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# Synergesis of Technology Breakthroughs with Management Innovations

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*Competitive advantage can only be achieved through successful fusion of technology and the demands of the ever changing market. A futuristic strategy aims at collaborative research where knowledge is a critical success factor, a key differentiator. Through constant technological innovation and cross-pollination of ideas from functional disciplines, a firm can successfully delay and even prevent the demise of its dominant ventures and stay competitive. We need to focus on our processes to refine and redefine them for sustainable advantage in the dynamics of the competitive market place.*

*(This article discusses the development of futuristic technology for sharpening core competencies to achieve competitive advantage & calls for the matching of management innovations with technology breakthroughs that hi-tech organizations shall have to develop & harness.)*

**F**AST technological changes, leading to the development of new products and services as a consequence of explosion of knowledge and burgeoning need to provide improved structure and functioning of the business organizations regarding R&D activities, need more innovation focussed attention. The ability to generate and utilize knowledge is the main thrust to stay competitive. In fact companies which innovate tend to manage and deploy their R&D resources in a better strategic manner. This requires vision on the part of top management not only to envisage innovation but support necessary R&D activities and attendant innovation efforts. It is important to make it a part of the value system of the organisation. Development of the first indigenously made Indian car by TELCO is an indication of an enduring vision based on provision of support to technological innovations and presence of adequate amount of technical enterprise on the part of top management. Formulation of suitable strategy to integrate R&D activities with corporate strategy is the pre-requisite for technological innovation. We all know that R&D activities are both of short term and long term nature. A balance should be maintained between the incremental developmental research which is of short term nature and the radical break through research which is to ensure that a proper leverage in the technological strength is struck. This will make certain that the two do not contradict each other. Innovations through R&D having different time horizons to utilise resources systematically to attain both major breakthroughs and minor developmental influences leading to viable products, shall be the broad plans adopted by well established MNC's.

Customisation of technologies to make the products market driven shall need establishment of linkages between R&D and customers. Converting demands from a hazy set of wants and needs into well defined products and services may need translation of skills known as 'demand articulation'. This is achieved by a two step process of converting market data into product concept and decompose the same into developmental projects.

To review, the innovations shall not come from radical breakthroughs but from a number of small incremental improvements on the existing technology, each building a chain on the other and on the premise of integrating the advances in different technological and scientific fields. A case is of Video Tape Recorders, which have been built by improvements in as diverse disciplines as magnetic theory and recorded electronics, frequency modulation, control theory, chemistry and material sciences. Thus, 'technology fusion' consisting of combining existing technologies and functional expertise, aims at blending incremental technical improvements from several previously separate fields of technology and results in new products and technologies. For innovation outcomes from the 'technology fusion' approach, assessment of capabilities and composition of the project team is an essential pre-requisite. This project team should have members with cross functional expertise.

fundamental industries. This will drive advanced economies and shall enable convergence towards information super highway, thereby setting a path for a multimedia industry along with entertainment business. This will generate hi-tech critical mass for the markets.

Coming back to the significance of continuous innovation in the technologies, the efficiency and the effectiveness of the operation of industrial systems of advanced nations, sight should not be lost of the fact that it is immune to human errors of interpretation and judgment. In advanced technologies harmonious orchestration and synergistic tendency of the salient factors of working of the industry is to be accomplished through team work. Shared vision of the economic features and perception of vulnerability is to be kept in view by the captains of industry using future technology. This calls for continuous innovation in management systems related to H.R.

Thurow, an American expert in 1992 envisioned that intensive development of seven key technologies shall sustain and intensify the development of these generic technologies in the advanced nations in order to cope effectively with the competitive prowess of their opponents. He stressed the need for a

focus on process rather than on product innovation. These technologies are micro electronics, bio-technology, new materials, civil aviations, telecommunication, robotics, machine tools, computers and software. In addition the commercial opportunities for exploitation in future are advanced materials manufacturing systems including Artificial Intelligence, flexible integrated management and sensor technology, life sciences including bio-technology.

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