

THE IMPACT OF INFORMATION SYSTEMS IN ORGANIZATIONS

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ABSTRACT

In this paper we will study the relationship between information systems and organizations. Respectively will try to show how information systems affect organizations and conversely.

Our purpose is to point out the necessity of implementation of information systems in organizations. It should be understood that one of the very important elements of the relationship between the company and the way we perceive people, is nevertheless the innovation. Technology is only one component that allows people to think differently about how they live and work, but not thinking technology, but on how to use technology to their ideas and imagine come to the fore.

KEYWORDS: Environments, Business, Technology, Information's, Innovation

INTRODUCTION

The development of information technologies and their application in organizations in recent years, it enables emergence of new complex forms of inter-organizational information systems based on web and internet technologies. As a consequence of this trend, have been introduced modern information systems in today's organizations.

Information systems in organizations are implemented for several purposes. One of the classic reasons for use of information systems is the storage and processing of records of events (transactions) that occur during the operation of organizations and enterprises.

Information systems and organizations influence one another. Information systems are built by managers to serve the interests of the business firm. At the same time, the organization must be aware of and open to the influences of information systems to benefit from new technologies. The interaction between information technology and organizations is complex and is influenced by many mediating factors, including the organization's structure, business processes, politics, culture, surrounding environment, and management decisions, which we will explain below in the paper.

1. What is an information system?

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 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. 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. A brief example contrasting information and data may prove useful. Supermarket checkout counters scan millions of pieces of data from bar codes, which describe each product. Such pieces of data can be totaled and analyzed to provide meaningful information, such as the total number of bottles of dish detergent sold at a particular store, which brands of dish detergent were selling the most rapidly at that store or sales territory, or the total amount spent on that brand of dish detergent at that store or sales region.

Three activities in an information system produce the information that organizations need to make decisions, control operations, analyze problems, and create new products or services. These activities are input, processing, and output. **Input** captures or collects raw data from within the organization or from its external environment. **Processing** converts this raw input into a meaningful form. **Output** transfers the processed information to the people who will use it or

to the activities for which it will be used. Information systems also require **feedback**, which is output that is returned to appropriate members of the organization to help them evaluate or correct the input stage.¹

2. Types of information systems

Conceptually, 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 or management information systems. Figure 1 illustrates this conceptual classification of information systems applications. Information systems are categorized this way to spotlight the major role each plays in the operations and management of a business. Let's look briefly at some examples of such information systems categories.²



Figure 1. Conceptual Classification Of Information Systems Applications

2.1. Operations Support Systems

Information systems have always been needed to process data generated by, and used in,

¹Kenneth C. Laudon, Jane P. Laudon, *Management Information System – Managing the digital firm*, 12th Edition, Prentice Hall. Page 15

²James A. O'Brien, George M. Marakas, *Management Information Systems*, Tenth Edition, McGraw-Hill/Irwin, page 13

business operations. Such operations support systems produce a variety of information products for internal and external use; however, they do not emphasize the specific information products that can best be used by managers. Further processing by management information systems is usually required. The role of a business firm's operations support systems is to process business transactions, control industrial processes, support enterprise communications and collaborations, and update corporate databases efficiently.

Transaction processing systems are important examples of operations support systems that record and process the data resulting from business transactions. They process transactions in two basic ways. In batch processing, transactions data are accumulated over a period of time and processed periodically. In real-time (or online) processing, data are processed immediately after a transaction occurs. For example, point-of-sale (POS) systems at many retail stores use electronic cash register terminals to capture and transmit sales data electronically over telecommunications links to regional computer centers for immediate (real-time) or nightly (batch) processing.

Process control systems monitor and control physical processes. 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.

Enterprise collaboration systems enhance team and workgroup communications and productivity and include applications that are sometimes called office automation systems. For example, knowledge workers in a project team may use e-mail to send and receive e-messages or use videoconferencing to hold electronic meetings to coordinate their activities.

2.2. Management Support Systems

When information system applications focus on providing information and support for effective decision making by managers, they are called management support systems. Providing information and support for decision making by all types of managers and business professionals is a complex task. Conceptually, several major types of information systems support a variety of decision-making responsibilities: (1) management information systems, (2) decision support systems, and (3) executive information systems.

Management information systems (MIS) provide information in the form of reports and displays to managers and many business professionals. For example, sales managers may use their networked computers and Web browsers to receive instantaneous displays about the sales results of their products and access their corporate intranet for daily sales analysis reports that evaluate sales made by each salesperson.

Decision support systems (DSS) give direct computer support to managers during the decision-making process. For example, an advertising manager may use a DSS to perform a what-if analysis as part of the decision to determine how to spend advertising dollars. A production manager may use a DSS to decide how much product to manufacture, based on the expected sales associated with a future promotion and the location and availability of the raw materials necessary to manufacture the product.

Executive information systems (EIS) provide critical information from a wide variety of internal and external sources in easy-to-use displays to executives and managers. For example, top executives may use touch-screen terminals to view instantly text and graphics displays that highlight key areas of organizational and competitive performance.

3. The development of information technologies and their application in organizations

Regarding the development of information technologies and their application in organizations in recent years, it enables emergence of new complex forms of inter-organizational information systems based on web and internet technologies. As a consequence of this trend, the following features of modern information systems can be established that exist in today's organizations:³

- In an organization there may be several different information systems;
- Most information systems are connected to computer and communication networks. If the whole organization is in network and employees can communicate and use information and knowledge of the whole organization, then that is a unique and integrated information system;

³Bouton C., The future of IS Technologies that will Force Change, eWeek, April 19, 2008, page. 231

- The inter-organizational information system includes a flow of information through two or more organization, which is primarily used for electronic business;
- Integrated information systems include large computers, small computers and hardware units connected with different types of networks, such as virtual private networks, networks that add value, intranets and the Internet. They also include software, databases, processes and people. These components, as it was outlined, are part of any information system.

Information systems in organizations are implemented for several purposes. One of the classic reasons for use of information systems is the storage and processing of records of events (transactions) that occur during the operation of organizations and enterprises. Modern information systems using communication links enable different types of users that can access larger quantities of data, information and knowledge than it was possible until a few years ago. Also, users can obtain data, information and knowledge with better quality compared to the quality of data that could be obtained a few years ago. The processing of data in an efficient and economical manner and their transformation into information and knowledge is actually one of the primary goals of modern information systems. Only such information systems can support the second primary goal of their use, and that is assistance and support in making business decisions. Today, it is important that users understand that by accessing to data, information and knowledge of information systems whose operation is based on computer technology, they not only obtain information and knowledge, but also obtain assistance in making business decisions.

Keeping accurate records and making quality decisions are very important for successful management of organizations and enterprises, both large and small.

4. Organizations and information systems

Information systems and organizations influence one another. Information systems are built by managers to serve the interests of the business firm. At the same time, the organization must be aware of and open to the influences of information systems to benefit from new technologies. The interaction between information technology and organizations is complex and is influenced by many mediating factors, including the organization's structure, business processes, politics, culture, surrounding environment, and management decisions. You will need to

understand how information systems can change social and work life in your firm. You will not be able to design new systems successfully or understand existing systems without understanding your own business organization.⁴

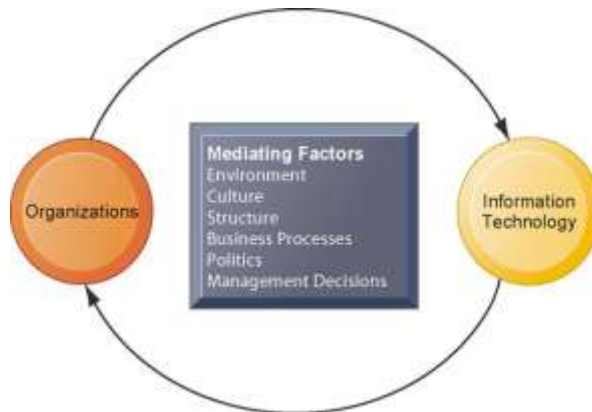


Figure 2 The Two Way Relationship Between Organization And Information Technology

5. What is an organization?

An organization is a stable, formal social structure that takes resources from the environment and processes them to produce outputs. This technical definition focuses on three elements of an organization. Capital and labor are primary production factors provided by the environment. The organization (the firm) transforms these inputs into products and services in a production function. The products and services are consumed by environments in return for supply inputs

An organization is more stable than an informal group (such as a group of friends that meets every Friday for lunch) in terms of longevity and routineness. Organizations are formal legal entities with internal rules and procedures that must abide by laws. Organizations are also social structures because they are a collection of social elements, much as a machine has a structure - a particular arrangement of valves, cams, shafts, and other parts. This definition of organizations is powerful and simple, but it is not very descriptive or even predictive of real-world organizations. A more realistic behavioral definition of an organization is that it is a collection of rights, privileges, obligations, and responsibilities that is delicately balanced over a period of time through conflict and conflict resolution.

⁴Kenneth C. Laudon, Jane P. Laudon, *Management Information System – Managing the digital firm*, 12th Edition, Prentice Hall. Page 81

5.1. Structure of organization

Information systems are an integral part of organizations. Indeed, for some companies, such as credit reporting firms, there would be no business without an information system. The key elements of an organization are its people, structure, business processes, politics, and culture.

Organizations have a structure that is composed of different levels and specialties. Their structures reveal a clear-cut division of labor. Authority and responsibility in a business firm are organized as a hierarchy, or a pyramid structure. The upper levels of the hierarchy consist of managerial, professional, and technical employees, whereas the lower levels consist of operational personnel.

Senior management makes long-range strategic decisions about products and services as well as ensures financial performance of the firm. **Middle management** carries out the programs and plans of senior management and **operational management** is responsible for monitoring the daily activities of the business. Knowledge workers, such as engineers, scientists, or architects, design products or services and create new knowledge for the firm, whereas data workers, such as secretaries or clerks, assist with scheduling and communications at all levels of the firm. Production or service workers actually produce the product and deliver the service (see Figure 3).⁵

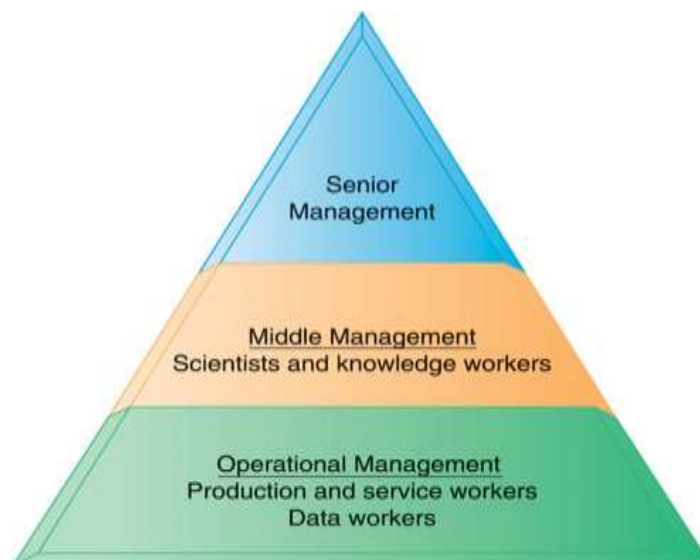


Figure 3 Levels In A Firm

⁵Kenneth C. Laudon, Jane P. Laudon, Management Information System – Managing the digital firm, 12th Edition, Prentice Hall. Page 81

Experts are employed and trained for different business functions. The major business functions, or specialized tasks performed by business organizations, consist of sales and marketing, manufacturing and production, finance and accounting, and human

An organization coordinates work through its hierarchy and through its business processes, which are logically related tasks and behaviors for accomplishing work. Developing a new product, fulfilling an order, and hiring a new employee are examples of business processes.

Most organizations' business processes include formal rules that have been developed over a long time for accomplishing tasks. These rules guide employees in a variety of procedures, from writing an invoice to responding to customer complaints. Some of these business processes have been written down, but others are informal work practices, such as a requirement to return telephone calls from co-workers or customers, that are not formally documented. Information systems automate many business processes. For instance, how a customer receives credit or how a customer is billed is often determined by an information system that incorporates a set of formal business processes.

Each organization has a unique culture, or fundamental set of assumptions, values, and ways of doing things, that has been accepted by most of its members. You can see organizational culture at work by looking around your university or college. Some bedrock assumptions of university life are that professors know more than students, the reasons students attend college is to learn, and that classes follow a regular schedule.

Parts of an organization's culture can always be found embedded in its information systems. For instance, UPS's concern with placing service to the customer first is an aspect of its organizational culture that can be found in the company's package tracking systems, which we describe later in this section.

Different levels and specialties in an organization create different interests and points of view. These views often conflict over how the company should be run and how resources and rewards should be distributed. Conflict is the basis for organizational politics. Information systems come out of this cauldron of differing perspectives, conflicts, compromises, and agreements that are a natural part of all organizations.

6. How informationsystems impact organizations andbusinessfirms

Information systems have become integral, online, interactive tools deeply involved in the minute-to-minute operations and decision making of large organizations. Over the last decade, information systems have fundamentally altered the economics of organizations and greatly increased the possibilities for organizing work. Theories and concepts from economics and sociology help us understand the changes brought about by IT.

6.1. Economic Impacts

From the point of view of economics, IT changes both the relative costs of capital and the costs of information. Information systems technology can be viewed as a factor of production that can be substituted for traditional capital and labor. As the cost of information technology decreases, it is substituted for labor, which historically has been a rising cost. Hence, information technology should result in a decline in the number of middle managers and clerical workers as information technology substitutes for their labor. As the cost of information technology decreases, it also substitutes for other forms of capital such as buildings and machinery, which remain relatively expensive. Hence, over time we should expect managers to increase their investments in IT because of its declining cost relative to other capital investments.⁶

Information technology, especially the use of networks, can help firms lower the cost of market participation (transaction costs), making it worthwhile for firms to contract with external suppliers instead of using internal sources. As a result, firms can shrink in size (numbers of employees) because it is far less expensive to outsource work to a competitive marketplace rather than hire employees.

7. Organizational environments

Organizations reside in environments from which they draw resources and to which they supply goods and services. Organizations and environments have a reciprocal relationship. On the one hand, organizations are open to, and dependent on, the social and physical environment that surrounds them. Without financial and human resources—people willing to work reliably

⁶Kenneth C. Laudon, Jane P. Laudon, *Management Information System – Managing the digital firm*, 12th Edition, Prentice Hall. Page 89

and consistently for a set wage or revenue from customers—organizations could not exist. Organizations must respond to legislative and other requirements imposed by government, as well as the actions of customers and competitors. On the other hand, organizations can influence their environments.

For example, business firms form alliances with other businesses to influence the political process; they advertise to influence customer acceptance of their products. Figure 4 illustrates the role of information systems in helping organizations perceive changes in their environments and also in helping organizations act on their environments. Information systems are key instruments for environmental scanning, helping managers identify external changes that might require an organizational response.⁷

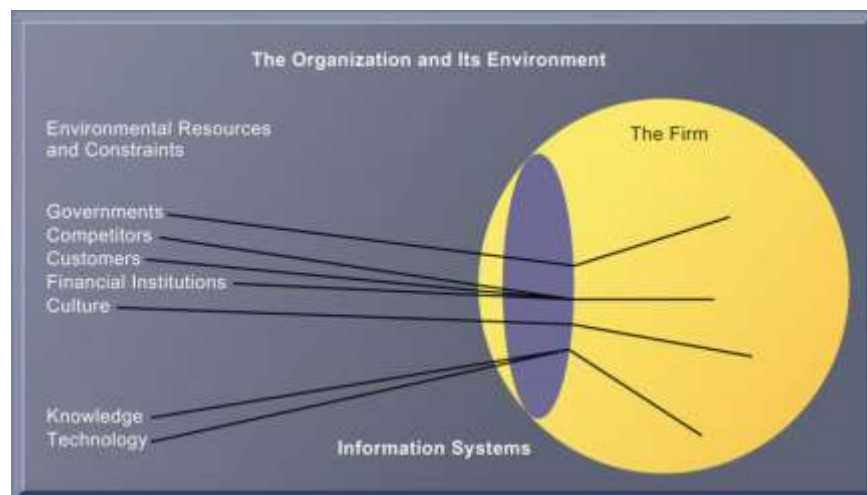


Figure 4 Environments And Organizations Have A Reciprocal Relationship

8. Strategic business objectives of informationsystems

What makes information systems so essential today? Why are businesses investing so much in information systems and technologies? Information systems are essential for conducting day-to-day business in the United States and most other advanced countries, as well as achieving strategic business objectives. Entire sectors of the economy are nearly inconceivable without substantial investments in information systems. E-commerce firms such as Amazon,

⁷Kenneth C. Laudon, Jane P. Laudon, Management Information System – Managing the digital firm, 12th Edition, Prentice Hall. Page 86

eBay, Google, and E*Trade simply would not exist. Today's service industries - finance, insurance, and real estate, as well as personal services such as travel, medicine, and education - could not operate without information systems. Similarly, retail firms such as Wal-Mart and Sears and manufacturing firms such as General Motors and General Electric require information systems to survive and prosper.

Just as offices, telephones, filing cabinets, and efficient tall buildings with elevators were once the foundations of business in the twentieth century, information technology is a foundation for business in the twenty-first century. There is a growing interdependence between a firm's ability to use information technology and its ability to implement corporate strategies and achieve corporate goals. What a business would like to do in five years often depends on what its systems will be able to do. Increasing market share, becoming the high quality or low-cost producer, developing new products, and increasing employee productivity depend more and more on the kinds and quality of information systems in the organization. The more you understand about this relationship, the more valuable you will be as a manager. Specifically, business firms invest heavily in information systems to achieve six strategic business objectives: operational excellence; new products, services, and business models; customer and supplier intimacy; improved decision making; competitive advantage; and survival.

CONCLUSIONS

The information society is that development stage when information technologies are becoming nervous system of the whole social system. Construction of the new society in developed countries and in countries facing the development includes policies to support information technology. The information society is a society where national wealth is growing as a result of supply and demand of knowledge and information and their spread in all parts of the social system. Technology can add value to the promotion of life, the way people and companies work, and the way that people can create new value better. It should be understood that one of the very important elements of the relationship between the company and the way we perceive people, is innovation. Innovation as a philosophy, as a new approach to life and work, where technology is only one component that allows people to think differently about how they live and work. The application of information systems in organizations is essential for easier processing

of business activity, thus saving time and the possibility of errors is reduced to a minimum.

REFERENCES

1. Kenneth C. Laudon, Jane P. Laudon, *Management Information System – Managing the digital firm*, (12th Edition, Prentice Hall)
2. James A. O'Brien, George M. Marakas, *Management Information Systems*, (Tenth Edition, McGraw-Hill/Irwin)
3. Bouton C., *The future of IS Technologies that will Force Change*, *eWeek*, April 19, 2008
4. Zlatka Popovska, *Systems Management*, (Faculty of Economics, Skopje, 2006)
5. Process Innovation: *Reengineering Work Through Information Technology*, (Harvard Business School Press, Boston, 1994)