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IMPLEMENTATION AND USE OF ERP AND WEB-ERP IN THE PRODUCTION OF SMALL SERIES AND UNIQUE

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Abstract: *This paper covers research on ERP systems and Web-ERP, highlighting the features of an ERP system, advantages and disadvantages of these systems obtained for implementation, evaluation and implementation of how such an instrument. Also in this paper will propose an algorithm to guide the process of using ERP systems and ERP web-specific production of small series and unique.*
Key words: *ERP (Enterprise Resource Planning), Information, implementation, AsisPlus, AsisRia.*

1. GENERAL CONCEPTS ABOUT ERP (ENTERPRISE RESOURCE PLANNING)

ERP is a complex software tool that integrates all departments of an enterprise in a common computer platform, organized by client-server structure, having a single database, for more efficient management of all resources within an enterprise.

The purpose of an ERP system is to ensure transparency of data, eliminating redundancy, providing information in the "real time" decision-making process and facilitate access to any relevant information depending on the degree of permissiveness in the activity.

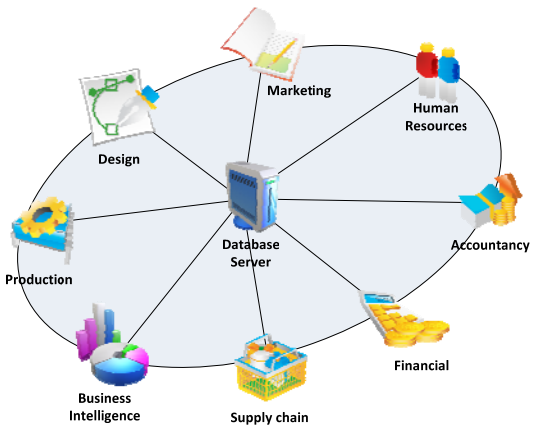

Fig. 1. The general architecture of an ERP system [1]

Note that an ERP system should cover all departments of an enterprise, regardless of its structure, to fulfill the purpose for which it was designed as follows: "real-time dissemination of information within the enterprise".

Information can be defined as a communication, a message containing the new elements of a phenomenon, in fact, a process that can be used to improve a decision or a decision is possible.

A quality information can be characterized by various factors such as: to be consistent, to be relevant, to be accurate, be timely and accessible.

- to be consistent - to include enough information that they can provide the user with as much knowledge;
- to be relevant - can provide the knowledge necessary to make a choice. An irrelevant information for a particular decision may be relevant to a different decision;
- to be exact - if the information is exactly what they will reflect the real situation of the phenomenon and also influence the decision. An inaccurate information has often serious consequences;
- be appropriate - there is a gap between receipt of appropriate information and when necessary decision. In other words, information received late may have a low

value or to lose all value. Information is a perishable product!;

- to be accessible - the presentation of information often play an important role. Not really if the information received is unclear or confusing, if the transition from information to knowledge is easy or very difficult.

Here are the main benefits that make implementation of systems within an enterprise:

- opportunity to obtain a competitive advantage;
- revenue growth;
- production planning;
- controlling and reducing costs;
- improving quality;
- creating opportunities, solving complex problems that would otherwise require a longer time to achieve etc..

Systems can affect the basic structure and organization design. Generally, these effects occur in the following ways:

- emergence of specialized units or departments in processing information. Most organizations are due separation departments to handle information in the system;
- eliminating hierarchical layers of management hierarchy, because systems can eliminate the need for intermediate levels of the management pyramid. In some cases can lead to new types of organizations, such as organization type T. The type T are organizations with flat structures, therefore, use of information systems within an organization can result in restricting managerial levels, with extensive electronic links with suppliers and customers with virtual departments and matrix management structure and an advanced information infrastructure;
- increase flexibility by changing the pace of work organization and capacity information processing;

Systems affect human behavior in organization. Some influences are positive, others negative.

Mention of the positive aspects that improve the efficiency of systems. In addition, some people find it more interesting and enjoyable to work with new technologies. As a result of computerization and the emergence of e-mail members of an organization can communicate with each other and outside the organization.

The category mentioned negative aspects that can lead to isolation systems people, because computers allow them to work and not interact directly with each other. With this software, managers can work remotely with the same effect, but they may not be available in the enterprise for those who need them, and working on his computer away from key parts of the social system. Agreements and understandings computer tend to become less personal.

Concerned about these issues, scientists examine how systems affect individuals' behavior and attitudes.

Despite many benefits, information systems have important limitations, such as: [79]

- systems are expensive and sometimes difficult to develop and enforce;
- systems can not apply any tasks or problems. Complex problems require judgments that can be performed only by men;
- managers sometimes rely too heavily on computer systems, which are often useful, but rarely can take the place of managers;
- information provided by managers may not be accurate, timely, complete and relevant as they seem. The results depend heavily on data provided here is the possibility of the phenomenon GIGO (Garbage In → Garbage Out);
- managers may have unrealistic expectations on systems that can do;
- systems may be subject to sabotage, viruses or power failure.

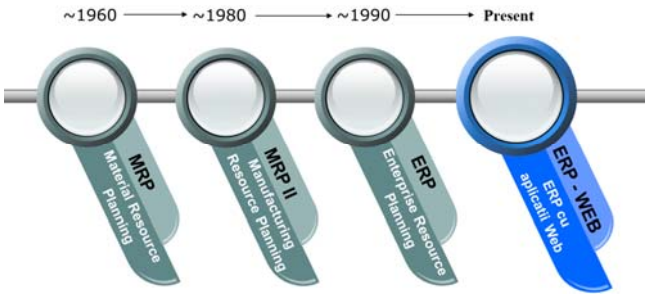

Fig. 2. Evolution of ERP

Around 1990 were first ERP (Enterprise Resource Planning), which consisted of several applications (modules) and each module was a specific function (department) of the company. It is worth mentioning that some of these features of the application could be found in MRP II (figure 2).

ERP concept was born when all information was managed using a computer in each department and could be integrated into a common platform with a single database by storing information in one place.

Today, ERP systems have made a new step in their development, namely ERP-WEB. This development allows using remote program (outside the enterprise) that is the internet using a web browser, similar to using a mail boxes. This use is outside restricted and access is possible only through a username and password.

2. STRUCTURE OF AN ERP SYSTEM

An ERP system consists of several modules (software) that supports all business departments: planning, production, accounting, sales, marketing, human resources, distribution, financial, inventory, maintenance, logistics, e-business and integrate them into a common platform.

Structure an ERP system is a client / server and ensures the use of a fast flow of information between all divisions / departments in a transparent company.

Integrating these modules into a common platform gives the advantage to eliminate the effect of redundancy (duplication), with technologies used in the database.

Data are the basics of an ERP system. The database consists of several tables that allow relationships to each other through fields. In these tables are stored and organized data. Currently the number of commercial database vendors is narrower compared with ERP providers. There are approx. 20 providers of database types compared to hundreds or even thousands of providers of ERP applications. Only providers that offer solutions that further databases are Microsoft and Oracle ERP applications. Achieving a complete solution requires a sustained effort to counteract the benefits of the solutions developed by specialized firms, which are known in the market.

The result is information processing. They are offered in several forms operator: reports, statements, newsletters, etc.., By posting them directly on the monitor screen (displays), after which they can be printed to the printer. Applications can provide these results in the form of files, which can then be processed with other environments (eg Excel files).

ERP applications are composed of a report generator, which can be built using the new reports were not provided in the initial requirements and allows for their parameterization and customization. Excel spreadsheet files type are most common on the export of files from ERP applications. This file is very easy to use in the process of analyzing data and making additional calculations, graphics, etc.. This export option is extremely important because it eliminates the subsequent change requests applications from the beneficiaries.

ERP applications can generate reports with standardized content, that content is defined in system implementation. Standard reports include: invoices, notices, order, etc..

Most ERP system vendors offer various solutions to customize reports according to the desired format and customize them by inserting a logo, letterhead, etc. specific.

3. CHARACTERISTICS OF AN ERP SYSTEM

The main features:

- several applications that have a client / server;
- manage all resources within the company;
- integrates and unifies business processes;
- database uses a single enterprise, the data is entered only once;
- allow the extraction of situations in "real time";
- multivalues and multilingual support;
- these systems are standardized, and in the implementation process is adjusted when necessary;

- allow for adjustments, modifications and customizations without programmer intervention.

Implementing an ERP system not always successful because of organizational problems that may arise in the implementation process, namely:

- lack of involvement of managers in corporate governance in the process;
- fear of change from accepting new users;
- implementation and use of a complete ERP system lasts up to one year;
- use of new systems and equipment in the data collection, data processing and obtaining information
- User training module;
- lack of appropriate psychological training of users;
- poor communication between the implementation team and the rest of the enterprise;
- up work was not prepared enough, or appropriate resources are insufficient.

4. PERFORMANCE EVALUATION OF AN ERP SYSTEM

Performance evaluation of an ERP system is an extremely complex activity. In this activity, should consider the following features:

- confidentiality - is achieved by increasing the degree of protection and security against unauthorized data access. Security can be achieved on several levels, namely: the user level and at the subcomponent level of functionality (the operations: view, add, modify, delete);
- scalability - is highlighted by the possibility of implementing only the modules that are absolutely necessary, and later adding other modules, depending on resources and needs;
- portability - is evidenced by how to transfer data from one platform to another, mainly referring to the type of database you use the ERP system;
- traceability - is highlighted by the convenience of document flow business, but also all processing;
- parameterization - is highlighted by the ease with which you can customize or adapt the ERP system, the way in which the rules and conventions defining how specific basis for each customer can manage their work.

5. STAGES OF IMPLEMENTATION OF AN ERP SYSTEM

Step 1. Information Flow Analysis - place identifying specific needs of the beneficiary and the necessary adjustments to be made. The most important role at this stage it is the beneficiary, who must make the most correct and precise requirements to be met by the ERP system.

Also during this stage are considered basic equipment used, such as computers, server, network, Internet, etc.. and other accessories (scanners, printers, etc..) necessary for optimum performance of the ERP.

Step 2. Installing the ERP system - installation takes place on the database server and the computers, installing applications. After installation go to check the system and links to other equipment such as printers, cash registers, scanners and devices.

Step 3. Implementation - is done configuring modules (applications), defining reports, lists and personalize print formats. All is now set security procedures and issues related to data backup, restoration and maintenance of application. It is worth mentioning that this phase be implemented all the requirements defined in step 1.

Step 4. Transfer - to move to the use of migration is necessary to provide some specific data from old to new application software, such as suppliers, products, customers, inventory, etc. initial balances.

Step 5. Training and education staff - teaching staff takes place on the use of the new system and if necessary will be done and school staff. Noted, that education is not included in the purchase price of the ERP.

Step 6. Checking correlations - check all correlations between modules, is absolutely necessary because all use the same database to ensure dissemination of information between modules.

Step 7. Maintenance - is maintenance, which can be made by an official of the company or may be performed under contract by the supplier company.

6. APPLIED STUDY

In this paper we proposed an algorithm to guide the process of using ERP systems and Web-ERP in the production of small series and unique.

ERP system used is called AsisPlus and is made by a local company, specifically in Cluj, called Alpha Software Ltd. ERP system is used only with licensed, which means that the Technical University of Cluj has the right to use for teaching and research.

The advantage is that a single base data ensures transparency, eliminate data redundancy and provides real time information.

In Figure 7.4, is proposed an algorithm to guide the process of using ERP systems and Web-ERP, the production of small series and unique.

An important feature of the production of small series and unique, is to make products to order. Custom manufacture a product involves a contract between customer and supplier, whether the supplier will send the project or is created within the enterprise, research and development department.

To achieve bids proceed to analyze the product, the first step is introduction to the catalog (nomenclature) products, then technology will be to determine the quantities of raw materials for the production of and identify the types of operations used in manufacturing and labor. This will be done with MRP algorithm. Once determined quantities are compared with existing stock, and as a result of this comparison will result in a situation with the necessary raw materials that need to be purchased.

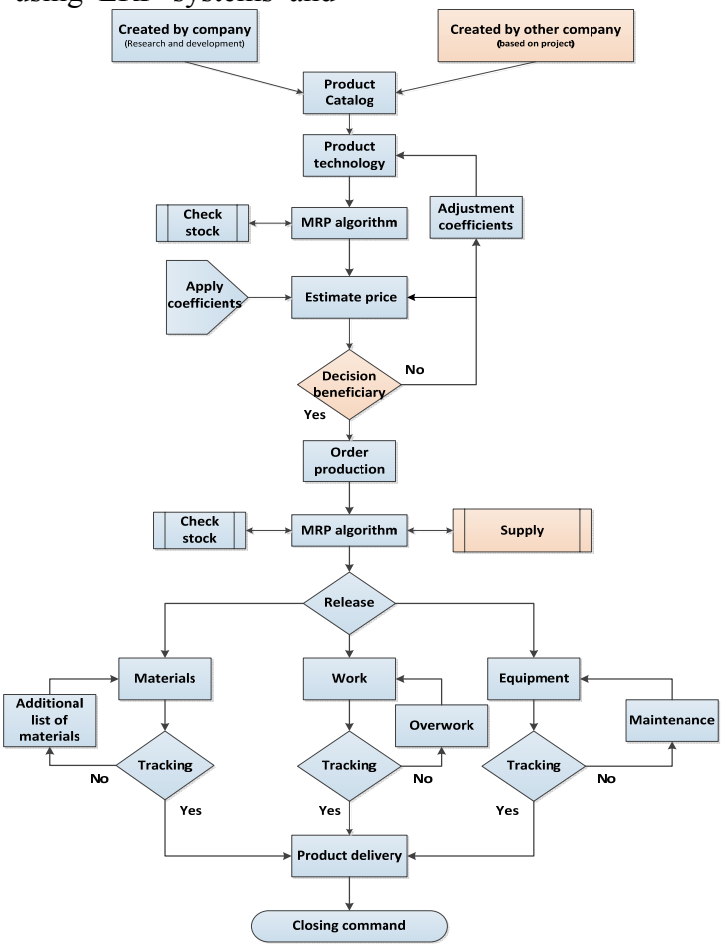

Fig. 4. Algorithm to guide their use of ERP systems and Web-ERP, the production of small series and unique [1]

6.1 USING THE MODULE "PRODUCTION MANAGEMENT" OF ERP (ASIS PLUS) AND WEBERP (ASISRIA)

Module "production management" allows planning and managing all activities and processes taking place within the production unit.

In the first stage of production takes place training is based on product introduction continues with a description of the classification tree of technology product development. This description is done by decomposing tree product: parts, parts, raw materials and labor. Development phase ends with establishes an estimated retail price of the product realization.

Asis.MP Module - allows production management:

- technological description of products / assemblies / parts;
- a quick calculation of the estimated retail price of products;
- establish the necessary supply of raw materials and auxiliary materials;
- preparing documentation for launching production;
- programming commands and batch production on (groups of commands);
- order tracking launched in manufacturing.

We will continue to implement the previous algorithm with Production Management module. To achieve this, we need a product to illustrate all activities. The product will be particularly simple, namely an office computer (Figure 7.5).

Fig. 7.5. The product taken as an example [1]

The first step to be made is the addition of the nomenclature of products, this operation involves defining features such as: product code, product name, product type, unit of product, etc.. With the introduction of the classification and accounting are recorded in account 345 - "finished". Here is more specific management, the stock price if known (optional) and can pass comments, if necessary

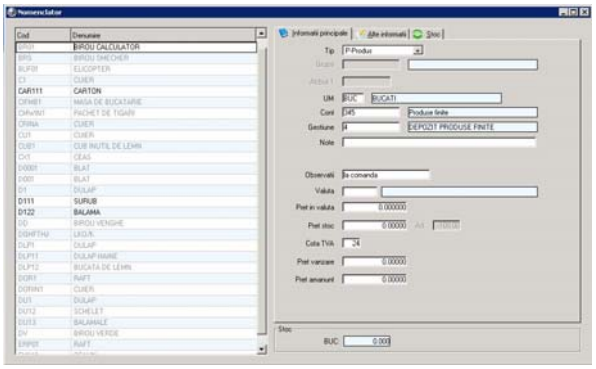

Fig. 7.6 Classification of ERP [1]

and AsisRia:

Fig. 7.6. Classification of Web-ERP [1]

To achieve manufacturing technology is required that the product is defined in the nomenclature. The next step to be performed, is importing the product classification in technology, then move to its creation.

- the structure - must define the components of these items include: parts, or parts;
- the operations - have defined operations which will apply the elements defined above in structure;
- the material - material must be defined and / or materials used in the operations defined above;
- the Stocked - who should define the validity period (if any);

- the result - depending on the level at which we are describing the technology, we can have two types of results, namely: product or component.

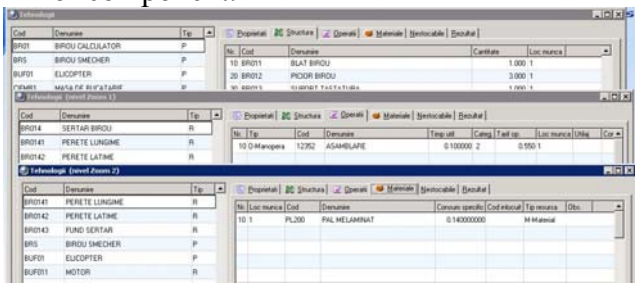

Fig. 7. The implementation of manufacturing technology – ERP [1]

and AsisRia:

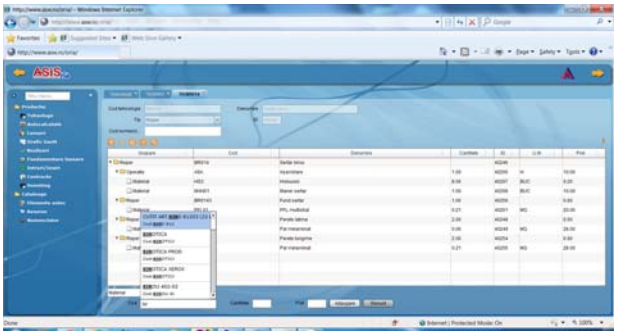

Fig. 8. The implementation of manufacturing technology – Web-ERP [1]

Pre-calculation - is an estimated price of the product. In the implementation pre-calculation taking into account several factors such as:

- cost of raw materials and materials - are determined by importing the product in quantities necessary for manufacturing technology and unit price of the stock material, the classification;
- labor costs - are incurred in carrying out operations during product operation * unit price;

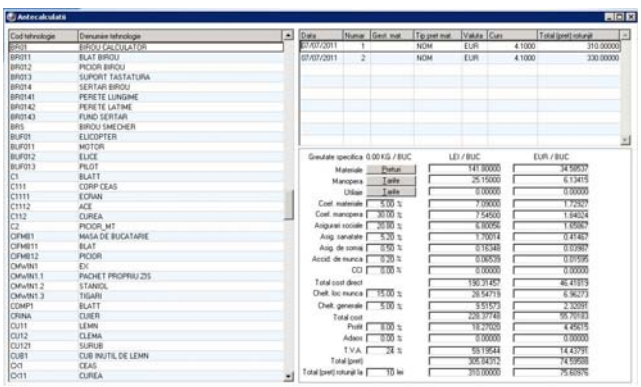

Fig. 9. The achievement of pre-calculation - ERP [1]

- coefficients of materials and labor - allow a percentage added to cost of materials and labor respectively, as the margin of safety if the prices of materials will change pending actual product or due to exchange rate;
- equipment costs - is consumption in the use of machinery, equipment in the product realization;
- defining coefficients for: kings, contributions, tax and VAT.

and AsisRia:

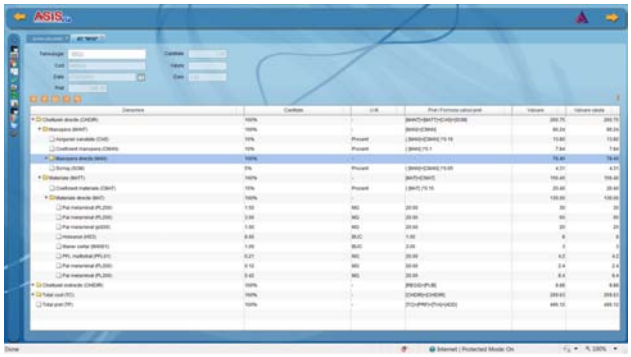

Fig. 10. The achievement of pre-calculation Web-ERP [1]

The application offers the advantage AsisPlus.MP complete several previous calculations (simulated prices) assigned to a product by changing the above mentioned coefficients and even the materials and workmanship. Change material prices and labor will be that only pre-calculation.

7. CONCLUSION

For a more efficient management of resources within an enterprise is advisable to use ERP software systems. In this paper have been revealed:

- how to achieve a detailed description of ERP systems in terms of characteristics, structure, components and presented an evolution of these instruments.
- have shown the benefits of implementing quality in terms of intelligence, adaptability, the scalability, redundancy and eliminating the effect of opening the e-business. Disadvantages in terms of implementation of these tools have taken

into account implementation costs, non-compliance modules, complexity and dependence on supplier;
- an algorithm to guide their use of ERP systems and Web-ERP in the production of small series and unique;
- illustrating operations performed within the ERP systems and Web-ERP by following the steps outlined in the algorithm.

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Implementare şi utilizare de sisteme ERP şi Web-ERP în cadrul producției de serie mică şi unicate

Rezumat: Aceasta lucrare cuprinde o cercetare asupra sistemelor de tip ERP şi Web-ERP, evidențiindu-se care sunt caracteristicile unui sistem de tip ERP, avantajele şi dezavantajele obținute în cazul implementării acestor sisteme, a modului de evaluare şi implementare a unui astfel de instrument. Deasemenea, se va propune un algoritm pentru ghidarea procesului de utilizare a sistemelor de tip ERP şi Web-ERP, specific producției de serie mică şi unicate.

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