3-Phase Parallel Model for Management Information Systems

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Abstract-A management information system (MIS) provides information that is needed to manage organizations efficiently and effectively. Management information systems are not only computer systems - these systems encompass three primary components: technology, people (individuals, groups or clusters, or organizations), and data/information for decision making. Management information systems are distinct from other information systems in that they are designed to be used to analyze and facilitate strategic and operational activities in the organization. Act of Management Information Systems is different from organization to organization. It depends on the type of work they perform. Academically, the term 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. Most business schools (or colleges of business administration within universities) have an MIS department, alongside departments of accounting, finance, management, marketing, and sometimes others, and grant degrees (at undergrad, masters, and PhD levels) in MIS. Not only universities, but any business organization should also have a MIS department. In this paper we suggest new approach for MIS which is a moderate then old MIS.

Index Terms-Management Information Systems, Computer Systems, Organization, Decision Systems.

I. INTRODUCTION

Management information systems encompass a broad and complex topic. To make this topic more manageable, boundaries will be defined. First, because of the vast number of activities relating to management information systems, a total review is not possible. Those discussed here is only a partial sampling of

activities, reflecting the author's viewpoint of the more common and interesting developments.

Likewise where there were multiple effects in a similar area of development, only selected ones will be used to illustrate concepts. This is not to imply one effort is more important than another. Also, the main focus of this paper will be on information systems for use at the farm level and to some lesser extent systems used to support researchers addressing farm level problems (e.g., simulation or optimization models, geographic information systems, etc.), those used to support agribusiness firms that supply goods and services to agricultural producers, Software Industry who develop software for company's, industries and accounting packages and the supply chain beyond the production phase. MIS deals with computer systems which provide accurate information in business system. System should be planned properly to reach management requirements. When management is satisfied the system is proper. It is up to the software professionals who should understand the system properly and thoroughly.

Secondly, there are several frameworks that can be used to define and describe management information systems. More than one will be used to discuss important concepts. Because more than one is used, it indicates the difficult of capturing the key concepts of what is a management information system. Indeed, what is viewed as an effective and useful management information system is one environment may not be of use or value in another.

Lastly, the historical perspective of management information systems cannot be ignored. This perspective gives a sense of how these systems have evolved, been refined and adapted as new technologies have emerged, and how changing economic conditions and other factors have influenced the use of information systems. A management information system gives the business

managers the information that they need to take decisions.

Early business computers were used for simple operations such as tracking inventory, billing, sales, or payroll data, with little detail or structure. Over time, these computer applications became more complex, hardware storage capacities grew, and technologies improved for connecting previously isolated applications. As more data was stored and linked, managers sought greater abstraction as well as greater detail with the aim of creating significant management reports from the raw, stored data. Originally, the term "MIS" described applications providing managers with information about sales, inventories, and other data that would help in managing the enterprise. Over time, the term broadened to include: decision support systems, resource management and human resource management, enterprise resource planning (ERP), enterprise performance management (EPM), supply chain management (SCM), customer relationship management (CRM), project management and database retrieval applications.

Computer Networks also play key role in Management Information Systems. Management and other staff requires information at their door steps to make decisions. This is possible only by network system.

An MIS supports a business' long range plans, providing reports based upon performance analysis in areas critical to those plans, with feedback loops that improve guidance for every aspect of the enterprise, including recruitment and training. MIS not only indicates how various aspects of a business are performing, but also why and where. MIS reports include near-real-time performance of cost centers and projects with detail sufficient for individual accountability.

II. PROBLEMS RELATED TO FAILURES OF MIS

Business organization should have a systematic design for success. Success depends on the hard work of every element in a business process. Total team work idles to success. In a business process is related to risk. If a business process starts with high risk then there will be good results as shown in Fig. 1. If business process starts with low risk then there will be bad results as shown in Fig. 2.

Fig. 1. Risk high Good results.

Fig. 2. Risk low Bad results.

To make business success there requires different type of frameworks. Because business success depends on various factors like management, staff, information systems which have to give accurate results on demand etc. All these factors are combined to be managed as Management Information System (MIS). Most of the business success formula is MIS. Computer Systems play key role in MIS. Software Professional design Software based on management requirements, market analysis, policies of the organization, etc.,

Business failures that can be considered:

1. No proper mission to management.
2. Lack of knowledge on business by management.
3. No proper hierarchy in the organization structure.
4. No proper staff.
5. Lack of usage knowledge of Computer Systems.
6. No proper software to assist them.
7. No future plans.

III. ANALYSIS RELATED TO MIS

If there is proper framework for business then there will be success in business. People invest lot of money on business and they expect returns on business. This is possible only if there is mission to management, because management is top level in the business. They take decisions and they are crucial in organization. This requires some exercises to be followed.

1. They have to impose policies on organization and staff.
2. They should have deadlines to their work.
3. Deadlines should be executed by resources.
4. If exercise can be failure or minor make changes in next executing exercise.
5. Add people if required.
6. Make your Computer Systems to work accurately for success.

IV. PROBLEM SOLUTION TO MAKE MIS

• Management

Management in all business and organizational activities is the act of getting people together to accomplish desired goals and objectives using available resources efficiently and effectively. Management comprises

planning, organizing, staffing, leading or directing, and controlling an organization (a group of one or more people or entities) or effort for the purpose of accomplishing a goal. Management has long term or major goals and minor or short term goals. Each goal is iterative. Short or minor goals are first visible base on current issues. Each short or minor goal whichever is visible first is iterated and evaluated. The based on result of first short or minor goal, next short or minor goal are made changed as in Fig. 3.

Fig. 3 Management Goals.

Resourcing encompasses the deployment and manipulation of human resources, financial resources, technological resources and natural resources. Since organizations can be viewed as systems, management can also be defined as human action, including design, to facilitate the production of useful outcomes from a system. This view opens the opportunity to 'manage' oneself, a pre-requisite to attempting to manage others.

• Information System (IS)

An information system (IS) - is any combination of information technology and people's activities that support operations, management and decision making. In a very broad sense, the term information system is frequently used to refer to the interaction between people, processes, data and technology. In this sense, the term is used to refer not only to the information and communication technology (ICT) that an organization uses, but also to the way in which people interact with this technology in support of business processes.

Some make a clear distinction between information systems, computer systems, and business processes. Information systems typically include an ICT component but are not purely concerned with ICT, focusing instead on the end use of information technology. Information systems are also different from business processes. Information systems help to control the performance of business processes. Fig. 4 is an example of a business system.

Fig. 4 Business System.

Alter argues for an information system as a special type of work system. A work system is a system in which humans and/or machines perform work using resources to produce specific products and/or services for customers. An information system is a work system whose activities are devoted to processing (capturing, transmitting, storing, retrieving, manipulating and displaying) information.

As such, information systems inter-relate with data systems on the one hand and activity systems on the other. An information system is a form of communication system in which data represent and are processed as a form of social memory. An information system can also be considered a semi-formal language which supports human decision making and action.

Information systems are the primary focus of study for the information systems discipline and for organizational informatics.

• Components of Information Technology

An Information System (IS) consists of five basic resources, namely:

1. People, which consists of IT specialists (such as a Database Administrator or Network Engineer) and end-users (such as Data Capture Clerks).
2. Hardware, which consists of all the physical aspects of an information system, ranging from peripherals to computer parts and servers.
3. Software, which consists of System Software, Application Software and Utility Software.
4. Data, which consists of all the knowledge and databases in the IS.
5. Networks, which consists of communication media and network support.

• Type of Substructure in MIS

Most management information systems specialize in particular commercial and industrial sectors, aspects of the enterprise, or management substructure.

- Management information systems (MIS), per se, 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.

- Decision support systems (DSS) are computer program applications used by middle management to compile information from a wide range of sources to support problem solving and decision making.
- Executive information systems (EIS) is a reporting tool that provides quick access to summarized reports coming from all company levels and departments such as accounting, human resources and operations.
- Marketing information systems are MIS designed specifically for managing the marketing aspects of the business.
- Office automation systems (OAS) support communication and productivity in the enterprise by automating work flow and eliminating bottlenecks. OAS may be implemented at any and all levels of management.
- School management information systems (MIS) cover school administration, and often including teaching and learning materials.
- Document MIS as volume for future use.

Advantages

The following are some of the benefits that can be attained for different types of management information systems.

- Companies are able to highlight their strengths and weaknesses due to the presence of revenue reports, employees' performance record etc. The identification of these aspects can help the company improve their business processes and operations.
- Giving an overall picture of the company and acting as a communication and planning tool.
- The availability of the customer data and feedback can help the company to align their business processes according to the needs of the customers.
- The effective management of customer data can help the company to perform direct marketing and promotion activities.
- Information is considered to be an important asset for any company in the modern competitive world. The consumer buying trends and behaviours can be predicted by the analysis of sales and revenue reports from each operating region of the company.

Basic functions of Management

Management operates through various functions, often classified as planning, organizing, staffing, leading/directing, controlling/monitoring and motivation.

- **Planning:** Deciding what needs to happen in the future (today, next week, next month, next year, over the next five years, etc.) and generating plans for action as shown in Fig. 3.
- **Organizing:** (Implementation) pattern of relationships among workers, making optimum use of the resources required to enable the successful carrying out of plans. Management expected to follow Hawthorne principle as shown in Fig. 5.
- **Staffing:** Job analysis, recruitment and hiring for appropriate jobs. Staff appraisals like bonus, incentives, perks and share partnership.
- **Leading/directing:** Determining what needs to be done in a situation and getting people to do it.
- **Controlling/monitoring:** Checking progress against plans.
- **Motivation:** Motivation is also a kind of basic function of management, because without motivation, employees cannot work effectively. If motivation does not take place in an organization, then employees may not contribute to the other functions (which are usually set by top-level management).

Fig. 5 Hawthorne Principle.

Levels of management

Most organizations have three management levels: first-level, middle-level, and top-level managers as shown in Fig. 3. These managers are classified in a hierarchy of authority, and perform different tasks. In many organizations, the number of managers in every level resembles a pyramid. Each level is explained below in specifications of their different responsibilities and likely job titles.

Policies and strategies in the planning process

- They give mid and lower-level managers a good idea of the future plans for each department in an organization.
- A framework is created whereby plans and decisions are made.

- Mid and lower-level management may add their own plans to the business's strategies.

Top-level managers

Consists of board of directors, president, vice-president, CEOs, etc. They are responsible for controlling and overseeing the entire organization. They develop goals, strategic plans, company policies, and make decisions on the direction of the business. In addition, top-level managers play a significant role in the mobilization of outside resources and are accountable to the shareholders and general public.

According to Lawrence S. Kleiman, the following skills are needed at the top managerial level. Broadened understanding of how: competition, world economies, politics, and social trends effect organizational effectiveness .

The role of the top management can be summarized as follows -

- Top management lays down the objectives and broad policies of the enterprise.
- It issues necessary instructions for preparation of department budgets, procedures, schedules etc.
- It prepares strategic plans & policies for the enterprise.
- It appoints the executive for middle level i.e. departmental managers.
- It controls & coordinates the activities of all the departments.
- It is also responsible for maintaining a contact with the outside world.
- It provides guidance and direction.
- The top management is also responsible towards the shareholders for the performance of the enterprise.

Middle-level managers

Consist of general managers, branch managers and department managers. They are accountable to the top management for their department's function. They devote more time to organizational and directional functions. Their roles can be emphasized as executing organizational plans in conformance with the company's policies and the objectives of the top management, they define and discuss information and policies from top management to lower management, and most importantly they inspire and provide guidance to lower level managers towards better performance. Some of their functions are as follows:

- Designing and implementing effective group and intergroup work and information systems.
- Defining and monitoring group-level performance indicators.

- Diagnosing and resolving problems within and among work groups.
- Designing and implementing reward systems supporting cooperative behavior.

First-level managers

Consist of supervisors, section leads, foremen, etc. They focus on controlling and directing. They usually have the responsibility of assigning employees tasks, guiding and supervising employees on day-to-day activities, ensuring quality and quantity production, making recommendations, suggestions, and up channeling employee problems, etc. First-level managers are role models for employees that provide:

- Basic supervision.
- Motivation.
- Career planning.
- Performance feedback.

Basic roles

- Interpersonal: roles that involve coordination and interaction with employees.
- Informational: roles that involve handling, sharing, and analyzing information.
- Decisional: roles that require decision-making (System-base and manual).
- Management skills
- Political: used to build a power base and establish connections.
- Conceptual: used to analyze complex situations.
- Interpersonal: used to communicate, motivate, mentor and delegate.
- Diagnostic: ability to visualize most appropriate response to a situation.
- Technical: Expertise in one's particular functional area.

Formation of the business policy

- The mission of the business is the most obvious purpose-which may be, for example, to make soap.
- The vision of the business reflects its aspirations and specifies its intended direction or future destination.
- The objectives of the business refers to the ends or activity at which a certain task is aimed.
- The business's policy is a guide that stipulates rules, regulations and objectives, and may be used in the managers' decision-making. It must be flexible and easily interpreted and understood by all employees.

- The business's strategy refers to the coordinated plan of action that it is going to take, as well as the resources that it will use, to realize its vision and long-term objectives. It is a guideline to managers, stipulating how they ought to allocate and utilize the factors of production to the business's advantage. Initially, it could help the managers decide on what type of business they want to form.

Implementation of policies and strategies

- All policies and strategies must be discussed with all managerial personnel and staff.
- Managers must understand where and how they can implement their policies and strategies.
- A plan of action must be devised for each department.
- Policies and strategies must be reviewed regularly.
- Contingency plans must be devised in case the environment changes.
- Assessments of progress ought to be carried out regularly by top-level managers.
- A good environment and team spirit is required within the business.
- The missions, objectives, strengths and weaknesses of each department must be analysed to determine their roles in achieving the business's mission.
- The forecasting method develops a reliable picture of the business's future environment.
- A planning unit must be created to ensure that all plans are consistent and that policies and strategies are aimed at achieving the same mission and objectives.
- All policies must be discussed with all managerial personnel and staff that is required in the execution of any departmental policy.
- Organizational change is strategically achieved through the implementation of the eight-step plan of action established by John P. Kotter: Increase urgency, get the vision right, communicate the buy-in, empower action, create short-term wins, don't let up, and make change stick.

Strategic Management

Strategic management analyzes the major initiatives taken by a company's top management on behalf of owners, involving resources and performance in external environments. It entails specifying the organization's mission, vision and objectives, developing policies and plans, often in terms of projects and programs, which are designed to achieve these objectives, and then allocating resources to implement the policies and plans, projects and programs. A balanced scorecard is often used to evaluate the overall performance of the business and its progress

towards objectives. Recent studies and leading management theorists have advocated that strategy needs to start with stakeholders expectations and use a modified balanced scorecard which includes all stakeholders.

Concepts/approaches of Strategic Management

Strategic management can depend upon the size of an organization, and the proclivity to change of its business environment. These points are highlighted below:

- A global/transnational organization may employ a more structured strategic management model, due to its size, scope of operations, and need to encompass stakeholder views and requirements.
- An SME (Small and Medium Enterprise) may employ an entrepreneurial approach. This is due to its comparatively smaller size and scope of operations, as well as possessing fewer resources. An SME's CEO (or general top management) may simply outline a mission, and pursue all activities under that mission.
- Whittington (2001) highlighted four approaches to strategic management. These are Classical, Processual, Evolutionary and Systemic approaches.
- Mintzberg stated there are prescriptive (what should be) and descriptive (what is) approaches.
- Prescriptive schools are "one size fits all" approaches that designate "best practice" while descriptive schools describe how strategy is implemented in specific contexts. No single strategic managerial method dominates, and remains a subjective and context-dependent process.

Information

Information, in its most restricted technical sense, is a sequence of symbols that can be interpreted as a message. Information can be recorded as signs, or transmitted as signals. Information is any kind of event that affects the state of a dynamic system. Conceptually, information is the message (utterance or expression) being conveyed. The meaning of this concept varies in different contexts.

Moreover, the concept of information is closely related to notions of constraint, communication, control, data, form, instruction, knowledge, meaning, understanding, mental stimuli, pattern, perception, representation and entropy.

Systems

A system is a set of interacting or interdependent components forming an integrated whole or a set of elements (often called 'components') and relationships which are different from relationships of the set or its elements to other elements or sets.

Fields that study the general properties of systems include systems theory, cybernetics, dynamical systems, thermodynamics, and complex systems. They investigate the abstract properties of systems' matter and organization, looking for concepts and principles that are independent of domain, substance, type, or temporal scale.

Some systems share common characteristics, including:

- A system has structure, it contains parts (or components) that are directly or indirectly related to each other;
- A system has behavior, it contains processes that transform inputs into outputs (material, energy or data);
- A system has interconnectivity: the parts and processes are connected by structural and/or behavioral relationships.
- A system's structure and behavior may be decomposed via subsystems and sub-processes to elementary parts and process steps.

The term system may also refer to a set of rules that governs structure and/or behavior. Alternatively, and usually in the context of complex social systems, the term institution is used to describe the set of rules that govern structure and/or behavior.

Networking

Computer Networking plays a key role in Management Information Systems. Information Systems can be related to individual or multiple systems. It depends on the architecture of organization and design of software professional. Management and other staff requires various information to there door steps. This is possible only by networks.

Software Professionals

Software plays a key role in MIS. Software Professionals should understand Business first. To understand business, Software Professional should study details of an organization. They should under Management and Management policies thoroughly. They should design there software in that way where it assist them in all decisions and all points. Software professional also should know about the organization, people, product, accounts and payrolls etc. This will take large amount of time. Even though a software project is

Re-engineering. Study the details of every requirement in the software project. Software Professionals are made into teams to identify the needs of organization at varies stages and each stage is carried out with document on transition. They have to understand Management, Management Policies, Staff, People, Product, Warehouse, Accounts, Payroll, Decision Supporting Systems, Market Analysis and Administration of organization as shown in Fig. 6. In Fig. 6 contains a 3-Phase Parallel model for making better MIS Software.

Before entering into 3-Phase Parallel Model, Software Professionals will study the organization, Management, Hierarchies in organization, Management Policies, Staff, Payroll, Accounts, Product, Market Analysis, Administration etc. After collecting all requirements related to data from all sources, they start process for Software Project.

Fig. 6. 3-Phase Parallel Model.

3-Phase Parallel model contains 3 phases as given below.

1-Phase will run as usual.

2-Phase is planned work.

3-Phase is current work.

Current work is merged to 1-Phase after some duration of time and that period is called Software Development Period. After completion of Software Project, we enter into maintenance period the regular system will follow automated work. At the maintenance period Software Professionals will assist staff in organization. 2-Phase and 3-Phase will be communicating each other to check Planned Vs Current. 2-Phase and 3-Phase is compared with 1-Phase to better results.

CONCLUSION

Management Information System is necessary task for every business. Most business is maintained by MIS volumes. MIS is iterative type and we document failure or success related to organization. If success we work to make more success. By having proper MIS one can take better decisions for present and future. Current work of MIS will assist future. MIS should be user friendly to organization and management. MIS plays key role in business and software makes it success.

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