

**“INDISPENSIBILITY OF MANAGEMENT INFORMATION SYSTEM(MIS),MIS-
COMPUTER INTERFACE-A CASE STUDY OF COMPUTER MAINTENANCE
CORPORATION PRIVATE LTD.(CMC) “**

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INTRODUCTION

The term Management Information System(MIS) is commonly used to refer to the study of how individuals, groups, and organizations evaluate, design, implement, manage, and utilize systems to generate information to improve efficiency and effectiveness of decision making, including systems termed decision support systems, expert systems, and executive information systems.

There are different areas of concentration with different duties and responsibilities in information system managers starting from the Chief information officer(CIOs),Chief technology officer(CTOs),IT directors and IT security managers. Chief information officer (CIOs) are responsible for the overall technology stately of their organizations. Basically they are more of the decision makers and action takers when it comes down determining the technology or information goals an organization and making sure the necessary planning to implement those goals are being met.

Kenneth and Jane Laudon identify five eras of Management Information System evolution corresponding to the five phases in the development of computing technology: 1) mainframe and minicomputer computing, 2) personal computers, 3) client/server networks, 4) enterprise computing, and 5) cloud computing.

The fifth era (cloud computing) is the latest and employs networking technology to deliver applications as well as data storage independent of the configuration, location or nature of the hardware. This, along with high speed cellphone and wifi networks, has led to new levels of mobility in which managers may access the MIS remotely with laptop, tablet computers and smartphones.

Management information systems, produce fixed, regularly scheduled reports based on data extracted and summarized from the firm's underlying transaction processing systems to middle and operational level managers to identify and inform structured and semi-structured decision problems.

Objectives Behind Study

1. To survey the role played by Management Information System(MIS).
2. To identify the indispensable role of MIS in today's organization.
3. To highlight the importance of MIS in decision-making.
4. To pinpoint in details the various indispensable relations of MIS and computers.
5. To elaborate on the interface of MIS and computer applications.
6. To identify the various advantages of MIS.

7. To discuss in details the application of MIS with complete and detailed analysis of Computer Maintenance Corporation Ltd.(CMC Ltd.)'s all round use of MIS .
8. At the end of this session, participants should be able to understand and appreciate the following pointsL-
 - 1.Principles and elements of MIS.
 - 2.The relationship between organizational structure and MIS.
 - 3.Information requirements for MIS.
 - 4.Different types of MIS.
 - 5.The process of developing a MIS.
 - 6.Criteria for MIS.
 - 7.Strategies for determining MIS design.

Research Methodology

1. Secondary data have been primarily used.
2. The period under study covers a period from 1975 to 2005.
3. Simple induction logic has been used to highlight the issue.
4. Various charts and diagrams have been used to explain the matter in a lucid fashion.
5. CMC's use of MIS in various fields have been elaborately illustrated.

Advantages of Management Information System(MIS)

Acting as a communication and planning tool.The availability of customer data and feedback can help the company to align its business processes according to the needs of its customers. The effective management of customer data can help the company to perform direct marketing and promotion activities. MISs can help a company gain a competitive advantage. Competitive advantage is a firm's ability to do something better, faster, cheaper, or uniquely, when compared with rival firms in the market. Companies are able to identify their strengths and weaknesses due to the presence of revenue reports, employees' performance record etc. Identifying these aspects can help a company improve its business processes and operations.

MIS & IS :

The terms MIS and information system(IS) are often confused. Information systems include systems that are not intended for decision making. MIS is sometimes referred to, in a restrictive sense, as information technology management. That area of study should not be confused with computer science.IT service management is a practitioner-focused discipline. MIS has also some differences with Enterprise Resource Planning (ERP) as ERP incorporates elements that are not necessarily focused on decision support.

MANAGEMENT INFORMATION SYSTEM AND COMPUTER :

Translating the real concept of the MIS into reality is technically, an infeasible proposition unless computers are used. The MIS relies heavily on the hardware and software capacity of the computer and its ability to process , retrieve communicate with no serious limitations. The variety of the hardware having distinct capabilities makes it possible to design the MIS for a specific situation. For example, if the organization needs a large database and very lit le

processing, a computer system is available for such a requirement. Suppose the organization has multiple business location at long distances and if the need is to bring the data at one place, process, and then send the information to various location, it is possible to have a computer system with a distributed data processing capability. If the distance is too long, then the computer system can be hooked through a satellite communication system. The ability of the hardware to store data and process it at a very fast rate helps to deal with the data volumes, its storage and access effectively. The ability of the computer to sort and merge helps to organize the data in a particular manner and process it for complex lengthy computations. Since the computer is capable of digital, graphic, word image, voice and text processing, it is exploited to generate information and present it in the form which is easy to understand for the information user. The ability of a computer system to provide security of data brings a confidence in the management in the storage of data on a magnetic media in an impersonal mode. The computer system provides the facilities such as READ ONLY where you cannot delete to UPDATE. It provides an access to the selected information through a password and layered access facilities. The confidence nature of the data and information can be maintained in a computer system. With this ability, the MIS become a safe application in the organization. The software, an integral part of a computer system, further enhances the hardware capability. The software is available to handle the procedural and nonprocedural data processing. For example, if you want to use a formula to calculate a certain result, an efficient language is available to handle the situation. If you are not use a formula but have to resort every time to a new procedure, the nonprocedural languages are available. The software is available to transfer the data from one computer system to another. Hence, you can compute the results at one place and transfer them to a computer located at another place for some other use. The computer system being able to configure to the specific needs helps to design a flexible MIS. The advancement in computers and the communication technology has the distance, speed, volume and complex computing an easy task. Hence, designing the MIS for a specific need and simultaneously designing a flexible and open system

becomes possible, thereby saving a lot of drudgery of development and maintenance

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The concept of user friendly systems and the end user computing is possible, making information processing a personalized function. However, the application of the management principles and practices in today's complex business world is possible only when the MIS is based on computer system.

MIS facilitates managerial functioning. Management information is an important input at every level in the organization for decision making, planning, organizing, implementing, and monitoring and controlling. MIS is valuable because of its content, form and timing of presentation. In the context of different levels of decision making, information can be described as:

- source,
- data,
- inferences and predictions drawn from data,

- value and choices (evaluation of inferences with regard to the objectives and then choosing a course of action), and
- action which involves course of action.

The MIS concept comprises three interrelated and interdependent key elements: management, system and information (Murdick and Ross, 1975).

COMPONENTS OF MIS

The following are components of MIS within an environment.

- a) Information system
- b) Database management system
- c) Intelligence system
- d) Research system

a) Information system

Any specific information system aims to support operations, management and decision making. An information system is the information and communication technology (ICT) that an organization uses, and also the way in which people interact with this technology in support of business processes.

b) Database management system :

These are computer software applications that interact with the user, other applications, and the database itself to capture and analyze data. A general-purpose DBMS is designed to allow the definition, creation, querying, update, and administration of databases. Well-known DBMSs include MySQL, PostgreSQL, Microsoft SQL Server, Oracle, SAP and IBM DB2. The following are the examples of database application: 1) Computerised Library System and 2) Automated Teller Machine.

c) Intelligence system:

An intelligent system is a machine with an embedded, Internet-connected computer that has the capacity to gather and analyze data and communicate with other systems.

d) Research System :

All it helps in identifying the key management problems, exploring various facets of the problems and suggesting relevant decision alternatives relating to the problem.

Role of MIS:

The role of MIS can be compared with the role of heart of a human being and blood is the information which flows in an organisation.

Use of MIS in Decision Making :

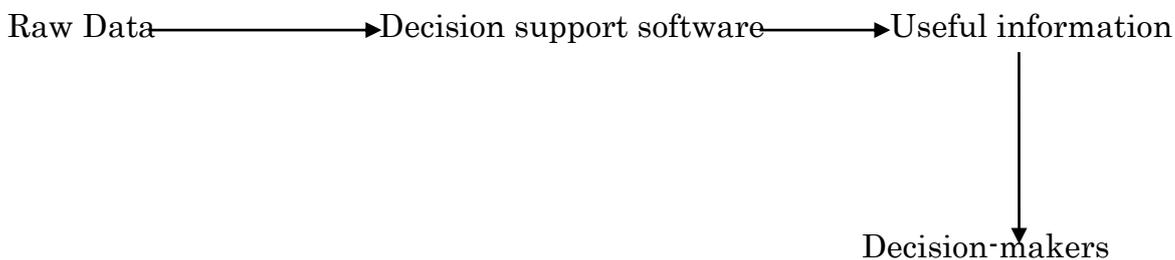
Research System component of MIS helps in identifying key management problems. Suggests decision alternatives for problems.

MIS delivers correct real time information and provides analytical tool for quick understanding of information and decision making.

IT provides new tools for managers to carry out both traditional and newer management roles, enabling them to monitor plan and forecast with more precision and speed than ever before and to respond more speedily to the rapidly changing business environment.

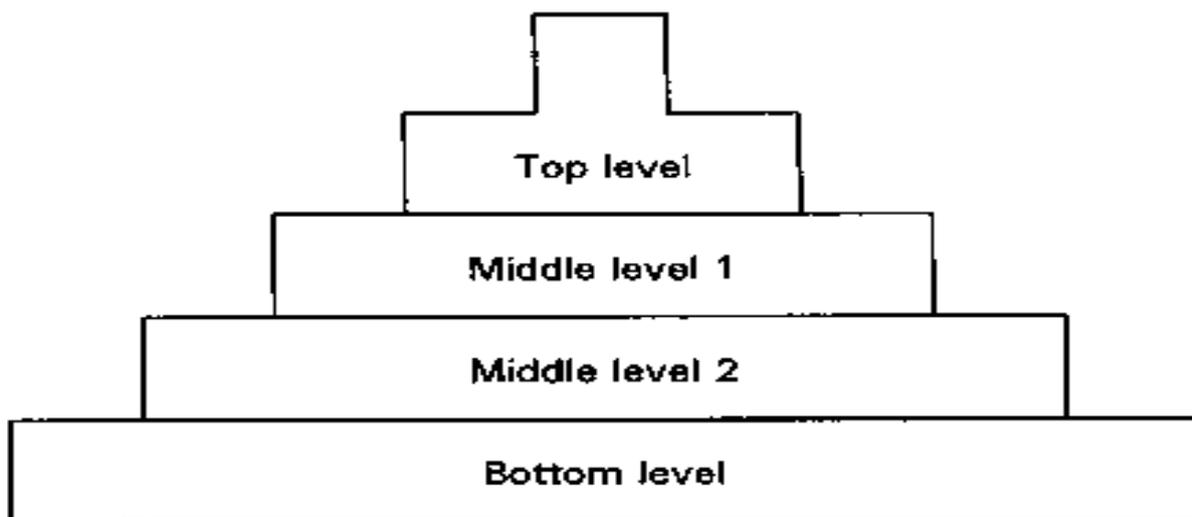
Another component of MIS , intelligence system, analyses business data ad provide interactive information during the decision-making process,from problem recognition to implementing decision. DBMSs provides a structured format of data which helps experts in business decision-making.

Diagrammatically,



MIS helps in decision making in situations like for example what should a company do, if suppose, in such company sales decreased by 15% in the eastern part of Nepal whereas overall sales increased by 20% in the entire eastern market.

MIS AS A PYRAMIDAL STRUCTURE



Outcomes of knowledge of MIS leads to the following positive effects:

1. Improved decision making
2. Greater connectivity and coordination within and outside organisation
3. Operational excellence
4. Effective market spacing

5. Increased customer intimacy
6. Better relationship
7. Knowledge management
8. Organizational development and change
9. Increased management efficiency.
10. Right information just at the right time.

“**Operational excellence** implies cost reduction in the long run, improved quality, increase in the production, increase in the volume of sales, waste minimization, better time management.”

“**Effective market placing** implies sound logistic support system, proper inventory system of raw materials, effective supply chain, reliable distribution channel, optimum stock of finished goods.”

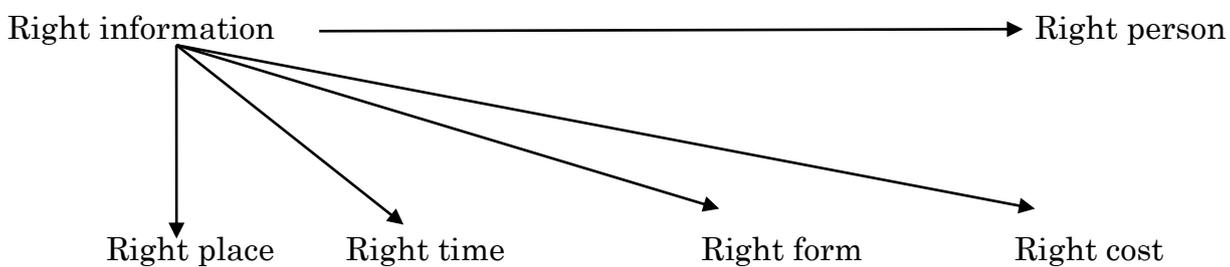
“**Effective market spacing**, for example, e-book, e-library, e-video/movies etc.”

MIS also helps in establishing better relation with government, labor union, trade union, other concerned line agencies and also serves as knowledge management for decision-making purpose.

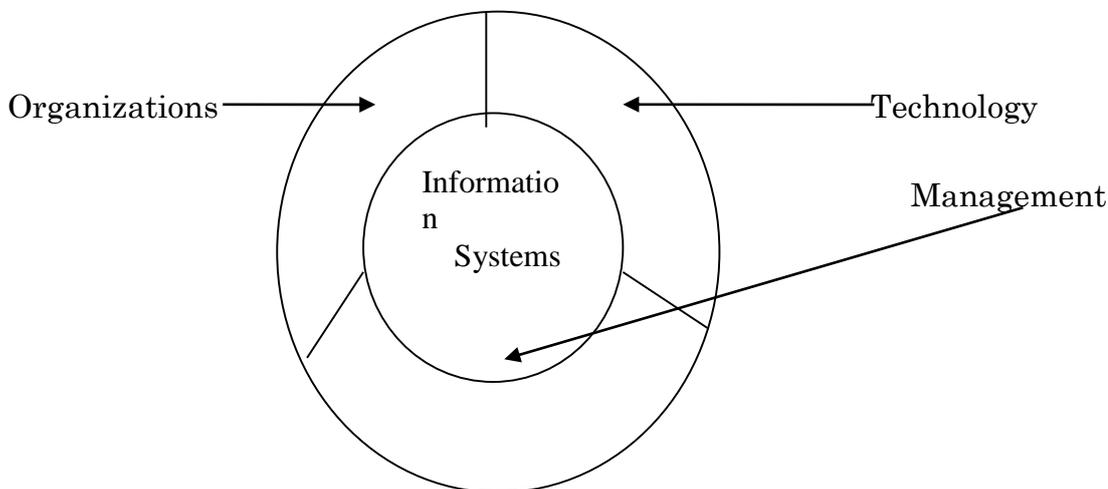
Organisational development and change is another outcome of MIS.

MIS also supports in generating efficient total quality management (TQM).

To simplify, MIS implies,

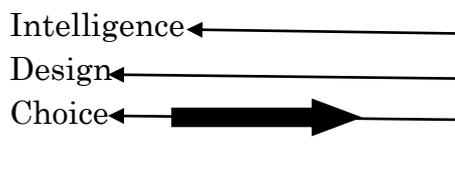


Management Information System (MIS) Diagram :



Decision Support System(DSS) in a chart presentation is as below :

Decision making process



.Herbert Simon Model Of Decision Making

Management information Systems (MIS), sometimes referred to as Information Management and Systems, are the discipline covering the application of people, technologies, and procedures — collectively called information systems— to solving business problems. Management Information Systems are distinct from regular information systems in that they are used to analyze other information systems applied in operational 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. The terms

MIS and information system are often confused. Information systems include systems that are not intended for decision-making. MIS is sometimes referred to, in a restrictive sense, as information technology management. That area of study should not be confused with computer science. IT service management is a practitioner-focused discipline. MIS has also some differences with Enterprise Resource Planning(ERP) as ERP incorporates elements that are not necessarily focused on decision support

Computer Maintenance Corporation(CMC) & Its Management Information System

CMC was incorporated on December 26, 1975, as the 'Computer Maintenance Corporation Private Limited'. The Government of India held 100 per cent of the equity share capital. On August 19, 1977, it was converted into a public limited company. In 1978, when IBM wound up its operations in India, CMC took over the maintenance of IBM installations at over 800 locations around India and, subsequently, maintenance of computers supplied by other foreign manufacturers as well. Taking over the activities of IBM in India, including many of its employees, helped the company to imbibe a service-oriented culture. This is demonstrated by our long-standing customer associations and our ability to provide high-quality and reliable service.

Significant events in CMC's history:-

1975

Incorporated as 'Computer Maintenance Corporation Private Limited'

1977

Became a public limited company

1978

Took up the maintenance of 800 IBM installations over India. Initiated training courses, predominantly for customers

1981

Commenced work on Project Interact, a UN-funded project

1982

Set up a research and development facility to develop competencies in the frontier areas of technology

1984

Diversified our activities to include turnkey projects, IT education and software development. Renamed ourselves as 'CMC Limited'

1985

First foray into biometrics, conceptualising an automatic fingerprint recognition system

1986

Aligned business focus along vertical markets like transportation, mining, power and banking
Implemented project IMPRESS, an online passenger reservations system for the Indian Railways
Set up Indonet — a countrywide data network (renamed as ITES)

1991

Acquired Baton Rouge International Inc, USA (BRI, later renamed in 2003 as CMC Americas, Inc) to focus on international markets

1992

The Government of India partially divested its holdings in CMC

1993

CMC listed on the Indian bourses

1995

Reorganisation of business into five strategic business units (SBUs)

2000

Opened London branch office

2001

Tata Sons Limited acquired a 51 per cent stake. CMC ceased to be a public sector enterprise. The board of the company was reconstituted

2002

CMC Centre awarded the ISO 9001:2000 Certificate by STQC. Certification services for a period of three years

Northern region division of our systems integration SBU certified ISO 9001:2000 by STQC, for a period of three years
Western region (SI) assessed SEI CMM Level 5 (quality level 5 of the capability maturity model for software, version 1.1 of the Software Engineering Institute, Carnegie Mellon University, USA)
Eastern region (SI) assessed SEI CMM Level 4
Tata Business Excellence Model (TBEM) adopted

2003

Renamed subsidiary, BRI, as 'CMC Americas, Inc'
Opened Dubai Branch office
CMC completes the 'India Census 2001' project of scanning and file creation of 228 million household forms

2004

CMC ties up with Xilinx (the world's largest supplier of programmable logic solutions) to establish Xilinx' 1st development center in Hyderabad called Xilinx-CMC India Development Center (XIDC)
The Government of India divested its remaining 26.5 per cent stake in CMC
CMC awarded the Gold certification from Cisco Systems, for customer satisfaction,

training, support and specialization CMC's VOICE project adjudged the first runner-up in the best eGovernance projects category at the CSI-Nihilent eGovernance Awards 2003-04

2005

CMC Centre, Hyderabad, Southern Region (Bangalore, Chennai & Hyderabad), Northern Region (Delhi, Lucknow, Bhopal, Indore and Raipur) and Eastern Region are assessed SEI CMM Level 5 for Systems Integration DQ Rates TCS-CMC as No. 1 in IT Services CMC signs The Brand Equity-Business Promotion (BE-BP) agreement with Tata Sons Ltd. This agreement is an institutionalized process in the Tata Group to drive relationship between Tata Sons and the signatory company. It is to collectively and cooperatively promote the TATA BRAND which would match the brand equity of international brand names CMC in line with TCS' business processes and practices implemented Ultimatix. Through the Ultimatix portal, all applications (Oracle Finance & Oracle HR modules) are accessible from one single window. BOLT, an online trading system, developed and implemented by CMC in March 1995 for BSE, completed 10 years of operations

Information Technology (IT) FOR THE COMMON MAN :-

Effective implementation of eGovernance can take IT to the common man, helping national and state governments to align their services with the changing needs of both citizens and stakeholders, as well as develop the economy. An IT-driven eGovernance system primarily involves the creation, storage, analysis, dissemination and use of information. It can provide vital inputs to the government's policy-making process. It makes government processes accountable eGovernance automates and thereby speeds up routine administrative functions. It enables the government to work better, yields higher revenue growth and costs less, apart from servicing citizens' needs as never before. Citizens can freely interact with various government departments anytime, anywhere with minimal effort. CMC's domain expertise in eGovernance can create customized solutions that address the entire spectrum of the information technology needs of state governments, the national government and even local self-government bodies like municipalities and zilla parishads. We also have packages for public health authorities, hospital solutions, law and order applications for police departments, water resources management solutions for irrigation departments, a first-of-its-kind package for tourism departments and a comprehensive social welfare monitoring application for tribals and other marginalised sections of society. Our solutions are highly scalable and inter-operable, offer seamless integration with existing applications, enable the convergence of diverse technologies, have lower maintenance costs and offer huge improvements in operational efficiency

CMC's eGovernance offerings include:

General administration

VOICE

(Versatile online information for citizen empowerment): India's first IT solution for municipal corporations across the country

LANDS

(Urban land management solution): Application software for the operation and management of a modern urban land development authority or an urban housing board.

mREINS

(Head of government information system): An integrated information and decision-support system for the chief minister of a state.

TWIMS

(Tribal welfare information management system): An integrated solution including a school education management system (SEMS), a beneficiary monitoring system (BMS), a village monitoring system (VMS) and an accounts package

Finance**KHAJANE**

(Treasury management system): A software that computerises all the treasuries in a state and provides regular updates regarding state expenditure and receipts to a central server at the secretariat.

iCOMITRAX

(Computerised information system for trade tax): An end-to-end trade tax solution that enables a state commercial taxation department to improve its services and increase its revenues through the use of IT.

Healthcare**FHIMS**

(Family welfare and health information and monitoring system): A system for effective monitoring of public health programmes and family welfare services

HMIS

(Hospital management information system): A system to manage patient care in a cost-effective manner, to enable effective utilisation of resources

IHC

(India health care): A solution enabling rural health workers to deliver quality health care by eliminating redundant data entry in paper registers

Law and order**FACTS**

(Fingerprint analysis and criminal tracking system): An advanced automatic fingerprint identification system, using state-of-the-art digital image processing, neural networks and pattern recognition techniques

BASforTAM

: CMC Biometric Authentication System (BAS) enables web based applications to be authenticated more securely with biometrics

VCOPS

(Versatile computerised operations for police services): An integrated enterprise-wide tool for increasing the efficiency of police units in crime control, law and order and administrative operations

Power utilities**PowerDesk**

: A consumer relationship management, billing and energy accounting system targeted for implementation at power utilities

mPOWER

: An online billing and CRM solution for power utilities

Water resources management**BAS**

(Basin-wide water accounting and budgeting system): A water accounting and budgeting system with a GIS interface

CIMS

(Canal irrigation management system): A comprehensive system for planning and management of an irrigation scheme

CMS

(Construction management system): Maintains data and generates reports and queries for the planning, design, construction and monitoring of irrigation projects

MIS

(Management information system): A comprehensive system for planning, design, construction, monitoring, operation and maintenance of irrigation schemes

Travel and tourism**VISTA**

(Versatile information system for tourist attractions): A first-of-its-kind integrated system that uses the power of IT to promote tourism

MANAGEMENT INFORMATION SYSTEM

The primary objective of CMC's management information system is to provide a comprehensive system facilitating the planning, design, construction, monitoring, operation and maintenance of irrigation schemes.

The system:

Provides quick, accurate and relevant information. Improves data management and handling capacity. Provides effective sharing of data and information amongst different management levels, as well as with associated offices. MIS has the following modules:

General

Data configuration

Data transfer

Document management and message handling

Coordination and reporting

Data security and systems administration

Single window information system

Construction

Management Land acquisition

Rehabilitation and resettlement

Resource requirement planning

Resource monitoring

Procurement monitoring

Stores and inventory

Schedule of rates
Roads and inventory
On-farm development works
Quality control
Construction monitoring and management
Command area development
Real estate and asset management

Operation and maintenance

Policy information
Planning
Project planning and investigation
Design and estimation
Operation and maintenance
Flood control
Overall monitoring and evaluation
Project modernisation / rehabilitation
Sustainable development / environmental management
Research, studies and development
Dam safety monitoring
Revenue information and billing
Command area agriculture
Integrated agriculture development
Maintenance management
Project management

Administration

Personnel management
Public relations
Legal affairs
Training
General administration
Vigilance department
Protocol
Organisation head office
Accounts and audit

Technical architecture, hardware and software platforms

MIS works on a client-server architecture. It facilitates maintenance of necessary data as well as generation of reports and queries for administrative management, construction management and other activities for water resources management organisations.

Functions	Technology/Product
Solution Platform	MS Windows NT
Front-end tools	Endura
Back-end tools	Oracle 7
Hardware	Pentium-based machines as Server and client

Seagate Crystal Report has been used to generate reports

Architecture

The MIS client-server architecture:Has a user-friendly, easy-to-use, secure graphical user interface (GUI)Allows web-based interfaces for reporting Ensures accurate and flexible reporting

Up gradation

MIS is presently being upgraded for web-based operations. The front-end will be ASP,and the database is being upgraded to Oracle 9i.

Strengths

A dedicated group drawn from experts in water resources, irrigation management,hydraulics, and hydrology, works for the design, development and implementation of the canal irrigation management systemCMC has extensive domain experience and understanding of the process, policies aswell as the operational and administrative management structure and style of irrigation departments

Experience

Design, development and implementation of MIS for a World Bank-funded project in India Feasibility studies to explore the functionalities required in an MIS, and to develop aframework for an information system

Indicative client list

Irrigation Department, Government of MaharashtraMaharashtra Krishna Valley Development Corporation (MKVDC), Pune Department of Information Technology, Ministry of Communications and Information Technology, Government of India

CMC has designed, developed and implemented amanagement information system (MIS) for this World Bank-funded project in Maharashtra, India

The product

MIS: Management Information System

A comprehensive system for the planning, design, construction, monitoring, operationand maintenance of irrigation schemes

The client

Irrigation Department, Government of Maharashtra

The department controlling water resources in India's most industrialised state

Project

Development and establishment of management information systems (MIS) for six selected major irrigation projects under the World Bank-funded Maharashtra Composite Irrigation Project - III (restructured)

Background

Out of the six selected irrigation projects, three schemes - Kukadi, Bhima and Krishna - are located in the Krishna river basin. The remaining three - Upper Penganga, Majalgaon and Jayakwadi - are located in the Godavari river basin in the state of Maharashtra. These six projects are administered by the chief engineer (specified projects), Pune, and the chief engineer (specified projects), Aurangabad. Each of the six projects is administratively divided into two circles - a project circle, headed by a superintending engineer and a command area development (CAD) circle, headed by an administrator. Each circle administratively controls four to five divisions, and each division, in turn, has four to five sub-divisions. A special analysis and evaluation cell (SAEC), headed by a superintending engineer, coordinates and interacts with the different project circles, CADA circles and associated institutions like the directorate of irrigation research and development (DIRD), the public works department (PWD), the revenue department (resettlement and rehabilitation), the quality control organisation and the agriculture department. The roles of the associated institutions have been specified by the state irrigation department.

Objective

The primary objective of developing and establishing an MIS for the selected major irrigation schemes was to provide a comprehensive system facilitating planning, design, construction, monitoring, operation and maintenance of the schemes. The system developed by CMC provides quick, accurate and relevant information. Improves data management and handling capacity. Provides effective sharing of data and information amongst various management levels and with associated offices

Scope

CMC handled the study, design, development, testing and installation of the management information system, training of officials, as well as implementation support for the system. MIS has the following modules:

Construction

- Land acquisition Rehabilitation and resettlement
- Resource requirement planning
- Procurement monitoring
- Stores and inventory
- Asset management
- Schedule of rates
- Roads and bridges
- On-farm development works
- Quality control³
- Construction monitoring and management
- Works accounts

Operation and maintenance

Plan of operation and management
Drainage network monitoring maintenance management
Resource requirement planning
Coordination with water users' associations (WUAs)
Command area agriculture
Asset management
Integrated agriculture development
Maintenance management
Project management
Administration management
Personnel administration

System

The system is based on a client-server configuration. The server is a Pentium machine with open SCO Unix as the operating system and open Ingres as the back-end. The clients are 486 PCs with Gupta SQL 5.0 (with Ingres router) as the front-end, operating in MS Windows. MIS covers the offices of the secretary, the joint secretary and the deputy secretary of the state irrigation department based in Mumbai, and is connected to the offices of the chief engineers (specified projects) in Pune and Aurangabad.

Research Findings:-

The role of MIS in today's business world is no doubt indispensable. CMC no doubt maintains a very good management information system for taking decisions relating to the business but it must further endeavour to design a proper system of MIS which would fully serve its purpose.

Recommendations:-

The following recommends have been made to implement MIS in CMC. It is important to provide computers in each business unit of CMC for quality decision. All business unit are needed to connect with networking system . CMC needs to provide training facility, for developed skilled people. The plant may make an effort to incorporate recent technological changes in respect of process, plant ,machinery and control strategy with the consultation with process licensors, vendors and engineering contractors. A common information bank may be created by CMC for spares and components for all enterprises CMC's and other plants, thereby, ensuring speedy maintenance.

CONCLUSION

A management information system (MIS) or computer information system (CIS) consists of five related components: hardware, software, people, procedure and collection of data (Post G.V and Anderson D. L., 1997).The goal of MIS is to enable managers to make better decisions can providing quality information. MIS can be the foundation of a business but it can also be expensive. It is important that the information system should be designed and organized to match the needs of the firm.

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