# The Role of Different Types of Information Systems In  Business Organizations : A Review

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## Abstract:

*For the last twenty years, different kinds of information systems are developed for different purposes, depending on the need of the business . In today's business world, there are varieties of information systems such as transaction processing systems (TPS), office automation systems (OAS), management information systems (MIS), decision support system (DSS), and executive information systems (EIS), Expert System (ES) etc . Each plays a different role in organizational hierarchy and management operations. This study attempts to explain the role of each type of information systems in business organizations.*

## Keywords:

Information systems,Types of Information Systems, Business Organization.

## Introduction

According to O'Brien, & Marakas, [1] information system (IS) can be any organized combination of people, hardware, software, communications networks, data resources, and policies and procedures that stores, retrieves, transforms, and disseminates information in an organization. People rely on modern information systems to communicate with one another using a variety of physical devices (hardware) , information processing instructions and procedures (software) , communications channels (networks) , and stored data (data resources) . According to Patterson [2] an information system is a group of interrelated components that work to carry out input, processing, storage, output and control actions in order to convert data into information that can be used to support forecasting, planning, control, coordination, decision making and operational activities in an organization. Every business organization in this era needs an information system (IS) to keep

track of all business activities, right from business planning, till the product delivery via manufacturing and quality cycles [3]. An information system can be defined technically as a set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making, coordination and control in an organization. In addition to supporting decision making, coordination, and control, information systems may also help managers and workers analyze problems, visualize complex subjects, and create new products [4]. Information systems contain information about

significant people, places, and things within the organization or in the environment surrounding it. By information we mean data that have been shaped into a form that is meaningful and useful to human beings. Data, in contrast, are streams of raw facts representing events occurring in organizations or the physical environment before they have been organized and arranged into a form that people can understand and use [5]. According to Shim [6] an information system is a computerized system that processes data (facts) and produces information. This process is defined as an information processing cycle (IPC). The information processing cycle consists of four operations. They are input, process, output, and storage.

## Types of Information Systems

According to O'Brien & Marakas [1] the applications of information systems that are implemented in today's business world can

be classified in several different ways. For example, several types of information systems can be classified as either operations (Support of business operation) or (Support of managerial decision making). Support of business operation such as transaction processing systems, process control systems and Enterprise collaboration systems (office automation system). Support of managerial decision making such as management information system, decision support system and executive information systems. According to Patterson[2] there are several categories of information system such as Data Processing Systems, Management Information Systems, Decision Support Systems and Executive Information System.
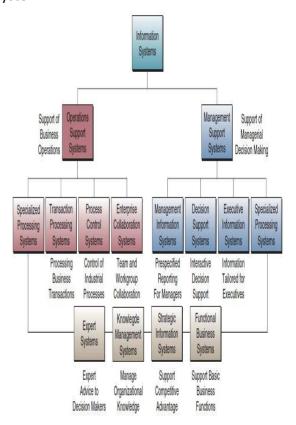
Figure 1: Operations and Management Classifications of Information Systems:  Source O'Brien & Marakas [1]

# The Roles of Different Types of IS In Business Organizations

## Transaction Processing Systems

Transaction processing systems (TPS) are the basic business systems that serve the operational level of the organization. A transaction processing system is a computerized system that performs and records the daily routine transactions necessary to the conduct of the business [4]. At the lowest level of the organizational hierarchy we find the transaction processing systems that support the day-to-day activities of the business [7].

## Process Control Systems

Process control systems is Monitor and control industrial or physical processes. Examples: petroleum refining, power generation, and steel production systems. For example, a petroleum refinery uses electronic sensors linked to computers to monitor chemical processes continually and make instant (real-time) adjustments that control the refinery process [1] .A process control system comprises the whole range of: equipment, computer programs, operating procedures [8].

## Enterprise Collaboration Systems ( Office Automation Systems)

Office automation systems are one of the most widely used types of information systems that will help managers control the flow of information in organizations [9]. Enterprise collaboration systems (office automation systems) are enhance team and workgroup communications and productivity [1].Office automation systems

are other types of information systems are not specific to any one level in the organization but provide important support for a broad range of users [7]. Office information systems are designed to support office tasks with information technology. Voice mail, multimedia system, electronic mail, video conferencing, file transfer, and even group decisions can be achieved by office information systems [6].

## Management Information Systems

Management information systems are a kind of computer information systems that could collect and process information from different sources in institute decision-making in level of management [9]. Management information systems Provide information in the form of pre specified reports and displays to support business decision making [1]. The next level in the organizational hierarchy is occupied by low level managers and supervisors. This level contains computer systems that are intended to assist operational management in monitoring and controlling the transaction processing activities that occur at clerical level. Management information systems (MIS) use the data collected by the TPS to provide supervisors with the necessary control reports [7]. According to Hasan,Y. [10] management information system is type of information systems that take internal data from the system and summarized it to meaningful and useful forms as management reports to use it to support management activities and decision making.

## Decision Support Systems

A Decision Support System is a computer based system intended for use by a particular manager or usually a group of managers at any organizational level in

making a decision in the process of solving a semi structured decision [11]. According to Heidarkhani, et al. [9] Decision Support Systems are a Kind of organizational information computerize systems that help manager in decision making that needs modeling, formulation, calculating, comparing, selecting the best option or predict the scenarios . According to Khanore, et al. [5] Decision-support systems are specifically designed to help management make decisions in situations where there is uncertainty about the possible outcomes of those decisions. According to Shim [6] a decision support system is a computer-based information system that assists managers in making many complex decisions, such as decisions needed to solve poorly defined or semi-structured problems .

## Executive Information Systems

Executive Information Systems have been developed, which provide rapid access to both internal and external information, often presented in graphical format, but with the ability to present more detailed underlying data if it is required [7]. Executive information systems provide critical information from a wide variety of internal and external sources (from MIS, DSS, and other sources tailored to the information needs of executives) in easy-to-use displays to executives and managers [1]. According to Patterson [2] An EIS provides senior managers with a system to assist in taking strategic and tactical decisions. According to Shim [6] an executive information system is designed to generate information that is abstract enough to present the whole company operation in a simplified version to satisfy senior management .

## Expert Systems

Expert systems are the category of AI which has been used most successfully in building commercial applications [7] .According to O'Brien & Marakas [1] Expert systems are Knowledge-based systems that provide expert advice and act as expert consultants to users. According to Patterson [2] an expert system is a computer program that tries to emulate human reasoning. According to Shim [6] Expert System is a set of computer programs that perform a task at the level of a human expert .

## Knowledge Management Systems

Knowledge management systems are knowledge-based information systems that support the creation, organization, and dissemination of business knowledge to employees and managers throughout a company [1].Knowledge management is the deployment of a comprehensive system that enhances the growth of an organization's knowledge Salisbury,M.W. [12].

## Strategic Information Systems

Strategic information systems apply information technology to a firm's products, services, or business processes to help it gain a strategic advantage over its competitors [1]. According to Belle, et al., [7] Strategic information systems are an important special type of organizational information system is used to secure or sustain competitive advantage in the market place .

## Functional Business Systems ( Information Systems From Functional Perspective)

Functional business systems are Information systems that focus on operational and managerial applications in support of basic business functions. Examples information systems that support applications in accounting, finance, marketing, operations management, and human resource management [1]. According to Khanore, et al. [5] Information system can be classified by the specific organizational function to Sales and marketing systems, Manufacturing and Production systems, Finance and accounting system and Human resource system .

- **Sales and Marketing Information Systems**

The sales and marketing function is responsible for selling the organization's product or service. Marketing is concerned with identifying the customers for the firm's products or services, determining what they need or want, planning and developing products and services to meet their needs, and advertising and promoting these products and services. Sales are concerned with contacting customers, selling the products and services, taking orders, and following up on sales. Sales and marketing information systems support these activities [4]. According to Shim [6] a marketing MIS supports managerial activity in the areas of product development, marketing mix, distribution, pricing decisions, promotional effectiveness, and sales forecasting .

- **Manufacturing and Production Information Systems**

The manufacturing and production function is responsible for actually producing the firm's goods and services. Manufacturing and production systems deal with the planning, development, and maintenance of production facilities; the establishment of production goals; the acquisition, storage, and availability of production materials; and the scheduling of equipment, facilities, materials, and labor required to fashion finished products. Manufacturing and production information systems support these activities [4]. According to Hernandez & Rivera [14] the production information system is a computer program that manages a database of information related to production. According to Shim [6] the mission of a manufacturing information system is to apply computer technology to improve the process and the efficiency of a manufacturing system, thus raising quality of products and lowering the manufacturing costs. In other words, a manufacturing system is a system that takes material, equipment, data, management, and information systems technology as the input and uses manufacturing and information process to generate better final products as output .

- **Finance and Accounting Information Systems**

Finance function is responsible for managing the firm`s financial assets, such as cash, stock, bonds, other investment. The accounting function is responsible for maintaining and managing the firm`s financial records such as receipts, depreciation, payroll etc [5] . According to Shim [6] The fundamental task of accounting software is to automate the routine chore of entering and posting accounting transactions. This information is organized in an electronic format so as to produce financial statements and can be accessed immediately to assist in the

management of the firm. A financial management information system provides financial information to all financial managers within an organization .Financial decisions are typically based on information generated from the accounting system  .

- **Human Resource Information Systems**

Human Resources Information Systems are process of producing, organizing, storing and distributing manpower information to help the organization managers at various levels, in order to make proper decisions .Nowadays the majority of successful companies are using human resource information systems to support daily operations of human resources Khanore, et al.,[5].The human resources function is responsible for attracting, developing, and maintaining the firm's work force. Human resources information systems support activities such as identifying potential employees, maintaining complete records on existing employees, and creating programs to develop employees' talents and skills [4].

## Conclusion

There are different types of information systems used in business organizations. transaction processing systems designed to records the daily routine transactions necessary to the conduct of the business. Office automation systems designed to support office tasks. Process control systems designed to Monitor and control industrial or physical processes . Management information system (MIS) basically concerned with converting data from internal sources into information which is then communicated to managers at all the levels, in all functions to make

timely and effective decisions for planning, directing and controlling the activities for which they are responsible .Decision support systems designed to help manager in decision making that needs modeling, formulation, calculating, comparing, selecting the best option or predict the scenarios .Executive information systems provides senior managers with a system to assist in taking strategic and tactical decisions . Expert system program designed to emulate human reasoning . This study attempts to clarify the role of each type of information systems in business organizations.

## Akknowledgement

## REFERENCES

1] O'Brien ,J.A.,& Marakas ,G.M. (2007) Management information systems -10th ed., by McGraw-Hill/Irwin, a business unit of The McGraw-Hill Companies.

2] Patterson ,A. (2005) Information Systems - Using Information, Learning and Teaching Scotland.

3] Nowduri1 ,S.,& Al-Dossary ,S. (2012). Management Information Systems and Its Support to Sustainable Small and Medium Enterprises International Journal of Business and Management; Vol. 7, No. 19,pp. 125–131.

4] Laudon, K. & Laudon, J. (2006) Management Information Systems: Managing the Digital Firm, 9th ed. Prentice Hall.

5] Khanore ,S.,& Patil ,R.,& Dand ,H. (2011) management information system, Institute of Distance and Open Learning , University of Mumbai.

6] Shim ,J.K. (2000) Information Systems and Technology for the Non-information Systems Executive, by CRC Press LLC.

7] Belle, J-P.V. ,& Eccles ,M.G., & Nash ,J.M. (2001) Discovering Information Systems.

8] Ciortea ,M. (2004). Aspects Regarding The Types of Process Control Systems, International Conference on Theory and Applications of Mathematics and Informatics, pp.90–95.

9] Heidarkhani ,A., & khomami ,A.A, & Jahanbazi ,Q.,& Alipoor ,H. (2013). The Role of Management Information Systems ( MIS ) in Decision-Making and Problems of its Implementation, Universal Journal of Management and Social Sciences ,Vol. 3, No.3,pp. 78–89.

10] Hasan,Y., & Shamsuddin,A., &   Aziati ,N. (2013), The Impact of Management Information Systems adoption in  Managerial Decision Making : A Review, The International Scientific Journal of Management Information Systems   ,Vol.8 ,No.4,pp.010-017.

11] Asemi , A., & Safari , A., & Zavareh, A.A. (2011). The Role of Management Information System (MIS) and Decision Support System (DSS) for Manager's Decision Making Process. International Journal of Business and Management, Vol. 6, No. 7;pp 164–173.

12] Salisbury ,M.W. (2003). Putting theory into practice to build knowledge management systems. Journal of Knowledge Management,vol.7,no.2, pp.128–141.

13] Hernandez ,W. , & Rivera, J. M. (1997). A Production Information System, an Application in the Pharmaceutical Industry, Computers ind. Engng Vol. 33, No. 1-2, pp. 15-18.

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