

ERP IMPLEMENTATION ISSUES

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Abstract: Starting from manufacturing and production planning systems, the present solution of ERP offer various features, covering in essence, with present development modules, integrating CRM, SCM and PLM, all enterprise function. The globalization requires a quick response of market needs, which can be obtained with an integrated ERP system. The article will present the past manufacturing and production planning techniques, the e-business applications integrated into cross-functional enterprise application clusters, like enterprise resource planning, customer relationship management, supply chain management, selling chain management or decision support, the today's requirements of ERP systems, the EU ERP market and a case study for ERP implementation in Romanian enterprise. Also, will be underlined the issues of ERP implementation in classic enterprise and the integration efforts, in order to achieve competitive advantage.

Key words: virtual enterprise, manufacturing, production planning, ERP.

1. INTRODUCTION

To face an increasingly competitive environment the businesses continues to advance the technology at an ever increasing rate and because of the relentless pressure and demands put on them by their consumers and competitors respectively, having in mind new organizational structures appears with specific rules [3]. The EU expansion, together with other markets unification, causing lifting of barriers to trade and increased globalization, generate new business opportunities, as quickly customer response, but on the other hand created new threats to existing businesses also [8].

Information technology-related changes in organizations have always been a central issue to information systems researchers. Various studies refer to ERP implementation, as critical success factor [4], involving a large Change Management Process often as known as BPR [1],[5], which objective is to maximize the collective efforts of all people involved in the change. It is no use in changing an organizations technology to the latest ERP system which will give huge benefits in efficiency and cost benefits if you don't have employees willing to use the technology [6].

Managing such change has become increasingly important with rapidly emerging social, economical and technological conditions. As emerging information technologies such as Enterprise Resource Planning Systems (ERP) and Internet-based Information Systems are becoming widespread, such technologies are often seen as enabling complex changes such as global systems integrations and virtual team working.

Starting from systems theory, Zhang [9] propose several definition elements that define ERP:

- *The Goal of an ERP System* - improving and optimizing internal business processes;
- *The Components of an ERP System* – common components of a Management Information System (MIS).
- *ERP Software* – module based ERP software is the core of an ERP system. Each software module auto-

mates business activities of a functional area within an organization. Common ERP software modules include product planning, parts purchasing, inventory control, product distribution, order tracking, finance, and accounting and human resources aspects of an organization.

- *Business Processes* – business processes within an organization falls into three levels - strategic planning, management control and operational control.
- *ERP Users* – employees of the organization at all levels, from workers, supervisors, mid-level managers to executives.
- *Hardware and Operating Systems* – many large ERP systems are Windows based. Legacy ERP systems may use other operating systems.
- *The Boundary of an ERP System* – usually smaller than the boundary of the organization that implements the ERP system.

Other definitions presents ERP like a system with multi-module application software packages that integrates key business and management processes across an enterprise. It serves as a backbone for the enterprise and helps manage the important aspects of a business, including procurement, order tracking, materials management, product planning, manufacturing, human resources, and financial management.

The problems presented in relevant literature [7] suggests a various set of reasons. These include:

- lack of top management support, changes in personnel, lack of discipline, resistance, and lack of broad-based company commitment are the major factors that slow down the process of implementation.
- during the implementation of an ERP system is needed a strong business process changes;
- lack of data accuracy and user involvement can attribute to system implementation failures.
- underestimating of education and training.

In the next sections will be present the business requirements for e-economy, manufacturing and produc-

tion planning, critical success factor for ERP implementation and the study case for Guzu Chim Romania.

2. BUSINESS REQUIREMENTS FOR E-ECONOMY

The e-economy might be seen as branch of conventional economy, developed around an information core and it ways of circulation. In this concept, an important underline is the information usage and manipulation in very various ways. So, in the beginning, the IT involved in an enterprise appears as “islands” of processes automations. Because of late IT evolution, the enterprises have the meanings necessary to develop activities in virtual environment, based on virtual processes, where the keywords are integration, collaboration and efficiency.

A VE, mentioned above, is defined as “a temporary alliance between two or more independent partners associated in order to achieve a common goal”. The virtual term used in this definition is not referring to a non-existent organization and is referring to product image in end user eyes, which have in mind a single manufacturer for the product not an alliance.

The VE essential characteristic is the partners cooperation, focused on core competencies and innovation covering the innovation capacity (organizational culture, strategy, marketing, project management), processing capacity (dynamic organization structure, production flow management, new information systems, competencies and technological abilities) and cooperation capacity (team work ability, breaking the mental borders regarding collaboration, network thinking).

The overall business requirements for e-economy environment is directly connected to the market challenges having as result the today’s enterprise need in order to satisfy a specific request appeared in market in one time and one place. To do so, specific goals must be defined [2]:

- changing the enterprise organization fashion, adopting a matrix organization form, oriented to multi-polar project management, each business being seen as a project, having as result a product or a service;
- limiting to a core expertise, the global market impose a maximum efficiency for an enterprise, by out-

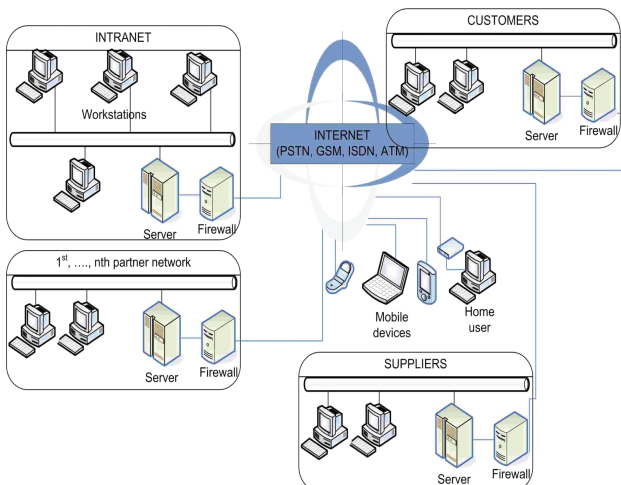


Fig. 1. VE IT infrastructure.

sourcing all non-profit activities, keeping instead the most competitive activities in comparison with the concurrence;

- concurrent process implementation, segmenting and parallel process suite having as result reducing the time-to-market;
- create multidisciplinary subsystems, having multidisciplinary subsystems solve various problems that can occur in a project developing;
- integration with partners, develop an IT structure (Fig. 1) able to maintain the collaborative process with the partners involved in enterprise projects.

3. MANUFACTURING AND PRODUCTION PLANNING

ERP systems have made a great impact on the information systems landscape during the 1990s and continue to do so into the 21st century. By the end of 1999, ERP systems accounted for over half the world’s installed base of application software. The vendor organizations most prominent in this market are Microsoft, SAP, Oracle, Sage Group, SSA Global, with a 23.6 MLD USD in 2004 and 14% increasing rate, accruing to consultancy firms for advisory and installation services. Initially, ERP systems were adopted by the world’s largest corporations. By 1999, most Fortune 500 companies had implemented ERP systems. As the high end of the market became saturated, ERP vendors moved to promote their products in medium sized organizations such as universities, and to regions beyond those initially penetrated in Europe and North America, recently data presented by European Commission in e-Business Watch Report, exceed vendor expectation (Figs. 2 and 3).

The study has the survey question: E1d: “Do you use an ERP system?” in 7 EU countries (CZ, DE, ES, FR, IT, PL, UK), for all enterprises from a sector. N = 5218 (total), cover weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising ...% of employment in sector / country).

So, the success of ERP implementation, end it to be just a commercial success and become an important economy growth component, affecting all range of business and companies.

Accordingly with definitions presented above and most significant software supplier recommendations, we

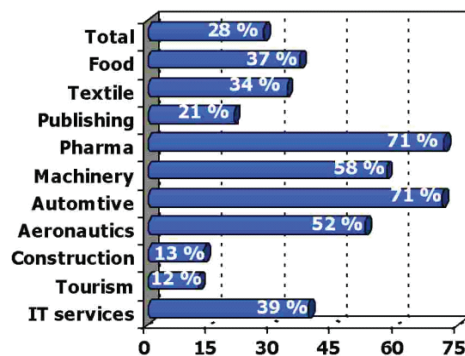


Fig. 2. Companies using ERP [%] of total surveyed companies by industrial sector for 5218 subjects.

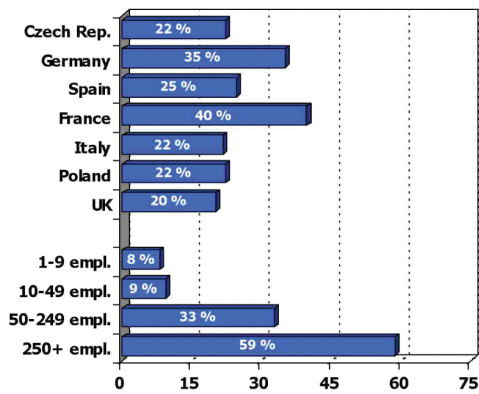


Fig. 3. Companies using ERP [%] of total surveyed companies by country and number of employees for 5218 subjects.

consider the most important manufacturing modules for ERP being:

- Production Orders (including simulated, planned, firm planned, released and finished orders) created and handled or planned from sales orders as standard, project, or multi lines. In this module Reservation system provides for hard and soft allocation. Blanket orders created for the efficient execution of long-term contracts. Also with serial and lot number processing handled and flexible costing system provided for standard, average, FIFO, LIFO and specific costing;
- Production reports produced and costs tracked and landed costs handled;
- Production Bill of Materials, including phantom BOMs;
- Version Management regarding manufacturing bills of materials and routings created and handled;
- Basic Supply Planning for both available-to-promise (ATP) and capable-to-promise (CTP), with multilocation planning facilitates efficient information and material flow through the supply chain, MRP scheduling, simultaneous planning of materials, capacities and costs and allow planners to instantly view the results of MRP;
- Demand Forecasting with Forecast and Master Production Schedule (MPS);
- Basic Capacity Planning based on Shop calendar and work shifts, Routings, Parallel scheduling, “Send ahead” functionality for Just-in-Time (JIT) production;
- Machine Centers. Allocates work and machine centers as capacities to the manufacturing process;
- Finite Loading. Finite loading of capacity constrained resources. Capacity constraints taken into account (to help planners make more reliable plans).

4. CRITICAL SUCCESS FACTORS MODEL

The enterprise which evolve in today’ economy must face the globalization process, as a result of large area market policy and very strong IT influence, with many failure dangers. There is rarely a single reason for failure. Usually many things contribute to it. Also, failure at one step contributes to failure at the successive steps.

The importance of management commitment is critical. Lack of commitment appears as a major cause in most of the failures. Also, poor testing is often the culprit. Testing can be seen as an impediment to going live, and is often overlooked, especially if the deadline is looming and the project is late.

When failure occurred, the company typically buckled down and made it work. Quitting was not an option. Most of these companies are now successful and wiser ERP users.

Worldwide there have been 30,000 ERP installations. Many have been problematic but problems are a fact of life. But many have been well executed.

We start with a very basic framework of the research, having in mind that the information systems are defined as a territory within organisations inhabited by processes, technology (hardware, software, and databases) and employees.

The most important domains illustrated in Fig. 4 are the Technology and Process domains with further levels that occur in ERP implementation success, sustaining the BRP efforts in two major directions: adopting new technologies and changing the way of doing business. For example, in the technology dissatisfaction can occur from technical, substantial, but also for strategic failure reason. Identifying critical success factors and related with reasons of failure offer an start framework of best practices in ERP implementation.

Furthermore, we detailed the four domains, shown in Fig. 5, into thinner image (e.g. conceiving technology critical success factors as sum of effects produced by integration, improvement, functionality, maintenance and dissatisfaction).

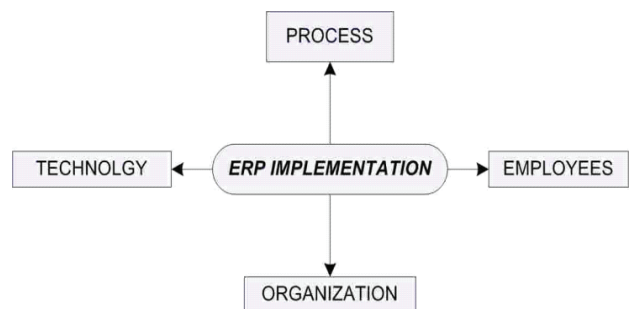


Fig. 4. Basic ERP critical success factors for ERP implementation.

TECHNOLOGY	ORGANIZATION	PROCESS	EMPLOYEES
INTEGRATION ☆	INCREASED BUSINESS PROFIT ☆ ★	PROCESS REENGINEERING ☆ ★	INDIVIDUAL BENEFIT ★
IMPROVEMENT ☆ ★	SERVICE AND QUALITY ☆ ★	IMPROVING INFORMATION ☆ ★	COLLECTIVE BENEFIT ★
FUNCTIONALITY ☆ ★	IMAGE BENEFIT ★	INFORMATION STANDARDISATION ☆ ★	
MAINTENANCE ☆ ★	INTEGRATION VISION ☆ ★		
DISSATISFACTION ☆ ★			

☆ TECHNICAL REASON
 ★ STRATEGIC REASON
 ☆ ★ SUBSTANTIVE REASON

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Fig. 5. Reasoning and information system domains model specifications.

Also we link the domain with reasoning, technical, substantive and strategic issues with the level of major four domains, for each level having one or more reasoning.

There are also very important the Organisation and Employees aspects regarding ERP implementation, viewed from changing Organization and Employees working concept, encouraging using and benefiting the results of an integrated ERP system (Fig. 4).

5. CASE STUDY

GUZU CHIM is one of the most important paints and construction materials producers in Romania, with 2.6 million of Euro revenue, 370 employees and two production units.

From business point of view, GUZU CHIM specific consist in very complex manufacturing process, being defined as *process manufacturing*. Former GUZU CHIM technology support for enterprise resource planning, used two different applications, without possibility of automate date transfer. For this reason, the inventory has up to one month and half registration delay, making forecasting and budgeting an impossible mission. Also, the manufacturing process changes were unable to be tracked in a short period of time. The reports were hard to obtain with up to date and valid data.

The requirement fro new ERP implementation has a strong focusing on managing and controlling complex manufacturing processes, integration with other business activities as: financials, general ledger, suppliers and customers management. The Microsoft Dynamics Nav implemented on GUZU CHIM is used by 30 employees from manufacturing, accounting, financial and sells departments, with more then four thousand medium registrations per month, doubling this value for busiest periods. As technical, infrastructure was used a client-server configuration, with three-tier architecture, based on Windows Server 2003, with common DBMS as SQL Server 2000 and Microsoft Dynamics Nav as application server.

Also, an important issue was the employees' resistance to changes, as a result of substituting the distributive information system with a centralized and integrated one. Encouraging of using and benefiting the results of an integrated ERP system was accomplished by ER Consultants from AGER Solutions, having a great role in implementation success. The success of the ERP implementation may be measured by its benefits, and this case we underline:

- track rapidly manufacturing changes and research results;
- real-time manufacturing forecasting and control;
- on-line inventory, sustaining the supplying and manufacturing activities;
- obtaining automate manufacturing planning suggestions, based on inventories and sells orders;
- easily obtain reports, containing up to date information.

6. CONCLUSION

The contribution of this paper is related to defining the business requirements for e-economy, where several

aspects where mention, based on previous authors' research in Virtual Enterprise domain, conceptualization and defining ERP features and limitations. Also, we contribute by identifying and modeling the relationship between major four implementation domains (technology, organization, process and employees) and reasoning of failure (technical, substantive and strategic reason). The case study presented is a recent ERP implementation in Romania, having as ERP Consultants AGER Solutions with Microsoft Romania support, being used for it complexity and high risk of failure, changing employees work conception is an authors' constant effort, by promoting collaborative framework and using the integrated information systems, research and education activities.

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