Make in India: How Manufacturing in India Can Become Globally Competitive

India faces several challenges to achieving world-class manufacturing. This paper outlines our solutions.
India’s Untapped Potential

With $2.3 trillion in GDP, India is the world’s ninth-largest economy and the third largest by purchasing power parity at $8 trillion. Yet manufacturing accounts for only 16 percent of the country’s GDP, compared with the services sector’s nearly 52 percent. India represents only 2 percent of the world’s manufacturing output, a tenth of what its neighbor China contributes. Clearly, India is punching below its weight in manufacturing.

Growth in manufacturing is crucial for India’s economic development. To capitalize on the demographic dividend, India must create nearly one million jobs per month over the next decade. Manufacturing has the potential to provide large-scale employment to the young Indian population and thereby enable a significant section of the population to move out of poverty. With this in mind, the Indian government has adopted “Make in India” as a core policy initiative to encourage and accelerate growth of the country’s manufacturing sector.

India has several strengths that could help it become a manufacturing powerhouse: a large pool of engineers, a young labor force, wages that are half that of China’s, and significant domestic consumption of manufactured goods. These factors become especially important as China, the world’s preeminent manufacturing destination, faces peak labor shortages and exponential wage growth.

“Make in India” is a core policy initiative intended to promote growth of the country’s manufacturing sector.

India does have a few shining examples of world-class excellence in manufacturing and well-established core sectors such as textiles, auto components, and, more recently, petrochemicals. For example, Bharat Forge’s Mundhwa plant, the world’s largest forging factory, is a state-of-the-art complex that has placed India on the world map for manufacturing. The company has all the necessary attributes: heavy investment in technology, a scientifically skilled workforce, and a sharp focus on lean manufacturing.

Yet, manufacturing executives continue to wonder if manufacturing in India is globally competitive. If not, what are the main issues inhibiting the country’s ability to compete with the best in the world, and how can those issues be addressed? Answers to these questions will determine if companies should set up shop or expand their manufacturing footprint in India.

Competitive Analysis

To better understand the global competitiveness of manufacturing in India, we undertook a comprehensive analysis, benchmarking select manufacturers against their peers around the world. We used A.T. Kearney’s proprietary Global Excellence in Operations (GEO) framework to assess manufacturers across six dimensions of operational excellence (see sidebar: About Global Excellence in Operations on page 3). We found a correlation between operational excellence and industry, with automotive manufacturers typically leading the field, followed
by large series manufacturers of consumer goods. Since geographic comparisons are influenced by distribution differences for industry types across regions, we analyzed a sample of sites that feature similar types of manufacturing and are represented evenly across all major manufacturing regions. Our findings were validated in one-on-one interviews with industry leaders and subject-matter experts.

The results of our study are sobering (see figure 1). Leading manufacturers in India, excluding pharmaceuticals, typically rank in the fourth quintile, which means more than 60 percent of global manufacturers fare better than Indian ones overall. In addition, because of the comparably low labor rates, no significant operational improvements have been observed over time. This might change as neighboring countries such as Malaysia, Vietnam, and Thailand are attracting more manufacturers with even lower wages.

In comparison, leading Chinese manufacturers are predominantly in the third quintile with a very strong improvement dynamic, and some new Chinese factories that were established as direct clones of Western automotive factories are already in the second quintile. Further ahead are Korea and Eastern European countries, including Poland, Romania, and Slovakia, which are catching up with the world’s leading manufacturers in Western and Central Europe and the United States.

Figure 1

Relative positioning of leading manufacturers by region

The good news is that Indian manufacturers fare better than global averages for cost control despite low capacity utilization, primarily because of lower wages and a focus on reducing costs. However, compared to those in the top quintile, Indian manufacturers face more quality complaints and fulfillment delays. The pace of innovation is much slower (with Indian manufacturers requiring two to three times longer to launch new products), and Indian players’ agility to scale up or down is much lower. In short, manufacturing in India lags global competition in vital areas.
A.T. Kearney’s Global Excellence in Operations (GEO) is a comprehensive benchmarking diagnostic to evaluate the efficiency and effectiveness of manufacturing organizations compared with global best-in-class companies. GEO assesses all aspects of manufacturing—from target setting to resource management.

GEO measures operations performance by studying six dimensions: customer satisfaction, quality, profitability, agility, innovation, and value addition (see figure). These dimensions are broken down into 16 criteria: value creation, customer feedback, market share growth, cost management, personnel productivity, asset productivity, complexity management, product and service quality, process quality, quality costs, volume flexibility, customer focus, lead times, speed, innovation success, and investment management. Against these criteria, more than 100 performance indicators are evaluated to create an overall GEO score that is adjusted for industry variations. Companies are benchmarked against peers from around the world and placed in quintiles based on their GEO scores, with the first quintile corresponding to the top 20 percent of companies surveyed and so on.

In India, the manufacturing benchmarking exercise was conducted across a variety of companies and sectors, including automotive original equipment manufacturers, large electrical equipment manufacturers, farm equipment companies, and tier 1 suppliers of engineered products. In addition, we interviewed more than a dozen industry leaders and subject matter experts in manufacturing to develop these conclusions.

Figure

**Operations assessment framework and performance dimensions**

Source: A.T. Kearney analysis
Our analysis points to four elements that contribute to India’s limited manufacturing competitiveness:

**Low productivity.** Manufacturers are held back by poor workforce productivity, primarily because of a lack of automation, outdated manufacturing processes, limited use of design-for-manufacturing, and numerous non-value-added tasks.

**Talent and skill shortage.** Rigid labor laws force companies to hire casual workers. Vocational schools are not well-equipped to train workers. Companies fail to focus on intermediate-level manager or foreman (meister) grades that can provide on-the-job training to direct labor, and Indian academics stress simulation and Excel modeling for engineers over kanban and kaizen processes.

**Inefficient supply chains.** Infrastructure bottlenecks and structural impediments attributed to state-level taxation policies have contributed to longer lead times and excess inventory across the value chain.

**Lower levels of supplier competence.** Many Indian tier 2 suppliers have been part-to-print suppliers that have not invested in improving their product development or quality control capabilities. This has made rework and returns routine, further reducing productivity.

While these challenges seem daunting, best practices can help manufacturers address the issues and be globally competitive.

**Challenges and Solutions for Global Competitiveness**

Our findings highlight several challenges to achieving global excellence in manufacturing. In this section, we outline the challenges and our recommended solutions.

**Challenge: Indian manufacturing practices are labor-intensive**

Manufacturers use the low cost of labor to offset the high capital outlay required for automation. We have seen manufacturers use semi-automation or low-technology automation solutions or custom design their own automation equipment to control capital costs. By itself, this is not a bad option. But it becomes a problem when manufacturers depend solely on labor arbitrage to gain a competitive advantage rather than concentrating on quality and productivity. Relying on labor and using non-standard automation often leads to more labor-related issues, a higher share of non-value-added time, poor plant-floor ergonomics, more health, safety, and environmental issues, and lower quality levels.

Interestingly, a common fallacy is that labor is flexible, and companies take pride in managing their workforce accordingly. However, with rigid labor laws and a more assertive workforce, Indian manufacturers are carrying excess headcount even during periods of low demand. Flexibility is a myth. While labor intensity as a strategy has worked in the past, it will be an impediment on a global playing field.

**Solution: Make smart investments in asset productivity**

A number of fundamental steps can improve manufacturing productivity, such as efficient line balancing, lean plant layout, and process de-bottlenecking. In addition, manufacturers can drive incremental innovation and leverage know-how of vendors and industry groups to keep
their manufacturing practices up to date. These steps can improve productivity by about 15 to 20 percent. Another 15 to 20 percent improvement is possible with structural changes. For example, smart automation—investing in capital equipment to improve productivity—places automation tools at select locations, ideally stations that have significant quality issues or stations with long cycle times.

Consider the case of a global construction equipment manufacturer in India. The company was suffering from low labor productivity as the work content in their products was a fraction of the labor time expended. In one plant, a complete lack of line flow and automation resulted in significant idle time, and high work-in-progress (WIP) inventory. By implementing level flow, productivity rose by 50 percent, and WIP inventory fell by 30 percent. In another plant, balancing existing lines resulted in a 20 percent gain in labor productivity. But manual welding and surface preparation operations, which set the takt time, continued to slow the process. Addressing these bottlenecks through simple automation resulted in productivity gains of more than 30 percent and a significant reduction in takt time.

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Challenge: Skilled manpower is in short supply

While India has a large working-age population, finding skilled manpower is difficult. One reason is the quality of training provided by Indian vocational trade schools, which lack the necessary equipment and infrastructure to impart relevant training, meaning companies have to retrain their labor force once recruited. India’s rigid labor laws also restrict companies from making radical changes and rewarding their best workers.

Similarly, the focus at the graduate engineering level has tilted toward analytics-based training and Excel modeling. As a result, engineers are not adept at concepts such as kaizen and kanban. Further, during employment, training programs for engineers are primarily oriented toward building managerial skills and not technical skills.

The impact of inadequately trained manpower is immense and a huge drag on productivity and lean practices. This is a type of muda, or wasted effort, that manifests itself in several ways. For example, retraining and upgrading the skills of new and existing employees has now become essential, with certain companies spending twice global averages to train employees. In addition, skill gaps require a much higher proportion of overhead manpower to provide on-the-job training and to actively manage this workforce.

Solution: Develop employee skills across all levels

The manufacturing industry can take collective and individual actions to grow a skilled labor pool. At a collective level, the industry can establish and support vocational training institutes for developing skilled labor pools around key manufacturing clusters. In addition, establishing
standards for curriculum and certification testing will ensure all entry-level workers have the skills needed to perform their jobs. For example, in the early 2000s, the Indian IT industry was able to rapidly induct hundreds of thousands of workers by setting up and partnering with specialized training academies or creating large-scale internal training programs.

Individually, manufacturers can improve their capabilities by developing relevant curricula and structured training programs aimed at workers at various stages of their careers. They can provide a standard apprenticeship or induction program for entry-level workers and more advanced technical or supervisory training for senior-level employees. The goal should be to improve the skills of the existing workforce to take on high-technology manufacturing processes. Once trained, retaining these highly skilled workers will require financial incentives and individual career paths.

Instituting formal foremen roles can be a simple yet effective tool to attain lean and, in the process, retain skilled labor. This will relieve the load on manufacturing engineers, who often double up as supervisors, and enable them to focus on pragmatic implementation of productivity enhancers such as kaizen and kanban to drive improvements.

**Challenge: Supply chains are largely inefficient**

Supply chains in India are a key contributor to non-value-added functions. An array of external factors affect supply chain networks, including market volatility and skewed demand patterns, infrastructure and transportation bottlenecks, and poor structuring of supply chain networks to optimize on sales and excise taxes. Manufacturers struggle to mitigate these external forces, which lead to increased raw material and finished goods inventory across the value chain. One business-to-business company had nearly 70 days of total inventory compared to a global industry average of about 35 days. Manufacturers have come to live with these supply chain inefficiencies, with most choosing to carry excess inventory to compensate for the inefficiencies and demand volatility.

In addition, companies suffer from several self-inflicted bottlenecks that impede lean processes. One common practice is to meet sales targets by pushing a larger portion of finished goods during the latter part of the month. For example, one automotive company ships 10 percent of total dealer shipments during the first 20 days of the month, another 30 percent during the next seven days, and 60 percent during the last three days of the month. This significantly increases channel inventory—from the supplier end, through the plant, and all the way to dealer stocks. This phenomenon, loosely referred to as month-end skew, runs counter to lean “flow” concepts and yet is an accepted practice.

Poor supply chain performance and reliability is also a reason why many Western companies use their Indian plants mainly to serve the domestic market and shy away from integrating them into their global networks.

**Solution: Increase agility to reduce waste across the supply chain**

Supply chain agility is crucial to a lean organization. Agile companies carry less inventory, manage flow better, and have fewer stock-outs. A manufacturer that wants to become more agile will focus on three areas:

**Organizational setup.** Make the supply chain organization a strategic partner, working at the same level as departments such as sales and production. This is accomplished by expanding the role of the supply chain function—bringing it into the ambit of strategy setting and
empowering it to manage risks. Also, to help manage market volatility, the supply chain organization needs to have a seat at the strategy table.

**Processes.** Practices such as supply and demand planning are vital to an agile supply chain. Many companies lack control of these core processes, which restricts their agility. An agile supply chain requires process discipline.

**Technology and tools.** Smart manufacturers use existing technology to improve supply chain agility and better manage volatile scenarios. For instance, business intelligence tools from enterprise resource planning (ERP) vendors provide the functionality (real-time inventory tracking) and versatility to increase supply chain visibility, thereby eliminating ambiguities and reducing safety stock requirements. ERP tools are crucial for managing complex supply chains, reducing inventory, and becoming more lean. Big data analytics can also be used to move from static forecasts to scenario planning, thus rationalizing inventory requirements based on realistic demand. India’s highly evolved IT industry gives manufacturers a unique opportunity to build custom tools cost-effectively.

When a large manufacturer of two-wheelers moved toward lean manufacturing, the company captured significant gains, including a tenfold increase in workforce productivity. Raw material inventory was reduced from one week to half a shift, finished goods inventory fell from 30 days to three, and rejected parts fell from 20,000 parts per million to fewer than 2,000.

**Challenge: Suppliers fail to provide high-quality products**

Tier 1 or tier 2 suppliers tend to be small or medium-size enterprises with limited engineering or process capabilities. Adoption of lean and quality systems is often low, which results in poor quality products. Supplier quality issues stem from the usual suspects: talent shortage (to solve quality problems at the source), process discipline (to prevent poor quality products from moving through the value chain), and effective measurement and monitoring systems (to track and solve issues). Having accepted rework as a way of life, manufacturers often throw more resources at the problem, which significantly reduces manpower productivity.

**Solution: Improve supplier fitness and product quality**

Solving deep-rooted supplier quality issues is possible, but it is not easy. It requires making all suppliers across the value chain lean. After all, one lean factory in an inefficient value chain is pointless; all partners need to become lean for the enterprise to be lean.

In the medium term, OEMs should invest in building quality into their designs, so that it is easier for lower-skilled suppliers to ensure quality. This can be further improved by investing in fixtures and *poka-yoke* (mistake-proofing) for suppliers to reduce quality issues.

However, the best results will come from a long-term approach, focused on suppliers and supply relationships. These relationships should have built-in incentives and mandates for lean improvements that will result in quality and cost improvements across the entire value chain. The first step is offering suppliers incentives to become lean not only in their processes but also in additional capability areas such as product development.

In effect, manufacturers that collaborate closely with suppliers to improve the suppliers’ operations also improve their own operations, reducing lead times and costs and improving quality. The goal should be to create a lean value chain.
Imperatives for Multinational Companies to “Make in India”

While the above solutions apply to Indian manufacturers, multinational companies manufacturing in India face some additional challenges, as they often use products and processes that are designed for other geographies. Following are our top five tips for global companies manufacturing in India:

- Provide robust product designs and manufacturability. Never trade product quality for lower costs.
- Partner with and develop key suppliers in India. Leverage supplier parks, and seek locations near prominent industry belts to reduce supply chain risks.
- Implement world-class quality and lean processes on the shop floor, and ensure process discipline through a zero-tolerance approach.
- Invest in training and retaining labor to ensure high levels of productivity. Balance labor requirements with automation to ensure overall quality.
- Employ India’s IT professionals to design tools for tracking and managing supply chains and production lines.

Except for a few pockets of excellence, manufacturing in India is yet to become globally competitive. India’s manufacturers have been improving slowly and steadily over the past few years, but more is needed to extend the few pockets of excellence. Adopting the principles of lean manufacturing will be key to joining the leaders in operational excellence and competing in the global ring.

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