and pinion steering systems and collapsible, tilt and rigid steering columns for passenger vans and MUVs. It has also collaborated with Fuji Auto-Tech to gain access to European markets. It is the first steering system company in the world to have received Deming Application Prize and was named as a Global Growth Company in 1997 by the World Economic Forum. Maruti is an alliance partner of Sona Koyo and also a major customer. Over the years, the company has made efforts to move up the value chain and also broaden its customer base. As a result, the company now has clientele that includes auto-majors such as Hindustan Motors, Hyundai, Telco, Eicher, Kirloskar, Daewoo, Tata Motors and Mahindra and Mahindra. Maruti continues to be the single largest customer accounting for 58 per cent of revenues.

Product Portfolio

Sona Koyo's product portfolio falls into two distinct families- steering system products and driveline products, with steering business fetching 60% of the revenues. The portfolio is shown in Table 1 (source: SKSSL web site).

Business Environment

India is currently on a high growth trajectory. High GDP growth coupled with higher disposable incomes and increased purchasing power are leading to increased penetration of passenger cars and multi-utility vehicles, which are only 10 per 1000 population in India as against 36 in

Switzerland. There is continuous up gradation from lower to upper segments, and the use of electric power steering in passenger vehicles is increasing (Fig. 1). Passenger car sales are growing at an average rate of 18%. Commercial segment is also showing good growth. The industry is highly competitive and there are pricing pressures on the auto-component manufacturers due to increasing competition in the automobile sector.

Table 1: Product portfolio

Steering System Products	Drive Line Products
· Rack & pinion (RP) manual steering · Rack & pinion power steering · Re-circulating ball screw (RBS) type gear assembly · Column assembly-rigid · Column assembly-collapsible · Column assembly- collapsible tilting · Universal joints	· Rear axle assembly · Case differential assembly · Propeller shaft

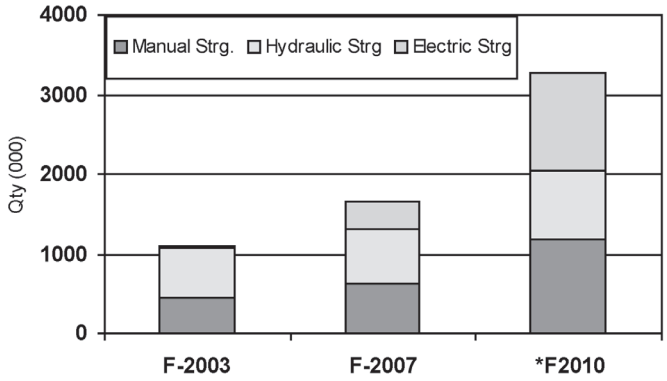

Figure 1: Steering system technology: trend towards EPS (Source: SKSSL)

Key Findings

Based on the discussion with the company management, some insight has been gained into the overall strategy of the company and various initiatives taken by it in recent years to improve its performance and emergence on the global scene. The key findings of the study are stated hereunder.

Sona Koyo's Mission and Growth Aspirations

Mission: Create a company that India is proud of.

Vision: To make Sona a partner of choice to global customers:

1. An organization of energized and involved employees
2. Growing & achieving high profitability

3. Supplying to major global OEMs directly or indirectly
4. At least 45% of the sales are to overseas customers
5. Continue to be No.1 steering systems company in India

Business Strategy

Based on the discussions with management, it seems that main elements of SKSSL's business strategy are:

- Build capabilities
- Diversify product portfolio
- Expand customer base
- Increase exports

Technology Strategy

The technology strategy of the company seems to include the following elements:

- Acquisition of technology by establishing JVs
- Assimilation and commercialization of acquired technology
- Developing in-house design and development capabilities
- Collaborating with leading institutions for developing future generation products

Initiatives

The company has taken following initiatives on the technology front to meet its growth aspirations in the domestic and overseas market:

- Acquisition of design, development and testing capabilities
- Capability to conduct performance testing of steering system on a vehicle
- Partnership with IIT-Delhi and IIT-Mumbai for developing new concepts
- Acquisition of capabilities for developing electronic controls for power steering systems
- Virtual simulation and analysis on designing, leading to reduction in development time of new products

IT Strategy

Sona Koyo is using IT for developing new technologies and designing and testing new products by:

- Leveraging IT tools in development processes
- Consolidating, integrating and optimizing systems

Initiatives

The company has taken following IT initiatives:

- Review of IT infrastructure
- Integration of the design software with ERP system
- Linking enhanced design software with new product development software
- System for feeding real time production data and integration with ERP system

TQM and TPM for Global Competitiveness

Sona Koyo systems went through a period of crisis in 1999 and adopted TQM. Then the company started implementing TQM and has gradually moved forward. It has implemented TQM programmes in three phases.

Now the company is in breakthrough phase. Its holistic approach to TQM has the following characteristics:

- Retainment - Work simplification (Application of Pokayoke (error proofing, Visualization and Exactness)
- Improvement - Skill building (Implementation of Toyota Production System-TPS, TPM, Group Kaizen Activities-GKA)
- Breakthrough - Uniqueness (New management model, unique products and processes and machine development)

Some of the other improvement measures and initiatives taken by the company are:

- 5 S
- Flow manufacturing
- Breakthrough management
- Risk hazard analysis
- Suppliers as partners (advocating TQM & TPM practices with suppliers)

According to the company, it implements TPM with the aim of attaining operational excellence, with continuous improvement. It has strong focus on quality, cost, delivery and safety for achieving the following targets:

- Quality - zero defect
- Cost - zero waste
- Delivery - zero breakdown
- Safety - zero accident

The Analysis

Technological Achievements

Technology strategy refers to choices that companies make in acquiring, developing and deploying technology in order to achieve business goals. It involves the acquisition, management and exploitation of the product and process technologies that are consistent and supportive of the firm's business strategies and can ultimately drive its business competitiveness by providing technologically based advantages.

Strategically SKSSL was formed through equity participation with Sona group and Koyo Seiko, Japan, and later it formed a joint venture with Maruti Udyog ltd., the largest domestic car manufacturer. The JV provided SKSSL an opportunity to supply its products to Maruti. Later, SKSSL diversified its customer portfolio to include most of the domestic and MNC automobile manufacturers. SKSSL secured the distinctive technological capabilities through its technology partner Koyo Seiko, now known as JTEKT, which is the largest player worldwide in steering systems and also through in-house R&D. It has set up sophisticated and fully integrated facilities for R&D and has been spending a fairly large proportion of its sales turnover on R&D.

It has succeeded in its efforts to shorten the time period of the process from the design

stage to the actual manufacturing, mainly through its association with Koyo. SKSSL has also created an appropriate IT infrastructure to carry out in-house development by installing state-of-the- art software and modeling tools. This hi-tech facility and trained engineers have helped SKSSL to achieve quicker and error-free updating of design documents, shorter lead-time for new product introductions and reduced downtime on account of developments.

It has had fruitful collaborations with leading technology providers and is working with leading academic institutions on disruptive technologies. Over the years, SKSSL has developed specialized capabilities in design and development. It involves customers in new product development and uses virtual simulation and testing tools. For localization, it takes feedback from dealers, car owners and drivers. As a result of these efforts, SKSSL has been able to achieve several breakthroughs and is paying attention to niche markets; development of steering columns for off-highway vehicles in U.S. being a case in point. Fig. 2 shows the trend in development of new products at Sona Koyo.

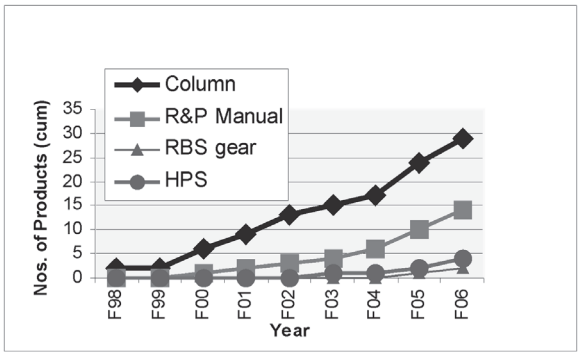

Figure 2: New product development at Sona Koyo (source: SKSSL)

Framework of Technology Strategy

Sona Koyo is learning with experience. To meet the challenges, it has adopted counter-offensive approach. Its strategy is evolving over the years with acquisition of capabilities and development of distinct competencies, particularly in designing. It has acquired 12 patents also. While earlier it had a cost focus, now with gradual acquisition of new capabilities and adopting TQM practices it is differentiating and positioning itself as a supplier of choice to global customers. The following framework appears to be applicable to Sona Koyo in respect of technology strategy.

Technology strategy of Skssl-capabilities based learning

Fig.3: Experiential learning

Alignment of Strategy

The above analysis shows that technology strategy and various initiatives of SKSSL emanate from the business strategy, crafted to realize the company vision. Strategy alignment is represented in Fig.4.

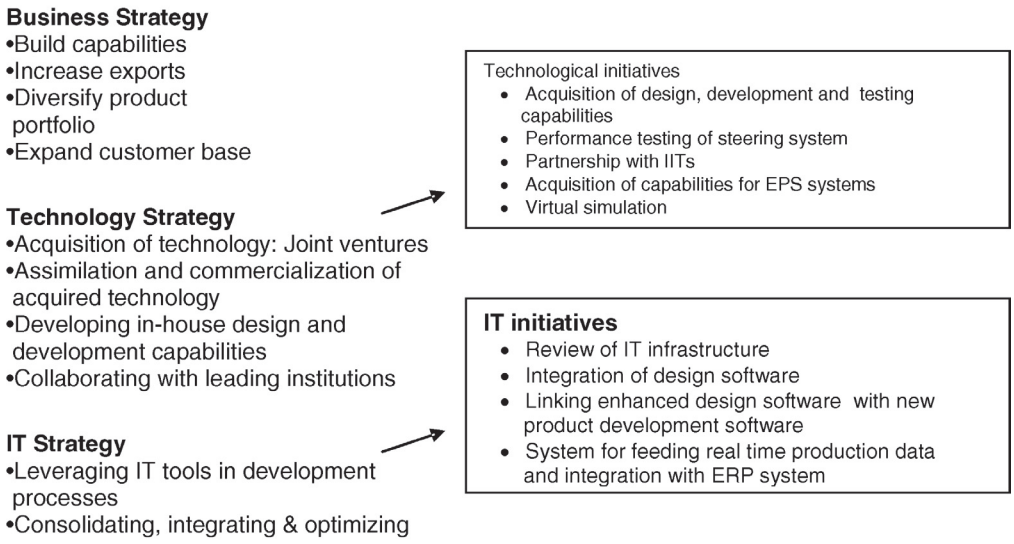

Figure 4: Strategy alignment at SKSSL

Other Outcomes

The effect of implementing TQM is distinctly positive on performance. The improvement in performance is evident on the following fronts:

- In-house rejections have come down from over 17,000 ppm in 1997 to 50 now
- Customer returns also have come down to the same level
- Number of new products developed has increased
- The company has moved up the value chain
- Operator efficiency has increased
- Sales per employee have also increased considerably

Learnings

Sona Koyo has a had a sound business strategy in the past few years and an effective technology strategy in place to make the best of the opportunity provided by the growing economy. Technology selection and product development through structured need analysis, decisions relating to in - house capability assessment and appropriate choice of collaborator have been important elements of their efforts to develop new products.

Location has also been selected very strategically, close to MUL in Gurgaon and to Hyundai in Chennai. It has strived to deliver with quality and performance in a profitable manner. This has been articulated through the technology strategy and expanding the market in existing businesses or launching new businesses through product and / or process innovations.

It has devoted attention to developing in-house R&D capabilities, and over the years has converted itself from being a unit manufacturing to print to a company designing products as per the needs of customers belonging to economy, high-end as well as some niche segments. It is now becoming a complete solutions provider.

The case has led to following learnings:

- Technological capabilities are a must to forge forward on the global scene
- Technology acquisition and absorption leading to commercialization pave the way for success on technology front
- Developing in-house R&D capabilities and distinct competencies are a must for sustaining the success
- Leveraging of IT leads to process efficiencies
- Making mark on the global scene requires continuous pursuit of excellence
- Collaborations and JVs result in mutual benefit and synergies

Discussion and Recommendations

Innovation and the strategic management of technology help firms, large and small, tide over survival and competitiveness related problems. Innovation in any organization can be broadly seen to be prevalent in several forms viz. product innovation, technology innovation, human innovation, market innovation, business innovation, organizational innovation, information systems innovation and global innovation (Bhat, 1997). With the advent of information technology, innovation acquired greater significance as the impact of information systems on different forms of innovation became more apparent.

Product innovation generally refers to technology developments that are oriented towards creation of products with better characteristics and can be seen as belonging to incremental innovation, technical innovation, application innovation or radical innovation (Gobeli et al. 1987). A firm must ideally exhibit all the four forms of product innovation. Further, a resource portfolio diagram helps in identifying projects requiring different orders of development efforts and efficiently allocating resources (Yamanouchi, 1986).

Technology innovation, evolutionary or revolutionary, depending upon the discontinuous or continuous nature of changes wrought by the technology, are further seen as necessary to drive innovation in different sectors. Even economic cycles have been known to correspond roughly with these innovation cycles (Mensch, 1979).

Human resources innovation has been attached great importance in recent times in firms, People having diverse capabilities are recognized as important assets (Oesch, 1993). Joseph Schumpeter's theory of creative destruction had always emphasized the importance of human capital in an organization (Schumpeter, 1934).

The importance of applying the right marketing strategy in a firm, depending upon the choice of stance viz. leader, niche player, challenger or follower in different categories of products depending upon organizational strengths and vision has been apparent (Shimaguchi, 1986). The importance of involving the end customers in the creation of goods and the effectiveness of an integrated marketing approach in which the production and marketing functions work in unison with the buyer has been stressed upon (McCarthy, 1968). SKSSL has been paying attention to these aspects.

Businesses are known to follow the traditional 'S' curve life cycle pattern of the technology

or product life cycle. Judicious decision making is thus called for in any business depending upon several factors varying from sector specific, competitor specific, technology specific and environment specific issues, coupled with effective implementation (Prahalad and Hamel, 1990).

Along with the above, the concept of a learning organization, in which employees continually expand their capabilities to contribute together towards the growth of the firm by learning how to learn together, has been gaining ground (Senge, 1996). The importance of continuous improvement or Kaizen, and continuous risk taking are different means of bringing about effective organizational innovation (Orihata, 1997 and Ohame, 1996), and SKSSL has been engaging in both.

Sona Koyo is a learning organization, involving end-customers in product development, and leveraging IT for design and development. It has linked its technology strategy to business strategy, to realize the vision of becoming a supplier of choice to global customers. It is continually making efforts to have access to the best technology, and commercialize it. While domestic growth is above expectations, exports are not picking up. This calls for attention to HR and further promoting creativity and innovation.

Global innovation issues transcend aspects related to individual country aspects and focus more on resources that are to be shared by mankind and on human and social aspects that affect life at large for all mankind. Various multilateral organizations are devoted to these aspects. Firms, in general, need to keep the overall perspective in formulating strategies. Information systems innovation, as apparent has a profound impact on most functions in an organization in ways that are getting unraveled by the day. The need to thus formulate and implement effective strategies built around this aspect cannot be neglected.

Conclusion

Sona Koyo is a successful steering system company. The major enablers of its competitiveness have been strategic management of technology, development of distinct competencies, adoption of world-class production systems and TQM approach to managing quality. To establish edge in the international market, it has to pay attention to human resource, derisk the business further and innovate aggressively.

Acknowledgement

The authors thank Professor Sushil, DMS, IIT - Delhi, for his valuable guidence in the study.

The authors also thank M/s SKSSL for enabling the study. They also thank DMS, IIT-Delhi, for providing research facilities for the study.

References

- Bhat, J. S. A. (1997) Management of innovation and R&D*, Globalization, Flexibility and Competitiveness*, Delhi.
- Gobeli, David, H. and Brown, Daniel, J. (1987) Analyzing product innovations, *Research Management*, 30(4).
- http:www.sonagroup.com.
- McCarthy and Jerome, E. (1968) Basic marketing: a managerial approach, Homewood, IL: R D Irwin.
- Mensch, G. (1979) The technology stalemate, New York, Ballinger.
- Oesch, R.V. (1993) A whack on the side of the head, Harper Collins Publishers, New Delhi.
- Orihata, M. (1997) Steering a new course for Japanese management, *Strategy & Business*, Second Quarter.
- Ohame, Kenichi (1983) The mind of the strategist: business planning for competitive advantage,

penguin books, England.
- Porter, M.E. (1983) The technological dimensions of competitive strategy, *Research*
- *on Technological Innovation, Management and Policy*, pp.1-33.
- Porter, M.E.(1985) Competitive advantage, Free Press, New York.
- Prahalad and Hamel (1990) The core competence of a corporation, *Harvard Business Review,* May-June, pp.79-91.
- Prahalad, C. K. and Hamel, G. (1990) The core competence of the corporation, *Harvard Business Review*, May-June, pp.79-91.
- Schumpeter, J. (1934) *The theory of economic development,* Harvard University Press, Cambridge.
- Senge, P. (1996) The fifth discipline, New York.
- Shimaguchi, M. (1986) Integrated Marketing, Tokyo. Yamanouchi, T (1986) Technology Management for Corporate Innovation, Tokyo.