9.1 INTRODUCTION

For effective management and performance improvement it is necessary to measure the various defined parameters of the process. Key Performance Indicator (KPI) provides the different parameters along with the measuring process. Once the things are measured, then they need to be presented effectively so that useful information can be derived from the raw data of KPI.

Operations Management is usually concerned with the efficient conversion of all resources into products or services for meeting the customer's needs. This subject has its root in the school of scientific management which sometime termed as "Efficiency Oriented Management". However, during the last three decades, it has started analysing a problem from holistic or systems approach by integrating supplier, producer and customers. This viewpoint has resulted in the evolution of new paradigm called customer satisfaction and delightment. The philosophy of Total Quality Management (TQM) has enabled to achieve this delightment. The prefixing of the world 'TOTAL' in Quality Management has introduced a sea change in the approach. TQM uses a variety of tools for attaining its objectives of which seven quality control tools are easiest to apply in any environment.

9.2 QUALITY TOOLS FOR IMPROVEMENT

The environment of the business of power sector has been changed recently largely due to partial deregulation of this sector. The need has increasingly being felt at least to achieve customer satisfaction, if not, delightment. Hence, it is essential to analyze the present situation critically by capturing the useful informations that will facilitate the process for effective managerial decision making.

In this direction, the seven quality control tools also known as **7 QC tools** are very useful. These tools revolutionised the business and the world. The paradigm is so wide that these tools can be effectively deployed and used in any kind of industry.

These 7 QC tools are as follows:

- Check Sheets
- Scatter Diagrams
- Histograms/Bar Chart
- Pareto Analysis
- Flow Charts
- Cause-Effect Diagram
- Control Charts

1. Check Sheets

This may be a simple listing of items which can represent information in an efficient, graphical format. If the system under analysis can be depicted into a form, it can provide a very useful management information.

Power Failure in a Month					
Reason	Week				
	First	Second	Third	Fourth	Total
Scheduled Cut	𝍸	𝍸 ||	|||	𝍸	20
Transformer Failure	||	|	|||	||	8
Conductor Failure	𝍸	||	𝍸 ||	|	15
Total	12	10	13	8	43

Figure 9.1 : Check Sheet

2. Scatter Diagrams

Scatter diagrams are graphical tools that attempt to depict the influence that one variable has on another. A common diagram of this type usually displays points representing the observed value of one variable corresponding to the value of another variable.

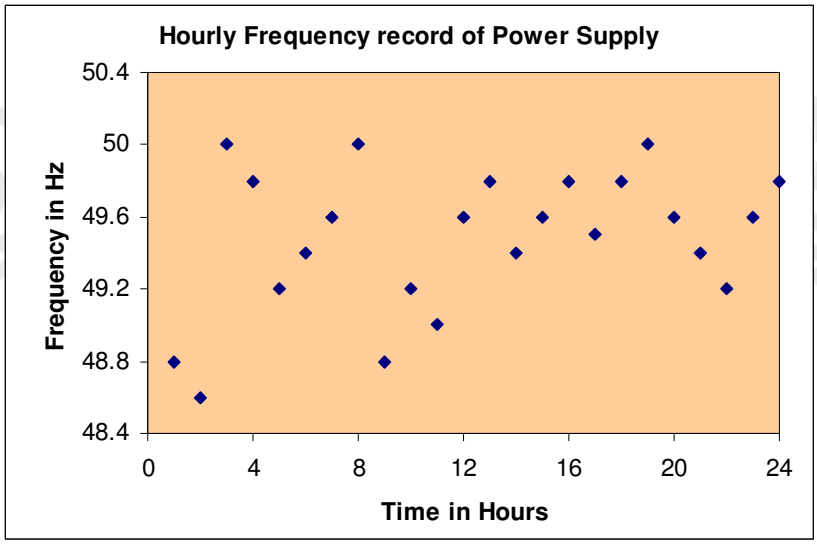


Figure 9.2 : Scatter Diagram

3. Histograms/Bar Chart

Histograms provide a simple, graphical view of accumulated data. It provides the easiest way to evaluate the distribution of data, including its dispersion and central tendency. It is very easy to construct a histogram.

4. Pareto Analysis

Pareto charts are based on the principle – "Vital Few Trivial Many". It allows user to focus attention on a few important factors in a process. It is

extremely useful because it identifies those factors which have the greatest cumulative effect on the system. Pareto chart is created by plotting the cumulative frequencies of the relative frequency data (event count data), in descending order.

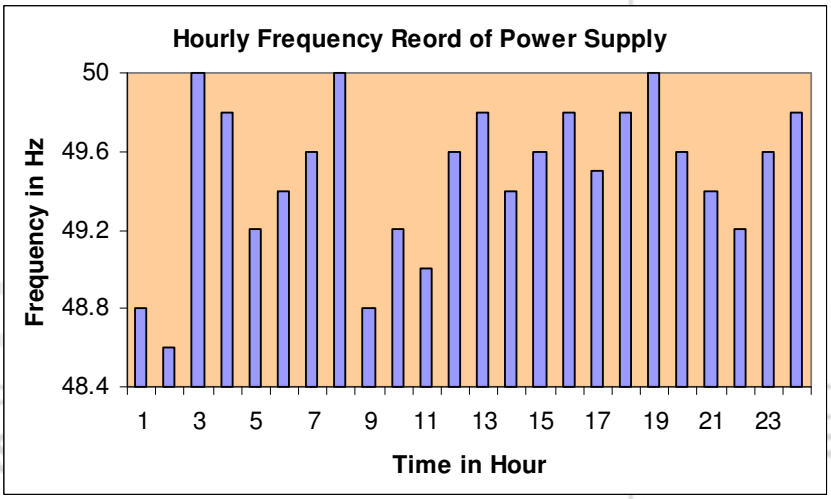


Figure 9.3 : Histograms/Bar Chart

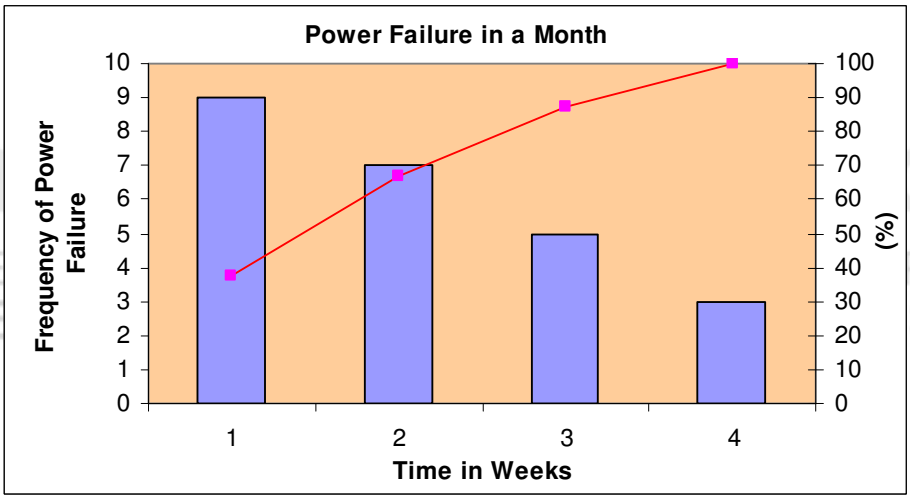


Figure 9.4 : Pareto Chart

5. Flow Charts

Flow charts are pictorial representations of a process. By breaking the process down into its constituent steps, flowcharts can be useful in identifying where errors are likely to be found in the system.

6. Cause-Effect Diagram

This diagram, also called an Ishikawa diagram (or fish bone diagram), is used to associate multiple possible causes with a single effect. Thus, given a particular effect, the diagram is constructed to identify and organize possible causes for it.

The primary branch represents the effect (the quality characteristic that is intended to be improved and controlled) and is typically labelled on the right side of the diagram. Each major branch of the diagram corresponds to a major cause (or class of causes) that directly relates to the effect. Minor branches correspond to more detailed causal factors. This type of diagram is useful in any analysis, as it illustrates the relationship between cause and effect in a rational manner.

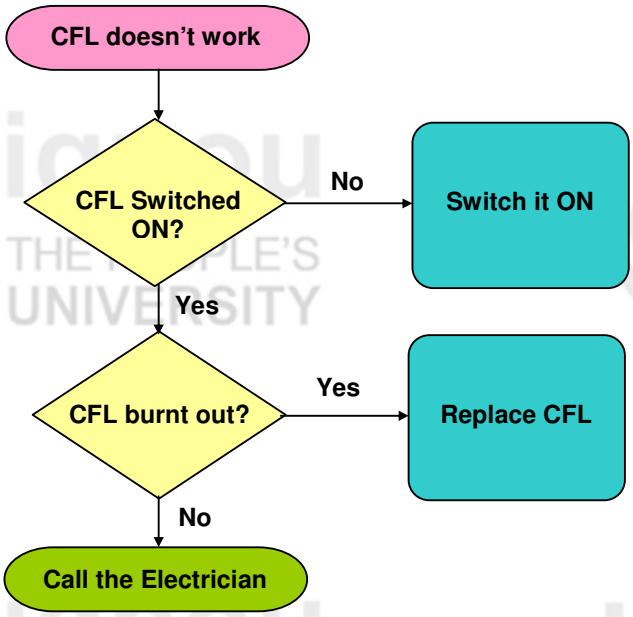


Figure 9.5 : Flow Charts

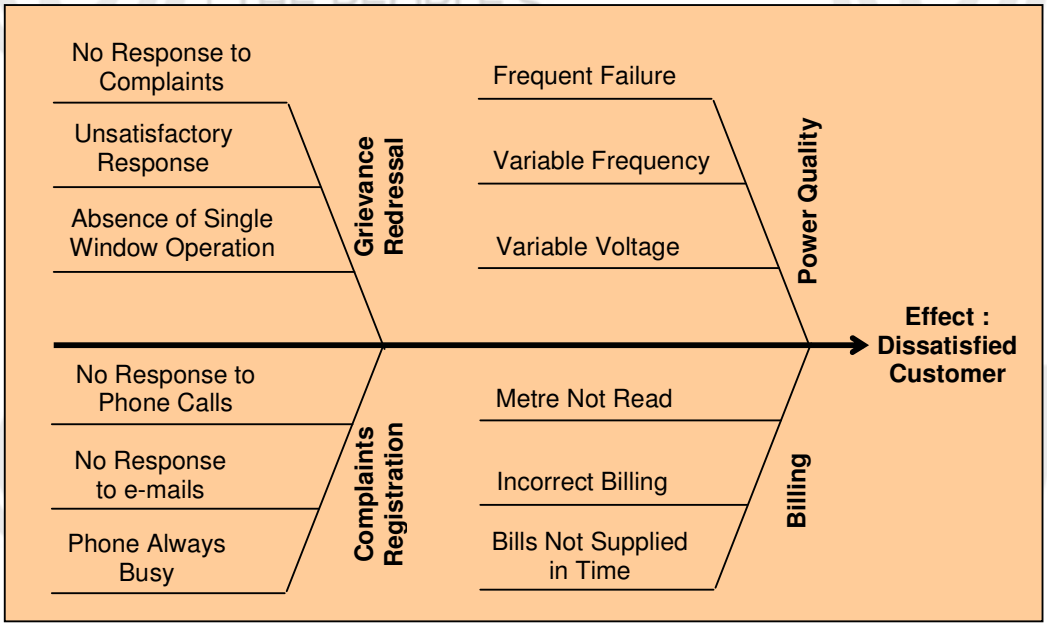


Figure 9.6 : Fish Bone Diagrams

7. Control Charts

The control chart is the fundamental tool of Statistical Quality Control (SQC). It indicates the common cause variation that is built into a system thus allow the user to determine the process consistency and continuity. Special causes can be assigned for a process which is out of control or going to be out of control. The bounds of the control chart are marked by upper and lower control limits that are calculated by applying statistical formulas to data from the process. Data points that fall outside these bounds represent variations due to special causes, which can typically be found and eliminated. The most commonly used SQC charts are X and R Charts, P Chart and C Chart.

Mere use of the quality control tools does not necessarily constitute a guarantee to achieve drastic improvements in quality. It is imperative to establish an environment and a system that will continuously promote quality in all aspects of its operation. The basic purpose of the entire quality program with the help of performance benchmarking and KPI data capturing is improvement in the process, in a particular methodology which include:

- Discovery;
- Analysis;
- Improvement;
- Monitoring;
- Implementation; and
- Verification.

9.3 MANAGEMENT OF INFORMATION

9.3.1 Internalization of KPI Process

It is the responsibility of management to ensure that the focus of all the participants in performance management and KPI exercise is there continuously throughout. It becomes imperative to internalise the KPI process. It requires continuous monitoring and exhibit the control whenever the system requires it.

9.3.2 Management of Initiatives and Focus

In this era of fierce competition and to have the competitive edge, it is important to conserve the material and human resources by way of utilizing the resources more judiciously by avoiding the wastage. The entire exercise is a kind of movement which needs to be started immediately and it will be effective in accomplishing this object. At the same point of time it is also important to focus on increasing the efficiency.

We can see that our competitors are ahead of us, using the newer technologies more quickly, adapt to change without any inhibition etc. It is nothing but the management of initiatives and focus. KPI and performance benchmarking exercise is the endeavour in that direction because it is by management and for management only. These are initiatives and provide the focus in a measurable fashion and process capabilities.

Management can feel the waste of material things and the inefficiencies. But how to address this feel and gain confidence that YES it is not only a feel but a reality, for that management requires initiatives and focus and this comes from KPI and benchmarking.

9.3.3 Dissemination of Learning

Management has initiated a program, subsequently invested a considerable amount of resources and learnt a lesson too. This learning now needs to be percolated down below so that it does not remain a mere learning but becomes a part and parcel of day to day life in the improved/changed processes. There are various means and ways through which learning of any kind can be disseminated. Human resource training is an example of that.

9.4 PERFORMANCE MONITORING AND CONTROL

9.4.1 Balance Business Score Card

Information Age

The current era is driven by the information. It is a revolutionary transformation and industries are competing in this revolutionary era with the help of information, so the competition is now an information age competition. This era is more revolutionary for service industries and particularly for industries like electrical utilities because of regulatory regime and pressure from all the stakeholders. So in this era, service industries including electrical utilities require new capabilities, continuous improvement and innovation, efficient management of assets etc.

The major requirement can be broadly classified as follows:

- Customer relationship development;
- Efficient and effective service;
- Meeting the customer expectations – introduce innovation through new and better products/services;
- Provide services at a low cost with shortest possible turn around time; and
- Systems and processes development, IT deployment.

It becomes imperative for organizations to compete and to meet the expectations of Customers, Shareholders and Employees. The organizations are adopting different management tools e.g. Benchmarking, Balanced Score Card, TQM, etc. and at the same point of time turning themselves to a variety of improvement initiatives viz. reengineering, activity based cost management, customer focused environment, employee empowerment etc. Moreover now-a-days things are changing so fast that one can say – "ONLY CONSTANT IS CHANGE" and organizations not only need to focus and manage the customer, financials, internal business processes and learning & growth aspects effectively and efficiently but also they require to realign their vision and strategy as indicated by the environment and business needs. We will discuss in subsequent section the importance of traditional model and need to have balanced score card to understand the transformation and the advantages of balanced scorecard over the traditional model to meet the growing demand created by the information age.

Traditional Model

The traditional model talks only about the finance and the financial accounting model. The results are published periodically may be in the form of quarterly and annual financial reports. This model is still used extensively to meet the requirement of the law of land and to build internal assets and capabilities and even for external parties' strategic alliance. This financial accounting model does not reflect say the quality of services, employee engagement – their motivation level, productivity, etc. customer satisfaction and their loyalty. These intangible assets are not included and reflected in the financials reports but these are the assets and capabilities which determine the competitive edge and the success of business in coming years and today.

Introduction to Balanced Score Card (BSC)

We see that the traditional model does not reflect the importance of intangible assets, their capturing and measuring mechanism and does not reflect the future prospects of the business. It is a collision between the long term capabilities & competitive edge at one end and the historical-cost which is immovable i.e. movable and immovable. The balanced score card includes measures of the drivers of future performance with the financial measures of past performance. It addresses the core issue of creation of future value through investment in technology, processes, innovation (for information age competition), employees, share holders and customers.

Kaplan and Norton who are considered the father of Balanced Score Card, developed this card which addresses all the requirement. They describe the innovation of this card as follows:

"The balanced scorecard retains traditional financial measures. But financial measures tell the story of past events, an adequate story for industrial age companies for which investments in long-term capabilities and customer relationships were not critical for success. These financial measures are inadequate, however, for guiding and evaluating the journey that information

age companies must make to create future value through investment in customers, suppliers, employees, processes, technology, and innovation."

The balanced scorecard suggests that we view the organization from four perspectives, and to develop metrics, collect data and analyze it relative to each of these perspectives. The pictorial representation of this model is shown below:

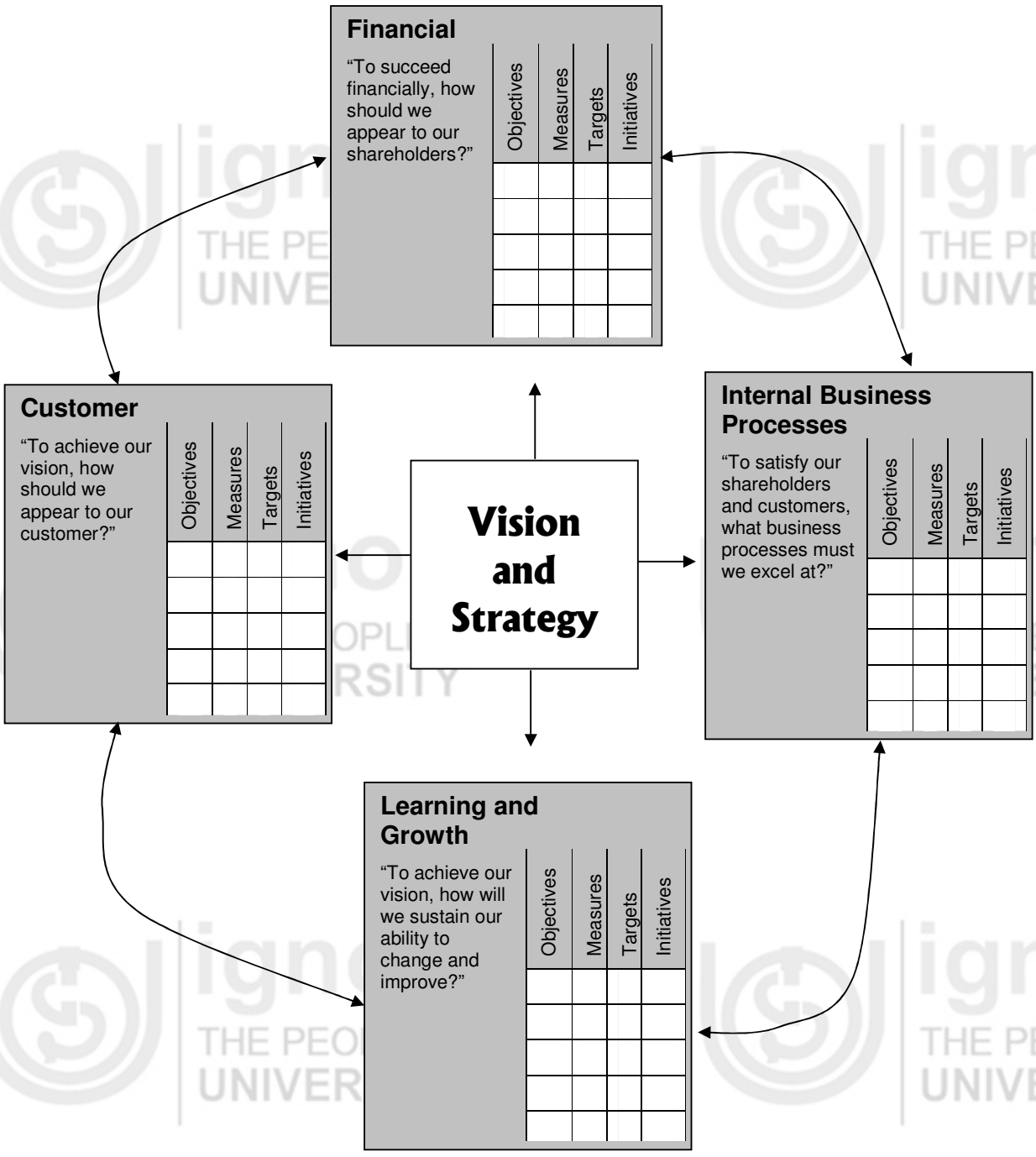


Figure 9.7 : Four Perspectives of an Organisation

(**Source :** *Robert S. Kaplan and David P. Nortan, "Using the Balanced Scorecard as a Strategic Management System" Harvard Business Review*)

Strategic Perspective

Strategic perspectives cover functions such as revenue, customer satisfaction, people, process and technology. Every organisation needs a strategy to survive and grow on its own within business environment in which it finds itself. Understanding of business environment starts with identification of the internal and external forces that shape its business.

Some dimensions of the forces that act on a business are:

(a) Internal dimension that includes employees, assets, technology and capital.

(b) External forces that impact or shape the course of an organisation in the business of power can be broadly classified into: Government Policies, Regulatory Policies, Socio-economic Environment, Competition-Industry Structure.

Organizational strategy for its survival, growth and performance improvement is decided only after careful detailed analysis of the business environment. Generally management thought has been centred on the mechanistic view of the strategy, structure and systems. Bringing in the customer focus, people issues and process view helps the company in ensuring a balanced approach towards its environment.

The core of Balanced Score Card (BSC) approach is bringing customer focus as the key driver into the whole process of strategy making. The balanced scorecard is nothing but management by fact and it comes from measurement. Balanced scorecard allows the managers to see their company more clearly. The Baldrige Criteria (1997) booklet reiterates this concept of fact-based management:

"Modern businesses depend upon measurement and analysis of performance. Measurements must derive from the company's strategy and provide critical data and information about key processes, outputs and results. Data and information needed for performance measurement and improvement are of many types, including: customer, product and service performance, operations, market, competitive comparisons, supplier, employee-related, and cost and financial. Analysis entails using data to determine trends, projections, and cause and effect – that might not be evident without analysis. Data and analysis support a variety of company purposes, such as planning, reviewing company performance, improving operations, and comparing company performance with competitors' or with 'best practices' benchmarks."

"A major consideration in performance improvement involves the creation and use of performance measures or indicators. Performance measures or indicators are measurable characteristics of products, services, processes, and operations the company uses to track and improve performance. The measures or indicators should be selected to best represent the factors that lead to improved customer, operational, and financial performance. A comprehensive set of measures or indicators tied to customer and/or company

performance requirements represents a clear basis for aligning all activities with the company's goals. Through the analysis of data from the tracking processes, the measures or indicators themselves may be evaluated and changed to better support such goals."

Managing Strategy through BSC

The Balanced Score Card (BSC) proposes four new management processes that separately and in combination, contribute to linking long-term strategic objectives with short-term actions. The processes are:

(i) Translating the Vision
- Clarifying the vision
- Gaining consensus

(ii) Communicating and Linking
- Communicating and Educating
- Setting goals
- Linking rewards to performance measures

(iii) Business Planning
- Setting targets
- Aligning strategic initiatives
- Allocating resources
- Establishing milestones

(iv) Feedback and Learning
- Articulating the shared vision
- Supplying strategic feedback
- Facilitating strategy review and learning

The balanced scorecard can be used as the foundation of an integrated and interactive strategic management system. Kaplan and Norton (1992) have mentioned that many organizations are using the BSC to:

- Clarify and update strategy
- Communicate strategy throughout the company
- Align unit and individual goals with the strategy
- Link strategic objectives to long-term targets and annual budgets
- Identify and align strategic initiatives
- Conduct periodic performance reviews to learn about and improve strategy.

Strategy-Focused Organization

Organization need to focus on five principles for the successful implementation of strategy. Organizations will rarely adhere to all five principles but exemplary organization typically incorporate much of the thinking.

These five principles are:

Principle 1	**:**	Translate the strategy to Operational Terms
Sub-Components	**:**	Strategy Map and Balanced Score Card (BSC)
Principle 2	**:**	Align the organization to the strategy
Sub-Components	**:**	Corporate roles, business unit synergies and shared service synergies
Principle 3	**:**	Make Strategy Everyone's Everyday Job
Sub-Components	**:**	Strategic awareness, personal scoreboard and balanced pay checks
Principle 4	**:**	Make strategy a continual process
Sub-Components	**:**	Link budgets and strategies, analytics and information systems, and strategic learning
Principle 5	**:**	Mobilize change through executive leadership
Sub-Components	**:**	Mobilization, governance process and strategic management system

BSC and KPI

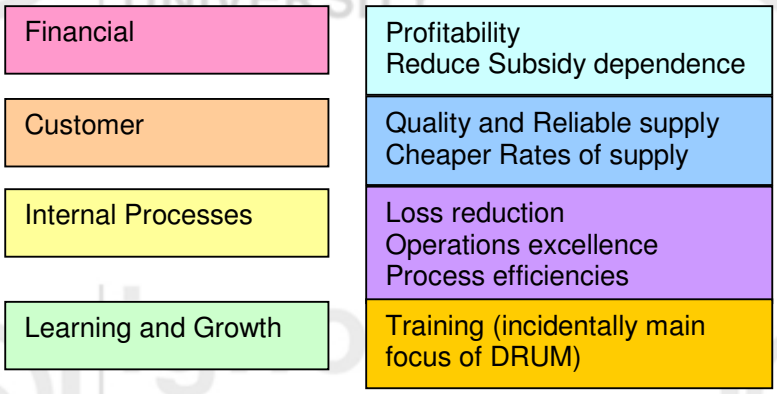
Every successful organization measures its performance across the following parameters, for dissemination to all stakeholders:

- Financial parameters – Profitability, sustainable growth;
- Customer focus – customer satisfaction, surveys, complaints handled;
- Business process improvements – reduction of losses, costs, cycle time, etc.; and
- Learning and growth – training, staff satisfaction, attrition, etc.

This is represented as a balanced scorecard for an organization that not only looks at the operating and financial parameters but also at the learning, growth within the organization and its customer focus.

Thus, each strategic perspective can be sliced across various facets of the organization and studied. It is also important that all strategic perspectives are tied to the critical success factors of the organization i.e. goals/activities that must be carried out to ensure the success of the organization. This can be measured in financial, technical or customer parameters.

If one were to develop the strategic perspectives across the four distinct zones (as presented in BSC) for a distribution company, it can be along the lines as given in the diagram below.



Once the strategic perspectives are defined (closely aligned with the critical success factors), the next step is in developing the goals. Goals should be specific and be measurable.

If the company proposes “Profitability” in its financial perspective, this should lead to development of goals such as ‘Return on Capital Employed’, ‘Asset Utilisation’, ‘Subsidy Reduction’, ‘Internal Resources Generation’, etc. it can be seen that each of the measures is specific and measurable and ties with the definition of profitability goal.

These goals are then converted into measurable parameters and described as Key Performance Indicators (KPIs). The KPI is not a raw data point but a meaningful analysis of critical data that measures the goal.

This entire system emphasis of measurement as the building block. The KPI is a very important tool for implementation of Balanced Score Card. One cannot improve; one cannot introduce any new concept/technology unless you measure. KPI not only defines what to measure, how to measure but provides a very useful insight to the management about the current state of affairs so that with the help of Balanced Score Card, overall strategy can be developed/realigned.

The KPIs help to prepare the matrix for balanced scorecard. The weightage can be assigned to each KPI to know the score. The overall result would show the current status and on the basis of which management can take the decisions for future course of action.

Balance scorecard (BSC) system can be used to understand how to implement strategic initiatives that help an organization to achieve its mission/ vision. BSC is a tool that helps in communication of strategic initiatives, measuring strategy, aligning the organization and a system of performance reviews.

There are three critical success factors in implementing the Balanced Scorecard.

(1) The active and visible support of senior management;

(2) A strong review process; and

(3) A knowledge team to drive and support scorecard deployment.

The balanced scorecard provides a framework for managing the implementation of strategy while also allowing the strategy itself to evolve in response to changes in the company's competitive, market and technological environments.

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4. J. Creelman, N. Makhijani: Succeeding with the Balanced Scorecard, John Wiley & Sons, 2005.

SAQ 1

(a) What do you understand about the strategic aspect of Balanced Score Card (BSC)?

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(b) Describe the process of implementation of BSC in your organization.

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9.4.2 Performance Benchmarking through Indicators

There are several indicators method for benchmarking. It is also not possible to benchmark all the indicators, collect and analyze the data and take the corrective action upon gap analysis. Thus it becomes imperative to classify the indicators in certain category and choose the appropriate indicators method for that category. The indicators can be classified into three broad categories:

- Partial Indicators;
- Specific Core Indices; and
- Overall Performance Indicators.

Partial Indicators Method

The partial indicators method consists of calculating different measures of the financial, operating, commercial, and quality of a business's performance. Past performance can provide information on improvements over time. These indicators account for the relationship of two simple measures, yielding indices of productivity, human capital development, or financial conditions, among others. Such performance indicators include, for example, the number of workers per one thousand connections, the percentage of loss, training hours, etc.

The ultimate purpose of the benchmarking exercise is to bring the step forward improvement and align the various business processes with the help of best practices to achieve the goal. Thus it becomes more important to select and tailor the set of indicators to the purpose and to the intended users.

Specific Core Indicators Method

This method emphasises to assign the responsibility and create the accountability. It is possible that for any of the main indicators, the stakeholder(s) do not have any kind of control on the processes governing the result of that indicator. It becomes imperative and helpful to supplement these indicators with specific core indicators. It will reinforce the effect of possible improvement actions.

Specific Core Indicators are widely used because they serve as a starting point for evaluating performance. The simple examples can be collections, network details related indicators.

Overall Performance Indicator Method

Overall Performance Indicator can be derived from a combination of few of the specific core indicators. The way this combination is usually performed is through a weighted average of core indices, where the weights reflect the importance assigns to each aspect of the firm performance, for an utility the weights may be assigned as per regulatory requirement/directive. These Indicator(s) provide a summary index and establish the relationship between functions of different departments. Thus it helps to communicate relative

performance of wide stakeholders and abridge the gap between different functions.

From a wider perspective, it helps the outside world to gauge the relative performance of different companies. For an utility, say regulator, may use these indicators to assess the relative efficiency of service companies.

9.4.3 Selection and Adoption of Best Practices

The balanced scorecard provides the current status with the help of KPIs. The exact area can be identified for focus. Once the focus area is selected, then the moot question remains – How to improve, what is the different methods-technologies-innovative products/service available and what should be the implementation strategy.

The conceptual framework to define a model electric distribution company (DISCOM) can be selected through the People-Process-Technology taxonomy as shown in Figure 9.8.

People	Process	Technology
Organization Structure	**Asset Management** – Includes planning and managing the company's investment in the physical assets employed in providing high quality electric service.	**Distribution Network** - Wires - Transformers - Capacitors - Substations - Poles, etc.
Working Management • Work Analysis and Staffing • Work Management Systems	**System Operations & Dispatch** – Includes the activities involved in optimizing the flow of electricity including purchasing and trading plus economic dispatch. At the field level, this includes feeder control.	**Metering Equipment**
Compensation and Benefits	**Field Operations –** Includes the classic operations and maintenance (O&M) activities of the distribution business, including construction, new hook ups, trouble calls and turn offs as well as meter testing and repair and other activities involved in day-to-day operations.	**O&M Equipment (trucks, tools, etc.)**
Training	**Customer Processes –** Includes the meter-billing-collection (MBC) process plus all customer interfaces, including customer relations and marketing (including advertising) as well as consumer education and outreach. **Corporate Processes –** Including activities that support management of primary business processes or that are purely executive functions.	**Computing and Telecommunications**

Figure 9.8 : People-Process-Technology Taxonomy

The next step involved the identification of the "best practices" which should be tailored to the conditions of individual DISCOM. A representative list of Best Practices is shown below in Figure 9.9.

Business Process: Asset Management
System Mapping on Geographical Information System (GIS)
High Voltage Distribution System
Reactive Power Compensation
Network Reconductoring & Reconfiguration
New Substations & capacity Augmentation of existing Substations
Prepackaged Substations
Ring Main Unit Installation
Business Process: System Operations & Dispatch
Automatic Remote Monitoring of SAIDI, SAIFI, CAIDI, and Voltage
Automated Meter Reading (AMR)
Timer-controlled Rural Load Management Scheme
Business Process: Field Operations
Installation of Fault Passage Indicators
Safety Equipment & Procedures
Meter Management
RFID-based Meter & Document Tracking
Business Process: Customer Processes
New Connection Management
Call Center
Spot Billing
Prepaid Metering
Automatic Bill Collection Machine
Business Process: Corporate Process
IT Infrastructure
IT Disaster Recovery
IT Configuration/Release/Change Management
IT Asset Management
Enhanced IT Solution for Finance & Accounts
Enhanced IT Solution for Energy Accounting
Enhanced IT Solution for Project Management
Training

Figure 9.9 : Representative List of Best Practices

The few best practices which can further be assigned to individual KPIs are illustrated in Figure 9.10. This list is just for illustrative purpose and not comprehensive but one has to remain vigilant throughout the life of product/service about the changes in processes, technology and realign the best practices accordingly. It is not one time panacea but a continuous journey.

Sl. No.	KPI	Best Practices	Benefits Expected
1.	SAIDI	• Fault Passage Indicators • Ring Main Units • Prepackaged Sub Stations	• Will help to identify the fault, isolate the fault and rectify the fault quickly as a result there shall be improvement in the performance of this KPI.
2	ATC Losses	HVDS	• Facilitate to arrest the commercial losses. • Facilitate to arrest the technical losses. • Better voltage profile
		Reactive Power Compensation Reconductoring and Reconfiguration	• Facilitate to arrest the technical losses.
		Energy Audit	• Creates Accountability • Locate the Loss Prone Zone • Focused Approach
		Collection mechanism e.g. ECS, Web Payment, Easy Bill, Cheque Drop Box etc.	• Better collection efficiency • Consumer satisfaction
3.	Consumer Satisfaction Index	Periodic consumer satisfaction survey	• It gives the confidence to the consumers that their service provider is well informed. • The hardships are minimized to the consumers.
		GIS, SCADA, ERP and their integration	• It ensures the facilitation to consumer to provide good quality supply.
4.	Meter Reading	Spot Billing Pre-paid Metering AMR	• Reduced Cycle Time • Minimization of Human Error • No human intervention
5.	IT System	Secured IT system Disaster management Risk mitigation plan	• Data capturing is the building block to take out the relevant information and develop a knowledge base. • Data storage ensures the availability of all the required information and helps to maintain the legal requirement. • It is very vital in case of catastrophe.
		Reports through IT system Knowledge gathering	• It provides the business insight and helps to chart out future course of action. • It can be presented in various formats, shapes etc. to help the management for making decisions. • The knowledge gathered through data analysis is useful for business insight and new set of procedures/change management can be initiated for better operations and maintenance of the system.

6.	Number of accidents	• Safety policy and procedures • Safety code • Requirement as per land of law	• Any activity planned and performed through defined procedures and not performed in haste ensures safety and security of network and the operating personnel. • Accident chances are eliminated, productivity enhances.
7.	Human Resource	• Robust HR policy • Skill matrix preparation and its mapping	• Defined roles and responsibilities ensure accountability as a result qualitative output is achieved. • The person possessing right skill set is entrusted the job to perform, which is prerequisite for the success of any job.
		• Requirement gathering through collaborative procedure • Road map to impart the training	• It ensures the skill enhancement of the work force and keeps them informed about new developments which serve as a great motivator. • Training if imparted purposefully ensures better output. • It enhances the confidence to perform the job and take additional responsibility.

Figure 9.10 : Best Practices Assigned to Individual KPIs

SAQ 2

Analyze your organization in the framework of People-Process-Technology.

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9.5 SOME RELATED ISSUES

There are many issues those are intricately related with the effectiveness and economics of power supply from the viewpoint of customers. These issues are mainly customer satisfaction, quality of electric supply and services, Customer Relationship Management (CRM). Electricity Regulatory Commission (ERC) also plays an important role for the fulfilment of the objectives of stakeholders viz. customers and power distribution companies. The quality of electric supply and services has already been discussed in previous unit. All these issues have now been briefly discussed.

9.5.1 Customer Satisfaction

Customer satisfaction measurement is a systematic process for collecting customer data (e.g. surveys, audits, etc.), analyzing these data to make it into actionable information, driving the results throughout an organization, and implementing satisfaction improvement plan. Thus, customer satisfaction measurement (CSM) is a management information system that continuously captures the voice of the customer through the assessment of performance from the customer's point of view.

Such measurement could me made by using any of the following methods:

- Surveys;
- Formal and informal feed back from customers;
- Use of customer account data; and
- Complaints.

However, survey is the most commonly chosen method due to its effectiveness and economy.

Customer satisfaction measurement will enable us to

- Understand how customers perceive your organization and whether your performance meets their expectation;
- Identify PFI'S (priorities for improvement) areas where improvement in performance will produce the greatest gain in customer satisfaction;
- Set goals for service improvement and monitor progress against a customer satisfaction index;
- Benchmark your performance against other organization; and
- Increase profits through improved customer loyalty and goodwill.

The organization's process for questioning, measuring and monitoring feedback of customer satisfaction and dissatisfaction should provide information on continual basis. It should address conformance to requirements, meeting needs and expectations of customers, as well as price and delivery of product.

Survey Process

The steps to be followed in any such survey process are given below. There is always a possibility of going back to any previous step through feedback system in case of any discrepancy or any change is survey objectives. These steps are self explanatory.

- Obtain Top Management Buy – In
- Determine Survey Objectives
- Exploratory Research
- Plan Sampling and Data Collection
- Design of Questionnaire
- Actual Survey
- Data Refining and Analysis
- Recommendation and Implementation Plan
- Plan Timing of Next Survey
- Survey Methodology

The customer satisfaction survey usually conducted for the purpose "**To listen to the customer".** The reasons for this survey are

1. To find out the reasons for customer dissatisfaction
2. To find out the focus of attention for process improvement
3. To determine whether previous improvement efforts have worked
4. To see whether strategic advantages or disadvantages exist.

Survey Methods and Analysis

There are two main methods of gathering information from customers: qualitative and quantitative.

Quantitative Research (Hard issues and facts)	**Qualitative Research** (Soft issues and opinions)
Telephone surveys Self-completion questionnaires (comment cards) Postal surveys Third party surveys Online surveys	Focus groups/user groups/customer panels Face-to-face interviews

Qualitative methods provide feedback from customers on `soft issues and opinions' and give the organization an opportunity to probe customers' feelings and attitudes on an in-depth basis. Typical qualitative techniques include user panels, customer groups, and personal interviews. Quantitative methods allow the organization to quantify customer opinions in a numerical fashion. Typical quantitative techniques include telephone surveys, self- completion questionnaires, the monitoring of compliments and complaints, and mystery shopping.

The questionnaire can be designed in a hierarchical structure of various dimensions (Figure 9.11) according to the involved business processes. This will facilitate the managerial decision-making process of the organisation with the help of the information generated from this survey. The analysis determines links between the following components.

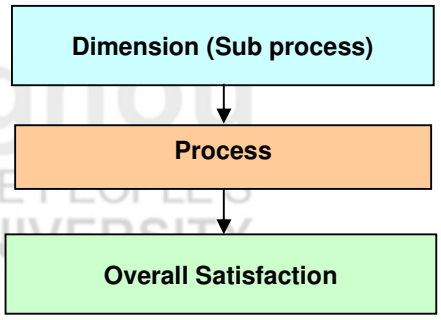
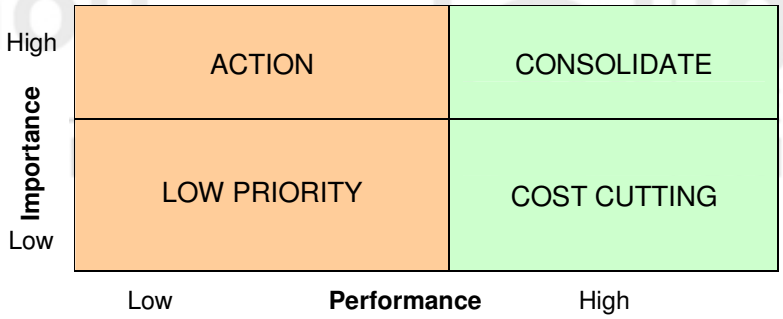


Figure 9.11 : Hierarchy of Dimensions

Customers' Satisfaction level with any particular process is influenced by the various dimensions or sub-processes linked with that process. Similarly, the overall satisfaction level is also depends upon the achievement Level of Various processes.

Importance Performance Mapping & Implementation Plan

Another data presentation device that many managers find appealing is the importance-performance map. The idea is derived from standard quadrant analysis, as had been used for many years in business strategy. In general, this approach argues, we should be most concerned about those issues for which importance is high and performance (typically measured by average satisfaction) is poor. These yield the greatest potential for gain.



Areas of Action

Another set of valuable recommendations could be drawn up from the analysis of importance-performance matrix. As shown in Figure 9.6, the matrix has four divisions in which values of different dimensions/factors will fall in. Depending upon which division factor is located, certain actions could be suggested. If any process/sub-process/factor is placed in a low importance and high performance quadrant, the cost reduction program needs to be undertaken for that process or factor. It is imperative for any power distribution organisation to undertake the task of monitoring of customer satisfaction for its own survival and growth and thereby to boost market goodwill.

(***Adopted from the Source :*** *"Customer Satisfaction Survey and Analysis"*
Dr. S.N. Nandi and Neena Singh, appeared in DRUM Training program Manual)

SAQ 3

Identify the parameters for conducting customer satisfaction survey for your organization.

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Customer Relationship Management (CRM) is a broad term that covers concepts used by companies to manage their relationships with customers, including the capture, storage and analysis of customer, vendor, partner and internal process information. It is a process used to learn more about customer's needs, wants and behaviours in order to develop stronger relationship with them.

There are three aspects of CRM which can be implemented in isolation from each other.

META Group developed this conceptual architecture in the late 1990s and given the name as CRM ECOSYSTEM.

i) **Operational:** Automation or support of customer processes that include a company's sales or service representative. Operational CRM provides support to FRONT OFFICE business processes, including sales, marketing and service. This creates the contact history of the customers that makes it possible to establish contact without repeating past history every time.

ii) **Collaborative:** Direct communication with customers that does not include a company's sales or service representative. This is done for variety of different purposes including feedback and issue reporting. Interaction can be through a variety of channel viz. Web pages, E-mail, automated Voice Response (AVR) or SMS. The objectives of collaborative CRM also include cost reduction and service improvements.

iii) **Analytical:** Analysis of customer data for a broad range of purposes is done at this stage through the heavy use of predictive analytics. Analysis is done for the following purposes.

   a) Design and execution of targeted marketing campaigns to optimize marketing effectiveness.

   b) Design and execution of specific customer campaigns, including customer acquisition, cross-selling, up-selling, retention.

   c) Analysis of customer behaviour to aid product and service decision making e.g. pricing, new product development, etc.

   d) Management decisions like financial forecasting, customer profitability analysis, etc.

   e) Prediction of the probability of customer defection.

Strategy and CRM

CRM sometimes considers as only information technology due to availability of quite a good number of software packages in the market. But, CRM is not just a technology, rather, a holistic approach of an organization for dealing with its customers. This includes policies and processes, front-of-house customer service, employee training, marketing, systems and information

management. Due to this all encompassing characteristics, CRM is now considered as a strategy to build a long lasting relationship with customers through the extensive usage of information technology. The following diagram (Figure 9.12) which is known as CRM Triangle.

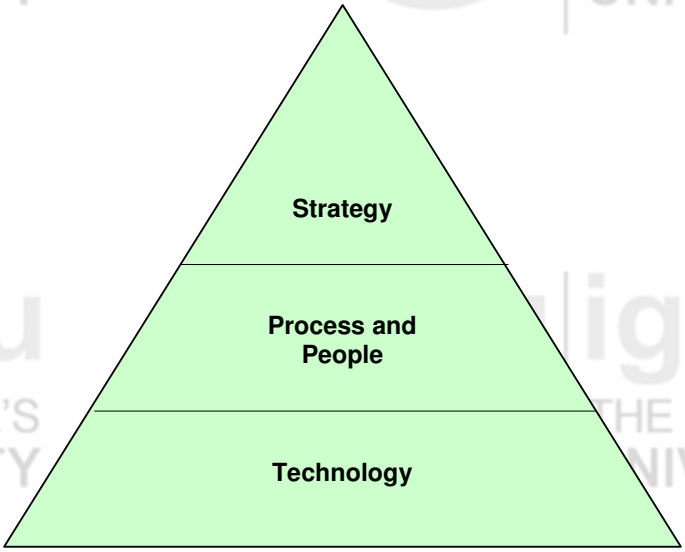

Figure 9.12 : CRM Triangle

Strategy refers to the overall stand taken by the company. It could choose a defensive posture in which it complies with the minimum requirements as stipulated by the Regulatory organization or it could be an aggressive company with newer services and better service delivery. However, it could stand between. Process is the method and the associated inputs to deliver services. People skill and knowledge along with most importantly, attitude should also be in line with the technology.

Such holistic approach is particularly useful in Indian electricity Distribution business, which is presently passing through a transition form a completely regulated market to at least a partly deregulated one. Customers are nowadays more informed and demanding. Distribution companies are also becoming conscious that technology could only act as an enabler and changes in other organizational aspects are together required.

The principle of CRM is that the more information a company has about its customers, the better. According to one well known expert, Prof. Adrian Payne of Cranfield University (U.K.), CRM is "the strategic process of identifying desirable customer segments, micro-segments, or individual customers on a one to one basis and developing integrated programs that maximizes through targeted customer acquisition, profit enhancing activities, and retention''.

CRM Framework

There exist various ways to view CRM framework. However, an operational strategic framework is more relevant to apply CRM in Indian power/electricity business systems. From the customer's perspective, CRM should provide an affordable, reliable and responsive service. From the corporate perspective,

CRM is a balancing act-managing often increasing expectation of customers while delivering value in line with what is profitable for the corporation. For the fulfilment of these objectives, it is imperative to acquire and organize information regarding all concerned stakeholders. Processes used to deliver different kinds of services are required to be redesigned or improved upon. All these aspects are integrated in a framework as shown in Figure 9.13.

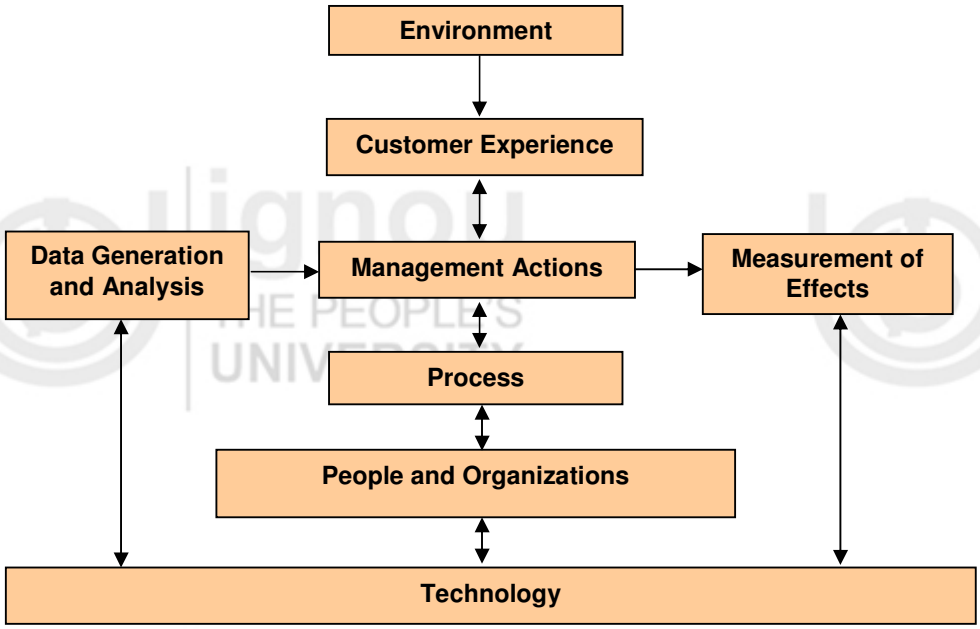

Figure 9.13 : CRM Framework

CRM system has two broad functions block, i.e. customer data management and customer service management.

Customer Data Management

The concept of data warehouse and data mining can be very useful for the management of customer data. A data warehouse is a powerful database which combines information from smaller databases.
Data mining is used to analyse the information contain in data warehouse to identify previously unseen pattern in customer characteristics and behaviour. Data mining can perform the following tasks.

1. Classification and segmentation of customer data according to a set of characteristics.
2. Regression to extract relationships useful for both predictive and descriptive purposes.
3. Link Analysis to expose patterns and trends.
4. Rule induction, a process of inducting general rules from a database.
5. Deviation detection to find out variation.

A few Indian electricity distribution companies like Andhra Pradesh have been benefited by applying this concept or tools of their customer data management.

Customer Service Management

CRM includes several activities related to planning – both long terms and short terms, measurement and control, improvement and innovation of all aspects of relationship with customers. The following aspect will have significant impact on electric utility business.

- Customer Segmentation
- Understanding requirements of various segments
- Customer Satisfaction Measurement
- Feedback Analysis
- Problem Solving

The service delivery companies are usually follow the following sets for solving problem.

1. Select the problem identified through feedback analysis
2. Collect and analyze the data regarding the relevant aspects of the problem
3. Analyze causes especially with the help of cause and effect diagram
4. Evolve solution
5. Implement the solution in collaboration with management
6. Evaluate effects
7. Standardize solution
8. Reflect on the whole exercise for lessons in the future.

CRM Software

CRM software products are most varied and variable in functionality and cost. The important CRM software application include:

- Contact Management
- Database management
- Data warehousing
- Data mining
- Decision support
- E-mail

(***Adopted from the Source*** **:** 1. *"CRM Tool & Techniques Applicable to Distribution Utilities", Dr. S.N. Nandi and Neena Singh, appeared in DRUM Training program Manual, and* 2. *"CRM – Wikipedia, the free encyclopaedia*)

SAQ 4

a) How relevant is the concept of CRM in any power-business organization?

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b) How your organization is going to be benefited with the adoption CRM triangle framework?

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9.5.2 Role of ERC in KPIs

The new Electricity Act, 2003, has empowered Electricity Regulatory Commission (ERC) to play a very decisive role in all matters related to this business of electricity. The ERCs are working in various states and also suggesting a National Tariff Policy (NTP) for the whole country.

The main functions of ERC are:

1) Evolving a policy for setting the tariff for purchase and sale of electricity including the retail tariffs to be paid by the end customer.

2) Licensing the distribution and retail supply (as per the Act, these functions are bundle together and cannot be segregated), transmission and trading functions.

3) Setting various standards of supply and the performance codes to be adhered to/ maintained by the licensee.

4) Ensuring that the sector works in an efficient fashion such that the value chain justly reflects the economic way of reaching the electricity to the consumer.

5) Setting tariff and other parameters to ensure that open access is facilitate in transmission and distribution. This includes the identification and eliminated of cross-subsidies over a period of time.

National Tariff Policy (NTP)

In the draft of NTP, it is suggested that while setting the tariff ERC should introduce performance-based cost of service regulations, a clear departure from the extant "**Cost+**" methodology.

While introducing the above methodology, ERCs would consider introducing **"multiyear tariff"** (MYT) principles. In MYT, the ERCs the utilities are encouraged to set in the initial and final values for certain controllable parameters such as loss levels, Salaries, Repair & Maintenance, etc. through a discovery and negotiation fashion (including public hearings). Uncontrollable parameters such as power purchase costs are to be automatically passed through the tariff, every quarter or a suitable period through Fuel Surcharge Adjustment (FSA).

The review will be done by ERC regarding controllable parameters only after the end of control period which is usually a 5 years period and not within control period. In some Latin American countries, this period is 10 years. Uncontrollable parameters would be allowed automatic pass through during the period.

The MYT principles, set out in the international practice, act more as a price cap rather than revenue cap. They set out the maximum that can be charged in the "RPI-X" principles (separately) for each and every function and that drives the tariff calculations.

ERCs are authorized to evolve a methodology for determining the cross-subsidy element and also for eliminating that. This means that ERC has to decide the number of years and the quantum of reduction either year-by-year or at the end of that period for cross-subsidy elimination. It is evident now that the regulatory process has large implications on the various activities of the utility.

ERC and KPI

The company needs to understand the strategic and near term impact of the Regulator's orders/ tariff approval process. Once these dimensions are understood, the company would be in a position to develop its key performance indicators (KPI) to ensure that the adherence to business guidelines set out by the Regulator is practiced and the company can at least end up at the same line as set out by the regulator.

The key performance indicators (KPIs) in the era of ERCs at the organization level are:

i) Energy Utilization/ Energy drawl
ii) Metered Sales
iii) Demand Raised (adjusted for actual input)
iv) Revenue collections
v) Losses
vi) Distribution Transformer Failures

Application Example

The electricity companies of Andhra Pradesh have successfully adopted the guidelines issued by ERCs Utilities in Andhra Pradesh (APTransco and DISCOMs) usually set their yearly KPI targets using the tariff order (and its directives) as the basis. Thus, the tariff order is analyzed into its components that affects its profitability, financial viability and liquidity. These are then converted into monthly targets for each section office, consolidated at the divisions, further aggregated at circle levels and finally into zone and then at the company level.

The organizations in the business of power sectors need to realize that KPIs are closely linked to the regulatory process. The KPIs have to be developed accordingly for reducing the business risk continuously and consequently improving the economic viability of the organization.

(***Adopted from the Source*** **:** *Role of electricity Regulatory Commissions and Key Performance Indicators (KPIS) – P. Karthikeya from DRUM Training Program Manual.*)

9.5.3 Directions for the Future

A framework has been developed and a set of core indicators for electricity Sector has been proposed. In the first instance, mapping the main sources of data can follow the proposed framework and indicators as some of these will be readily available from open sources. However, the data needs to be regularly updated and there does not seem to have a sustained effort at the level of the organisation to do this.

The suggested KPIs can be adopted at National level with a varying degree of benchmark. An atmosphere of accountability, measurement and improvement thus can be created which will give benefit to electricity Distribution Sector with more satisfied customer. The Ministry of Power needs to give a requisite impetus to all the participating utilities to work upon to first monitor the KPIs, compare them internally and with other utilities and to create an atmosphere of excellence with a reward and penalty provision.

Economic regulation of utilities/ DISCOMs usually focuses on price regulation, with relatively less attention to performance standards and social obligations. On the other hand, technical rules are not generally concerned with economic aspect and cost-efficiency. The linkage of economic and technical regulation after liberalisation presents a challenge for regulators. The existing norms are unsatisfactory, hence, it is quite essential to move quickly towards international standards in stages.

- Preliminary state
- Transition stage
- Final stage

Roadmaps for each stage are to be decided by regulators.

9.6 SUMMARY

This unit discusses the various universal tools those can be applied in the power-sector for the improvement of organizational efficiency and effectiveness. These tools viz. Seven QC, Balanced Score Card (BSC), Customer Relationship Management (CRM), etc. although, have developed in a different context, but, have now emerged as a few most powerful yet universal analytical tools. The seven QC-tools are simple statistical tools for presenting the existing facts qualitatively which can subsequently act as an input for effective decision making. The Balanced Score Card is one of the most talked about approach developed during the early 1990s for strategy development for the improvement of any organization.

The BSC attempts to develop the strategy in four distinct directions. Three critical factors have been identified in its implementation. CRM is a tool for identifying the relationship between customers and suppliers/producers. Three aspects of CRM have been identified as operation, collaborative and analytical. CRM system has also broad block which are Customer Data Management and Customer Service Management. CRM has uses few newer concept of computer science engineering like data warehouse and data mining.

Finally, the role of Electricity Regulatory Commission (ERC) in a partially deregulated environment has also been discussed in this unit.

9.7 TERMINAL QUESTIONS

1. Discuss the seven QC-tools and its importance in the organization for performance improvement.
2. What is Balanced Score Card? Discuss the process of managing strategy through BSC.
3. How balanced score card can be linked with KPI?
4. Discuss the various approaches to performance benchmarking through indicators.
5. Discuss the process of assessing the customer satisfaction.
6. What do you understand by Customer Relationship Management (CRM)? How CRM can be applied in the organizations in the power business sector?
7. Discuss the role of data warehouse and data mining in CRM framework.
8. Discuss the role of Electricity Regulatory Commission on the tariff policy of electricity power business.