APPLICATION OF MANAGEMENT INFORMATION SYSTEM (MIS) IN SMALL SCALE INDUSTRIES (SSI): A CONCEPTUAL STUDY

Abstract

The Management Information System (MIS) involves several aspects of organizational functions and has shown gradual progression over a period of time. Also, MIS is an inevitable part of any organization. Irrespective of the size of the organization, a large amount of time is spent in the collection, analysis, documentation and communication of data. Every organization has a sophisticated, well-structured, dynamically growing information system with a high commercial value. Most of the MIS are extensively used by the managers at different levels of organizational structure. Every management professional must have basic skills in understanding a specific information system. MIS gives awareness about the overall health of the organization to the top level management. The revolution in the information technology has made these information systems a center of attraction in the modern management. MIS helps to achieve a competitive gain, balance market strength, increase market shares, secure finance, introduce new product and service, reach out more customers and gain customer preferences at a faster rate. Production, marketing, finance and human resources are the important functional areas of the management and they must be always supported by the information systems. Production function plays a significant role in the manufacturing organizations. It controls the production and operation tasks involving design, facility location, facility layout, product design, production planning and control, material management and control of cost and quality. This paper

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gives a true insight into the functioning of an efficient Small Scale Industry (SSI) and importance of MIS to SSI. It gives ample exposure to various activities of an information system that helps the people in decision making process. In order to endure increasing business complexities, improve productivity and to have a continuous growth, every SSI must include an effective and proficient MIS

Keywords: MIS, SSI, decision making, productivity, information system.

I. INTRODUCTION

The Management Information System (MIS) involves several aspects of organizational functions and has shown gradual progression over a period of time. Also, MIS is an inevitable part of any organization. Initially, MIS was used in data processing and presenting the data in the form of reports at regular intervals of time. The information is obtained by analyzing the data. This is same as the production concept in which a finished product is obtained from the raw material. Irrespective of the size of the organization, a large amount of time is spent in the collection, analysis, documentation and communication of data. MIS helps in strategic planning, management control, operational control and transaction processing. It includes various systems such as query systems, analysis systems, modeling systems and decision support systems. MIS generates and communicates information, identifies a problem and also helps in the decision making process. It therefore, plays a dynamic role in management, administration and operation of an organization. A MIS is available in the case where an organization needs a large database and a very little data processing. In the case of distant communication of the information, a satellite communication system can be used to assist a computer system. Large volumes of data can be effectively handled, processed at a faster rate, stored or retrieved with the help of a hardware system. The computer system organizes the data as per the requirements and processes the data for lengthy and complex computations. The hardware capability of a computer system is enhanced by the software, which handles data processing (both procedural and nonprocedural). Data can be transferred from one computer system to another.

Management - A Control System: Planning, organizing, staffing, coordinating, directing and controlling are the functions of the management which can be viewed as “Management Control System”. The control process involves the basic steps as shown in Figure-1.

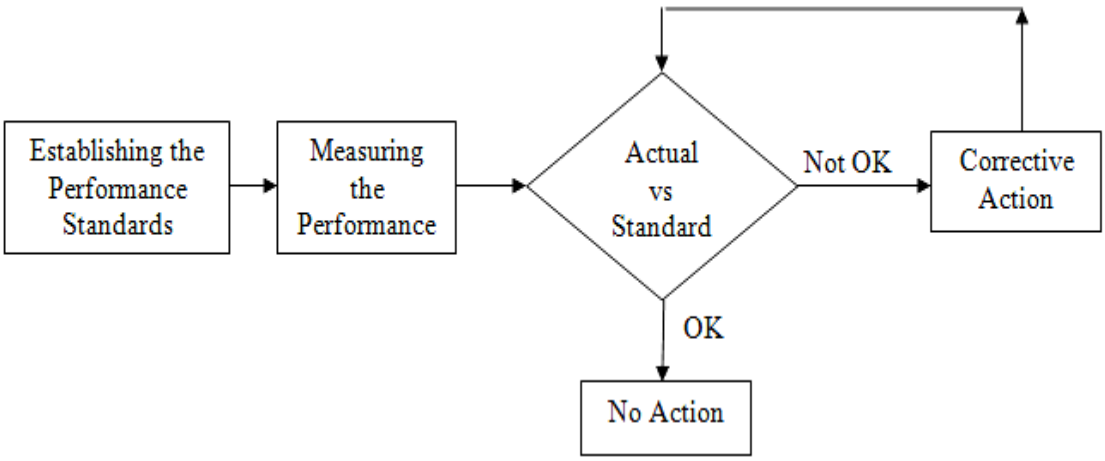

Figure 1: Management - A Control System

Management sets the performance standards in line with the objectives, designs the information feedback systems, compares the actual performance with the preset standards and identifies deviations (if any), also takes suitable corrective actions in case of significant deviations. The management as a control system executes these efforts in a systematic manner.

II. OVERVIEW OF THE STUDY CONDUCTED

The objective of this study is to appreciate and realize how important MIS is to a small scale industry. It also looks into how MIS works and what are the different input/output formats required in operating a MIS.

1. **Methods of Data Collection:** A clear differentiation between the data and information is done in MIS. If it is related to a production system, data is similar to the raw materials and the information is equivalent to the finished goods generated after processing the raw material.

   The characteristics of Information are as follows:
   - Improving representation of an entity.
   - Updating the level of knowledge.
   - Having a surprise value.
   - Reducing uncertainty.
   - Helps in decision-making.

   The information quality can be good or bad based on the blend of the above characteristics. The choice of a method for data collection influences the information quality. Also, designing a data collection method influences the data and information quality. MIS include data collection methods and data processing. The important characteristics of information systems include:

   - Management Oriented.
   - Management Directed.
   - Integration.
   - Common Data Flows.
   - Heavy Planning Element.
   - Subsystem Concept.
   - Flexible and Simple to Use.
   - Data Base.
   - Distributed Data Processing.
   - Information as a Resource.

2. **Database Concept:** An integrated collection of well-defined data and information, centrally controlled in all its aspects, crated and stored in a typical structure for any organization is known as a database. Based on the organizational needs and operations, single or multiple databases can be employed. Data Structure and Storage should facilitate the ability to share, retrieve, evolve and also the integrity of data. The database separates a design of the information system from the data design and its management.

3. **Database Models:**

   The commonly found database models include:

- **Hierarchical Model:** This model can be used when the organizational data can be arranged one after the other in a hierarchical manner or represented in terms of different levels. This model uses records, nodes and fields which are just equivalent to roots, branches and leaves of a tree. The Structure of a Hierarchical model is shown in Figure 2.

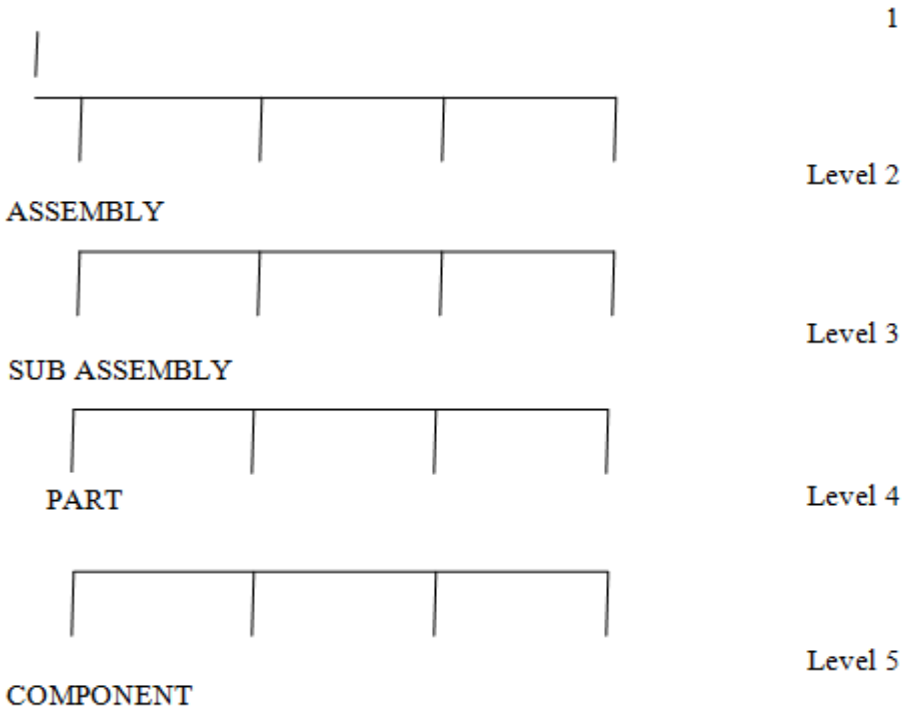

Figure 2: Structure of a Hierarchical Model

- **Network Model:** This model performs the function of interconnecting the entities of an organization into a network. The arrangement of the blocks represents the data model. The block is an entity or a record. The area of the database includes the collection of the blocks. The organization's database is represented by the blocks, the area and the arrows in this type of model (Bachman's diagram). The model is expressed in 'Y' structure as shown in Figure 3.

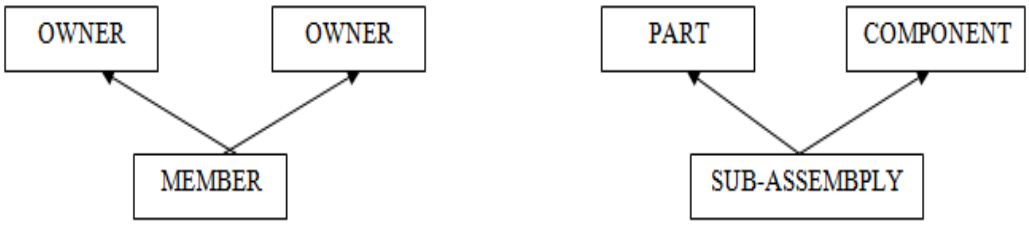

Figure 3: Structure of a Network Model

Records include a component, a part, a subassembly and an assembly. A member record is positioned at the tail of an arrow. The owner is located at the head of an arrow. An arrow connecting the owner to member is a set.

- **Relational Model:** In this model the relation is shown by the concept of 2-dimensional table. As shown in Table 1, the component name and component number represents the data in the tabular form. This model employs theories of relational algebra representing the data in various tables. The relationship between a component and a part is represented in Table 2.

Table 1: Representation of Relational model

Component Number	Component Name
100	Washer
102	Nut
109	Bolt
111	Screw

Table 2: Relation between a component and a part

Component Number	Part Number	Usage of Component in the Part	Component Name
100	10	3	Washer
102	11	2	Nut
109	12	1	Bolt
111	14	4	Screw
100	10	3	Washer
109	10	4	Bolt

4. **System Concept:** The boundaries and objectives define and determine a system. A large system can be considered as an arrangement of smaller systems (sub systems) in a logical order. A large system can be fragmented into smaller subsystems up to a certain level. The term system is quite commonly and frequently used in explaining the subjects such as traffic system, education system or a business system, etc. It offers a meaningful framework for describing and understanding the features and problems of the subject. The three basic parts of any system organized in a particular order are represented in a model as given in Figure 4.

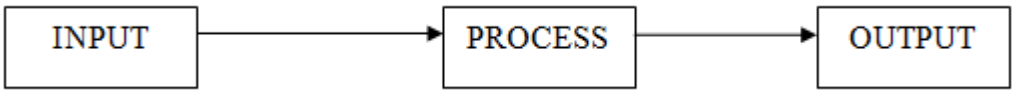

Figure 4: System Concept

A system may have single input and multiple outputs or many have several inputs and outputs. Every system operates in an environment which influences the system design and performance..

III. APPLIATION OF MIS IN SMALL SCALE INDUSTRY

There are several areas where MIS takes an important role in the small scale industry. The decision in a small scale industry are normally taken by people who are expected to be "Jack or all trades" this is very much unlike large industries where there are functional specialist taking important decision with the help of MIS, which make their task simple since the quantity values of decision are quality considerable and huge. The important areas where MIS had its predominant existence in the industry studied were:

- **Purchase:** Order Processing, Scheduling, Bill of Materials, Material Purchase Request, Purchase Order, Approved Vendor List, Vendor Performance Evaluation, Vendor Selection, Material Receipt, Receiving Inspection Report, Store Inventory etc.

- **Production:** Equipment List, Break Down Maintenance Record, Processes Instruction Sheet, Jigs and Fixture Details, Stage Inspection Check Sheet, Master List of Instruments and gauges, Final Inspection Report, Preservation of Product etc.

Process Charts and Formats: Process chart help to identify data object and their relationship using a graphical notation. The relationship between two data object could be one to one, one to many, many to many. Formats are helpful to collect and store data. These help to access the data as information to production functional processes. The amount of information obtained by formats depends up on the nature of the organization, the type of production processes and the quantity to be produced etc.

1. **Purchasing Order from Customer:** The organization is going to receive the enquires or tender letter and a confirmatory letter is sent to customer with a request to rectify terms and condition. Whenever any necessary or relevant information or data is obtained from the customer (requirement), planning for product realization is initiated product realization describes in detail the organization, process and control.

2. **Scheduling:** As per the customer requirement a production schedule is prepared this is setting both starting and ending time for producing the product and the same sent to production department. Based on the production schedule, the purchasing activity is initiated for the purchase of parts and materials.

3. **Bill of Materials:** A bill of materials lists each part and the quantity requirement for one assembly. Bill of materials is the basic document used in material requirement planning.

4. **Material Purchase Request:** This gives the basic requirement of material and also determines the quantity of parts, materials etc.

5. **Purchase Order:** This continues recorded data (output from material purchase request) such as part number, quantity etc this is sent to the approved vendor.

6. **Approved Vendor List:** Data about the vendors are recorded in vendor list such as name, a type of item approved, phone number etc this helps in the identification of the vendor and aids the ordering process.

7. **Vendor Performance Evaluation:** This gives evaluated data about a vendor such as item of supplied, total quantity rejected and accepted etc.

8. **Vendor Evaluation for Selection:** This helps in selection of vendor, considering the type of machine makes, range, accuracy etc. It also takes into account the man-power and skills, inspection aids inevitable, list of customer and commitment with vendor.

9. **Material Receipts:** The material receipts record (data stored) contain bill number, vendor name, part number (raw material) supplied quantity and determines supplied quantity, required quantity and balance quantity of material and so no. this gives information on the material recorded and available for further processes.

10. **Receiving Inspection Report:** This gives a brief summary on the parts checked as per required specification with the help of receiving inspection plan and criteria. If the material is satisfactory then the materials are accepted otherwise the same is rejected.

11. **Store Inventory:** This is a detailed list of movable goods information of each receipts in terms of which gives the date, DC number, received quantity, issued quantity, returned quantity and stock quantity of material.

12. **Equipment List:** As per production scheduled available information that describes the characteristics of the products specification or description, inspection, control plan, quantity plan is given in this. These characteristics are transformed into parameters that are to be controlled in product or processes at various stages of convention from raw material to final product during this process equipment to be used and their capability requirement are matched for various operations to produced the required quantity of product with the availability time.

13. **Breakdown Maintenance Record:** If any breakdown equipment occurs, it is attended to immediately and prepared to bring it back to fit condition for use. During this process recorded data such as machine name, nature of problem, time of breakdown, verification of repair etc are entered in to this format. These data are used to implementation of periodic preventive maintenance procedures.

14. **Process Instruction Sheet:** During production process various operations are to be done. During this process different types of tool are used. A planned programming sequence of operation is to be recorded whit suitable required tools, jigs and fixtures setup during the process and produce the product.

15. **Jigs and Fixtures:** Different jigs and fixtures are entered in this format with their code number and it is used to identify the jig number. For detail components for different items.

16. **Stage Inspection Check Sheet:** This gives stage inspection instruction and provides methods of inspection instruments to be used, sampling frequency and size. It also gives relevant direction information in each stage.

17. **Master List of Instruments and Gauges:** Master List of Instruments and Gauges available.

18. **Control Plan:** There is a control plan, which carries details of the customer, part description, process, machine used, characteristic, evaluation sample frequency, control method and so on which gives an overall picture of all activities that are taking place.

19. **Final Inspection Report:** This gives information on the product specifications that are checked with the help of different equipments and gauges, the observed dimension compared with specification. If the dimensions are within the control limit then the product is accepted otherwise it is reworked or rejected.

20. **Preservation of Product:** Preservation of product various stages of product realization process and delivery to initiated destination depends on the condition that cause the product loss and its conformity, various states or conditions are tabulated along with their methods of preservation adopted and identification method described at for various stages.

21. **Quality System Manual:** However this unit being a small scale unit with an ISO Certification find that there is a quality system manual for control of production and service provision, which gives a lot of details governing this process there is also a quality system manual that guides the purchase process.

IV. CONCLUSIONS

This paper has given a true understanding of how important an information system can be to a small scale industry. Though level of activity in a small scale industries is small compare to a large industries, it is observed that all these activities are to be coordinated by a handful of a people, which makes information system (MIS) all the more important. Also this paper has rendered adequate exposure to the various activities into an information system which helps the concerned people to take day to day decision thus a lot of learning about the importance of MIS has applicable to a small scale industries has as taken place making every minute of this work an enjoyable experience. It is very important for every organization to have a competent and effective MIS to improve its productivity, so that the organization can grow even in the environment of increased business complexities.

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