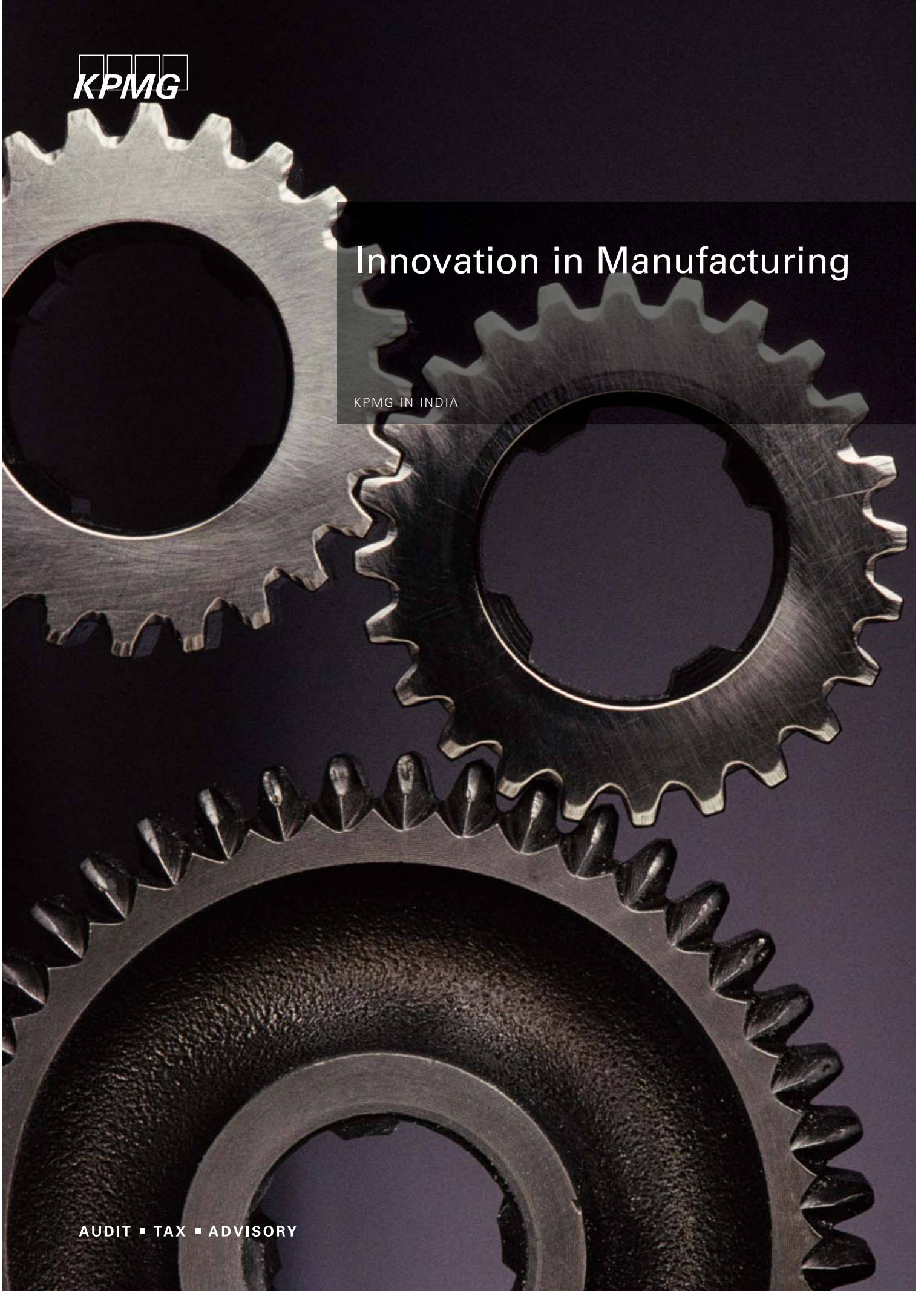

KPMG

Innovation in Manufacturing

KPMG IN INDIA

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As India emerges as a centre for services and value-added manufacturing (sectors where there is a significant design & engineering content), companies have to compete for increasingly scarce human resources. The looming skills shortage and the higher perceived sense of glamour attached to the Services economy, places much more pressure on the manufacturing sector - both to compete for resources and also manage the fallout of increasing wage costs. Wages in manufacturing have traditionally been lower than the Services sector, level-for-level, but that differentiation now has almost vanished. Additionally, the relatively higher margins in the services economy greatly impede the ability of the Manufacturing sector to pay comparable wages. Therefore one finds that Indian manufacturing dominance tends to converge towards those sectors where margins, design & engineering content, and degree of customization is higher - like Pharma, Auto, Auto components, high-end Textiles, etc.

The only way manufacturing companies can face up to these challenges is through more and more innovation, that can improve efficiency, margins, and product differentiation.

KPMG looked at the area of Innovation in Manufacturing and is presenting some insights through this whitepaper.

Pradeep Udhas
Head - Markets
KPMG in India

Background

India is one of the fastest growing economies in the world, and is seeing a steady growth, based on strong fundamentals. The nominal GDP has seen a consistent rise from around USD 300 billion in 1994 to over USD 600 billion in 2005, thus making India a significant force in the world economy. The real GDP has been growing consistently over the 5 percent mark in the last few years and has reached a high of over 9 percent in 2006.

India's growth in recent times has been driven by the 'services and manufacturing sectors.' India enjoys significant advantages in these areas, through its availability of skilled manpower, lower costs and a large and growing domestic market. India is seen as a very attractive investment destinations by global MNCs, given its growth potential of over 8 percent per year.

However, a sustained growth in the long term cannot be based on the low cost advantage alone; given the rapid expansion of the manufacturing sector in China. Research has shown that the Indian manufacturing sector tends to attract high value-added manufacturing as compared to China, which is predominantly into high volume and low technology manufacturing. In this context, the success story of Indian business begins with a differentiation that continuously helps to gain competitive advantage.

On the other hand, the Indian domestic consumer market is remarkably underdeveloped and offers significantly latent potential to manufacturing companies. Thus, businesses seeking to tap these markets need to innovate, adapt and develop new products and services to create demand. The brand and value conscious consumer calls for new manufacturing practices and methodologies to remain competitive.

As India seeks to maintain its growth over the long term, Indian companies need to focus on developing capabilities in 'innovation.' In this context, the companies need to address key questions such as:

- What is innovation in the context of manufacturing?
- What are various challenges in the Indian manufacturing sector, and how have companies addressed these challenges?
- What are the key success factors for successful innovation?

This paper has been developed as a background note, to provide perspectives and insights on the above mentioned key areas and to facilitate useful discussions. This paper has been prepared based primarily on information available from secondary sources, with some inputs from KPMG's knowledge base.

Innovation in Manufacturing

Definition of Innovation in the context of manufacturing

Innovation literally means, 'introducing something new.' In the business context, an innovation occurs is considered only when it is successfully introduced and commercialized. Innovation in manufacturing covers wide areas like introduction of new processes/practices, new technology/equipment, new materials, etc.

Businesses could resort to innovation in manufacturing for several reasons. The approach to innovation could be either proactive or reactive. In addition to productivity and quality gains, innovation also results in improved responsiveness to customer demands, lower turnaround times, reduced waste levels and downtime, higher product quality, better designed products, capacity for a wider product range, streamlined relationships with suppliers and customers.

In the next section, we have discussed key innovations in manufacturing and looked at how successfully companies have reacted to these practices.

Opportunities for innovation in manufacturing

Based on our assessment of successful innovations across multiple sectors in manufacturing, the key types of innovation can be classified under the following categories:

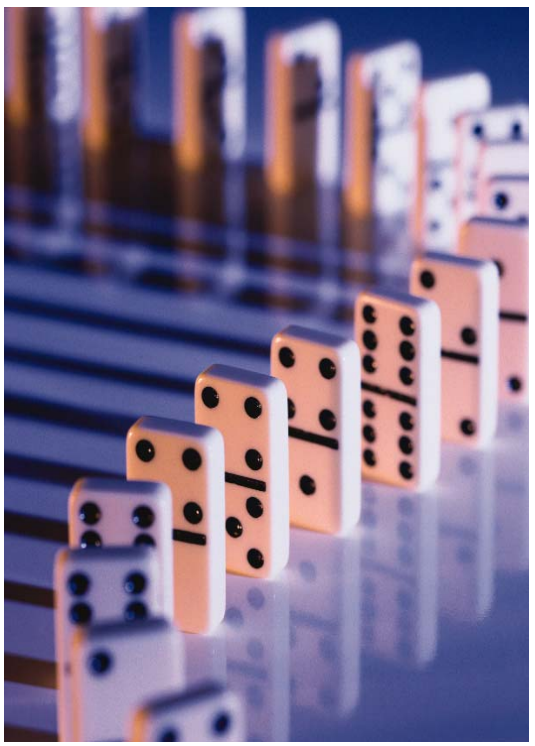
1. Innovation in sourcing
2. Innovation in manufacturing processes
3. Management innovation
4. Innovation through technology

These are further discussed in the following sections.

Innovation in sourcing

New components, new suppliers or an improved deal with the existing suppliers could improve products and profits significantly. A number of companies have integrated the suppliers into the manufacturing processes to ensure online visibility on inventory at various stages and quality control. E-auctions and reverse auctions to manage material costs are other examples of increasing efficiency in procurement.

In the Indian context, the ITC group has created a successful business model, E-choupal, for procuring agricultural produce like Soya etc from the farmers directly. By eliminating the government-mandated trading mandis, ITC has developed a 'win-win' model for both the company and the farmers. Other examples of virtual mandis for trading are IndiaAgriline developed by EID Parry and Dairy Portal from Amul India.



Innovation in manufacturing processes

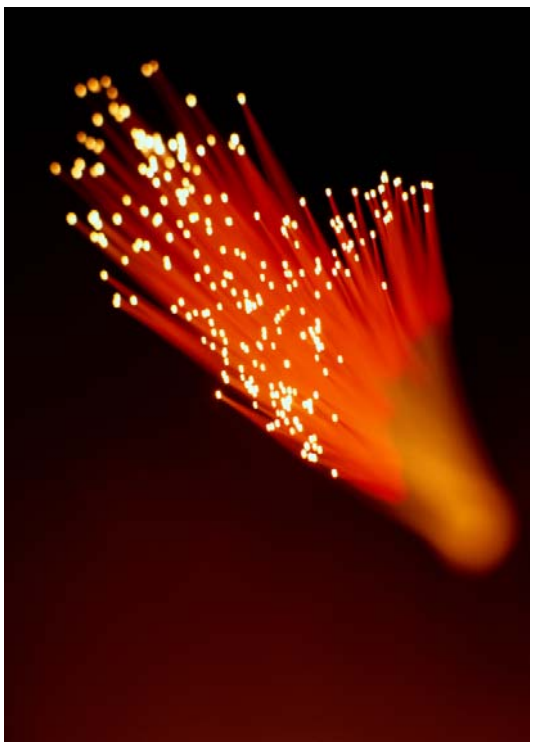
Companies can innovate in the way products are developed or manufactured, either within the firm or across the supply chain. Such innovations are termed as 'Process Innovation'. It is typically aimed at garnering competitive advantage through improved quality, reduced costs or reduced *time-to-market*.
For example, one of the greatest innovations to impact manufacturing in the 20th century was the *Assembly Line model* for manufacturing cars, developed by Henry Ford. The concept, however, did not change the product, but it significantly and permanently changed the process for manufacturing and delivering the product.

Several automotive companies, today, use the collaborative product development to shorten their new product development cycles, in collaboration with Tier I suppliers. For example, Mahindra & Mahindra (M&M) adopted an innovative production process called the *Integrated Design and Manufacturing (IDAM)* for the development of its multi-utility vehicle (MUV), Scorpio. The IDAM team consisted of cross-functional teams including suppliers, who catered to every aspect of product development, from design and testing to vendor development and marketing. With a team of 120 people and an investment of USD 120 million – just one-fifth of what a world major would have spent on a similar-sized project – M&M developed a successful product that captured a major share of the MUV market in India.

Management innovation

Management innovation refers to innovation in management principles and processes that will eventually change the practice of what managers do, and how they do it. Typically, such innovations have long lasting impact on the organization. Innovation in Business model falls under this category. Toyota's lean manufacturing model is a good example of such a practice. It not only addressed key processes; but moved beyond the definition of Process Innovation, by involving a fundamental shift in management philosophy. Toyota's model has transformed the way the manufacturing industry works

Toyota's global competitive advantage is based on the corporate philosophy known as the *Toyota Production System*. The company has a consumer-friendly and market-driven approach to both product development and distribution. It believes that the empowerment of the workers is the centerpiece of a human resources management system that fosters creativity, continuous improvement, and innovation. Thus, the company encourages its employees to participate in all aspects of decision making and it engenders high levels of employee loyalty. A major hallmark of Toyota's success in the world market is attributed directly to the synergy in its policies in human resources management and supply chain networks. On an average, there were over 10 improvement suggestions per employee per year, and over 99 percent of suggestions were implemented.



Innovation through technology

Technology has been a tremendous driving force for innovation in businesses; especially in the recent times. Many breakthrough concepts and development in businesses have been primarily driven by the development of new generation technology. New materials could improve products or their packaging and presentation.

Over the past few decades, there has been a growing concern globally about the fast depletion of global resources and the need to conserve them for the future. These include both natural and human resources. Another key concern is the need to control pollution and to safeguard the environment. These have also been the key drivers for innovation in developing greener technologies and manufacturing practices; for example: development of electric / hybrid vehicles.

Such innovations typically take time to gain acceptance and become commercially successful; as the long-term advantages offered by the technology are not immediately evident to consumers. Hence, companies that innovate in these areas need to have a long-term view.

Having looked at the opportunities for innovation in manufacturing, in the next section we focus on the various imperatives for successful innovation.

Imperatives for successful innovation

Developing a successful innovative organization involves efforts not only from the organization, but also gaining support from external stakeholders and the government.

Organizational imperatives

Develop strategies that foster innovation

Innovations typically involve long gestation periods and investment, thus to ease the process businesses could adopt a three-pronged strategy for innovation: initiatives that would impact the organization in the long term, quick wins and continuous incremental improvements for the existing products. This would broaden the scope and mitigate the risk of putting too many resources into one initiative. An innovate strategy that includes incremental innovations and continuous improvement will help in liberating minds throughout the company. It will also make people more receptive to change; when big breakthroughs happen.

Put in place teams to manage innovation

Companies that have an experience of creating successful innovation show that an effective way of fostering innovation is to put in place flexible innovation group structures. Typically, the group is handled by a leader supported by a team of innovators in a collaborative environment.

Specialist Innovation teams should have high communication with the mainstream business. Productive interactions would enable continuous improvement and free flow of ideas into the main stream.

Develop specific performance measurement system

Traditional performance reviews and their associated metrics is another danger zone for innovations. Organizations need to design the metrics based on specific needs. A good practice adopted by successful innovators is to keep performance measurement of regular business activities separate from the innovation efforts.

Imperatives for Government

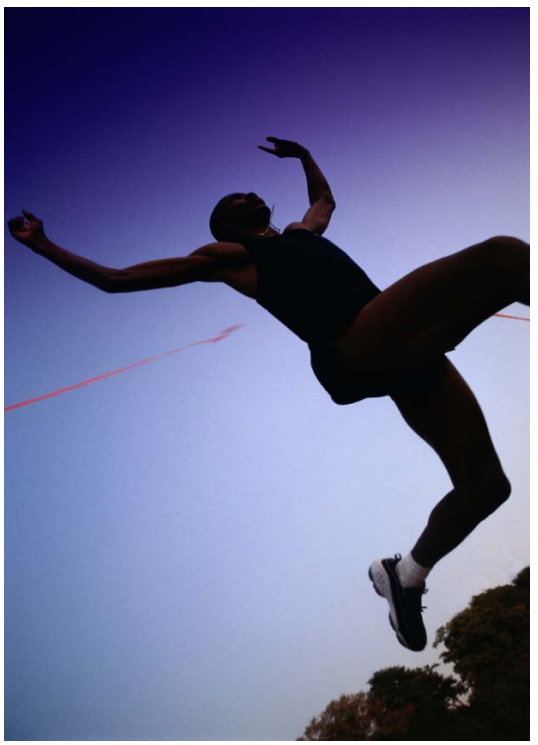
Support innovation through fiscal measures

Many companies, especially small and medium enterprises, are discouraged from investing in innovation in a big way. This is because of the risks involved and the long gestation period for payback. The government could play a key role here; either by providing tax deductions and other fiscal incentives for the investment made by the organization or by encouraging venture capitalists to invest in the business through similar measures.

Ensure protection of IPR

An assurance that their intellectual property will be protected will go a long way in encouraging companies to invest in innovation. This is another area where the government can play a key role. The need is not just for tighter laws, but also for implementing them effectively to ensure that companies have recourse to speedy legal settlement of IPR disputes.

Conclusion



Increasing competition in global and domestic markets imply that companies cannot sustain cost advantage for a long term. The experience of all globally successful companies underscores the fact that success depends on consistent innovation, so as to stay ahead of competition.

Businesses can innovate on several fronts in manufacturing – on processes, technologies and management principles. Innovation is not a one-time exercise; it involves continuous efforts in re-inventing the firm's products, services and processes in the light of market and technology developments. This would require firms to develop specific strategies, teams and performance measures to foster innovation.

At the same time, the government can support innovation by providing an assurance that the companies' intellectual property is adequately protected, through legal provisions that are also administered effectively.

In the final analysis, success depends on each company's willingness to take risks and implement changes.

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