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INTEGRATING E-LEARNING INTO INFORMATION SYSTEMS OF ORGANIZATIONS

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Abstract: *In the modern society, computer science is being used by more and more organizations to control their activities by using special software and hardware configurations to automate the processing of data that is available. There appeared a large variety of computer applications designed for specific tasks, but still it is hard to find an application that meets all the requirements of a specific organization. Using separate computer applications for every activity that is carried on can be a solution, but in this case internal communication and compatibility issues can appear. Because creating customized software for each organization can be expensive, the best solution that emerged is to create an integrated information system composed of modules that are compatible with each other. Information systems modules cover almost all of the activities an organization is carrying on, like production control modules, inventory modules, management modules, data storage modules, human resources modules, learning modules.*

Among the modules that compose the information system of an organization, e-learning modules become more and more important and can be integrated in the whole system. These modules are important in modern organizations to train the employees, contributing to their lifelong learning. By using e-learning modules, an organization can have multiple advantages from the economic point of view because training the people involved in various activities can be done internally, in a way more adapted to the specific of the organization. The present paper aims to focus on the possibilities of integrating e-learning technologies in the information systems of modern organizations.

Keywords: *software modules, integrated information system, e-learning module, e-learning technologies;*

I. INTRODUCTION

Modern organizations use a variety of information systems, most of them being based on information and communication technologies. Among all the information systems that are currently used, organization-wide integrated information systems are the most notable, being composed of a number of interconnected systems used for different purposes like: production control, financial management, customer management etc.

The complex nature of some companies requires that their employees have an adequate level of training in order to obtain good results at work. For this reason it is important that the employees of such an organization follow lifelong learning courses complementary to their work.

The most appropriate and in the same time economic way for a company to train its employees is to use modern e-learning technologies. As informatics systems in their own, e-learning tools must therefore be integrated with the other informatics systems that an enterprise is using.

II. INFORMATION SYSTEMS OF ORGANIZATIONS

Modern organizations that carry on their activity in the knowledge society use a multitude of systems in order to manage the information they have access to, between these the information and computer systems having a priviledged position.

Inside organizations, computer systems can have different purposes, some of them being designed for e-learning.

The objectives of an informatics system can be classified according to several criteria [5]:

- Depending on their scope, informatics systems objectives may be primary or secondary; the purpose of e-learning information systems may seem secondary to an organization, but, on the long term, they affest the future of the whole organization;
- Depending on the domain that is influenced, there are informatics systems affecting the core activities of organizations (greater output, reducing consumption of raw materials, increasing labor productivity, increase incomes, improve profitability) or informatics systems that affect the functioning of information system of economic organization as a whole; the e-learning informatics systems, by training the elployees, have results that can not be seen immediatly, but are equally important to the others;
- Depending on the possibilities to quantify their effects there are informatics systems that have results that can be easily quantified (like reducing costs of different types, greater output etc.) and informatics systems that have results that are not easy to quantify; in the second cathegory are situated the e-learning informatics systems because their results are reflected more in the quality of the human resources.

Also it can be said that an informatics system is a system that enables an organization to retrieve information from the outside world, store it and process it and then use it and process in various forms as for example to obtain different reports.

An informatics system must not be confused with an information system, the latter being "an accumulation of human and capital resources invested in a business organization to collect and process data necessary to obtain information that will be used at all levels of management decision and control of that organization "[4].

We believe that the informatics system of an economic organization is integral part of its decision information system and that e-learning informatics systems have an important role, although indirect, in shaping the future of an organization.

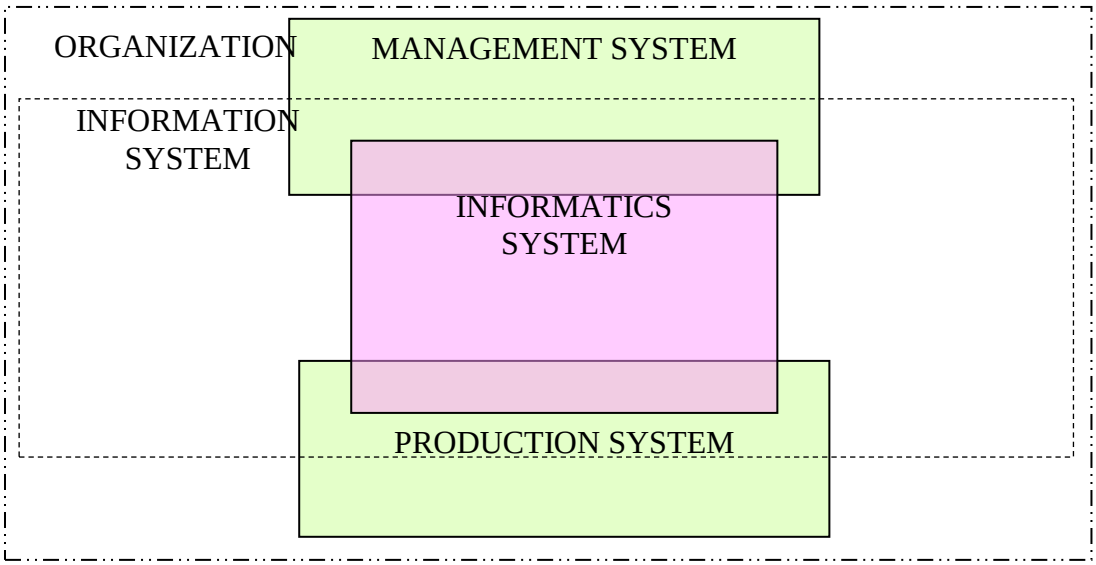

Figure 1. *Role of the informatics system within the information system of an organization* [5]

As can be seen from Figure 1, the informatics system of an organization is a part of the information system of an organization and it links the management system with the production system, whatever its nature. Through the information system the management of an organization can accesses data regarding the driven system. E-learning systems can be viewed as part of the informatics system, inside the information system, having the role to make knowledge more accessible to the human resources.

Performance of informatics systems in general and of e-learning speciffic systems in particular can be measured by the advantages they bring to organizations that use them. They depend on both the performance of the technical equipment used and on the efficiency of how they are used.

III. VERTICALLY INTEGRATED INFORMATION SYSTEMS

For ease of information transfer it is beneficial that all the computer systems used by a company to be interconnected and have access to a common database. From this point of view, of all the systems within a company, vertically integrated informatics systems stand out, being better known as Enterprise Resource Planning (in short ERP), which, among different modules, may also include e-learning systems.

ERP (Enterprise Resource Planning) is an integrated management solution for companies that are operating in different areas of activity. These systems have been already successfully implemented and used in many companies, enabling integration and centralization of all their specific functions. An ERP system can be seen as a complete integrated software solution designed to assist most of the activities and processes of a specific undertaking, from the surveillance of the production itself to financial management, top management of the enterprise to the training of the human resources containing dedicated modules for each of these tasks.

The main advantages of ERP systems are getting a better quality of products (or better quality of services that are offered) a business is offering, better customer service and better management, all leading to better performance record from the economic point of view and not only.

Enterprise Resource Planning (ERP) can be defined as a "company-wide software system used to manage and coordinate all the resources, information and business functions starting from the distributed data" [3]. Typically, ERP consists of different modules connected through a network and it has a centralized database.

An integrated ERP system can integrate computer subsystems on all levels of a company, from executive information systems for strategic management to transaction processing systems that are at the operational level. Interconnection of these systems at different levels provides several advantages for all parties involved in this way in an economic process have access to necessary information [1]. For example, the management of a company can have real time access to information from the operational level and can take informed decisions and to see when changes occur that involve changes in the decision or strategy. [1]

Even if an ERP solution can cover most activities within a company operating in the market, with modules for different activities such as human resources or such as production control it is not always necessary for the company concerned to buy the modules from the same manufacturer [1]. Each module can be implemented separately, the system being open. This modularity is good for companies interested in ERP solutions because they can extend their existing system in accordance with their needs, without having to buy an expensive solution since the beginning. Companies can buy ERP subsystems from different suppliers or even create their own modules in accordance with their needs, the only condition to obey being the compatibility between modules. Figure 2. shows an example of a generic ERP system used by a company, including an e-learning module.

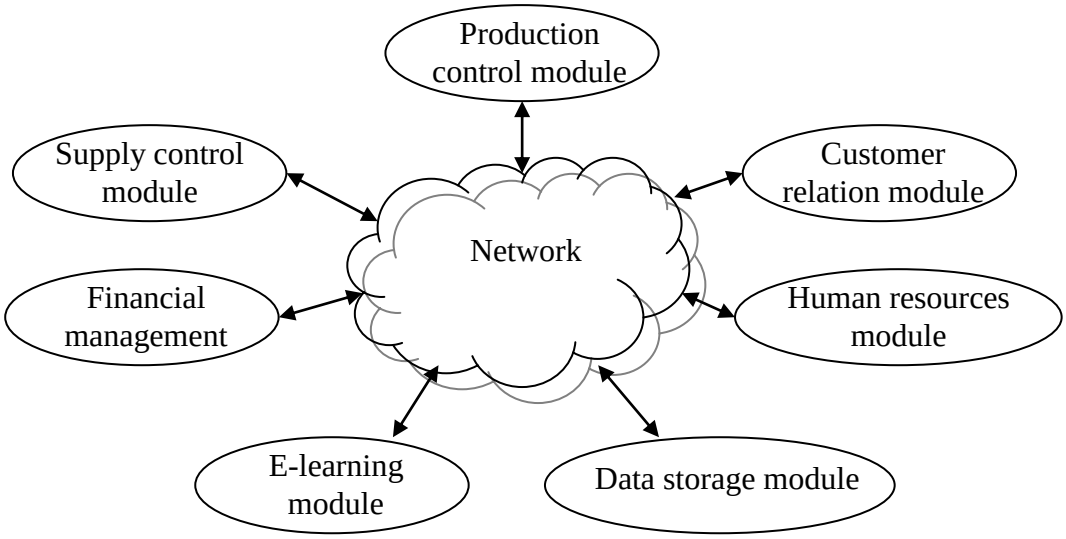

Figure 2. *Enterprise Resource Planning* architecture example [1].

Enterprise Resource Planning is usually structured in a series of modules interconnected by a communication system, which usually is a local area network LAN, but not only, important being the fact that all the modules are compatible with each other and are able to share the common data.

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IV. E-LEARNING MODULES AS PART OF INTEGRATED INFORMATION SYSTEMS

E-learning, being an activity based on modern technology, especially computer and communication systems must be based mainly on informatics systems.

Even though e-learning technologies can be used for training people in general, in this paper we are approaching e-learning technologies from the point of view of a company that needs to train its human resources in order to obtain better results, and, on the long term, better profitability. For this reason we can consider that integrating e-learning modules in the integrated informatics systems of companies can bring advantages such as training the human resources of an enterprise more efficiently.

Integrated informatics systems like ERPs described in the previous section cover most activities an organization is carrying on.

If we consider that an enterprise is producing certain products or services, we can say that the quality of these products and services depends mainly on the quality of the inputs of the processes that the enterprise is carrying on. These inputs can be: material resources, financial resources,

informational resources and human resources. Among these types of resources, the quality of the information resources and the quality of human resources can be increased based on the information that results from the production processes.

It is though necessary to gather and store information from all the levels of the enterprise, this operation being facilitated by the existence of an ERP type integrated informatics system. The data collected in such a way from the enterprise can be directly used to improve the quality of the information resources used by the enterprise as an input.

Similar, but indirectly, it is possible to improve the quality of the human resources by training them according to the information gathered. To accomplish this task, the use of dedicated e-learning tools brings certain advantages. In Figure 3 the feedback cycle from the information that is gathered and stored to the information resources and human resources is illustrated.

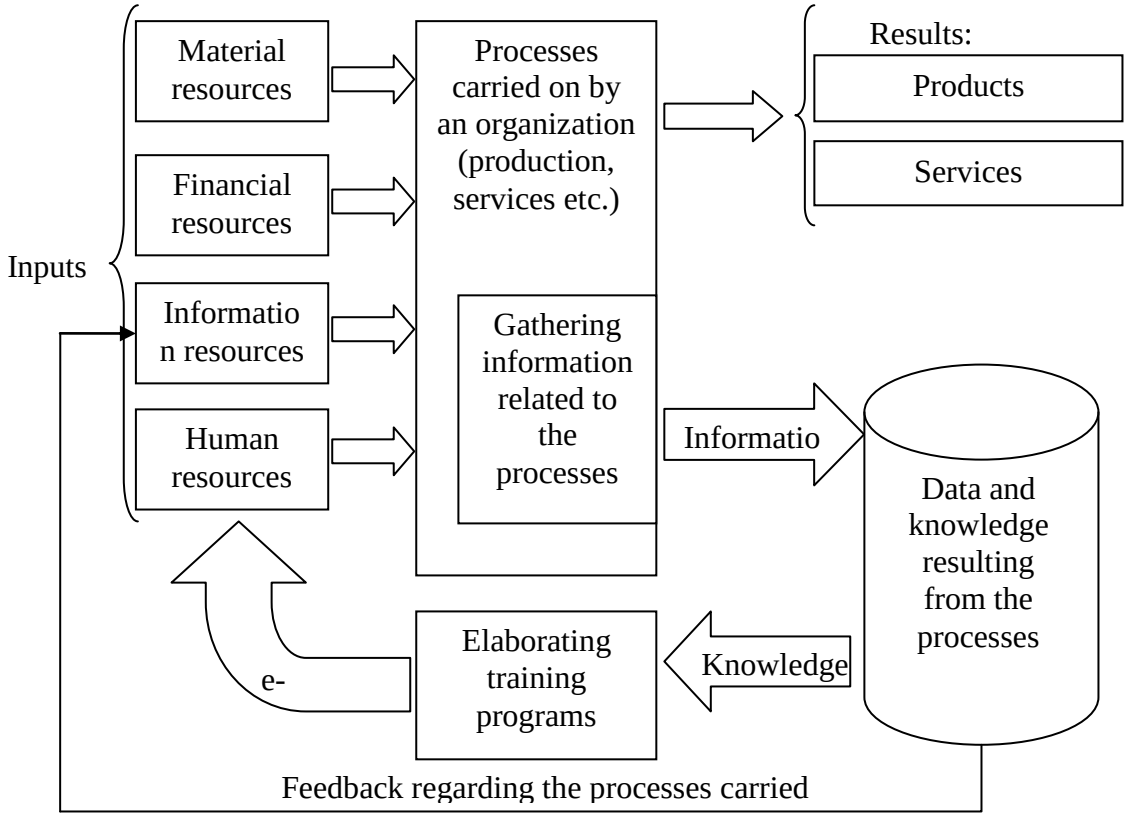

Figure 3. Information circuit inside an organization

The integration of the e-learning systems with all the other informatics systems an enterprise is using has the advantage that knowledge can be transmitted in a shorter time to the human resources and the quality of the inputs is improved in a shorter time. Because in the modern society changes occur very rapidly and those who react first to changes and adapt easier are the most successful, the integration of modern e-learning systems into one's ERP like integrated system can mean the difference between success and failure.

V. CONCLUSIONS

In a society where complete integrated hardware- software solutions like Enterprise Resource Planning are proven to bring important advantages to companies that use them, creating specialized e-learning modules capable of communicating and integrating with such systems is an approach that can be advantageous for those enterprises that have to train their human resources to keep pace with the changes they are encountering.

Using separate computer applications for every activity that is carried on is not any more a solution because delays in reacting to the changes in the surrounding environment can mean the difference between success and failure, so using integrated e-learning modules can be the best option, eliminating any compatibility issues, and facilitating the adaptation of the enterprise in different situations. Among the modules that compose the information system of an organization, e-learning modules become more and more important and can be integrated in the whole system. By using dedicated e-learning modules, an organization can have multiple advantages from the economic point of view because training the people involved in various activities can be done internally, in a way more adapted to the specific of the organization.

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