

**Elective Group: (III) Information Systems**  
**Knowledge Management**  
**Unit 4**  
**Total Quality Management and KM**

4.1 TQM and KM

4.2 Bench marking and KM.

#### **4.1 TQM and KM**

Total Quality Management (TQM) is a structured system for satisfying internal and external customers and suppliers by integrating the business environment, continuous improvement, and breakthroughs with development, improvement and maintenance cycles while changing organizational culture.

The TQM philosophy emphasizes use of people, usually in multifunctional teams, to bring about improvement from within the organization. It stresses optimal life cycle cost and uses measurement within a disciplined methodology to target improvements. The key elements of the philosophy are the prevention of defects and an emphasis on quality in design. Important aims include the elimination of losses and the reduction of variability. Further, it advocates the development of relationships – employee, supplier and customer. The entire TQM philosophy is based on an intense desire to achieve the best in all processes.

TQM is at first glance seen primarily as a change in an organization's way of doing work. In the human services, this means the way clients are processed, the service delivery methods applied to them and ancillary organizational processes such as paperwork procurement processes, and other procedures. But TQM is also a change in an organization's culture, its norms, values, and belief systems. TQM is also a change in an organization's decision making processes and power bases. For substantive change to occur, changes in these three dimensions must be aligned : TQM is a technological change, will not be successful unless cultural and political dimensions are attended to. It is a well known fact that TQM, deployment results in a radical change, in the culture and the way of work in an organization. However, a fundamental factor crucial to its success is leadership, including philosophy, style, and behavior. These must be congruent as they are presented by a leader.

#### **Basic Principles of TQM**

While Total Quality Management has proven to be an effective process for improving organizational functioning, its value can only be assured through a comprehensive and well thought out implementation process. TQM principles are the main factors, which guarantee the successful implementation of TQM. Broadly speaking, they can be classified into ten major headings :

- i. Leadership
- ii. Commitment
- iii. Total customer satisfaction
- iv. Continuous improvement
- v. Total involvement
- vi. Training and education
- vii. Ownership

- viii. Rewards and recognition.
- ix. Error prevention
- x. Cooperation and teamwork

### **TQM Structure**

Dr. Edward Deming – management philosophy and systems expert encouraged the Japanese to adopt a systematic approach to problem solving, which later became known as the Deming or Plan Do Check Act(PDCA) Cycle. Deming subsequently replaced “Check” by “Study”, as the word reflected the actual meaning of the approach more accurately. Hence, PDCA cycle is also alternatively abbreviated as the PDSA cycle. Accordingly to Deming consumers are the most important part of a production line. Meeting and exceeding the customer’s requirements is the tasks that everyone within an organization needs to accomplish. Furthermore, the management system has to enable everyone to be responsible for the quality of his output to his internal customers.

Deming’s thinking in the late 1980’s can best be expressed as Management by positive cooperation. This calls for a different organizational climate (organizational culture) and involves the following three elements:

- Happiness in work
- Innovation
- Cooperation

In the TQM framework, the subsequent section deals with the principles of Hoshin which is required to fully comprehend the structure of TQM. TQM organizations integrate customer knowledge with other information and use the planning process to orchestrate action throughout the organization to manage day to day activities and achieve future goals. Plans are reviewed at periodic intervals and adjusted as necessary. The planning process is the glue that holds together all TQM activity.

TQM organizations hold the belief that customers will be satisfied only if the products and services that meet their needs, are consistently delivered when expected, and are priced for value. TQM organizations use the techniques of process management to develop cost-controlled processes that are stable and capable of meeting customer expectations. TQM organizations also understand that exceptional performance today may be unacceptable performance in the future. So they use the concepts of process improvement to achieve both breakthrough gains and incremental continuous improvement. The final element of the TQM model is total participation. TQM organizations understand that all work is performed through people. This begins with leadership. In TQM organizations, top management takes personal responsibility for implementing nurturing, and refining all TQM activities. They make sure that people are properly trained, capable, and actively participate in achieving organizational success. Management and employees work together to create an empowered environment where people are valued.

### **Hoshin**

The term ‘Hoshin’ is short for ‘Hoshin Kanri’. The word Hoshin can be broken into two parts. The literal translation of ‘ho’ is direction. The literal translation of ‘shin’ is needle, so the word ‘Hoshin’ could translate into direction needle or the English equivalent of compass. The word ‘Kanri’. The second part ‘ri’ translates into reason or logic. Altogether, ‘Hoshin Kanri’ means management and control of the organisation’s direction needle or focus. ‘Hoshin Kanri’,

is a proven technique that helps organizations focus efforts, and achieve results. ‘Hoshin Kanri’ was developed in Japan, but it is based on the US techniques of Management By objectives and the classical PDCA improvement cycle. ‘Hoshin Kanri’ is used to communicate the company policy to everyone in the organization. Its primary benefit is to focus activity on the key things necessary for success. Japanese Deming prize winners credit Hoshin as being a key contributor to their business success. Progressive US companies like, Hewlett-Packard and Xerox have also adopted Hoshin as their strategic planning process. Almost all the Malcolm Baldrige National Award winners use some form of “Hoshin like” planning process.

In its simplest form, ‘Hoshin Kanri’ is nothing more than a system of forms and rules that encourage employees to analyze situations, create plans for improvement, conduct performance checks, and take appropriate action. However, in practical application, it is much more than forms and rules.

## TQM TOOLS

The quality tools can be used to improve any kind of process, including manufacturing processes, business processes, and educational processes.

Traditionally, TQM TOOLS are classified as follows;

### 1. Traditionally quality tools

- histograms
- Cause and Effects Diagrams
- Check Sheets
- Pareto Diagrams
- Control Charts
- Scatter Diagrams

### 2. Management and planning Quality Tools

- Affinity Diagrams
- Nominal Group Technique
- Relations Diagrams
- Systematic Diagrams
- Force field Analysis
- Matrix Diagrams
- Flow chart
- Process Decision Program Charts
- Arrow Diagrams

## Six Sigma

Six Sigma can be simply defined as, a measure of quality that strives for near perfection. Six Sigma is a disciplined, data driven approach and methodology for eliminating defects in any process- from manufacturing to transactional and from product to service.

The statistical representation of Six Sigma describes quantitatively how a process is performed. To achieve Six Sigma, a process must not produce more than 3.4 defects per million opportunities. A Six Sigma defect is defined as anything outside customer specifications. A Six Sigma opportunity is then the total quantity of chances for a defect. Process sigma can easily be calculated using a Six Sigma calculator.

The fundamental objective of the Six Sigma methodology is the implementation of a measurement based strategy that focuses on process improvement and variation reduction,

through the application of six sigma improvement projects. This is accomplished through the use of two six sigma sub methodologies – DMAIC and DMADV. The six sigma DMAIC processes (Define, Measure, Analyze, Improve, Control) is an improvement system for existing processes falling below specification and looking for incremental improvement. The six sigma DMADV process (Define, Measure, Analyze, Design, Verify) is an improvement system, used to develop new processes or products at six sigma quality levels. It can also be employed if a current process requires more than just incremental improvement. Both six sigma processes are executed by six sigma green belts and six sigma black belts, and are overseen by six sigma master black belts. According to six sigma academy, black belts save companies in lots of money per project and can complete four to six projects per year.

Six sigma consultants all over the world have developed proprietary methodologies for implementing six sigma quality based on the similar change management philosophies and applications of tools.

### **Re-engineering Methodologies**

Business or major process re-engineering focuses on aligning personnel activities with business strategies while assessing the value of key activities. Additional performance information is generally collected using:

-Performance reviews

-Activity analysis surveys

In the performance review, an independent team interviews a cross-section of employees and assesses performance against the Baldrige Total Quality Criteria, other quality standards, or a customized set of criteria. Improvements needed in key business processes are identified.

An Activity analysis survey, is a low cost Activity Based Costing (ABC) snapshot of the value added in individual processes and activities and does not require changing the financial system. Employees fill out a short (coded) survey on how they allocate their time and assess the value of the tasks which consume their time. The statistically aggregated results are analyzed to highlight low value activities. A team of key managers and professionals analyze the statistical results and suggestions to identify value and cost improvement opportunities.

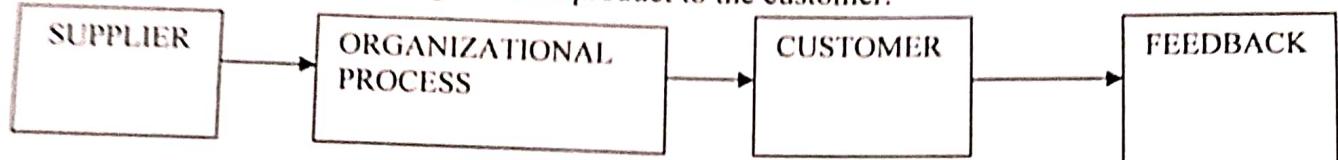
A workshop is conducted to develop and prioritize a consensus list of value and cost improvement opportunities. The appropriate cost reduction, six sigma – value analysis, process improvement workshops are then used to develop specific improvement approaches.

### **Business Process Re-engineering**

Business Process Re-engineering (BPR) is the popular term for re-optimization of organizational processes and structures following the introduction of new Information Technologies into an organization. There is considerable anecdotal evidence that, even small changes in the use of information technology in an organization may require major restructuring of the organization to take full advantage of the efficiencies created by the technology. There is also considerable evidence that without major restructuring, the introduction of IT may not produce savings needed even to justify the investment. Although the evidence for organizational restructuring to accompany technological change is strong, there is much less agreement on exactly what organizational changes are needed to take full advantage of the technology. The controversy includes both the macro and micro level changes. At the macro level, the most salient issue is the change in the degree of centralization of decision making, with related questions about the depth and shape of organizational hierarchies. At the micro level, the most salient issue is the

job definition and content, with related questions about communication patterns, job satisfaction of employees, and skill requirements.

Before proceeding to understand the BPR methodology, let us understand the components that form a simple business process as highlighted in the figure. The figure highlights a simple business transaction, which involves taking a raw material from a supplier, performing the required processes and delivering the final product to the customer.



**Figure 4.1: Business Process Model**

Continuous Business Improvement Model, which was used earlier to bring about improvements to a business process within an organization.

Continuous process improvement is by establishing performance measurement baselines, feedback mechanisms and measures to incorporate the feedbacks within the process.

#### **Key features**

- BPR presents an approach for rapid improvement of business processes.
- BPR provides a differing approach wherein it is assumed that the current process is irrelevant.
- This enables the designers of business processes to disassociate themselves from current process, and focus on a new process.

#### **Implementation approach**

The following list specifies the general approach undertaken by organizations embarking on a BPR initiative

1. Define the scope and objectives of the re-engineering project
2. Learning process (with customers, employees, competitors, non competitors and new technology)
3. Create a vision for the future and design new business processes.
4. Create a plan of action based on the gap between your current processes, technologies and structures, and the final objective.
5. Implementing the solution.

## **4.2 Bench marking and KM.**

Bench marking is an undertaking of companies that aim to emulate the ways things are done best anywhere, within or outside their firm, industry, or sector. Many firms have adopted benchmarking as a significant, systematic technique for measuring the company's performance toward its strategic goals. One argument for bench marking is that there are existing best practices within different parts of the same company. We begin by identifying those skills and capabilities within our own organizations before we look outside. Texas Instruments, Harris Corporation, AMP, UNISYS and Rank Xerox have tried this approach and reaped substantial benefits and cost savings. Benchmarking can also provide insights into areas such as:

- Overall productivity of knowledge investments
- Service quality
- Customer satisfaction and operational level of customer service
- Time to market in relation to other competitors
- Costs, profits, margins
- Relationships and relationship management

**“The Wise learn many things from their Enemies”**

Even though the term bench marking probably did not exist in 414B.C, the time of Aristophanes quote above, he said something very profound about it (Aristophanes could not guess at that time that his ideas would be so applicable to knowledge management) By benchmarking your own business against your competitor's, you get information how to tweak your company's performance goals to stay competitive, in relation to your competitors. By using such a relative measure, all companies stand to gain. By knowing where they stand on the intellectual forefront in relation to their competition, companies can focus on improving process and process knowledge in areas where their scores are below average. Benchmarking, like any other business process, is most likely to produce a payback when strategic business objectives and goals drive it.

## **Benchmark Targets**

Table 4.1 summarizes possible targets against which you can benchmark your company's KM initiatives. You can identify other relevant targets from your own company, from rival firms, from nontrivial firms, or from averages representing your industry or sector. Each has its own benefits and down sides, the choice, finally, is one of subjective judgment and weighted costs.

There are companies that represent the ideal firm within each industry. Lacking any other options, this is usually the best place to begin. These firms have performance levels that other firms aspire to. In the software industry, arguably every firm aspires to be a Microsoft. In terms of customer loyalty, every firm aspires to be an Apple Computer.

Table 4.1 What Do you Benchmark Against?

Benchmark Target	Upsides	Downsides
Other units within your company	This breaks down internal barriers to communication and conversation between various divisions and offices of your company, targets are easily accessible.	Internal policies might come into play, the measures are not indicative of what is considered superior performance in your industry.
Competing Firms	Your company is measured against its direct competition, you get a fair understanding of the knowledge assets of your competitors as an aggregate, partners can easily be identified.	Legalities can make this very difficult, if an trusted third party such as a consulting firm is brought in, additional costs are imposed.
Industry	All of the above, this also lets you gauge your company's standing in the overall market	This can be very expensive, privacy issues begin to surface.
Cross-industry	You might be able to gain valuable insights from non competing firms and apply them to your own company.	All of the above, this does not let you gauge your company's standing in relation to your competitors, the sample population is not truly representative of your own industry or sector, it is often difficult to persuade companies to participate in such an effort, the cost of such an effort is rarely worth it.

Although benchmarking can be a good starting point, you need to be aware of its limitations. Benchmarking by itself, cannot be used as a strategy for KM. Many companies, including Zerox, have successfully used it in their 10 step program, but it is not a sufficient metric for knowledge work in and of itself. However, it can provide useful quantitative inputs for your real-options models.

### The Benchmarking Process

The benchmarking process can be used for self-comparison as well. That is, you can use the benchmarking to obtain an initial benchmark value before you implement a KM system or program. You can then, at a later stage, run the same benchmark to see whether anything has

improved from last time. E.g., you might want to see whether your knowledge sharing network and customer support repository has had a positive effect on the average level of customer satisfaction. You can benchmark the level of customer satisfaction both before and after the new system is implemented and see whether any changes occurred. Be cautioned, however, that this is a slippery road, if you select the wrong benchmark, you will end up focusing on the wrong set of processes.

Table 4.2 Prevalent Role Models in the Benchmarking Process

Performance Areas	Commonly Accepted Role Models
Speed of product development	The former Netscape Corporation
KM integration	Buckman Labs
Software development and Marketing	Microsoft Corporation
Innovation and new product development	3M
Customer loyalty	Apple computer
Brand management	Disney
JIT manufacturing	Toyota
Logistics	Wal-Mart
KM measurement efficacy	Skandia
Mail order	Dell, L.L.Bean
Franchising	McDonalds
Quality management	Motorola
Product line recognition	O'Reilly Publishers
Strategic planning	General Electric
Cost based competition through market	E-machines Inc., Airtran, Southwest Airlines
Demand volume	Taco Bell

### Benchmark Lessons

If you consider your company's KM system to be a competitive resource, build into it the four things that benchmarking teaches.

1. Make it valuable : Focus on including knowledge that is most valuable, then expand the coverage to less valuable knowledge. The key phrase is "valuable knowledge with relatively short term payoffs." However, be careful not to ignore the long term payoffs and investments. Let the types of knowledge (such as customer support knowledge, design knowledge, and competitive bid related knowledge) that have immediate outcomes be the starting point, then expand the benchmark's coverage to other, less compelling or semi-significant areas. Benchmarking will, at the very least, provide information about the areas where you lag behind your completion. Focus on those areas first.

Anecdotal evidence suggests that managers do not buy into ideas that strain finances of a company without short term payoffs for too long. Even though a comprehensive KM strategy might be at work in the background, show your senior management some short-term outcomes.

2. Make it rare : Focus on the areas of knowledge that give you an edge over competition. Through benchmarking studies, you can easily figure out the areas in which your competition is not strong. If any of those areas are a possible source of competitive advantage, by all means, support them. Gateway, for example, is known for its customer service. If you have a problem with a computer you bought from them, you know that you will probably find a knowledgeable customer support representative on the other end. Almost all PC manufacturers have some kind of customer support, but Gateway decided to strengthen this over anything else. Most of Gateway's customers tend to be repeat buyers, simply because of its excellent customer service. Gateway also uses a customer knowledge repository to be able to track all previous problems that a customer might have had in the past.

Some companies build a competitive advantage by taking one of the given metrics to a level that is rare and that customers value. NEC has built on this rarity, as well. NEC's printer division provides an overnight replacement warranty for all its laser printers for two years from the date of purchase. By being able to track customer information through a sophisticated knowledge retrieval system, NEC provides overnight replacements after asking little more than one question (the printers serial number) on the phone.

3. Make it hard to copy. Customer data is an excellent example of a resource that is very hard to copy. Benchmarking can help you figure out the resources that you have and your competition does not. If you focus on resources that can be copied, it will, at best, buy you a temporary competitive advantage. However if you focus on knowledge areas in which your employees possess skills, you can make it immensely difficult for your competition to copy those without luring away your employees. Consulting companies have known this for a long time, and it's about time you thought of applying the same idea to the knowledge assets within your own company.
4. Make it hard to substitute. Whatever categories of knowledge you focus on, make sure that straightforward substitutes do not exist. Companies that thought they have gained an edge by outsourcing a part of their manufacturing operations to firms in Third World countries did not take long to realize that everyone else could do the same. And they did. Knowledge relating to skills, reputation, and experience cannot be easily substituted with close equivalents. Make sure you focus on such areas when you begin. Benchmarking is unlikely to reveal such areas unless a high level of job diversity in the employee pool is involved in the effort.

### **The Balanced Score card Technique**

The approach that is a viable method for measuring knowledge centric performance of your organization is the Balanced Score card approach. Kaplan and Norton originally proposed the Balanced Score card in their landmark article published in the Harvard Business Review. The Balanced Score card provides a technique to "maintain a balance between long-term and short term objectives, financial and nonfinancial measures, lagging and leading indicators, and between internal and external perspectives". The basic score card for translating vision and

strategy into actual goals.

The Balanced Score card can also be used to evaluate the impact of the KM system on complementary criteria. The four processes involved in using the Balanced scorecard approach for managing knowledge. Involve the following steps.

1. Translate the KM vision. Managers need to reach consensus as to why knowledge is being managed or needs to be managed. What are the firm's visions for the KM investment? The vision needs to be translated into concrete goals and objectives before any actions can be measured. The beauty of the Balanced Score card is that it can be used to create short-term, specific goals for individual employees, all of which feed to the organizational vision.  
While we are on the subject of vision, let me make it very clear that the vision rarely comes by copying the mission statement.
2. Communicate and link : This lets you measure as you go along your objective of selling the idea to your company's employees. You can gauge how well your employees are being trained to use the system as a part of their work. You can also measure how well you have linked rewards to both the effective use and contribution of knowledge. The KM champion must communicate the strategy along the entire rung of employees and demonstrate the links between individual employee goals, and the departmental/organizational goals, in terms of leveraging knowledge.
3. Do the reality check. This part of the Balanced Score card strategy determines how well your chosen metrics, explicated goals, targets and allocated resources align with the initial ideas you had in mind for the KM system.
4. Incorporate learning and feedback. The Balanced Score card lets you evaluate the goals, metrics, and targets that you have chosen for your KM system, then analyze how well they are actually working.

The Balanced Score card approach lets you track the current health of the KM strategy that you have chosen for your organization.

#### **Questions :**

- 1 Write a note on Total Quality Management and Knowledge Management
- 2 Explain in detail Bench marking and Knowledge Management
3. Explain TQM Tools.