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# **Management Information System for Effective and Efficient Decision Making: A Case Study**

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## **ABSTRACT**

Decision making is an integral part of the functioning of any organization. To facilitate Decision making in this ever-competitive world it is imperative that managers have the right information at the right time to bridge the gap between need and expectation. To facilitate better flow of information adequate Management Information Systems (MIS) is the need of the hour. Thus it is important to have an understanding of the MIS followed in an organization by all levels of management in order to take effective decisions.

A management information system collects and processes data (information) and provides it to managers at all levels who use it for decision making, planning, program implementation, and control. The MIS has many roles to perform like the decision support role, the performance monitoring role and the functional support role.

To get a realistic and holistic view of the MIS, MIS of MCC Limited (Name disguised) was taken as a case study. To get a more detailed understanding of a particular function of the company, we studied the need, uses and benefits of MIS with respect to the Material Department of the company. Inventory Management was of prime focus in our study.

MCC Limited is one of the first Indian companies to realize the potential and importance of information technology and adopt automation and IT. The organization started computerizing its systems as early as 1968.

The organization has traveled a long way from the days in 1968 when it was using simple keypunching machines. Significant improvements have been made in the application systems and infrastructure. From Batch processing to on-line systems, from IBM1401 to the latest UNIX and Windows 2003 based machines it has made timely transitions determined by available technologies and business requirements. The MIS has greatly facilitated and synchronized the information flow in the organization and the management feels that it has played a role in the growth and increased performance of the company.

Key words : MIS , DECISION MAKING

## **INTRODUCTION**

Management Information Systems (MIS) is a system consisting of people, machines, procedures, data bases and data models, as its components. The system gathers data from Internal and External sources of an organization; processes it and supplies Management Information to assist managers in the process in decision making. Thus it is safe to conclude that an information system is "a system consisting of the network of all communication channels used within an organization".

There are many potential benefits of MIS investments

Investing in information systems can pay off for a company in many ways.

1. It can support a core competency.
2. Enhance distribution channel management.
3. Builds brand equity.
4. IT investment can boost production processes
5. Information systems allow company flexibility in its output level.

An information system comprises of all the components that collect, manipulate, and disseminate data or information. It usually includes hardware, software, people, communications systems such as telephone lines, and the data itself. The activities involved include inputting data, processing of data into information, storage of data and information, and the production of outputs such as management reports.

## **OBJECTIVE OF THE STUDY**

The objective of this project is to study the MIS implementation of MCC Ltd. and with the help of this domain, to get an insight into the needs of MIS in business setups on a big scale, various functions performed by the MIS, benefits derived out of such a system and the risks involved.

The study focus was analyzing the business needs of the organization, key challenges or desired functional requirements of the MIS, the IT solution that is currently implemented and the outcome of such a system.

MCC Ltd. requires MIS to map internal processes and interaction with the external environment to the technology and ensure the solution delivers real benefits to the business.

## **SCOPE OF THE STUDY**

The scope of our study is to understand the reasons behind the need of MIS in MCC. The study would develop knowledge of what information is needed on a regular basis for decision making purposes and how it is sought and used by MCC with the help of MIS .During the study , the MIS support to the Company as a whole with special emphasis on Inventory Management practiced in the Material Stores Department of the company is covered .

## **METHODOLOGY**

The Primary Data was collected from SAP Implementation Head IT Infrastructure Managers in the Information System department of MCC Limited by conducting telephonic interviews and collecting documentation which gave an insight into the procedures being followed with regards to the functioning of MIS.

The Secondary Data was taken from various online sources like the website of the company [www.MCCcement.com](http://www.MCCcement.com) and various reference books on MIS.

## **NEED FOR MANAGEMENT INFORMATION SYSTEM**

This is a universally accepted fact that all managerial functions are performed through decision making. For taking rational decisions, timely and reliable information is essential and is procured through a logical method of information collecting, processing and disseminating to decision makers.

In today's world of ever increasing complexities of carrying out business, every organization, in order to survive and grow, must have a properly planned, analyzed, designed and maintained MIS. This need is even more increased because organizations now have to compete not only locally but also globally.

MIS assist decision makers, by providing the required information at various stages of decision making and thus greatly help the organization to achieve its goals and objectives. On the other hand, if an MIS is poorly planned and constructed, it may provide inaccurate, irrelevant or obsolete information, which may even prove fatal for the organization.

## **TYPES OF MIS AND USES**

MIS is a concept, which is a matter of degree rather than an absolute one. In management there are perhaps few other areas other than MIS which has created so much controversy. We would make an attempt to try to look into different types of MIS as they have evolved during the course of time.

1. Transaction Processing System
2. Management Information System
3. Decision Support System
4. Executive Support System
5. Office Automation System
6. Business Expert System

**Transaction Processing System:** It processes transactions and produces reports. It represents the automation of fundamental, routine processing used to support business operations. It does not provide any information to the user for decision making. TPS uses data and produces data.

**Management Information System:** MIS is an information system that processes data and converts it into information. A management information system uses TPS for its data inputs. The information generated by the information system may be used for control of operations, strategic

and long-range planning, short-range planning, management control and other managerial problem solving.

**Decision Support System:** A decision support system is an information system application that assists decision-making. DSS tends to be used in planning, analyzing alternatives and trial and error search solutions. They incorporate a variety of decision-making models and thus are capable of performing what-if analysis.

**Executive Support System:** An ESS is a special kind of DSS. It is specially tailored for the use of chief executives of an organization to support his decision-making. Thus ESS is a comprehensive information system that includes various types of decision support systems, but it is more specific and person oriented.

**Office Automation System:** Office automation refers to the application of computer and communication technology to office functions. Office automation systems are meant to improve the productivity of managers at various levels of management by providing secretarial assistance and better communication facilities.

**Business Expert System:** A BES is a knowledge based information system that uses its knowledge about a specific, complex application area to act as an expert.

## **ROLES OF MIS**

### **THE PERFORMANCE MONITORING ROLE**

MIS are not just statistics and data analysis. They have to be used as an MBO (Management by Objectives) tool. They help:

- ❖ to establish relevant and measurable objectives
- ❖ to monitor results and performances (reach ratios)
- ❖ to send alerts, in some cases daily, to managers at each level of the organization, on all deviations between results and pre-established objectives and budgets.

### **THE FUNCTIONAL SUPPORT ROLE**

Business processes and operations support function is the most basic. It involves collecting, recording, storing, and basic processing of data. Information systems support business processes and operations by:

- ❖ recording, storing and processing sales data, purchase data, investment data, payroll data and other accounting records

- ❖ recording, storing and processing inventory data, work in process data, equipment repair and maintenance data, supply chain data, and other production/operations records
- ❖ recording, storing and processing personnel data, salary data, employment histories, and other human resources records
- ❖ recording, storing and processing market data, customer profiles, customer purchase histories, marketing research data, advertising data, and other marketing records
- ❖ recording, storing and processing business intelligence data, competitor analysis data, industry data, corporate objectives, and other strategic management records

use of all the above to implement, control, and monitor plans, strategies, tactics, new products, new business models or new business ventures.

## **THE DECISION SUPPORT ROLE**

The business decision making support function goes one step further. It is an integral part of making decisions. It allows users to ask "What if...?" questions: What if we increase the price by 5%? What if we increase price by 10%? What if we decrease price by 5%? What if we increase price by 10% now, then decrease it by 5% in three months? It also allows users to deal with contingencies: If inflation increases by 5% (instead of 2% as we are assuming), then what do we do? What do we do if we are faced with a strike or a new competitive threat?

## **COMPANY PROFILE**

**MCC** MCC Limited is India's foremost manufacturer of cement and concrete. MCC's operations are spread throughout the country with 14 modern cement factories, 13 Ready mix concrete plants, 19 sales offices, and several zonal offices. It has a workforce of about 9000 persons and a countrywide distribution network of over 9,000 dealers. MCC's research and development facility has a unique track record of innovative research, product development and specialized consultancy services. Since its inception in 1936, the company has been a trendsetter and important benchmark for the cement industry in respect of its production, marketing and personnel management processes. Its commitment to environment-friendliness, its high ethical standards in business dealings and its on-going efforts in community welfare programs have won

it acclaim as a responsible corporate citizen. MCC has made significant contributions to the nation building process by way of quality products, services and sharing its expertise.

In the 70 years of its existence, MCC has been a pioneer in the manufacture of cement and concrete and a trendsetter in many areas of cement and concrete technology including improvements in raw material utilization, process improvement, energy conservation and development of high performance concretes.

MCC's brand name is synonymous with cement and enjoys a high level of equity in the Indian market. It is the only cement company that figures in the list of Consumer Super Brands of India.

The company's various businesses are supported by a powerful, in-house research and technology backup facility - the only one of its kind in the Indian cement industry. This ensures not just consistency in product quality but also continuous improvements in products, processes, and application areas.

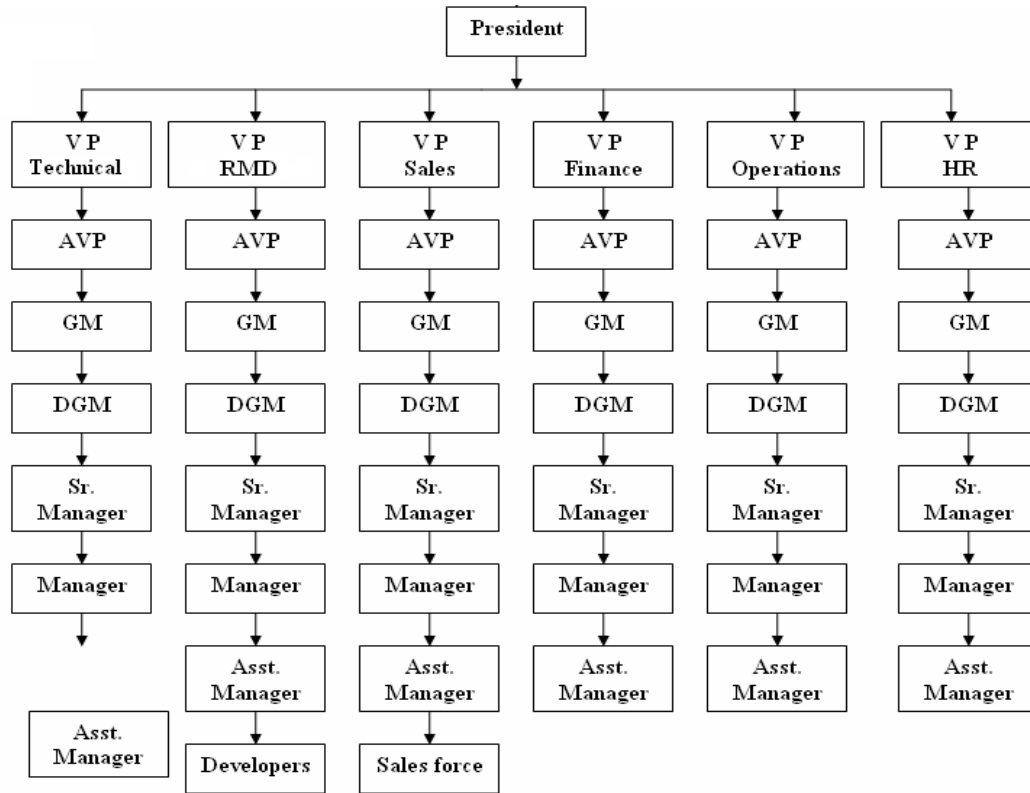
MCC has rich experience in mining, being the largest user of limestone, and it is also one of the principal users of coal. As the largest cement producer in India, it is one of the biggest customers of the Indian Railways, and the foremost user of the road transport network services for inward and outward movement of materials and products.

MCC has also extended its services overseas to the Middle East, Africa, and South America, where it has provided technical and managerial consultancy to a variety of consumers, and also helps in the operation and maintenance of cement plants abroad.

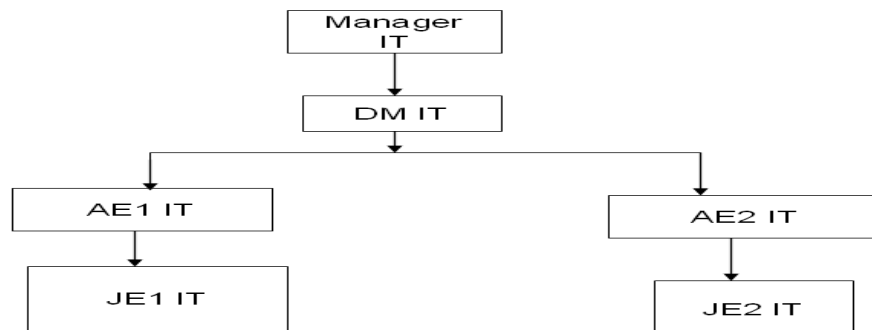
MCC demonstrates the practices of being a good corporate citizen undertaking a wide range of activities to improve the living conditions of the under-privileged classes living near its factories.



## ORGANIZATIONAL STRUCTURE OF THE MCC LTD.



## Structure of IT Division



# INVENTORY MANAGEMENT



A product that is in excessive demand is usually extremely difficult to manage. Supplying the right amount of products implies that an accurate demand forecast is essential. This impacts the entire supply chain to facilitate efficient consumer response based on consumer demands it becomes imperative that such companies consider inventory management seriously. Making accurate demand and supply predictions is an ideal situation that anyone in the supply chain management arena could dream off.

By providing timely accurate information pertaining to inventory location, movement and valuation, receipt of goods, sale and return of goods and profits you can make sure that your inventory is visible throughout a network.

With inventory management you can set your product catalog to hide products that are not in stock, or change prices based on the amount of products available in the warehouse. The quantity available can be displayed to the shopper and this can prevent unnecessary confusion when the shopper adds items not available to a shopping cart. The store buyer can be automatically notified about low inventory levels.

IT (Information Technology) is a key enabler in the transformation of purchasing into a strategic business function. The challenge is to find a way to put these technologies to use and create value and competitive advantage.

### **The Main Objectives in Inventory Management are:**

- Improved customer service
- Reduced inventory investment
- Increased productivity
- Benefits of inventory management applications
- Complete control of inventory.
- Complete information about the value of the inventory
- Complete visibility on Quantities on hand, Quantities committed and Quantities sold
- Response time to demand changes reduced
- Increased sales
- Knowledge of the exact size of merchandizing inventory
- Taxes and insurance premiums paid on excess merchandize inventory avoided.

### **MIS AT MCC CEMENT**

MCC is one of the first Indian companies to realize the potential and importance of information technology and adopt automation and IT. The organization started computerizing its systems as early as 1968. The organization has traveled a long way from the days in 1968 when it was using simple keypunching machines. Significant improvements have been made in the application systems and infrastructure. From Batch processing to on-line systems, from IBM1401 to the latest UNIX and Windows 2003 based machines it has made timely transitions determined by available technologies and business requirements.

MCC has made a quantum jump from in-house developed systems using Oracle 9i and Developer 6i to an ERP based solution. This decision was solely based on its strategic objectives and the business benefits that are expected to follow. With this move people, business processes and technologies across the country are aligned.

The implementation of ERP solution for process control is shown in the figure below.

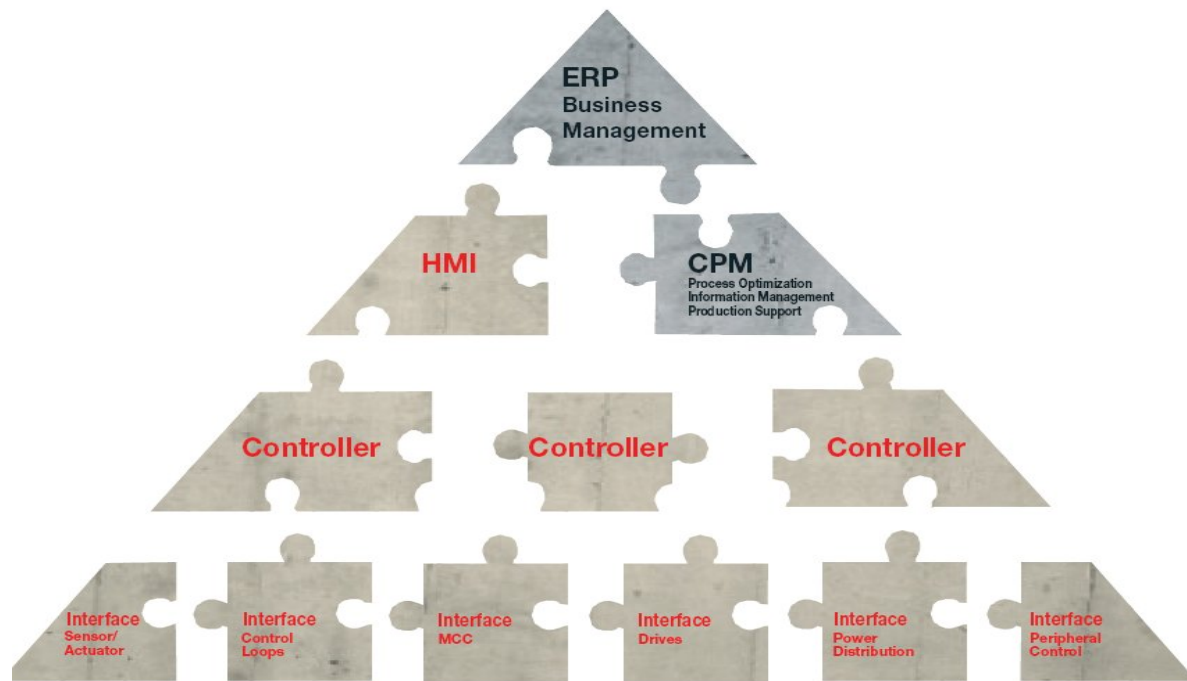


Fig.1 The ERP implementation for process control at MCC Ltd.

IT department is still continuously working on improving the functionality and removing the errors of the system. As a result system is becoming better day-by-day, thus improving the productivity of the company.

## NEED FOR AN INTEGRATED MIS

The benefits associated with an integrated MIS are

- Better processing of the large volume of data in an organization.
- Reducing the Redundancy of Data that occurs in case of separate packages.
- Availability of all the required information about any department through a common system.
- Making the system capable of supporting the managers in making decisions.
- Facilitate the communication between the various regional offices of the company and the corporate office along with the main plant.

- Use of online data to speed up the information flow of the organization and facilitate decision-making

## **FUNCTIONS PROVIDED BY CURRENT MIS**

### **Plant (Manufacturing & Maintenance)**

#### **Production**

- Break down and Plant performance Module
- MIS Reports and stoppage Module, Stock position

#### **Raw Materials Management System**

- Integration with Weigh Bridge and Security Gate
- Daily stock, issue position and bill passing
- Transport Freight Payment Systems

#### **Weigh Bridge**

- Integrated with Security Gate
- Stopped one mechanical weigh bridge
- 500 trucks can weigh for gross and tare in single day  
$$500 \times 2 = 1000$$
- Time Management Reports, Truck Movement reports
- Weighment is integrated with invoice cum challan freight
- Payment
- Truck position inside and outside the plant.

#### **Computerized Preventive Maintenance Software**

- Both plant are using this module
- Preventive Maintenance and Break down Module
- Shutdown module and integrated with inventory
- Forecasting of spares and skills usage module

#### **Inward & Outward Materials Security**

- Control on returnable goods

### **Work Order and analysis**

- Work Order will be prepared by authorized person
- Provided to all departments. Integrated with Rate Master
- And budget.

### **Labour Deployment and accounting System**

- Daily supply of Contractor Labour deployment
- Against regular, adhoc and shutdown requirements
- Daily/monthly/yearly analysis reports
- Contractor labour Bill passing system

### **Commercial Applications**

#### **Marketing accounting and analysis System**

- Excise module and Sales Tax Module
- Transport Bill passing module
- Order Confirmations and Dispatch Instruction
- Free Market Requirements, Railway Receipt
- Commercial Invoice, Debit Note, Credit Notes.

#### **Stores Inventory & Non Inventory**

- On Line indent, Issue and Receipt Materials
- Delivery Schedule
- Controlling the inventory
- Controlling the increased inventory
- Stores Ledger, consumption Summary
- MIS reports, Budget V/s Actual Consumption.
- Integrated with financial Package
- Repair & maintenance inventory, Department Wise Expenses.

#### **Purchase Management System**

- Purchase Order integration with indent
- On line enquiry, Party wise information
- Pending list of purchase order
- MIS reports, Purchase / Indent Register

- Payment Advice System (Advance, regular)

### **Financial accounting System**

- All types of voucher feeding
- Purchase and freight bill passing
- Other Expenses bill passing and TDS Module
- General Ledger, Sub Ledger and Trial balance of two
- Financial years.
- Auto payment advice, Bank forwarding letters, payment
- System, Overhead Analysis reports.
- Integrated with inventory and Payroll module MIS Reports
- Cash Budget,

### **Vehicle Movement**

- Controlling on Taxi, Car etc

### **On line General information System**

- Information provided to Users about
- On line Leave status I.e. opening, availed and closing status
- Electricity Deduction Employee wise, Quarter wise
- Over time Status department wise
- Welfare rules and Regulations, Telephone list, etc
- Actual Consumption against budget, Welfare information

### **Human Resource Development**

- Topic Courses, General Awareness Programme,
- TNA of Workmen, TNA of LCW, Individual record of ext/int
- Training, Pending Training etc.

### **Payroll & PIS Module**

- Pay slip of Staff, Worker, School, Badli & Casual Worker
- PF, VPF, Bonus, Gratuity Module
- LIC, CTD, Thrift Society, Co-operative advances Module.
- Recovery & Deduction, PIS and Income Tax Employee wise
- Integrated with Financial Package

- Over Time, C-off Module
- Payroll of Marketing Department (Transferred from HO)

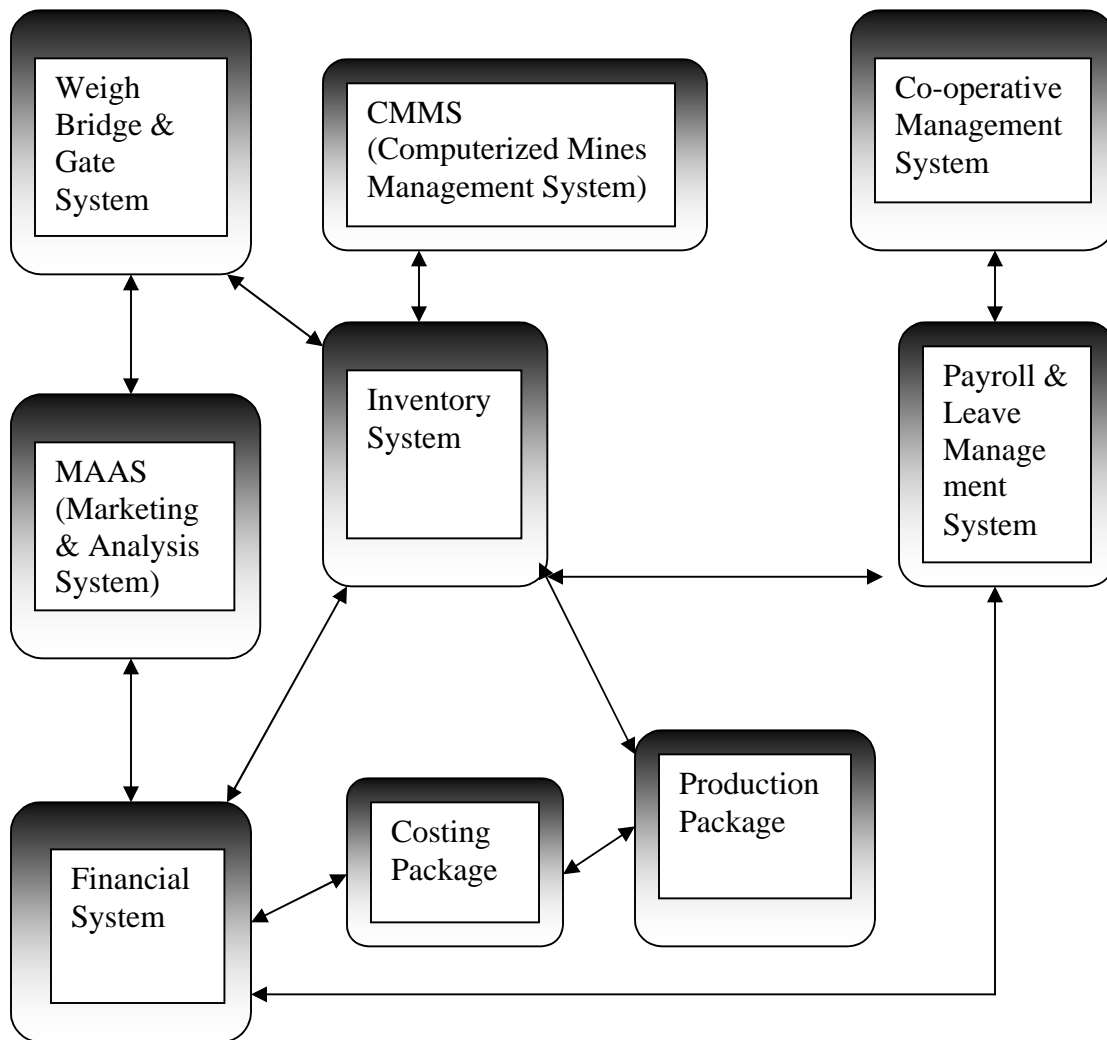
### **Sales accounting Systems**

- Sales accounting Systems, Rent Payment System
- Data loading, Expenses Payment System,
- Freight Payment, MIS, Transferring in FAS

### **Gate Pass System (Returnable & Non-returnable goods)**

- All goods send through Computerized Gate Pass
- Integrated with Gate System.
- Pending repair items information

### **Architecture of MIS at MCC Limited**





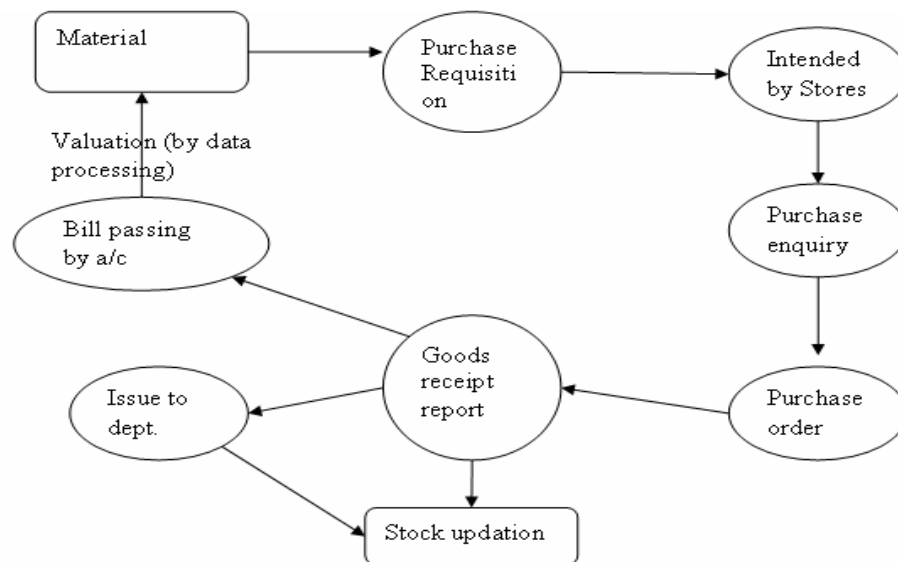
## Inventory Management Module of Current MIS

Current MIS of the company is basically a In-house developed system, also comprising of few specialized readymade software packages bought from outside developers. It comprises of 11 main modules covering all the main functions of the company.

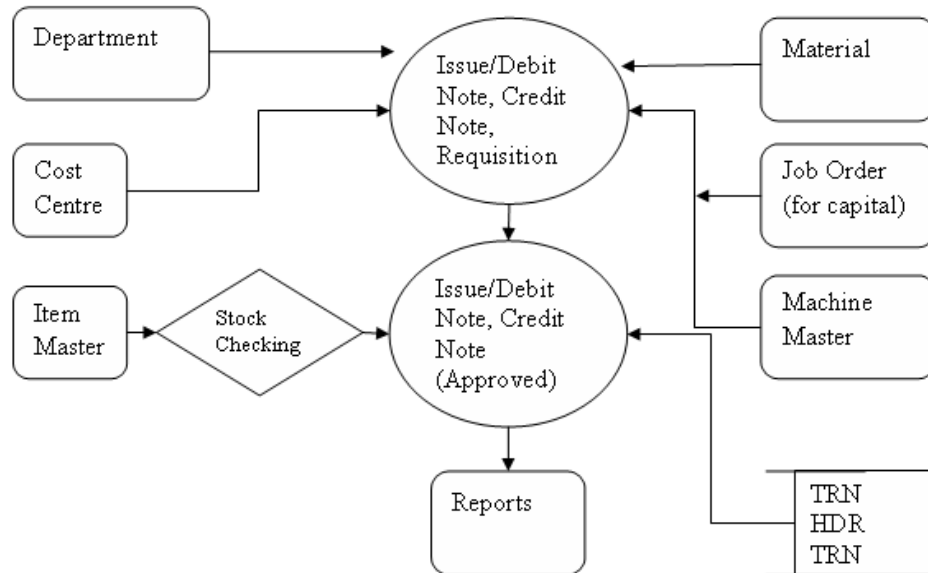
Inventory Management Module is one of the most important parts of the system. It is highly integrated with the other modules and capable of functionalities like Auto Alarming when inventory is low. It is capable of generating more than 200 different types of reports to help managers in different required ways. Its main parts include Inventory issue, purchase, bill passing, other OER passing, freight passing, stock updation etc.

### DFDs and Data processing diagrams:

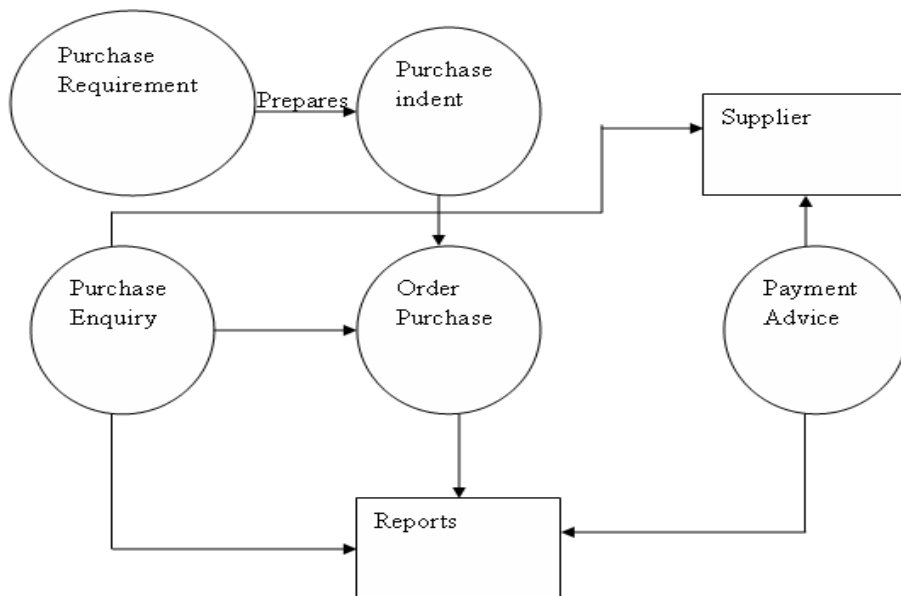
#### Inventory Package Context Level Diagram (CFD):



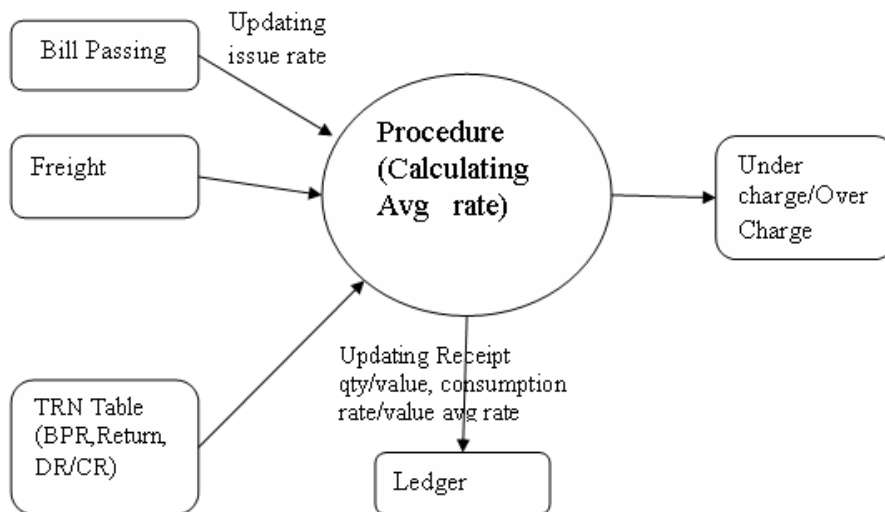
### Inventory Package Issue DFD:



### Inventory Purchase DFD:



## Data Processing (Full Inventory Module)



## Application used for Work order Preparation at The MCC Ltd.

### 1. ITEM CODE CREATION

- There are 9 types of item group in Non Catalogue Item

– Medicines	806
– Stationary	807
– Repair Order	808
– Transportation Order	809
– Raw materials	810
– Capital Orders	811
– Job Orders	812
– Laboratory Items	813
– Direct book orders	814

### 2. Indent Posting

### 3. Indent Sanctioning

#### 4. Indent Type Updation

#### 5. Order Preparation

#### 6. Order Printing

After analyzing the system properly, it was concluded that system is working fine at an overall level and consisting of very minimal problems. These problems can't be stated as such problems and instead can be stated as future path as follows: -

- Still lack of system integration after a level. Though inventory management module is integrated well with all the other modules like financial system, thus reducing the redundancy. But still there is need of paper work and manual intervention when reordering is required. System cannot be configured to reorder automatically, even for the fast moving raw material.
- Lack of Web Integration: MCC hasn't still employed the concept of taking orders or ordering through web and have no integration of its system to its website.
- Legacy Network Support: Backbone network used by MCC is still the same, which they used in 1993. They haven't upgraded the network support from then, which has started creating problems for them already. As MIS of the company is improving day-by-day including more and more functionalities, the network has already become very slow.
- Lack of training to managers to effectively use the decision support functionalities of system: This is another problem that we felt at the company. IT department is basically making the improvements in the system continuously with new added functionalities, but there is lack of training to managers to effectively use these functions in way that can support them to make better decisions. For example, on an average, a manager uses only 10-15 types of reports out of more than 200 types of reports available.

### **CONCLUSIONS**

Considering the given problems, their analysis and research on comparative MIS systems used in the similar kind of industries, following recommendations for the company are suggested.

- IT department of the company should now work towards integrating the system on a higher level and making the company Paper-Less Office. This should be done by

integrating the system in a way that the manual intervention be minimized in the day-to-day process.

- The company should also start Web-Based ordering and selling, so that to be able to catch up with the growing industry.
- As more improvements in MIS would be done, and Web-support to be also incorporated, it is more than sure that current Network available is going to crash. To cop this, company needs to upgrade its network. For this purpose, it is suggested the tie-up of company with some outside contractors like IBM or CISCO to continuously upgrade and maintain their network.
- With each up gradation, it is suggested to give training to the managers of the company about effectively using the added functionalities and use of them in a better way. This can be also done by providing a handbook along with each up gradation.

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