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Information Systems as Support to Corporate Management

Summary

The idea of this paper is to introduce the great support of information systems to the management activities of a corporation. Information system as a combination of information technology and people's actions that support operations, management and decision making, involves four major types of systems: Transaction Management System, Management Information System, Decision-Support System and Executive Support System, and with that it is able to entail and support all business activities. In traditional firms these systems tend to be isolated from one another, and information does not flow seamlessly from one end of the organization to the other. However, in contemporary digital firms, the different types of systems are closely linked to one another. Taking into account the main areas of an enterprise, viewed from a functional perspective; manufacturing and production, sales and marketing, finance and accounting and human resources, one of the major challenges that enterprises face today, is putting together data from all of the departments in order to make information flow across the enterprise. These changes require powerful new systems that can integrate information from many different functional areas and organizational unites and coordinate firm activities with those of suppliers and other business partners. Those new systems or applications, also called as enterprise applications help to unify the firm's structure and organization, provides more efficient operations and customer-driven business processes, help in achieving great efficiencies by automating parts of processes, contribute to completely rethinking processes, assist in all levels of management and in the perspective of technology, the corporation is represented as a unified platform. Although there are several challenges to build these systems, we strongly believe that there are extraordinary opportunities to use information systems to achieve business value and increase profitability.

Keywords

information systems, corporate management, decision making, executive management, business process automation

1. Introduction

We are in the middle of a quick development phase of technology and business innovations which is transforming the global business scene. An entirely new Internet business culture is emerging with deep implications for the conduction of business.

This can be seen easily by observing how the work is done in businesses by using high-speed Internet connections for e-mail and information gathering through mobile phones, portable computers and handheld devices.

The rising Internet business culture is a set of expectations that everyone has. Everybody is waiting for online services for purchasing products and services, expecting to be able to communicate with their vendors, customers, business partners and employees 24/7 over the Internet. So, in overall information technologies and information systems are revolutionizing the operation of companies, industries and markets, and the main objective of this paper is to describe this transformation and to help managers take advantage of the rising opportunities.

Information system is an integrated set of components for gathering, storing, and processing data and for distributing information and knowledge. Business corporations and other organizations rely on information systems to carry out and manage their operations, interact with their customers and suppliers, compete in the marketplace, and support decision making (Zwass, 2011). In addition to supporting decision making and control, it may also help managers and employees analyze issues, visualize difficult subjects, and create new products.

The information that organizations need in the decision making process, in controlling operations, analyzing problems, and creating new goods and services, is produced by information systems through three activities. These activities are input, processing and output. Input gathers or collects raw data from within the organization or from its external environment. Then the phase of processing converts this raw input into a meaningful form. At last output transfers the

processed information to the people who will use it or to the activities for which it will be used. Beside these main activities information systems also require feedback, which is an output that is returned to appropriate members of the corporate to help them evaluate or correct the input stage.

Information systems can be classified by the specific organizational function they serve as well as by organizational level.

Based on the organizational level, business functions, and business processes that information systems support, they are classified in four major types of Systems: Transaction Management System, Management Information System, Decision-Support System and Executive Support System. (Laudon & Laudon, 2011)

Information systems have become essential, online, interactive tools, which are deeply involved in the minute-to-minute operations and decision making of large corporations. Over the last decade, information systems have fundamentally changed the economics of corporations and greatly increased the possibilities for organizing the overall system of work.

2. Major types of information systems

Transaction processing systems are the basic business systems that serve the operational level of the corporation. A transaction processing system is a computerized system that performs and records the daily routine transactions necessary to conduct business.

This type of system is often so central to a business that its failure for a few hours can lead to a firm's demise and perhaps that of other firms linked to it.

Managers need this system to monitor the status of internal operations and the firm's relations with the external environment. Transaction processing systems can be also major producers of information which can be used as an input for the other types of systems.

Management Information System can be defined as the study of information systems in business and management. This type of system serves the management level of the corporation, providing managers with reports and often online access to the corporation's current performance and past records. (Harsh, n.d.)

Habitually, management information systems are oriented fully to internal, not environmental, events. They serve the functions of planning, controlling and decision making at the management level. Generally, they count on the data which are provided by the transaction processing systems.

Management Information systems usually serve managers weekly, monthly and yearly reports, although some of these systems enable managers to drill down to access daily or hourly data if necessary. Management Information systems generally offer answers to custom questions that are known previously and have a predefined method for answering them. (Nowduri, n.d.)

Decision support systems also serve the management level of the corporation. These systems, in contrast from MIS, help managers make decisions that are new, unique, rapidly changing and not easily specified in advance. They address problems where the procedure for arriving at a solution may not be fully predefined previously. Although decision support systems use internal information from transaction processing systems and management information systems, they often carry information from external sources, which sometimes can be the competitors.

If we take a look at all systems, we can easily say that Decision support systems have more analytical power than other kind of systems. They use a diversity of models to analyze data or they compact large amounts of data into a form in which they can be analyzed by decision makers. DSS are user-friendly and interactive, so the user can give and change statements, ask different questions and include new data. (Gopinathan, 2007)

Executive support systems are used by senior managers to help them make better decisions. So, they serve the strategic level of the organization and they address non-routine decisions, which require judgment, assessment, and insight because there is no agreed-on procedure arriving at a solution.

ESS is designed to incorporate data about external events but they also represent summarized information from internal management information system and decision support system. They filter, compress, track critical data and display the data of greatest importance to senior managers. All these data and information are delivered through a portal and presented graphically in a great way.

Unlike the other types of information systems, Executive support systems are not designed mainly to solve specific problems. Instead of that, ESS provides a generalized computing and communication capacity that can be applied to a changing array of problems, and unlike DSS, it tends to make less use of analytical models.

The various types of systems in the corporation have interdependencies. TPS are typically a major source of data for other systems, whereas ESS is mainly a recipient of data from lower-level systems. Other kinds of systems may exchange data with each other as well. Data may also be exchanged between systems serving different functional areas. For instance, an order taken by a sales system may be transmitted to a manufacturing system as a transaction for producing or distributing the product specified in the order and sent to financial reporting in MIS. (Singh & Kaur, 2012)

It is definitely beneficial and challenging to integrate these systems so that information can flow easily between different parts of the organization and provide management with an enterprise-wide view of how the organization is performing as a whole. But incorporation costs money, and joining together many different systems is extremely time consuming and difficult. This is a major challenge for large organizations, which are typically loaded with hundreds and thousands of different applications serving different levels and business functions. Each organization must consider its needs for integrating systems against the difficulties of mounting a large-scale systems integration effort.

Information systems can be classified by the specific organizational function they serve as well as by organizational level. In the following section we have described information systems that support each of the major business functions.

The sales and marketing function is responsible for selling the organization's products or services. Marketing is concerned with recognizing the customers for the firm's goods or services, determining the customers' needs and advertising and promoting these goods and services. Sales are worried with contacting clients, selling the products and services, taking orders, and following up on sales.

Information systems are used in sales and marketing in different ways. At the strategic level, sales and marketing systems monitor trends affecting new products and sales opportunities, support planning for new products and services, and monitor the performance of competitors. At the management level, sales and marketing systems support market research, advertising and promotional campaigns and pricing decisions. It is analyzed the sales performance and the performance of the sales staff. And at last at the operational level, sales and marketing systems assist in locating and contacting prospective customers, tracking sales, processing orders, and providing customer service support. (Laudon & Laudon, 2011)

The system secures data about each item sold for further management analysis. The managers of the firms examine these sales data to monitor sales activity and buying trends.

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. Strategic-level manufacturing systems deal with the company's long-term manufacturing goals. At the management level, manufacturing and production systems analyze and monitor manufacturing and production costs and resources. Operational manufacturing and production systems deal with the status of production tasks.

The finance function is responsible for managing the firm's financial assets, such as cash, stocks, bonds, and other investments, to maximize the return. This function is also in charge of managing the capitalization of the firm. To determine whether the corporation is getting the best return on its investments, the finance function must obtain a considerable amount of information from sources external to the corporate.

The accounting function is responsible for maintaining and managing the firm's financial records-receipts, payments, reduction, and payroll-to account for the flow of funds in a company.

Strategic-level systems for the finance and accounting function establish long-term investment goals for the firm and provide long-range forecasts of the firm's financial performance. At the management level, information systems help managers oversee and control the firm's financial resources. Operational systems in finance and accounting track the flow of funds in the firm through transactions such as paychecks, payments to vendors, securities reports, and receipts.

The human resources function is responsible for magnetizing, developing, and maintaining the company's workforce. Human resources information systems support activities, such as identifying potential employees and keeping complete records on existing employees. (Sadiq, Khan, Ikhlaq, & Mujtaba, 2012)

ERP Systems

One of the major challenges that companies face today is putting together data from the systems that are described to make information flow smoothly across the company.

These changes require powerful new systems that can integrate information from many different functional areas and organizational units and coordinate business activities with those of suppliers and other business partners.

Today's firms are finding that they can become more flexible and productive by coordinating their business processes more closely and, in some cases, integrating these processes so they focus on efficient management of resources and customer service. Enterprise applications are designed to support organization-wide process coordination and incorporation.

ERP system supports most of the business system that maintains in a single database the data needed for a variety of business functions such as Manufacturing, Supply Chain Management, Financials, Projects, Human Resources and Customer Relationship Management.

In order to achieve a faultless integration, an ERP system uses multiple hardware and software components. Intended to ease the administration and optimization of internal business processes across a corporation, ERP packages have become the competitive tool for most large trade organizations. ERP software uses a single database that allows the different departments to communicate with each other through sharing the information. ERP systems comprise function-specific components that are designed to interact with the other modules such as the Order Entry, Accounts Payable, Accounts Receivable, Purchasing, Distribution etc.

Figure 1 Components of an ERP system
Source: *Retail Enterprise Resource Planning,*
Available: *http://www.dmsretail.com/erp.htm.*

ERP systems consist of different modules such as order entry, purchase, sales, finances, inventory management, DRP (Distribution Resource Planning) and human resources. The components are designed to work effortlessly with the rest of the system and provide a consistent user interface throughout the system.

The different modules of one ERP system and their functionalities are best explained by the figure below. As can be seen, the system is between the customers and the suppliers of the service or product. The customer makes his order, and this is the inducement for the system to start functioning. The order is supplied to the Sales Management department, where various activities regarding the order processing are done. The section which comes next is Data analyses and reports, followed by Production Management and Inventory. The IT Management and Purchase Management come along. It can be concluded that this kind of system takes care of every data which is going in and out of the company, and therefore it provides great evidence.
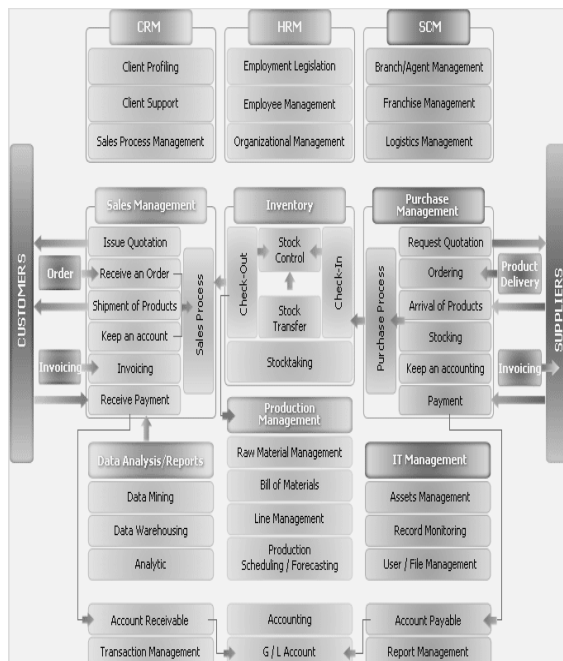
Figure 2 ERP System in the companies
Source [Partially from]: *Retail Enterprise Resource Planning,*
Available: http://www.dmsretail.com/erp.htm

In the absence of an ERP system, a large corporation may find itself with many separate software applications that do not communicate to each other and do not effectively interface. That is why the bellow mentioned tasks may be considered as advantages of the usage of ERP Systems:

▪ Integration among different functional areas ensures proper communication, efficiency and effectiveness
▪ Design production
▪ The process of tracking orders from receiving until fulfillment
▪ The income cycle from invoicing all the way through cash receipt
▪ Tracking the 3-way match between Purchase orders (what was ordered), Inventory receipts (what arrived), and Costing (what the vendor invoiced)
▪ Accounting for all of these tasks, tracking the income, expenditure and earnings on a granular level.

Despite the numerous advantages there are also some disadvantages of these systems. The issues within ERP systems are mainly due to inadequate investment in ongoing training for involved staff, including those implementing and testing changes, as well as a lack of corporate policy protecting the integrity of the data in the ERP systems and the way it is used.

▪ Personalization of the ERP software is limited.

▪ Re-engineering of business processes to fit in the "industry standard" set by the ERP system may lead to a loss of competitive advantage.
▪ ERP systems may be very expensive leading to a new category of less professional "ERP light" solutions
▪ ERPs are often seen as too inflexible and too difficult to adapt to the specific workflow and business process of some companies – a fact that is stated to be as one of the main causes of their failure.
▪ Once a system is established, switching costs are very high for any one of the stakeholders.
▪ Confrontation of sharing sensitive internal information between departments can reduce the effectiveness of the software.
▪ Some large corporations may have multiple departments with separate, independent resources, missions, etc, and consolidation into a single enterprise may give limited paybacks.
▪ The system may be too composite measured against the actual needs of the client. (Adempiere, 2006)

3. Specific impacts of Information Systems

Information systems have become essential, online, interactive tools, which are deeply involved in the minute-to-minute operations and decision making of large corporations. Over the last decade, information systems have fundamentally changed the economics of corporations and greatly increased the possibilities for organizing the overall system of work.

From economic point of view, information technology changes both the relative costs of capital and the costs of information. Information systems technology can be considered as a factor of production that can be substituted for traditional capital manual labour, buildings and machinery. As the cost of information technology decreases, it is substituted for labour force, which historically has been a rising cost.

Information technology, especially the use of networks, can also help businesses decrease the cost of market participation (transaction costs), making it valuable for businesses to pact with external suppliers instead of using internal sources.

Information systems in addition can reduce internal management costs. According to agency theory, the corporation is viewed as a "nexus of contracts" among self-interested individuals rather than as a unified, profit-maximizing entity (Jensen & Meckling, 1976). The owner employs "agents"

to work on his or her interest. However, employees need constant control and management; otherwise, they will tend to follow their own interests rather than those of the owners. As companies grow in size and scope, organization costs rise because proprietors must expend more effort on supervising and managing employees.

Behavioral researchers have stated that information systems make possible the flattening of hierarchies by expanding the allocation of information to empower lower-level employees and increase management efficiency. Consequently managers now can receive more precise information on time, so they become faster at making decisions that is why fewer managers are required. As a result, management costs are reduced, and the hierarchy becomes much more efficient.

These changes mean that the management extent of control has also been widened, enabling high-level managers to manage and control more employees spread over greater distances. Many companies have eliminated thousands of middle managers as a result of these changes.

Information technology helps corporations systematize in more flexible ways, increasing their ability to sense and react to changes in the market and to take advantage of new opportunities. Information systems can give both large and small companies additional flexibility to overcome some of the limitations posed by their size.

Small companies can use information systems to obtain some of the power and reach of larger organizations. They can coordinate activities, such as processing bids or keeping track of inventory, and many manufacturing tasks with very few managers, clerks, or production workers. (Mayers, n.d.)

Large companies can use information systems to achieve some of the agility and responsiveness of small organizations. One aspect of this phenomenon is mass customization, which is the ability to offer individually personalized products or services using the same production resources as mass production. Information systems can make the production process more flexible so that products can be customized to each customer's unique set of requirements (Zipkin, 2001).

Another behavioral approach observes information systems as a product of political competition between organizational subgroups for influence over the organization's policies, procedures, and resources. Many IT investments require changes in personal, individual routines that

can be tender for those involved. That is why retraining and additional effort may be required on employees.

Information systems potentially change an organization's structure, culture, politics, and work; that is the reason why there is often considerable resistance to them when they are introduced.

4. Conclusion

Businesses face extraordinary opportunities to apply information systems throughout the firm to achieve higher levels of productivity, earnings, and ultimately advance share prices. Today information systems support virtually all levels and functions in the firm. In addition they enhance decision making of both managers and employees, providing information where and when it is needed in a format that is easily integrated into everyday business life.

Managers and business firms invest in information technology and systems because they provide real economic value to the business. The decision to build or maintain an information system assumes that the returns on this investment will be superior to other investments in buildings, machines, or other assets. These superior returns will be expressed as increases in productivity, as increases in revenues (which will increase the firm's stock market value), or perhaps as superior long-term strategic positioning of the firm in certain markets (which produce superior revenues in the future). There are also situations in which firms invest in information systems to cope with governmental regulations or other environmental demands.

We can see that from a business perspective, an information system is an important instrument for creating value for the firm. Information systems enable the firm to increase its revenue or decrease its costs by providing information that helps managers make better decisions or that improves the execution of business processes.

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