

Pathway to Make in India

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Abstract

“Make in India” is an epoch-making wake-up call for us. We hardly have any product to satisfy even our indigenous customers. Analysing our existing situation would reveal our Strengths, Weaknesses, Opportunities and Threats. Whilst, we are strong in our natural resources and manpower, we lack in; updated technology, work environment and managing capabilities. In production, we need to adopt the latest technologies by way of JVs and by inviting the bests in the world. Primarily, there need to be ‘Customer Focus’. TQM should be embraced through Quality Circles. Various techniques like; 5’S, JIT, Lean and Agile manufacturing etc. and 100% Employee Participation, Digitalising Operations, efficient SCM and E-Marketing are necessary. Organisational ownerships should rest with Employees as well to get maximum productivity. Infrastructure, Government Regulations and Work Environment must be very congenial. Everyone, from Owners/Partners to Customers, Employees, Vendors and the Society should become a clear Winner in the process.

Keywords: 5 ‘S’, 6 Sigma, An Epoch-making Call, Bench Marking, CPM, Digitalizing Operations, Employee Ownership, E-tailing, FMEA, History of Advancements in Manufacturing, JIT, Kaizen, Le-Agile, Present Scenario, Pathway, PERT, PDCA, Poka Yoke, QC, Recommendations, SCM, SWOT Analysis, Zero Defect

1. An Epoch-making Call

The call by the Honourable Prime Minister for ‘Make in India’ has a historic significance. It has come at a time when our country is substantially lagging behind in the global manufacturing scenario. Our country’s prosperity is at very low ebb with majority of the individual’s livelihood needing immediate improvement. Despite possessing rich resources, we are at least a few decades backward in manufacturing. As such, we are squarely dependent on imports, be it a humble light bulb or an aircraft. For defence, 100% of our budget allocation goes to a few foreign countries. This has been going on since independence. Although late, we need to wake up immediately. To change the scenario overnight is a no doubt a daunting task. A careful study of the

present scenario and following the Right Pathway can definitely lead us to ‘Make in India’ era.

2. History of Advancement in Manufacturing

Right from the very beginning, people attempted to improve upon the manufacturing procedures. A devoted branch in Engineering known as Industrial Engineering came into being in 1850. The Royal Industrial Institute of Madrid was set up. Similar Institutes came into being in France and Belgium. Pennsylvania University introduced Industrial Engineering in 1909. An Industrial Engineer researches methodically to optimise every aspect of manufacturing viz; demand-supply, procurement,

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inward/outward movements, process, time, cost, quality and continuous improvement to achieve better than the existing results.

Henry Fayol and Frederic Winslow Taylor worked for improvement in the production processes in the late 19th Century, which came to be known as 'Scientific Management'.

During the 2nd World War, Japan was totally devastated. Post WW-II, Edward Deming, Joseph Juran, Philip Crosby went to Japan from the USA. They independently propounded various Quality Management theories, which, were eagerly adopted by Japan's industries. Japanese Engineers like; Kaoru Ishikawa, Shigeo Shingo, Taiichi Ohno, Massakai Imai, Hiroyuki Hirano etc. put their heart and soul behind industrial innovations. Soon the war ravaged tiny country became the best industrially in the whole world. They beat USA in the biggest industrial challenge ever. The industrial giant took a beating at their home by high quality economic Japanese products. In 1960, the Emperor of Japan decorated Deming with the "Second Order Medal of Sacred Treasure". The scholars of Japan launched an annual 'Deming Prize' in his honour. In 1980, NBC TV aired a Programme in the US titled; "If Japan Can, Why Can't We?" After this, the Western World woke up to the reality. It is now high time for us also to realise and wake up.

3. The Present Scenario

In most of our industries, we follow the technologies/processes/methods/management techniques which are age old. Our entrepreneurs are still scared of the word 'Quality'. They feel that more quality may mean more cost. In an attempt to reduce cost and increase profitability, most of the companies try to compromise with quality and provide inferior materials/workmanship. This, in the long run ruins

our industries.

We still have the work culture that feels the workers are cogs to the machines. Most of the managements try to extract maximum output through various means. The workers try to put up resistances and both the parties look upon each other as enemies. Political parties and local influential persons with vested interest make the scenario worst. An environment of hostility prevails in most of the industries. This works as a great deterrent to the productivity.

Our present industrial policies are not supportive to industrial growth. We have problems in getting land, clearances, licences, infrastructure etc. in running/setting up of an industry. Red-tapism, corruption and resistances from different quarters have made the things worst. In a nut-shell, our industry regulations are far from investor friendly.

To the contrast, some of the countries, particularly China, Korea, Japan etc. have made commendable progress in technology/manufacturing process. Almost all our household items like LED/CFL bulbs, TV, fridge, air conditioners, washing machines, computers, mobile phones etc. are manufactured in other countries and assembled/marketed in our country.

There is also a yawning gap in the studies of Production Engineering/Industrial Engineering/Operations Management/TQM etc. and training in various technical trades. Our syllabuses do not include upgraded technologies/management techniques.

4. SWOT Analysis

4.1 Strengths

Ours is a vast country endowed with rich resources. Those include; minerals, lands, water, abundant

sunlight, natural air etc. We have a substantial strength of diligent and laborious manpower supported by intellectuals, excellent engineers and superb managerial skills. We have a huge existing and potential consumers and industrial/institutional/Government buyers, which attract many foreign companies. In most parts of the country, we witness a pleasant workable weather throughout the year.

4.2 Weaknesses

We lack in the latest technologies. R&D activities are almost insignificant. Qualities of our products are extremely poor. Hardly there is any focus on customers' aspirations. Our worker-management relationship is very poor. There prevails an environment of disbelief and animosity between the two. Our engineering/managerial/ skill studies are not in consonance with the modern industry requirements.

4.3 Opportunities

We have very good opportunities to become the world leader in manufacturing. There is a huge domestic market comprising 125 Crores customers. We have vast opportunity to manufacture/produce solar /wind power, defence items, vehicles, aircrafts, consumer durables and many more.

4.4 Threats

Many of our brainy students and skilled artisans prefer to go and settle abroad. There are tough competitions from our neighbouring countries like; China, Japan, Korea etc. These competitors have already taken our markets by storm by offering high quality and value added commodities at a very low price.

5. Pathway

5.1 Creating a Production-friendly Business Environment

This is the very first step in this direction. A congenial business atmosphere must be available throughout the country. There need to be well demarcated lands. Abundant power/water, infrastructure, rail/road/waterway, finance etc. should be arranged for setting up production units. The process of granting approval should be hassle-free and unbiased. There should not be any interference by any politician or others. Licence Raj, Corruption, Extortion etc must be totally prohibited. Procedures for Taxes, duties, levies etc. should be simplified and the loopholes therein must be plugged.

5.2 Dealing with Human Resources

Historically, people used to be enslaved, tortured and made to work as 'Workers' by their 'Owners'. Slavery was institutionalised by some wealthy and powerful nations. Slavery flourished in the UK, the USA, France, Portugal, Roman Empire etc. British Government was at the helm of Slavery affairs. Slave-workers brought fortunes to these countries. British Parliament passed a rule in 1807 banning slavery in the UK but not in the colonies ruled by them. In 1933 only slavery in British ruled countries were also banned. In America, slavery was banned in 1865.

Gradually, the term changed to 'Worker'. F W Taylor, in his "Scientific Management Theory" proposed for 'rationalisation of workflow' and introduced 'rest' to the workers between working hours. His theory increased productivity. It was discarded by the USA and implemented by the Russia. Productivity in Russia increased significantly.

Peter Drucker considered workers as ‘Assets’ rather than ‘Liabilities’. Hawthorne experiments pointed out that ‘Good behaviour by the management’ and ‘Team work’ were the key motivating factors to improve productivity rather than money or anything else. ‘Manual workers’ started being transformed to ‘Knowledge workers’. Various productivity-linked management tools point out that, without whole-hearted support and active participation of all the employees, achieving best results were not possible. The ‘Management’ - ‘Employee’ divide gradually started to vanish due to the recognition that, if ‘Employees’ were the ‘Business partners/Owners’, the organisations were able to derive best results.

Human resources is the most important and sensitive resources and must be dealt in with utmost care and humanity. We have several examples available with us, where all the employees are the owners of the organisations and such companies are able to achieve the best results. Mondragon Cooperative Corporation of Spain, Huawei Corporation of China, Lijjat (tasty) Papad of India, and Anand Milk Union Limited (AMUL) are a few testimony of such cooperation.

5.3 Harnessing Productivity Enhancing Tools

5.3.1 Critical Path Method (CPM)

Critical Path Method or CPM is an important scheduling tool for effective Project Management. CPM was developed jointly by DUPONT Corporation and Remington Rand Corporation for managing Plant Maintenance Projects in 1950. In CPM, a network of activities with their respective durations is drawn with relation of the preceding and succeeding activities. The maximum duration path without any float is called the Critical Path. This represents the minimum duration of the project.

5.3.2 Program Evaluation and Review Technique (PERT)

This was developed almost simultaneously with CPM by Booz Allen and Hamilton as a part of US Navy’s “Polaris Missile Submarine Program” along with Lockheed Corporation. PERT analyses the tasks required to complete a project. It estimates the time required to accomplish each task. It can reasonably cater for even very large projects embedded with uncertainties. Both PERT and CPM techniques are used together for Project Management.

5.3.3 Five ‘S’

5 ‘S’ was devised by Hiroyuki Hirano in Japan while trying to improvise upon the production system. This procedure, together with TQM and JIT enabled Japanese industries to improvise a lot on productivity. Existence of 5 ‘S’ in Japan could be discovered by the Western countries only after 1980s. Toyota adopted this whole heartedly.

In Japanese parlance, 5 ‘S’ stand for and the English meanings thereof are; i) SEIRI: Shorting, ii) SEITON: Setting in order, iii) SEISO: Sweeping/Shining/Cleaning, iv) SEIKETSU: Standardising & v) SHITSUKE: Sustaining the practice.

The whole thing revolves around a simple principle. That is to keep the work place/office/store yard etc. clean and tidy. Unwanted items should be taken out and required items should be stacked nicely and neatly. The procedure should be standardised and practised across the whole organisation.

5.3.4 Just In Time (JIT)

JIT is an inventory strategy. It is deployed to minimise inventory at any point of time and receiving goods exactly at the neck of the moment the same is required. This principle applies for receiving raw materials, movement of WIP, replenishment of

parts/ stocks in a workshop/supermarket etc. This system also originated in Japan. Initially it relied on 'KANBAN' system or display of a specification card seeking replenishment. This system has been modernised by "E-KANBAN" or ERP/SAP systems. There is not only a substantial savings on reduced inventory but also from standardisation of work flow.

5.3.5 Benchmarking

Benchmarking is nothing but comparing one's products or processes with the best in the world. Through this process, an organisation tries to understand what it needs to adopt to surpass the best in the category.

5.3.6 Deming's PDCA Cycle

This is one of the most effective tools to achieve Total Quality Management. It is a customer focussed approach. As per this method, a manufacturer or service provider has to improvise upon the quality of his products/services consistently. The process of PDCA cycle is such that, it compels its owner to solve the problems in a sequential and systematic manner.

PDCA stands for Plan, Do, Check and Act. 'Plan' identifies problems, prioritises them, pinpoints the critical one and plans a schedule to achieve the target. 'Do' is the part to collect data, analyse and identify the cause and take trial corrective actions. The step 'Check' is used to judge the results of Trials. If unsatisfactory, the previous steps are repeated. If satisfactory, the next step 'Act' is followed. In this step, the revised process is documented, standardised and the employees are trained to follow the revised methodology.

5.3.7 Six Sigma

Sigma is a symbol of Standard Deviation. Continuous improvement planning in an organisation can

achieve correctness up to 6 Sigma levels, which is no more than 3.4 parts per million defects. Adoption of stringent process control may bring in such results. Very few companies have reported to achieve such magical figures.

5.3.8 Zero Defect

Zero defect philosophy was advocated by Phillip Crosby in his 14 point steps to attain right quality. It is no doubt a noble idea but difficult to achieve. However, following this may reduce mistakes substantially.

5.3.9 Failure Mode and Effect Analysis (FMEA)

FMEA is a process of analysing risk of failure of design of a Product/Process/Service etc. It is a pure Technical model in that specific field carried out by experts in that field. First, the theoretical model is scrutinised for any probable error and ratified. A prototype is made and trials are carried out repeatedly to identify and rectify the errors. When the model is finally accepted, it is documented and put to production.

5.3.10 Poka Yoke

In Japanese, Poka Yoke means 'mistake proofing'. This method is invented by Shigeo Shingo. It introduces some anomaly between two retro-fitting parts, so that these could be fitted in a particular orientation only. Although, the innovation looks simple, it has a massive contribution in the world of products.

5.3.11 Quality Circle (QC) Philosophy

Delivering lectures on Quality is rather easy than implementing. QC helps in implementing the same. Various voluntary groups (QCs) are formed in an

organisation from within the interested employees selected from various departments. They are motivated and thoroughly trained to implement the programme under the superintendence of the top executive. There could be various QC groups like: 5 'S', Product Quality, Communication, Customer relations, Training, Increase in Productivity, Employee Motivation, Quality aesthetic, Health, Safety and Environment etc.

5.3.12 Kaizen

Massakai Imai made the term 'Kaizen' immortal by authoring a book with the same title. This Japanese term means improvement. "Kaizen (Improvement) Eno (in) Yon (four) Dankai (steps). These four steps are nothing but the 'PDCA' cycle propounded by Deming. The five main ways to achieve Kaizen are; i) Team work, ii) Increased employee participation, iii) Increased high morale infusion by management, iv) Developing Quality Circles & v) Management's consistent commitment towards Quality. This system believes in motivating the employees to give their suggestions regarding operations, quality, production process or any other thing. Its effects are miraculous.

5.3.13 Lean, Agile and Le-Agile Manufacturing

Lean Manufacturing was devised and adopted by Taiichi Ohno and Massakai Imai at Toyota Plant. It works on the philosophy of reducing seven types of 'Wastages' covered under; *Muda* (Non-value adding work), *Muri* (Overburden) and *Mura* (Unevenness of work-flow). This increases productivity and reduces cost substantially.

Agile system keeps the production system alert for adopting quick changes in products. It advocates for undertaking production only on receipt of orders

as against mass production in Lean system.

Le-Agile is a hybrid of the two. In this products are kept in semi-finished conditions and are finished as per demands.

5.3.14 Efficient Supply Chain Management (SCM)

SCM describes the whole process from sourcing raw materials, WIP, production in shop, handling, transporting, stocking and reaching the products to the customers. The more the system is efficient at every step, the cost of production and time cycle decrease and quality increase.

5.3.15 Digitalizing Operations

The entire system of receiving order, requisitioning raw materials, scheduling, passing information to production shop, tracking despatch and receipt by the purchaser can be digitalized. It works at the fastest speed with least manual interference. Many delays and unnecessary steps are avoided. The entire system could be tracked at the click of a mouse. The client can also track the whereabouts of his product. This system is going to be a must for all industries in the future.

5.3.16 E-Marketing or E-tailing

E-tailing is the short form of Electronic Retailing. In the conventional system, the finished goods move from the producer to the stockist-distributor-dealer-retailer network to reach the customer. The products are transported and handled several times, kept as inventory with these intermediaries and all the concerned agencies also have to add their cost and profit margins. In between, due to multiple handling, maintaining long inventories, a few of the products get damaged/spoiled, some over-live their

effective life etc. Cost increases due to prolonged inventory, spoilage etc. Ultimately, the customer has to pay a much higher price to procure the item. In E-tailing system, most of these intermediaries are done with. The customer can directly place order on the Manufacturer through internet. Finally, he gets a good discount of at least 40-50% and also fresh products.

6. Recommendations

- A centralised cell for “Make in India” needs to be formed comprising highly talented Scientists, Technologists, Innovators and Management Gurus from India and abroad.
- Make our country truly investor-friendly by making rules and regulations simple but effective. There must be time-bound and effective disposal of all investment proposals.
- There should be deterring punishments for delaying tactics, biases and corrupt practices.
- JV proposals in various sectors with latest technologies and TQM may be given lucrative incentives like Tax concessions, direct Govt buying etc.
- Employee participation models must be encouraged. Political unionism in work place should be replaced by ‘Welfare Board’ constituted by employees, employer and a Govt. Nominee. Decision of this Welfare Board should be final and no agitation or arbitrary decisions by employer shall be acceptable. Working conditions must be comfortable and the salary of the highest paid staff should not exceed 20 times of the lowest paid.
- Engineering and technical courses should be standardised at par with the latest technical/managerial requirements. Widespread Skill development should be done in Govt/ Pvt Sectors.
- While the above mentioned tools are to be followed, it should be understood that the management and technological practices do not remain static. Substantial commitment on R and D is a must. R and D labs must be set up across the country with focussed objectives.