

MANAGEMENT INFORMATION SYSTEM

MODULE 2- APPLICATION OF MIS IN MANUFACTURING SECTOR

INTRODUCTION

The automation in manufacturing companies has significantly improved in all areas of processing, but at the same time it has also created a staggering amount of data. Though IT departments have taken advantage of hardware improvements to economically store the increased data, there never seems to be enough time or resources to meet the needs of factory managers who face the “fact gap” that exists between the data and the usable information required to make real business decisions.

For manufacturing/operations companies, getting the right information to the right people in a timely manner has never been more important than it is today— to reduce hidden costs, to increase production, and to maximize profits. Manufacturers have to manage the complexity of their supply chain, internal manufacturing, and operations along with meeting their distribution and customer requirements. Manufacturers today are faced with making extremely complicated decisions in real-time, on a daily basis, with limited information. Manufacturers face increasing globalization, more competition than ever, and customers whose demands reflect their own knowledge and expectations of a global market. Every manufacturing company is different like different processes, different tracking systems and different challenges. All of these variations add up to the fact that you need a management information system (MIS) that caters to the specific needs as well. While looking for a MIS solution you may define your needs and formulate a list of requirements that simplify the adoption of information technology for improving performance.

Management Information Systems are distinct from regular information systems in that they are used to analyze other information systems applied in operational

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activities in the organization. Academically, the term is commonly used to refer to the group of information management methods tied to the automation or support of human decision making, e. g. Decision Support Systems, Expert systems, and Executive information systems. MIS is a planned system of the collecting, processing, storing and disseminating data in the form of information needed to carry out the functions of management.

Currently the position is that both MIS and manufacturing have been slow to recognize their contrasting corporate cultures and to deal with resolving the conflict between the two groups. Longstanding differences in corporate culture have undermined efforts to implement computer integrated manufacturing (CIM). Improvements in manufacturing productivity, as a direct result of investment in information systems, have been slow and inconsistent. The most commonly cited reason for the under-utilization of information systems in manufacturing environments was the “lack of co-ordination and co-operation” between MIS and manufacturing.

An example of a popular computerized production control system developed in the 1970s and marketed heavily in the 1980s is MRP-II. It theoretically integrates all of the material management processes and should interface with the organizational administrative systems to provide information to other functional subsystems, including executive information systems. MRP-II systems have had limited success as did their MRP predecessors. There is indication that the degree of success depends on three issues: top management commitment, the implementation process, and hardware and software selection.

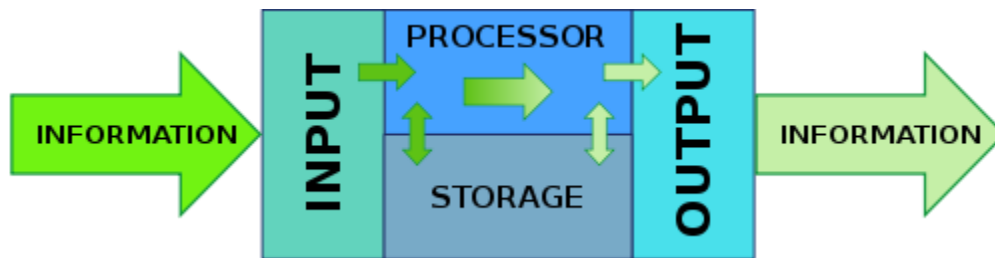
Many managers in the manufacturing industries in South Africa may be unaware of the capabilities and use of an effective MIS. Most manufacturing industries are possibly already using products of Information Technology. However, their awareness level of applying information technology to designing effective management information systems to overcome their specific problems needs to be investigated and determined. To be effective in today’s dynamic and competitive business environment, a manager, and indeed, an organization, must think in the system mode.

MODELS OF INFORMATION PROCESSING SYSTEM

information processing system, as its name suggests, is a system (be it electrical, mechanical or biological) which takes information (a sequence of enumerated symbols or states) in one form and processes (transforms) it into another form, e.g. to statistics, by an algorithmic process.

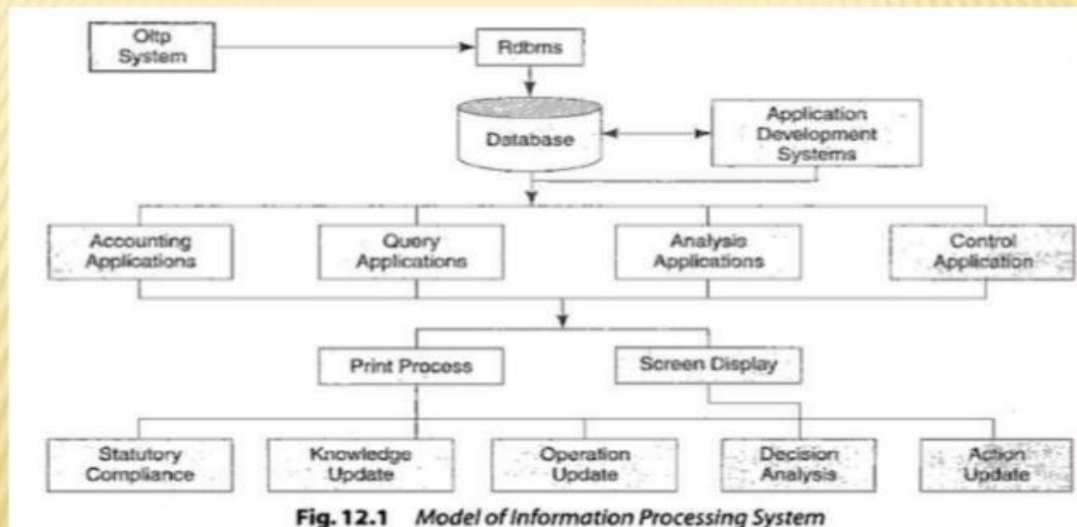
An information processing system is made up of four basic parts, or sub-systems:

- input
- processor
- storage
- Output



An object may be considered an information processor if it receives information from another object and in some manner changes the information before transmitting it. This broadly defined term can be used to describe every change which occurs in the universe.

MODEL OF INFORMATION PROCESSING SYSTEM



Many companies make hundreds of different products, each product consisting of individual components perhaps numbering in the thousands. The task of coordinating all of the individual activities required making the parts, assembling them, and deliver the product to the customer is complex indeed. It is a problem in information processing. The cycle of information-processing activities that typically occur in a manufacturing firm which produces discrete parts and assembles them into final products for sale to its customers

Because there are different interest, specialties and levels in organization, there are different kinds of systems. No single system can provide all the information an organization needs. The organization is divided in to strategic, tactical and operational level and then further divided in to functional areas such as sales and marketing, manufacturing and production, finance and accounting and human resources. Systems are built to serve this different organizational interest.

Need of the system

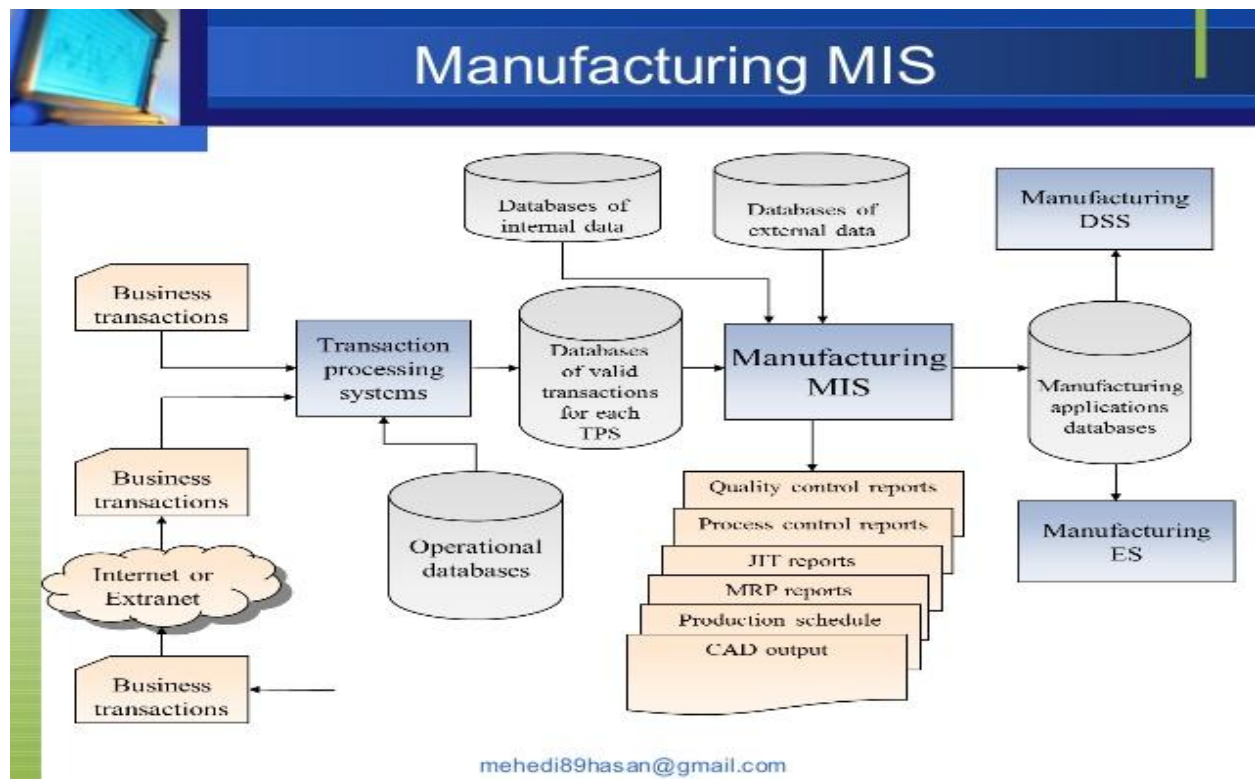
The major problem faced by the manufacturing industries today is identified as;

1. Plant capacity problem
1. Manual handling
2. Poor utilization of resources
3. Long manufacturing lead times
4. Sub optional production scheduling
5. Maintaining the right inventory levels
6. Errors in manufacturing records

The above mentioned problem can be attributed to poor management of information flow. There is need for substantial change in outlook regards management of factory affairs

APPLICATION OF MIS IN MANUFACTURING SECTOR

Management information systems are typically organized around the functional areas of an organization. MIS for manufacturing sector should have the following components



Total picture of manufacturing Management information system may look like as given fig. This starts from either forecasted demand or customer's order. Subsequent activities are interrelated and a comprehensive information system tries to help the manager keep a tab on each activity.

This information system helps to follow up the order placed with vendors, proper receipt of materials from vendors' inspection and inward material quality control and finally its proper storage. Similarly on the production side, the production schedule is prepared based on the dispatch schedule. Production plan ensured that the material is issued timely from warehouse and any rejection must be properly salvaged. The produced material must go through quality control process and it goes to warehouse or customer only after it has passed quality assurance test.

APPLICATION OF INFORMATION SYSTEM MODEL TO PERSONNEL MANAGEMENT

Fast changing markets, industries, and services require organizational environments capable of constant adaptation with bright new ideas and reduced time-to-market. Under these competitive reality, HRM has a more critical role than ever because new forms of business require new ways of involving people. HR professionals must analyze social, economic, political-legal, and technological environment opportunities to redesign HRM processes and practices that are key success factors to the organization mission and objectives. In recent years, information technology has effects on almost every aspect of our society, as well on organizational processes, including HRM processes and practices. From a position associated with administrative management, it has managed to become a strategic partner of organizations, largely because of the use of technologies.

Human resource information system support activities such as identifying potential employees, maintaining complete records on existing employees and creating programs to develop employee's talent and skills.

HR MIS sometimes called HRIS (Human Resource Information Systems), is an integrated system and has the following modules;

1. Recruitment Subsystem- A recruitment module should handle all your internal form-filling and authorization processes; allow managers or HR to post advertisements and supporting documentation online, offer applicant tracking and even initial sifting. There may also be functionality to build talent pools which can then be 'trawled' for suitable candidates when a vacancy becomes available. Of all HR technology, it's recruitment modules that have embraced social media to the greatest extent

Common recruitment module features include:

- Customized pipelines for different roles
- One-click posting of jobs and job descriptions to a variety of jobs boards
- Automated assessment processes, inc. interview scheduling
- Applicant tracking
- Resume parsing
- Standard metrics and analytics for candidate profiles
- Mobile app
- Social media interface
- Digitized offer management

2. Training- Learning and development is a key element when it comes to employee management. This module allows HR to track qualification, certification, and skills of the employees, as well as an outline of available courses for company employees. This module is often referred to as an LMS, or Learning Management System, when it's a stand-alone. An LMS usually includes available e-learning and other courses to be followed by employees.

3. Benefits administration- Benefits management is all about providing timely information and aiding employees to make the right choice for their circumstances. This module should manage and monitor employee benefits, healthcare and pension/welfare packages, tracking enrolment options and any financial implications.

Common benefits administration module features include:

- Online open enrollment
- Automated communication of enrolment options and information
- Plan comparison tool to aid employee choices, inc. costs and contributions breakdowns
- Automatic event management of the benefits life cycle
- Legislative compliance for your territory

4. Performance management- Automating the appraisal process, recording and tracking objectives and targets, this module should incorporate your competence framework, job standards and/or other relevant systems.

Common performance management module features include:

- Setting and managing goals
- Links to competency framework
- Scheduling of appraisal meetings
- 360 performance feedback
- 'In the moment' feedback tools
- Big Data gathering for a broader picture of individual performance
- Links to talent management and succession planning functions

5. Workforce management- Primarily a scheduling function, this module should link closely to (and is often combined with) time and attendance and leave management. Similarly, real-time functionality may involve linkages to other business intelligence systems such as ERP and CRM to match workforce deployment to shifting needs

Common workforce management module features include:

- Scheduling and shift management
- Workflow monitoring
- Management dashboard with real-time data and metrics

6. Time and attendance- Alongside payroll, this is probably one of the longest-standing HR automations: the time clock. These days, such systems often incorporate biometric identification to avoid 'buddy punching' and will link directly to (or be an integral part of) the workforce management module, with information links to your payroll and accounting software.

Common time and attendance module features include:

- Employment attendance tracking
- Time clock management
- Biometric systems
- Functionality for remote and mobile workers
- Legislative compliance (e.g. minimum mandated rest break)

7. Absence and leave management- Again, often linked to the time and attendance and workforce management functions, your leave management module is an automated way to allocate, book, approve, track and monitor any absence from the workplace. It may be for vacations, compassionate reasons, illness,

parental leave, even jury duty. Request and approval processes should be streamlined and the outcomes incorporated into team calendars where appropriate. Common absence and leave management module features include:

- Self-service leave requests
- Integration with workforce management (scheduling) and time and attendance functions
- ‘Account management’, tracking accrued vacation time and usage.
- Metrics and analytics, including absence levels and trends

APPLICATION OF INFORMATION SYSTEM MODEL TO FINANCIAL MANAGEMENT

Management Information Systems (MIS) in Finance have been widely adopted both by corporations as well as governments. They are information systems with capacity to maintain large data bases enabling organizations to store organize and access financial information easily. These systems are primarily used for accounting operations and generation of financial reports. Increasingly they are also used to support budgetary, planning and decision making processes. These systems are credited with increasing financial transparency, efficiency and accountability.

A financial MIS provides financial information for managers to make daily decisions on operations within the organization. Most systems provide these functions:

- Integrate financial information from multiple sources
- Provide easy access to financial information in summarized form
- Enable financial analysis using easy-to-use tools
- Compare historic and current financial activity

A financial MIS often has a number of subsystems, depending on the type of organization. These include systems to analyze revenues, costs and profits, auditing systems for both internal and external purposes and systems to manage funds. A financial MIS can also be used to prepare reports for third parties, such as external auditors or shareholders.

Financial MIS has the following subsystems;

1. Working capital management subsystem- It manages the working capital finances of the organization. Working capital I the capital required for an

organization to operate. It is use to pay for salaries and materials. Normally it is in the form of short term debt. This subsystem provides information about the requirement for working capital and the ideal method of financing it.

2. Receivable and payable Management- it is that module of the financial MIS in which the receivables and payables of a company is managed. This module manages debtors and creditors by maintaining key information about them and their commercial terms and reference with organization.

3. Budgeting- It is a strategic function of finance. The budgeting module has tools for making projections of the future needs of resources, so that the budgeting can be performed well. The budgeting module helps the finance department to take decisions on the quantum of money spent on each activity of the organization.

4. Funds management module- This module helps the finance department to take better capital expenditure decisions by providing the relevant information. The module helps the decision makers in the finance department by giving them information about fund utilization, cost of funds, the most suitable fund management options etc.

5. Financial Control System- It helps the finance department to exercise a control over finances by giving control related information to the department.

APPLICATION OF INFORMATION SYSTEM MODEL TO PRODUCTION MANAGEMENT

Enterprises generate a vast amount of data daily in their manufacturing operations that need to be processed so that important decisions are made faster, and the manufacturing flow remains free from bottlenecks. To manage the massive amounts of data, organizations need a set of tools that can help them manage the manufacturing/production data throughout the enterprise. Manufacturing is not a single area. It is instead a multidisciplinary area that includes several functions from product engineering to facility design and scheduling as well as fabrications and quality control management. Each of these functions can see dramatic improvements through the use of an information system. It is also why Manufacturing Information Systems seem to be complicated since they address

several interacting domains. The Manufacturing information systems provide accurate and timely data that can be used in manufacturing to make critical decisions

Production information system performs an integrating role within the production system of any organization. Management of activities/operations in a production system is concerned with decision making related to different components of the system so as to accomplish the desired output. These decisions can be divided as periodic-decisions viz. selection, design and updating of resources, transformation process and methods, and continual decisions about day-to-day operation and control of various activities/operations in the system. These decisions can also be divided in planning, implementation and control categories.

Production information system is a network to generate necessary information and process it to make various decisions related to some production system. It consists of communication channels and information processing centers collecting information from its sources of origin, storing, updating, collating and processing it and then supplying the processed information to the various users of the system. A production information system can be viewed as an independent group of sub-systems each related to its successor, each performing a different function though yet united with others for achievement of the overall objective. It interacts with both its internal and external environments.

The system has the following subsystem;

1. Production management subsystem- It provides information for managing the production process of a firm. It provides information about production in different periods, the planning of capacities and monitoring of the production process so that control can be exercised over the production process. Capacity planning and production scheduling related information is also provided so that the operations manager can use this information for better decision making.

2. Maintenance management subsystem- It helps in managing the maintenance of machine in a firm. Different companies have different maintenance policies and the system must give the necessary information regarding such policies. This

system also provides the information regarding performance of machine and their period of maintenance free life.

3. Quality management Subsystem- It helps the quality team take quality related decisions in a better manner. Quality checked data are analyzed in this module and information is passed on to the department for decision making.

4. Project management subsystem- It provides information about project. This module has a facility for PERT/CPM type analysis and crashing activities to fit the entire project within the cover cost and time schedule. This is a complex and advance subsystem

5. Inventory management subsystem- An inventory management system (or inventory system) is the process by which you track your goods throughout your entire supply chain, from purchasing to production to end sales. It governs how you approach inventory management for your business. Inventory systems tell you the number of components or ingredients you need to create or assemble your final product. Without this information you may end up with excess stock, eroding your bottom line, or with insufficient stock to meet customer demand.

APPLICATION OF INFORMATION SYSTEM MODEL TO MARKETING MANAGEMENT

The Marketing Information System refers to the systematic collection, analysis, interpretation, storage and dissemination of the market information, from both the internal and external sources, to the marketers on a regular, continuous basis. The marketing information system distributes the relevant information to the marketers who can make the efficient decisions related to the marketing operations viz. pricing, packaging, new product development, distribution, media, promotion, etc. Every marketing operation works in unison with the conditions prevailing both inside and outside the organization, and, therefore, there are several sources (viz. Internal, Marketing Intelligence, Marketing Research) through which the relevant information about the market can be obtained

Marketing information system is a set of procedures and methods for regular and planned collection, analysis and presentation of information in making marketing

decisions. It is an interacting, continuing, future-oriented structure of persons, machines and procedures designed to generate an orderly flow of information collected from internal and external sources of information. MIS helps in product launches, authorizes the co-ordination of marketing strategies, and is an integral part of Sales Force Automation (SFA), Customer Relationship Management (CRM), and customer service systems implementations. It permits decision makers to more effectively manage the sales force as well as customer relationships.

It supports strategy development for new products, product positioning, marketing communications (advertising, public relations, and sales promotion), pricing, personal selling, distribution, customer service and partnerships and alliances. MIS gives the foundation for the development of information system-dependent e-commerce strategies.

The system has the following subsystem;

1. Point of sale system – This system is another fact of the order entry system. It captures data about the order at the point of sale and frequently found in fast food centers chain marketing, department store. The information obtained from point of sale becomes input to the FAIS and also to the marketing information system. Point of sale updates immediately inventory and sales levels. Through point of sales can be monitored minute and inventory also can be monitored closely.

2. Market intelligence system – This system refers to an information system regarding the strategies of the competitors. Most of the intelligence system of market obtained in an unstructured manner will be through the word of mouth or through observing statistics available through the media as well as commercial data base services. Nowadays due to heavy increase of competition there is a heavy need for the data of market intelligence to have appropriate decisions in marketing.

3. Market research system – This system provides details on particular problem of marketing. It gathers consumer related data that can be utilized to support decisions of marketing. Through marketing research useful information as to promotion, sales and product can be obtained. Marketing research can be through phone interview, personal interview and mail services etc.

4. Forecasting system – Market forecasting system is essential system. It refers to estimating the future demand for the services or products. This system normally takes input from the existing information systems and allows the organization to forecast the future. By utilizing various techniques of predicting the demand of the products can be ascertained that serves as basis for all the functional area. Appropriate predicting technique should be utilized based on the information. The forecasting helps for planning as well as useful for controlling also.

5. Direct mail advertising system – In this system, the company mails, brochures and sends the information directly to the target customers. For this reason company keeps company's mailing address. The data may be drawn from the files of customers, account receivable files and prospect files as well as other data purchased from outside. This is quite opposite to mass advertising that reaches an unspecified number of people that may purchase the product or not. This direct mail advertising system permits high target market selectivity, flexibility, personalization, early testing of the product or services as well as measurement of the results.

6. Delivery routing and tracking system – This system tracks the goods vehicles position and calculates the status of delivery. Delivery tracking system employs satellite dishes on the delivery vans in order to monitor the movement and location of vehicles and goods. Delivery routing systems help to route the vehicles efficiently in order to deliver the goods to the customers at lesser cost. The routing software works on geographical maps as well as identifies the best routes for the sake of vehicles that would expedite delivery and reduce the cost.

7. Marketing Decision Support System: It includes several software programs that can be used by the marketers to analyze the data, collected so far, to take better marketing decisions. With the use of computers, the marketing managers can save the huge data in a tabular form and can apply statistical programs to analyze the data and make the decisions in line with the findings.