

## **CHAPTER III**

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## **CHAPTER III**

### **CONCEPTUAL FRAMEWORK**

#### **3.1 INTRODUCTION**

The last decade has a tremendous growth in the area of Information Technology. There may be rapid advances in the technologies for communication media like television, computer, internet, printing and publishing has enabled us to get promotes access to required information. The computer is the most versatile machine man has ever made. The IT system is broadly divided into two parts. One is the hardware computer configuration of number of multiple devices and operating system and other is a number of data handling and processing software programs and packages with the help of integrated deployment of such hardware and software systems. The role of computers and IT has become essential for space research. IT has converted the world into a global village.

Computer is used as rapid problem solving equipment in the field of science and technology, commerce and industry, medicine, agriculture, education, research, administration and planning etc. Computers are said to be status symbol for advanced management. Information technology has replaced the conventional methods to solve technical and operational problem. Computerization can be defined as the process of transforming existing manual systems with the help of computer for management of information. The computer is a tool to do the tasks like information/data representation, information/data retrieval and processing, information/data storage and information/data communication effectively, efficiently and extremely quickly.

#### **3.2 CONCEPT OF IT**

IT is the area of managing technology and spans wide variety of areas that include but are not limited to things such as processes, computer software, Information systems, computer hardware, programming languages, and data constructs. IT provides businesses with four sets of core services to help execute the business strategy: business process automation, providing information, connecting with customers, and productivity tools. IT professionals perform a variety of functions that ranges from installing

applications to designing complex computer networks and information databases. A few of the duties that IT professionals perform may include data management, networking, engineering computer hardware, database and software design, as well as management and administration of entire systems. Information Technology is starting to spread further than the conventional personal computers and network technologies, and more into integrations of other technologies such as the use of cell phones, televisions, automobiles, and more, which is increasing the demand for such jobs.

### **3.3 APPLICATIONS OF INFORMATION TECHNOLOGY**

The fundamental computer applications are processing, storage and retrieval of Information and developing effective technologies. Important application is video on demand also applications like home shopping or shopping on web. All healthcare system using Telemedicine or Geographic Information system requires a high bandwidth as in all such cases it is necessary to communicate video or graphics. Today the Information Technology concepts are also used in business applications ranging from inventory control , preparation of various business documents like pay bill, sales report, analysis report, inventory report, accounting and financial management etc. The requirement to bring all the activities of business organization under single software has led to the development of ERP systems. The ERP systems are bundle of the software which includes the standard business practices. Information Technology is playing a significant role in standardization of different processes in banks, sugar factories, railway reservation system, hospitals, communication etc. EDI has allowed the different automated/computerized organizations to transfer documents electronically. The process is updating the conventional practice through IT in the different organizational is still going on.

### **3.4 COMPUTER BASED INFORMATION SYSTEM**

“Information system may be defined as organized collection of human, software, hardware and communication equipment and databases, in which the person controls, process and communicate the information.” The objective of the Information system is to gather the data, processing of data communicating the information to the user group i.e. top level, middle level and operational

level etc. In a computer based Information System, the business analyst used to collect the data and prepare the report in the form of chart, table, graph etc. to analyze the business. The requirement of a business analyst may be programmed and computer based system may be developed to study and analyze these reports.

**Basic components of computer based information system are:**

- **Users:** The most important components of the Information system are the users. These users include the different group of persons who manages the system and those who retrieve the information from this system take decisions. Another set of the users are those who not only retrieval the information but also provide the information to an information system.
- **Hardware/Communication Equipment:** Lot of organizations maintain constant touch with a large customer base and it requires that the Information system at an organization must be enable computer network and to communicate the information through internet or other communication channel. All hardware, network and communication equipment forms an important component for a computer based Information system.
- **Software:** Software is a collection of programs. The software once installed in computer system is considered as most important component of information system. These programs process the data and generate report for customers and different reports for the managers.
- **Database:** Database is structured collection of data. The software fetches the data from the database and processes them as per the requirement. To develop an efficient Information system, it is necessary to have good design of database.
- **Set of Methods:** Set of Methods refers to the tradition and practices prevailing in the business house where the Information system is used. Various traditions, practices, which govern the business, are laid down in the form of rules which are then coded into the programs. These rules which are then coded into the programs.

These rules or methods changes from time to time whenever any new business practice is adopted or any change in the business environment is observed. The information system must be adapted to these changes and must be flexible to incorporate the changes in the Business environment.

### **Information System required for co-operative Sugar factory**

The primary purpose of computerized information system in the sugar factories is to provide a multi-level, cross- functional, and timely flow of accurate, relevant information to all components of the organization and to make the report generation flexible. This can be achieved only by introducing the system integration concept while designing the system in the sugar factories. There are following types of Information Systems is required for sugar factory.

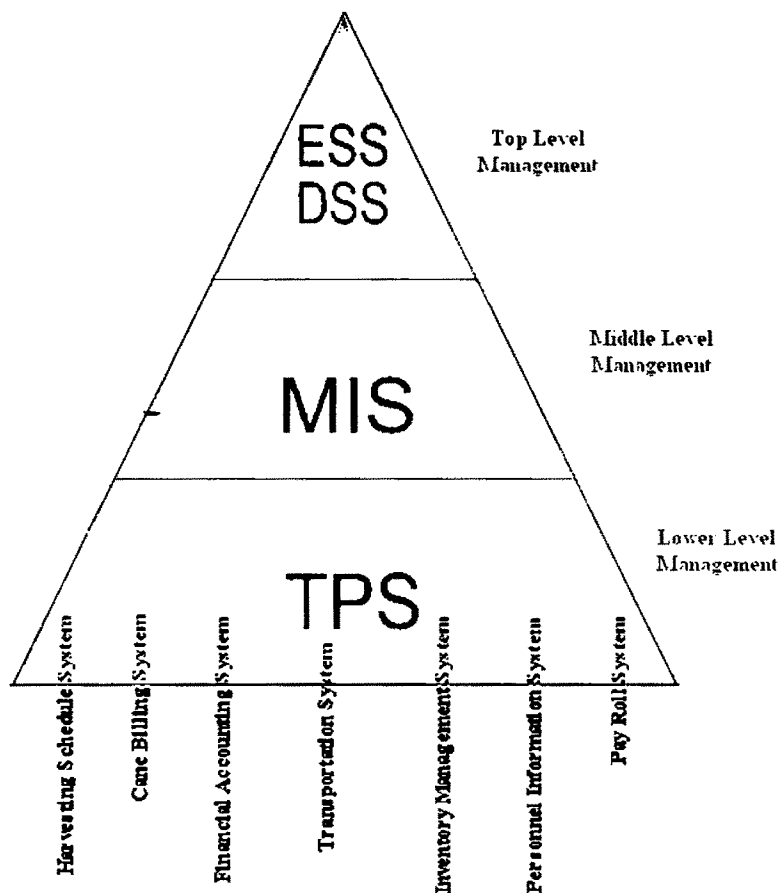
- **Transaction Processing System:** A transaction processing system is a computerized system that performs and records the daily routine transaction necessary to conduct business. They serve the organizations operational level. Payroll, sale order entry, plantation record entry, issue and receipt record maintenance, preparation of cane payments and contractors payment are the various examples of transaction processing systems in sugar factory. Some of them are explained below.
- **Management Information System:** Management Information System (MIS) serve the management level of the organization, providing managers with reports and, in some cases, with online, access to the organization's current performance and historical records. Typically, they are oriented almost exclusively to internal, not environmental or external, events. MIS preliminarily serve the functions of planning, controlling, and decision making at management level. Generally, they depend on underlying transaction processing systems for their data.
- **Decision Support System:** Information system at the organizations management level that combines data and sophisticated analytical models to support semi -structured and unstructured decision making. Decision Support System (DSS) also serves the management level of

the organization. DSS helps managers make decisions that are unique, rapidly changing, and not easily specified in advance. They address problems where the procedure for arriving at a solution may not be fully predefined in advance. Although DSS use internal information from TPS and MIS, they often bring in information from external sources such as current stock prices or product prices of competitors.

- **Executive Support System:** Information system at the organization's strategic level designed to address unstructured decision making through advanced graphics and communication. [1]

They address non-routine decisions requiring judgment, evaluation, and insight because there is no agreed – on procedure for arriving at a solution. ESS creates a generalized computing and communication environment rather than providing any fixed application or specific capability. Computer based information systems in sugar cooperatives are shown with the help of Figure.

Fig.No. 3.1. Computer-based Information System of sugar factory.



### 3.5APPLICATIONS OF IT IN SUGAR FACTORY

There are broadly two areas in sugar factories where Information Technology based-tools, technologies and systems can play a vital role in overall working environment. These are:

- Factory Automation
- Transaction

**Factory Automation:** The management of sugar factories is planning in a big way to automate the manufacturing process of sugar by introducing microprocessor based control systems.

**The Advantages of automation:**

- Better quality sugar production
- Increase the technical efficiency of the factory
- Increase recovery by continuous monitoring of production process.
- Minimum losses of energy.
- Elimination of routine labour intensive work operations can be more gainfully employed in process optimization. This will reduce the existing manpower.
- Cost reduction
- Reduction in consumption of electricity.
- Centralized automation will help better decision making.
- Recording of process information in detail.
- Better use installed capacity.
- Easy exchange of information. –
- Simplified operation.

There are following possible areas of production needs automation. These are

- Juice Evaporation Process
- Sulphitation Process
- Vacuum pan Boiling Process
- Cane feeding

The other areas of automated production process are the chemical analysis of the products and by-products at various stages of production processes and automation of weighing of cane and sugar by interfacing the weighing machines with the personal computers.

**Transactions:** The functional areas have been identified for computerization to increase the overall performance of the sugar co-operative factories.

- Harvesting Schedule
- Cane Growers Information
- Cane Billing
- Financial Accounting
- Transportation
- Inventory Management
- Distillery Product Accounting
- Shares Accounting
- Personnel Information Systems
- Pay-roll [2]

### **3.6 IMPORTANCE OF IT IN SUGAR INDUSTRY**

Computerized process control improves sugar refinery production sugar. The factory needs computerization because the technical advances are in agriculture and improving the efficiency of sugar refining techniques. Also the factory needs to improve performance. The role of IT helps to fast data processing and better decision-making. Some of sugar factories have adopted modular approach for computerization, which does not fulfill competitive requirement of the industry. The factories generate a data which are to be processed for day-to-day decision – making and report generation. Information Technology is used to alter work culture, accessibility of data storage, ability to monitor and report generation for effective management decision making at all levels in an organization. It helps in efficient and effective utilization of manpower, materials and other resources. In Sugar factories there is computerizing various manual work like pay-roll, harvesting Billing, Cane Accounting, sugarcane billing, transporter billing etc. One of the latest developments in the field of IT is 'ERP system. The electronic process of control system helps to maintain output constant and also reduction in –



process inventories, permitting decreased tank sizes. The sugar factories recruiting trained persons for handling computerization activities at their respective sugar factories. Because of trained staff the sugar factories could minimize the investment on computerization. Also it helps to computerize various applications, which were handled manually. The automatic process control system allows the refinery to operate 24 –hour.

### **3.7 PERFORMANCE PARAMETERS OF SUGAR FACTORY**

Information on some of the important performance parameters relating to sugarcane production, financial management, factory personnel management and inventory and factory performance can be shared for comparative analysis and competitive advantage. These parameters are mentioned below

#### **A. Crushing and Production Information**

- Area and other details of sugarcane cultivation of members
- Yield of sugarcane production per hector
- Recovery percentage and analysis
- Crushing and production.

#### **B. Personnel Management Data**

- Number of permanent and seasonal Employees
- Number of technical employees
- Attendance, leave and overtime
- Wage and salary statistics
- Employee training and development
- Promotion, punishment and legal matters

#### **C. Factory Performance Data**

- Average crushing rate
- Time lag between harvesting and crushing
- Fiber percent
- Juice percent
- Loss in molasses and Bagasse
- Recovery percentage
- Total loss and its reasons
- Laboratory analysis

- Energy audit
- Lime and other chemical consumptions

#### **D. Financial Data**

- Sales
- Levy
- Cash/credit amount
- Average sugar realization
- Harvesting cost
- Transport cost
- Expenses per ton
- Total expenses
- Total liabilities
- Total income
- Deficit

Basically using the capability of computers in processing and storing data can be applied in sugar industry for financial accounting, cane billing, harvesting and transporters billing, cane plantation and harvesting scheduling, payroll, inventory management, sales, laboratory analysis, harvesters and transport billing. Computerization plays an important role in the performance improvement of sugar factory. By implementing computer based system in various areas, sugar factories can receive desired results in different performance parameters. [2]

### **3.8 PROBLEMS OF IT IMPLEMENTATION IN SUGAR FACTORY**

Sugar factory is one of the biggest agro-based industries in India. Most of the sugar factories are placed in rural area. Globalization and liberalization, all industries in private sector have improved their management system through Information Technology and they have improved their performance as well. The co-operative sector is a national and social need that the management of these co-operatives should be improved through Information Technology.

Organizational and management process problems encompass those factors that affect control over planning, procurement, and implementation of Information Technologies. In general these kinds of problems provide a window for viewing a variety of organizational operations with regard to IT.

This study will make use of the following Problem types: management process problems, organizational environment problems, leadership problems, technical systems problems, and personnel problems.

#### **IT Problems, Initial Categorizations**

##### **Leadership Problems:**

- Interdepartmental Coordination
- Individual Support
- Organizational Support
- Timeframes and Scheduling

##### **Management Process Problems:**

- Strategic Planning
- Budgeting
- Organizational Directives
- Written Guidelines

##### **Organization Environment Problems:**

- Organizational Culture
- Internal and External Politics
- Contracts
- Changing Technologies
- External Consultants

##### **Technical Systems Problems:**

- Existing Systems
- Standardization
- Compatibility

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**Personnel Problems:**

- Organizational Expertise
- Individual Expertise
- Internal Leadership
- Staffing
- Resistance to Change
- Training

As discussed previously, the problems related to this study are broken down by problem type and the specific part of the IT development and deployment process which they affect. A number of the problems are important factors in more than one part of the process.[3]

**3.9 CONCLUSION**

Manufacturing industries improve their performance through computerization. In the cooperative sugar industry, computerization is in process over the last two decades. There is wide scope for implementation of computer-based systems with the latest innovations in the field, enabling to improve overall performance. Today all industries use Information Technology to improve performance and growth of Industry. Sugar Industry is also not an exception to it.

**References:**

1. Yadav D.S. (2005), "Foundation of Information Technology", New Age International (P) Ltd., Publication, New Delhi, Revised Second Edition.
2. Jaiswal M.P and Singh N.P second state level sugar conference , Malegaon July 4-5,1993,' conference proceeding page No.4.1 to 4.15
3. Suzanne Beaumaster, "Information Technology Implementation Issues: An Analysis" Ph.D thesis in Public Administration and Public Policy, State University, 1999.