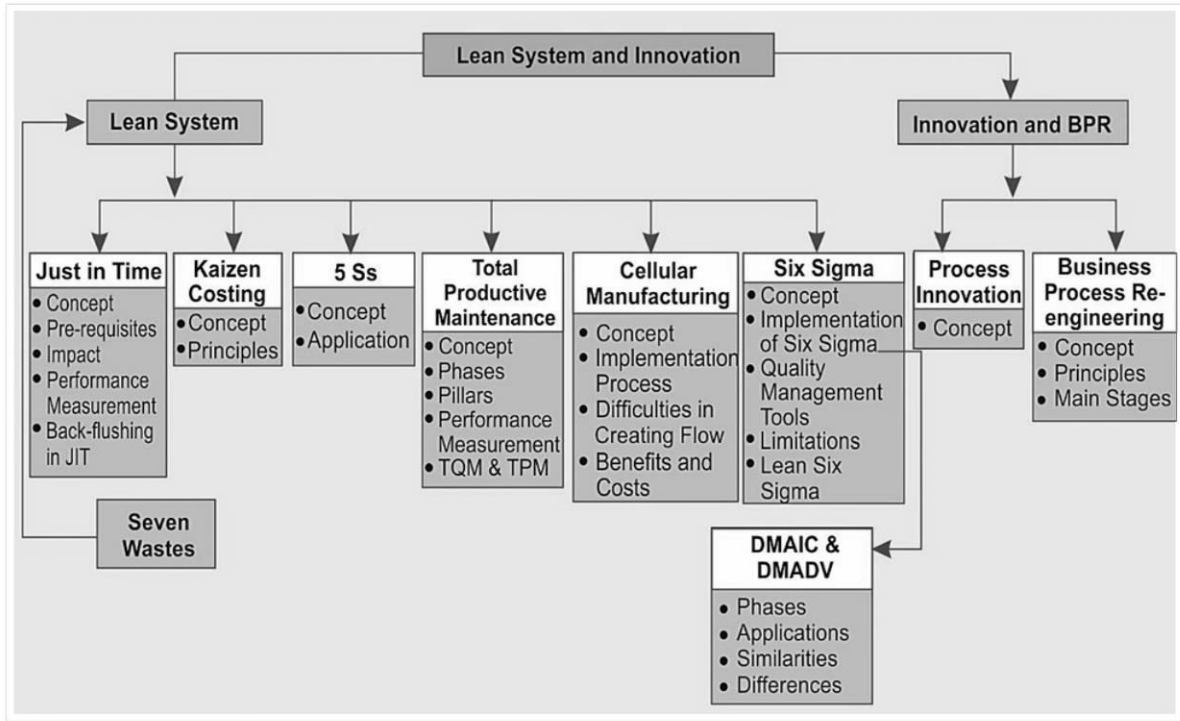


## **CHAPTER 3: Lean System & Innovation**

Broad Contents of the chapter:



### **Lean System:**

**Lean system** is a systematic method for waste minimisation without sacrificing productivity in a manufacturing system.

**Waste** is any step or action in a process (called as Non Value Added Activities) that is not required to complete a process successfully.

Generally there are 7 types of wastes:

- Overproduction
- Excess Inventory of any material
- Waiting of Men, Material and Equipment
- Motion: unwanted Movement of Men, Material and Equipment
- Transportation of Men, Material and Equipment
- Rework of defects
- Over processing: Unnecessary operations being done.

Lean manufacturing involves a shift from traditional batch and queue Push Production to product aligned Pull production.

**Techniques** adopted by lean manufacturing are:

- A. Just in Time (JIT)
- B. Kaizen Costing
- C. 5 S
- D. Total Productive Maintenance (TPM)
- E. Cellular Manufacturing
- F. Six Sigma

These applications are based on the following **Principles**:

- A. Perfect first time Quality
- B. Waste reduction
- C. Continuous improvement and
- D. Flexibility.

**Features** of Lean Manufacturing are:

- A. Zero waiting time
- B. Zero inventory
- C. Pull processing
- D. Continuous flow of production
- E. Continuous finding of ways to reduce process time.

### **Just in Time (JIT):**

JIT is a system whose objective is to produce or procure products or components as they are required by a customer or for use rather than for stocking. JIT is a Pull system that responds to demand as against the normal Push system wherein production is made for stocking. Under JIT, in case of Production, a product is produced as per Customer order and in case of Purchase, material is bought as per consumption schedule without the need for any storing. The features of JIT can be tabulated as under:

|                                                                                                     |                                                                                                     |                                                                              |
|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Spare Parts / Materials from suppliers on the exact date and at the exact time when they are needed | Straight delivery to the production floor for immediate use in manufactured products                | Visit of engineering staff at supplier sites to examine supplier's processes |
| Installation of EDI system that tells suppliers exactly how much of which parts are to be sent      | Dropping off products at the specific machines                                                      | Shorten the setup times                                                      |
| Eliminating the need for long production runs / Streamlined flow of parts from machine to machine   | Training to employees how to operate a multitude of different machines, perform limited maintenance | Several alterations in the supporting accounting systems                     |

### **JIT system aims at:**

- Meeting customer demand in a timely manner;
- Providing high quality products;
- Providing products at lowest possible cost.

The **5 main features of JIT** production system are:

1. Organise production in manufacturing cells, a grouping of all the different types of equipment used to make a given product. i.e. adopt Cellular Manufacturing.  
**Material – handling costs are reduced.**
2. Hire and retain workers who are multi-skilled so that they are capable of performing a variety of operations, including repairs. Thus, **labour idle time gets reduced.**
3. Apply TQM to eliminate defects. As, there are tight linkages in the production line, and minimum inventories at each stage, defect arising in one stage can hamper the other stages. **JIT creates urgency for eliminating defects as quickly as possible since manufacture is done by Pull method.**
4. Place emphasis on reducing set-up time which makes production in smaller batches economical and reducing inventory levels. Thus, **company can respond to customer demand faster.**
5. Carefully selected suppliers capable of delivering high quality materials in a timely manner directly at the shop – floor, **reducing the material receipt time.**

### **Prerequisites of JIT:**

- Low variety of goods
- Vendor reliability
- Good communication
- Demand stability
- TQM
- Defect free materials
- Preventive maintenance

### **Impact of JIT System:**

A. **Waste Costs:** Important aspect of JIT is to follow TQM and Six Sigma through which wastes are eliminated. Wastes can be in the form of materials, unused equipment, idle labour, defective products, reworks etc. When fully installed, JIT system will vastly reduce all these type of wastes which in turn will reduce the cost of products,

B. **Overhead Costs:** Material handling facilities and Quality Inspections are reduced by great levels. All inventory levels will come down resulting in large-scale reduction in godown spaces (rents), lesser insurance premia, lesser material staff etc.

**C. Product Prices:** When high quality of goods are produced, naturally, the products can command premium in the market. Further, if delivery aspects are strengthened to ensure timely delivery to customers, then premium can be levied on customers who are specific with these factors. If customers are not particular with these factors, then it will be difficult to increase the price of products.

**Performance Measurement in JIT System:** Performance Measurement indicators used in traditional system are not applicable under JIT.

**Machine utilisation** monitored under traditional system is **not required** under JIT system. This is because, if machine utilisation happens to be a key factor, then managers will be forced to utilise machinery to the full extent irrespective of orders which results in buildup of inventories that is against the principles of JIT.

Similarly, **piece rate tracking** of each employee **is also irrelevant** since tracking of this leads to sacrifice of Quality. Further under JIT scenario we are supposed to produce what is required and not more than that.

Further, **labour efficiency** tracking also **is not required**. Variance analysis related to labour is also not required.

However, the following measures will be of importance under JIT environment.

- A. **Inventory Turnover:** There should be a marked improvement of this factor
- B. **Setup time reduction:** Since production runs will be short under JIT system, the setup time of Machines will also come down. Further, setup time reduction will be there in case of Cellular Manufacturing also. A working cell is a cluster of machines that can be operated by a single operator.
- C. **Customer Complaints:** JIT system is based on the premise of producing Excellent Quality products. This implies that Customer Complaints will get reduced drastically. Further, any complaint from customer is to be seriously treated and investigated immediately to avoid further production of inferior quality products.
- D. **Scrap Generation:** Material scrap should be brought down to exceedingly low levels.
- E. **Cost of Quality:** Focus of JIT is to create High Quality products. So, it is necessary to track all Quality costs (both Prevention & Appraisal) and monitor them to see the scope of reduction.
- F. **Customer Service:** This has several components like timely supplies, sending full orders, maintaining right quality of products etc.
- G. **Ideas Generated:** JIT envisages ideas from operating level persons also for improving overall efficiency in operations.

The common feature among all the above operations measures is they are non financial in nature (except Quality Costs). They are operational measures that focus on details for overall improvement.

**Kanban Card** is a notification card given by the Downstream Machine Manager to all his Upstream Machine Managers (from whom he receives parts) indicating the just sufficient quantities that are required by him. This works in Pull system of environment.

**Backflushing in JIT:** Backflushing requires no data entry of any sort until finished product is completed. Once finished product is completed, quantity produced is fed into ERP system. The quantity so fed will workout the inputs of respective items utilised based on BOMs' of the output. This is suitably adjusted with scrap etc., if any, to ascertain the quantity of inputs consumed based on which payment is released to suppliers. However, to ensure Backflushing works properly the following are to be maintained accurately.

- a. Production Reporting
- b. Scrap Reporting

In case of backflushing, **Lot Tracing** is very difficult. At times lot tracing is required to recall the items. This problem can be overcome with suitable advanced software systems.

It is also difficult to have **inventory accuracy** in case of Backflushing.

The above problems will be compounded if proper **qualified staff** is not available to feed data into systems. This will result into GIGO scenario.

### **Kaizen Costing:**

Lean manufacturing is founded on the idea of Kaizen, i.e. continual improvement. Improvement is a continuous process and not a one time program. All the time there may not be radical big improvements as in BPR. Even continuous small improvements may turn into significant improvement when totaled.

The small improvements can take place in any area like waste reduction in production, assembly, movement of materials, elimination of work steps etc. The questions that are answered are similar to that of Value Engineering. But the reductions that are derived by Kaizen Costing are smaller in nature as compared to Value Engineering but still they are worth the effort.

## **5S**

5S is the name of a workplace organization method that uses a list of five Japanese words: **seiri, seiton, seiso, seiketsu,** and **shitsuke**. It explains how a work space should be organized for efficiency and effectiveness. The above 5 phases of workplace organisation can be translated from Japanese as **Sort, Set in order, Shine, Standardise** and **Sustain**.

### **Sort (Seiri):**

- Make work easier by eliminating obstacles.
- Reduce chances of getting disturbed with unnecessary items.
- Avoid accumulation of unnecessary items.

### **Set in Order (Seiton):**

- Arrange all necessary items in an efficient way so that their access will

be easy.

- Ensure FIFO basis so that it is easy to pick and use items.
- Place components according to their use. Frequently used items are to be placed nearer as against non frequently used.

### **Shine (Seiso):**

- Clean workplace daily or on a set frequency.
- Keep workplace Safe, Easy and Pleasing to work.
- In an unfamiliar environment, people must be able to detect any problem within 50 feet.

### **Standardise (Seiketsu):**

- Standardise best practices.
- Maintain high standards and Orderliness
- Every process has a Standard.

### **Sustain (Shitsuke):**

- Be not harmful to anyone. Training and Discipline to maintain proper Order.
- Do without being Told.
- Training is Goal oriented process

5S methodology is being applied to a wide variety of industries including Manufacturing, Health care, Education & Government.

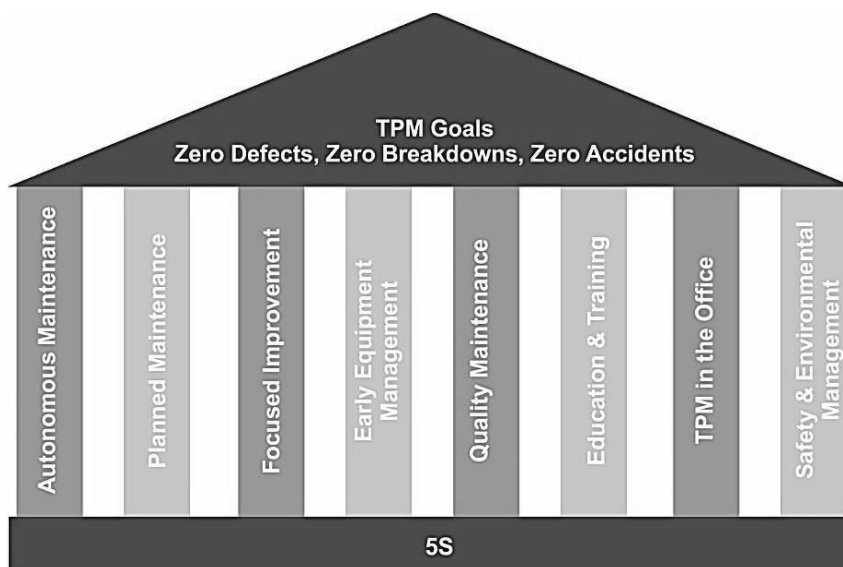
### **Total Productive Maintenance (TPM):**

This is a system of maintaining and improving the integrity of production and quality systems. This is done through machines, equipment, processes, and employees that add to the value in Business Organisation. TPM helps in maintaining all equipment in Good working condition without any breakdowns.

Introduction of TPM involves 4 Stages:

- Preparation Stage:** Suitable environment is to be created in the organisation along with its awareness.
- Introduction Stage:** Initialisation of TPM, information to suppliers, customers, and other stakeholders.
- Implementation Stage:** This is done through 8 activities known as 8 pillars of TPM
- Institutional Stage:** This is the stage of getting TPM awards.

TPM strategy is built on the 5Ss' theory. The 8 pillars of TPM are built on the foundation of 5Ss'.



| Foundation & Pillars              | About                                                                                                             | Techniques                                                                                         |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Foundation: 5S                    | TPM starts with 5S.                                                                                               | Sort, Set in order, Shine, Standardise, Sustain.                                                   |
| P-1: Autonomous Maintenance       | To ensure Machinery works without break down.                                                                     | Cleaning, Lubricating, Visual Inspection, Tightening of Loosened Bolts etc.                        |
| P-2: Focused Improvement (Kaizen) | This pillar is about the <i>minor improvements made on continuous basis</i> to improve efficiency.                | Kaizen Register, Kaizen Summary Sheet, Why-Why Analysis, Summary of Losses.                        |
| P-3: Planned Maintenance          | This is <i>proper maintenance system</i> adopted for improvement in reliability and maintainability of equipment. | Preventive Maintenance, Breakdown Maintenance, Corrective Maintenance, and Maintenance Prevention. |
| P-4: Early Management             | This focuses on <i>shortening the time required</i> for product and equipment development.                        | Engineering and Re-engineering Processes.                                                          |
| P-5: Quality Maintenance          | Achieving customer satisfaction through delivery of highest quality product.                                      | Root Cause Analysis, Customer Data Analysis.                                                       |
| P-6: Education & Training         | Aims to improve knowledge/ skills and enhance morale of employees.                                                | Training Calendar, Policies for Education and Training, On-site Training etc.                      |
| P-7: Office TPM                   | Application of TPM techniques in administration to improve productivity and efficiency and elimination of losses. | Analyzing processes and procedure towards increased Office Automation.                             |

|                                      |                                                                                               |                                                                                       |
|--------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| P-8: Safety, Health, and Environment | Safety of worker is utmost important. It aims to have zero accidents and zero health damages. | Drama, Safety Slogans, Quizzes, Posters Making to create awareness related to safety. |
|--------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|

**Performance Measurement in TPM:** The most important performance measurement in TPM is Overall Equipment Effectiveness (O E E). This requires the identification of 6 Big losses as detailed below:

1. Equipment Failure Losses
2. Setup / Adjustments
3. Idling and minor stoppages
4. Reduced speed
5. Reduced yield and
6. Quality defects

First 2 are called **Appraisal Losses** and next 2 are called **Performance Losses** and the last 2 are called **Quality Losses**.

Overall Equipment Effectiveness (OEE) is calculated by multiplying all the 3 losses

$$O E E = \text{Appraisal Loss} \times \text{Performance Loss} \times \text{Quality Loss}$$

Ideal values for O E E Measurement are:

Availability (Appraisal) > 90%  
Performance > 95%  
Quality > 99%

That is OEE of around 85% is treated as world class performance.

### **T Q M Vs. T P M:**

1. Both TQM & TPM aim for Cost Reduction, Improving Customer Satisfaction and Cutting down Lead Times.
2. Both TQM & TPM require involvement of workers in all phases.
3. Both TQM & TPM require education and training to participants.
4. Both TQM & TPM require long time to notice sustained tangible benefits.
5. Both TQM & TPM require commitment from Top Management for implementation.

### **Cellular Manufacturing (One Piece Flow Production System):**

Cellular Manufacturing is a part of both JIT and Lean system. The goals of Cellular Manufacturing are:

- To move as quickly as possible
- To make wide variety of similar products
- To make as little waste as possible

A cell is created by consolidating the processes required to create a specific output like a part or set of instructions. Each cell has one or more machines that accomplish certain task of manufacturing. The product moves from one cell to the next one. At each cell part of the manufacturing is done. In the assembly line multiple cells will be there. U shaped designs are followed because this facilitates the supervisor to move less and have more supervision over operations.

Flexibility of operations is the biggest advantage. Changes are easy to make as the machines are automatic. Variety of product scaling is possible and also minor changes to the overall design are easy to incorporate. Reduction in the extra steps are done in the process of creating specific output and quick identification of problems and their resolution. This gives massive gains at the time of implementation in Productivity and Quality apart from inventory reduction. It is for this reason that **One Piece Flow Cell (Cellular Manufacturing) is called the ULTIMATE in Lean Production.**

**Implementation Process:** Implementation of Cellular Manufacturing involves the following steps:

1. The parts to be made must be grouped by similarity into families.
2. A systematic analysis of each family is made to the Production Flow Analysis (PFA) in case of Manufacturing Families or in the examination of Design Product Data in case of Design Families. This analysis is time consuming and hence costly also. Yet it is important because a Cell needs to be created for each Family of Parts. There are several mathematical models and algorithms to aid planning for Cellular Manufacturing.
3. Once these variables are determined with a level of uncertainty, optimisations are possible to minimise factors such as total cost of holding, inter cell material handling, external transportation, machine hours and labour salaries etc.

**Difficulties in creating the Flow:** Following difficulties need to be addressed to create efficient flow in Cellular Manufacturing.

- A. Exceptional Elements
- B. Machine Distances
- C. Bottleneck Machines and Parts
- D. Machine Location and Relocation
- E. Part Routing
- F. Cell Load Variation
- G. Inter and Intracellular Material Transferring
- H. Cell Reconfiguring

- I. Dynamic Part Demands and
- J. Operation and Completion Times

### **Benefits and Costs:**

- A. Scattered processes are merged to form short focused paths in concentrated places. This, done by logic, reduces Flow time, Flow distance, Floor space, Inventory handling, Scheduling Transactions, Scrap and Rework (because of quicker identification of non conformities) etc. Cells lead to simplified manufacturing processes and costs can also be easily identified as they are limited to respective cells rather than scattered at different places.
- B. Production and quality controls are facilitated. Cells that are underperforming in either volume or quality can be easily isolated and targeted for improvement.
- C. Cellular Manufacturing benefits employees also. Small Cell Structures improve group cohesiveness and scales down manufacturing process to manageable levels for workers.
- D. Workers can more easily see problems and possible improvements within their small Cells and take corrective actions which improves their morale. Further, improvements suggested by workers themselves require less supervision resulting into overheads reduction.

### **Limitations:**

- A. Cellular Manufacturing can lead to decrease in production flexibility since cells are designed for specific volumes flow
- B. If the demand increases, the cells have to be realigned to meet new requirements, which happens to be a costly exercise.

### **Six Sigma:**

Eventhough Six Sigma was introduced in 1986, it became more popular in 1996 and thereafter. Currently, Six Sigma is used in several sectors of the industry.

Six Sigma is Quality improvement technique whose objective is to eliminate defects in every aspect that affects customer satisfaction. The philosophy of Six Sigma is by measuring defects, steps to eliminate the defects can be taken and practically achieve "Zero Defect" scenario. The focus of Six Sigma is on:

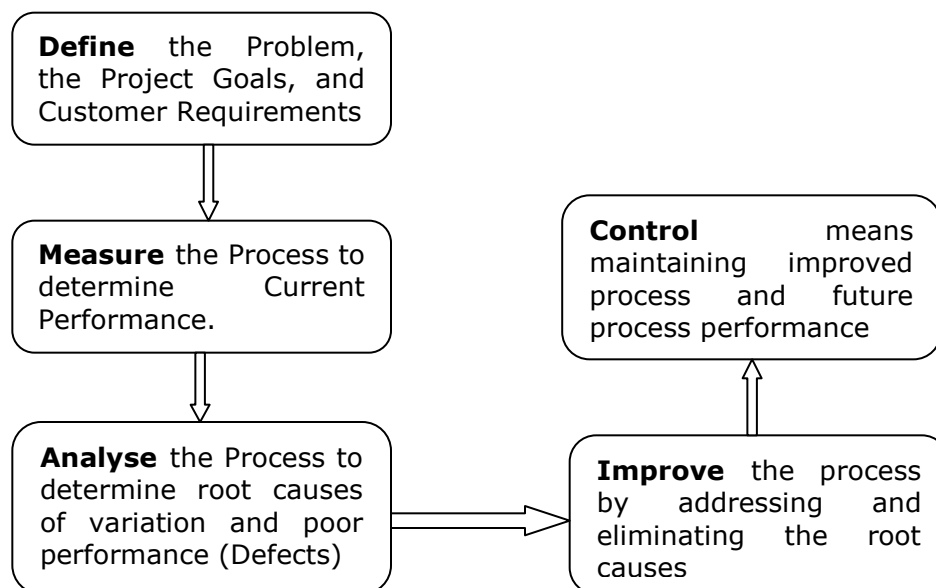
- 1. Customer satisfaction.
- 2. Decisions based on data-driven facts.
- 3. Management, improvements, and processes.
- 4. Proactive management team.
- 5. Collaboration within the business
- 6. Goal for perfection.

Under Six Sigma 3.4 defects for million opportunities is the accepted standard. This implies near perfection of process / operation. It may not be possible to achieve Six Sigma stage at one go. But, practiced continuously, certainly it should be possible gradually. As we tend to reach Six Sigma level, the benefits of it keep flowing as we keep improving quality.

There are 2 methodologies for implementation of Six Sigma:

For existing business processes, it is DMAIC (Define Measure Analyse Improve and Control) and for New Processes it is DMADV (Define Measure Analyse Design and Verify)

**DMAIC** steps will be as follows:

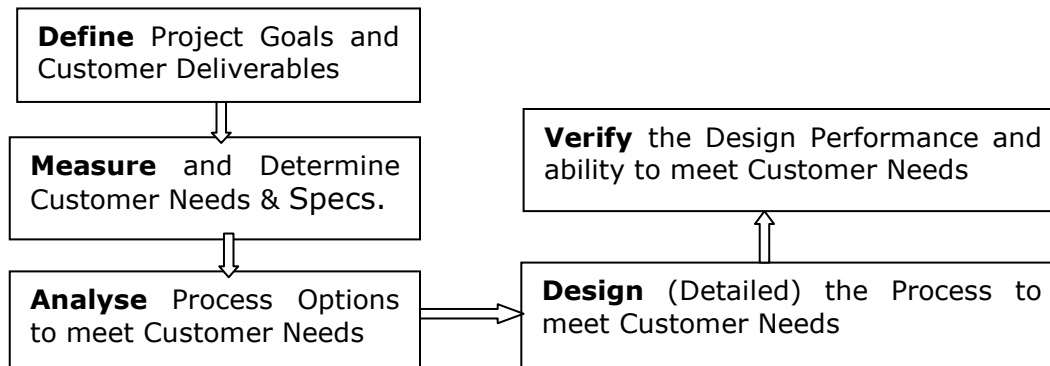


DMAIC is used in the following scenarios:

1. A product or process exists.
2. The project is part of ongoing continuous improvement process.
3. Only a single process needs to be altered.
4. Competitor's actions are stable.
5. Customer's behaviour is unchanging.
6. Technology is stable.

**DMADV:** This is used for creating high quality product keeping view of customer requirements. This is an improvement system which is used to **develop new processes or products at Six Sigma quality levels.**

The steps will be as follows:



DMADV is used in the following Scenarios:

1. A product or process is not in existence
2. Existing process has been optimised using either DMAIC or some other method.
3. Projects have strategic importance.
4. Multiple processes need to be altered.
5. Competitor's performance is changing.
6. Customer's behaviour is changing.
7. Technology is growing.

### Similarities between DMAIC and DMADV:

Both are Six Sigma Methodologies based in Defects per Million Opportunities (DPMO)

Both use same kind of Six Sigma quality management tools

Customer Needs are the basic parameter for both the tools.

Broadly, DMAIC deals with improving existing processes to meet customer needs whereas DMADV deals with new design or redesign.

### Differences between DMAIC and DMADV:

| DMAIC                                                      | DMADV                                                                                        |
|------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Reviews the <i>existing processes</i> and fixes problem(s) | Emphasis on the design of the product and processes.                                         |
| More <i>reactive</i> process.                              | <i>Proactive</i> process.                                                                    |
| Increase the <i>capability</i> .                           | Increase the <i>capacity</i> .                                                               |
| Rupee benefits <i>quantified</i> rather <i>quickly</i> .   | Rupee benefits more <i>difficult to quantify</i> and tend to be <i>much more long term</i> . |

|                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Examples of DMAIC <i>problem-solving</i> methods:</p> <ul style="list-style-type: none"> <li>▪ Reduce the cycle time to process a patent.</li> <li>▪ Reduce the number of errors in sales list.</li> <li>▪ Improve search time for critical information.</li> </ul> | <p>Examples of procedures that the DMADV is designed to address:</p> <ul style="list-style-type: none"> <li>▪ Add a new service</li> <li>▪ Create a real-time system.</li> <li>▪ Create a multiple-source lead tracking system</li> </ul> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### **Limitations of Six Sigma:**

1. Six Sigma focuses on QUALITY only.
2. Six Sigma does not consider Intangible results.
3. Substantial infrastructure is required.
4. For certain tasks, Six Sigma is Complicated.
5. All products do not require Six Sigma Standards.
6. Six Sigma focuses on specific processes only.
7. There are a lot of real time barriers that need to be resolved to convert theoretical benefits into practical benefits.

**Lean Six Sigma:** Lean Six Sigma is the combination of both Lean System and Six Sigma techniques to achieve greater results. BY using Lean Six Sigma, organisations will be able to maximise profits, Build better teams, Minimise Costs, and Satisfy Customers.

### **Process Innovation (PI) and Business Process Reengineering (BPR):**

Process Innovation and Business Process Reengineering are similar techniques. Process innovation is used for NEW processes whereas Business Process Reengineering is used for EXISTING processes.

PI is more Radical than BPR because PI changes overall structure of an organisation whereas BPR streamlines an existing process.

**Process Innovation** means the implementation of a new or significantly improved production or delivery method. Significant changes include changes in techniques, equipment, and / or software etc. However, minor changes or changes due to seasonal or cyclical changes are not considered as part of Process Innovation.

Process of innovating new solutions could fall into one of the following areas:

- **Production:** This relates to processes, equipment and technology to enhance production, including computer software.
- **Delivery:** This includes use of bar codes, tracking systems, shipping software etc. which help in supply chain and delivery systems.
- **Support Services:** Innovations are not limited to simply production or delivery but also extend to Purchasing, Maintenance, Accounting etc. service areas also.

**Business Process Reengineering:** Michael Hammer is treated as the pioneer of BPR.

BPR is defined as

**Fundamental Rethinking** and

**Radical Redesign** of Business Processes to achieve

**Dramatic Improvements** in critical contemporary measures of performance such as

**Cost, Quality, Service and Speed.** (Reengineering focuses on end to end business processes)

**Fundamental Rethinking:** This phase requires the management to challenge the very basic assumptions under which it operates. Questions like why do we do what we do? And why do we do it the way we do? Etc. are pondered to find new ways of doing.

**Radical Redesign:** In this phase a Fresh Start / Clean Slate approach is made. That is if we happen to be new business, how do we operate our business? The objective is to **reinvent what is done** rather than tinkering on the current processes for marginal improvements on what is being done currently.

**Dramatic Improvements:** This is result of the earlier 2 processes. The Fundamental Rethinking and Radical Design are aimed at having Dramatic Improvements rather than the improvements of the order of around 10%. Reengineering has loftier objectives. For instance Ford's Reengineering has lead to reduction of 75% manpower in procurement division.

**End to End Business Processes:** Managers lose track of their real business and goals when processes are segmented into individual tasks to be handled by a specialists and mechanisms are put to track and control the tasks. BPR considers a holistic view of the business processes that contain activities which cut across traditional functional lines. For instance, executing a customer order involves the tasks such as Checking the credit worthiness of customer, checking the availability of material, checking the logistics feasibility etc. etc. which are handled by different specialists. The customer will not be interested in the internal processes of the organisation. Under BPR, all these activities order fulfillment are categorised into one and a single person is made responsible for order execution.

**Principles of BPR:** The following are the principles of BPR

1. **Organise around Results and not around Tasks:** Jobs are to be designed around an objective (or outcome) rather than around tasks. As illustrated above, jobs are designed around "Order Fulfillment" rather than around individual tasks like order receiving, checking inventory, credit worthiness etc. If one person is made accountable for Order Fulfillment, this will eliminate many handoffs, numerous

errors, delays, misunderstandings and also the traditional segregation of duties.

2. **Have those who need the results of a process perform the process:** Once jobs are designed around objectives, this principle helps in eliminating the coordinating and communication activities among the different task managers under traditional system. For instance, if a customer wants to buy a car, it is better the choice of options available (say with regard to tyres, colour and type of seat Fabric etc.) are given to the customer himself for selection rather than done by someone else.
3. **Integrate the processing of information into the work process that produces the information:** This helps in quicker and error free processing of information since the person who is familiar with the information processes it. This will also help in elimination of communication gaps that arise if done by another person.
4. **Treat geographically dispersed resources as centralized:** Decentralised resources provide better service to customers at the expense of creating redundant operations and lost economies of scale. Centralisation will help in taking benefits of economies of scale, getting bulk discounts, better logistic facilities etc.
5. **Line parallel activities instead of integrating them:** If parallel activities are created, then communication networks and shared databases are to be used to eliminate duplication of activities. While processing a loan application, if loan cannot be granted due to certain shortcomings, then these shortcomings are to be communicated to other appraisers also as they do not waste their time on processing the application.
6. **Put the decision point where work is performed, and build controls around the process:** Organisations usually distinguish between workers from those who monitor and supervise the jobs of workers. This is done under the assumption that workers do not have enough knowledge, time, inclination or responsibility for monitoring what they do. Organisations can reduce non-value added management by flattening the organisation structure. This helps in faster decision making and its implementation. This changes the role of Manager from Controller and Supervisor to Supporter and Facilitator. Further, information technology also can be used. This will result in the elimination of Middle level Managers who have been summarising and reporting information to higher management.
7. **Capture information at Source and only Once:** This is done to avoid duplication of activities. This will minimise errors as the person who is familiar with action records information. For instance if material received is certified by Materials Department, the same can be accepted by Accounts payable department for making payment

without again entering the same information. ERP systems, Networking, EDI etc. facilitate this method.

Porter's Value Chain (Porter classifies the activities as Primary activities and Support Activities. Chapter 1) is normally used in BPR as a technique to identify and analyse processes that are of strategic significance to the organisation.

## **CHAPTER 1: Strategic Cost Management - Introduction**

Broad Contents of the Chapter are:

1. Traditional Cost management and its Limitations
2. Strategic Cost Management

### **Traditional Cost Management and its limitations:**

Traditional Cost Management deals with Cost Allocation and Overheads absorption and focuses mainly on cost control and cost reduction. This involves comparing actuals with standards and monitoring variances and taking corrective actions to ensure actuals are in line with standards.

### **Limitations of Traditional Cost Management:**

- A. Emphasis is more on cost control and cost reduction. In today's dynamic environment, over emphasis on cost reduction may result in dangerous results. For instance large cutting down on advertising or preventive maintenance may be suicidal.
- B. Focuses more on internal operations and does not consider external competition, customer expectation etc.
- C. Over emphasis on cost reduction may result in quality compromising which in turn may drive away customers.
- D. Traditional cost management is mostly historical and based on financial data which at times may mislead while taking strategic decisions.
- E. Traditional cost management is reactive in nature.
- F. Traditional cost management has short term outlook like month, quarter, year etc.
- G. Traditional cost management has limited focus on improving existing operations and processes.

### **Strategic Cost Management:**

In the current dynamic business scenario, it is not just sufficient to control costs. It is also required to manage costs strategically to ensure continuous profits to the business inspite of stiff competition and increasing consumer demands.

Strategic cost management may be defined as the managerial use of cost information at one or more stages of strategic management. Strategic management has 4 stages, viz.

- A. Formulation of Strategies;

- B. Communication of strategies in the entire organisation;
- C. Implementing strategies; and
- D. Developing and installing controls to monitor the success of strategies.

Strategic cost management is the application of cost management techniques to improve the strategic position of the business to attain and retain sustained competitive advantage apart from controlling costs.

Strategic cost management is an integral part of value chain. It lays more focus on continuous improvement to deliver superior quality products to customers. It percolates through all the stages of design, development, procurement, production, delivery, service etc.

### **Traditional Cost Mgmt. (TCM) Vs. Strategic Cost Mgmt. (SCM)**

| <b>Feature</b>      | <b>T C M</b>                            | <b>S C M</b>                                                                                                                                                     |
|---------------------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Time Span           | Short Term                              | Long Term                                                                                                                                                        |
| Focus               | Mostly Internal                         | Internal & External                                                                                                                                              |
| Cost Driver Concept | Based on volume of the product          | Each value activity has a separate cost driver. So, cost is related to volume of cost drivers of different activities rather than just the volume of the product |
| Objective           | Problem solving and attention directing | Cost leadership or Product differentiation                                                                                                                       |
| Cost Reduction      | Primary objective                       | Primary objective is cost containment, i.e. cost reduction and value improvement at the same time.                                                               |
| Approach            | Risk averse                             | Risk taking and ability to adapt to changing environment.                                                                                                        |

### **Components of Strategic Cost Management:**

Strategic Cost Management has 3 components. Viz.

- A. **Strategic Positioning Analysis:** Strategic Positioning reflects the choices a company makes to create value and how this creation of value differs from others in the same industry. Value creation by a company depends on following 3 factors
  - a. Organisational values, culture and systems;
  - b. Internal environment - Resources and Competencies; and

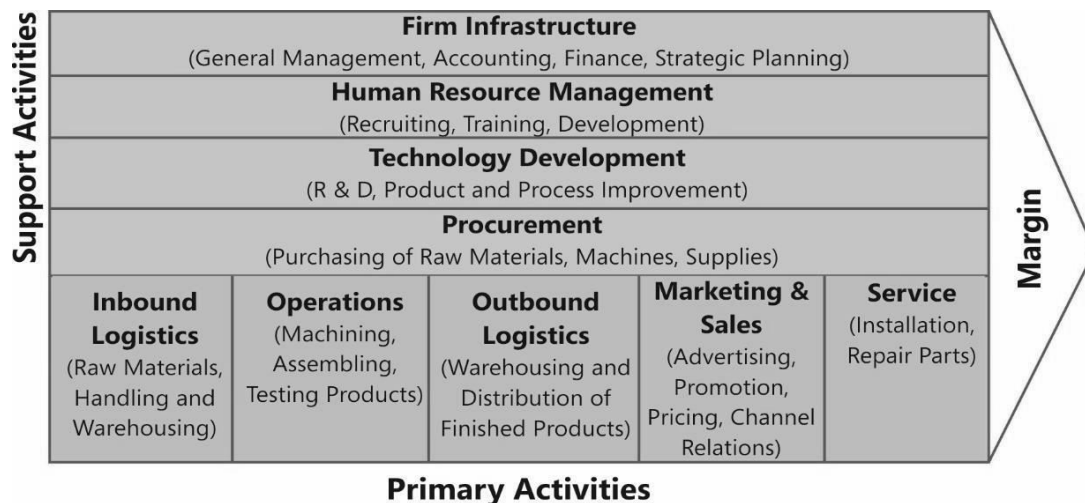
c. External environment. External environment can be analysed through **PESTEL** (Political, Economic, Social, Technological, Environmental and Legal)

B. **Cost Driver Analysis:** Costs of a product are driven by both Structural Cost Drivers and Executional Cost Drivers. Structural cost drivers are based on the structure of the organisation and Executional cost drivers are based on the utilisation of different resources by a company to achieve its objectives and goals.

C. **Value Chain Analysis (VCA):** Value Chain Analysis is a process by which an organisation identifies and analyses the various activities that add value to the product. Intention is to eliminate or minimize Non-Value added activities.

The concept of Value Chain was propounded by Michael Porter in 1985 who says Value Chain as *"Internal processes or activities a company performs to design, produce, market, deliver and support its product."* He further stated that *"a firm's value chain and the way it performs individual activities are a reflection of its history, its strategy, its approach of implementing its strategy, and the underlying economics of the activities themselves."*

Porter further classified the activities of an organisation into Primary activities and Support activities as per the following diagram:



Primary activities are those activities which are directly involved in conversion of inputs to outputs and Secondary (or Support) activities are those which support primary activities. Margin is the difference between the value created by the activities and the cost of creating such value.

**Framework of V C A:**

Value Chain Analysis is done both internally (i.e. within the organisation) and externally (i.e. within the industry). Internal V C A requires internal information and external V C A requires industry information. Strategic framework of V C A consists of:

- A. Industry Structure Analysis;
- B. Core Competencies Analysis; and
- C. Segmentation Analysis

**Industry Structure Analysis is studied through Porter's 5 forces which are:**

- a. Bargaining power of buyers,
- b. Bargaining power of sellers,
- c. Threat of Substitute products or services,
- d. Threat of new entrants,
- e. Intensity of competition among rival firms.

**Core Competencies** arise through resources or capabilities. They can be through unique skill sets of people, or through technical knowhow, or through cost leadership, or through product differentiation, or the assets of the organisation etc.

Core competencies are to be validated from time to time. Validation is done through 3 tests

- a. Access to wide variety of markets,
- b. End product benefits to customer, and
- c. Difficult for competitors to imitate.

(Example is Google's Search engine.)

Loss of core competencies may prove disastrous for the organisation.  
(Example is Nokia feature phone)

Core competencies are used to leverage the Value Chain of current business or even new business. A cement industry with good logistics and dealer network can have steel products also. Similarly a bank with good customer base can have insurance business as well.

**Segmentation Analysis** leads to the identification of segments where the organisation is doing well and where it is not. For this analysis following steps are to be followed:

- a. Segment variables and categories are to be identified. Segment variables may be products, type of customers, Geographical areas, etc. etc.
- b. Construction of segment matrix

- c. Analysing attractiveness of segment
- d. Identification of key factors of each segment
- e. Exploiting respective segments for overall benefit of the organisation.

### **Superior Performance and Competitive Advantage**

In order to survive and prosper, organisations should:

- a. Supply what customers desire and
- b. Survive competition

Firm's competitive advantage is the difference between the sale value it realises from customers and the cost it incurs to create such value. The competencies can be achieved by an organisation through:

- a. **Product differentiation** (eg. Apple products, Gillette razor etc.)  
Differentiation arises when products quality is superior, Superior innovation of the product, Superior response from customers etc.  
and / or
- b. Through **Low Cost Advantage** (eg. Jio). In this case, firm has 2 options. Either to increase the market share at the cost of higher profits or go for higher profits with less concern about market share.

### **Mission, Vision, Objectives and SCM:**

**Mission** indicates the reason for the existence of an organisation. This answers the question why the organisation should exist? Related issues are:

- A. What kind of products or services is it going to offer;
- B. What type of customers are targeted;
- C. What's the primary market
- D. What's the Geographical area of operation etc.

A Mission statement should be **Customer Focused and not Product Focused**

**Vision** statement indicates what the organisation intends to achieve from its Mission. A Vision statement must be challenging, ambitious and motivate employees to work towards organisational goals. Vision is long term in nature ranging from 3 to 10 years or even more.

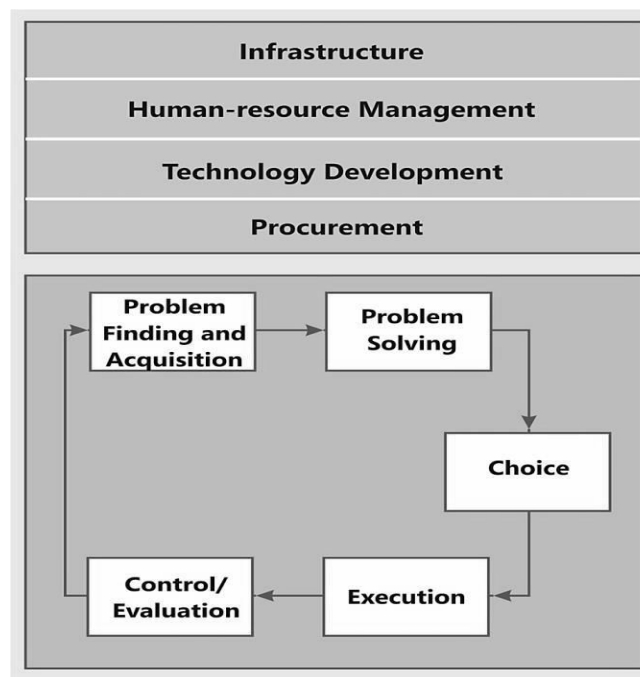
**Objective or Goal** is a precise measurable future state that the organisation intends to achieve. This indicates what needs to be done to meet the vision of the company. Timeframe of Objectives or Goals are short term in nature and range from as short as a day to a quarter, to a year etc.

**SCM** is required to align the Mission, Vision and Objectives of the organisation and attain Goal Congruence. The organisation must be positioned to attain sustained competitive advantage in the dynamic environment. This is achieved through product differentiation and / or cost

leadership. Thus, SCM is closely linked to the organisation's Mission, Vision and Objectives.

### **Value Shop Model or Service Value Chain:**

Value shop mobilises resources (say: people, knowledge or money) to solve specific problems such as curing an illness or delivering a solution to a business problem, or identifying an opportunity etc. This approach is designed to solve customer problems rather than creating Values as in production scenarios. This model is applicable to service sector whereas VCA is applicable to production sector. In value shop principle, no value addition takes place. It only deals with the problem, figure-out the main area which requires its service and finally comes with the solution. To arrive at solution it adopts iterative process and simulation till solution is achieved. This model is useful for Banks, Insurance, Telecom etc. companies. The model has the same support activities as Porter's Value Chain but the primary activities are described differently.



### **Role of Management Accountant:**

Management Accountant is traditionally considered as expert on cost analysis; cost estimation; cost behaviour; standard costing; profitability analysis by product, customer or distribution channel; profit variance analysis; financial analysis etc. However, Today Management Accountants must also have skills in activity-based costing, benchmarking, re-engineering, target costing, life-cycle costing, economic value analysis, total quality management, value chain analysis etc. Value chain analysis is a team

effort. Management accountants need to collaborate with engineering, production, marketing, distribution and service professionals to focus on the strengths, weaknesses, opportunities and threats identified in the value chain analysis results. By championing VCA, Management Accountant enhances firm's value and demonstrates the value of Management Accountants for the firm's growth and survival.