

# Case Study of PLIVA Pharmaceuticals Inc. - Aligning ERP System Implementation with Business Process Change

Vesna Bosilj Vuksic and Mario Spremic  
*University of Zagreb, Graduate School of Economics and Business*  
*Department of Information Science and Business Computing*  
*10000 Zagreb, Croatia*  
*E-mail: [vbosilj@efzg.hr](mailto:vbosilj@efzg.hr) or [mspremic@efzg.hr](mailto:mspremic@efzg.hr)*

**Abstract.** *The main objective of this paper is to present the impacts of information technology (IT) and enterprise resource planning (ERP) systems in business process renovation projects. A case study of business process reengineering project and the implementation of the SAP software solution in PLIVA (PLIVA pharmaceuticals, Inc) is presented.*

**Keywords.** business process change, enterprise resource planning (ERP), business process reengineering (BPR), case study, SAP, PLIVA pharmaceuticals Inc.

## 1. Introduction

The nineties of the last century had a focus on changing the business processes hand in hand with the introduction of new information technology (IT). Recent research papers demonstrated the critical role of information technology in business process restructuring projects (Grant, 2002; Arora and Kumar, 2000). Several authors have claimed that Hammer's well-known business process reengineering (BPR) definition is too limited as it suggests BPR is about making changes to processes, while IT plays only an enabling role (Grant, 2002; Koch, 2001; Siriginidi, 2000). The contributions of IT in BPR could be categorized in two different ways (Chang, 2000). Firstly, IT contributes heavily as facilitator to the process of reengineering. Secondly, IT contributes in the reengineering process as an enabler to master the new process in the most effective way (Davenport and Short, 1990). It must be stressed that IT applications have the strongest impact on the standardization or elimination of process variations. For that reason, BPR and IT infrastructure strategies, both of which are derived from organizational strategy, are in need of effective alignment to ensure the success of the BPR initiative (Al-Mashari and Zairi, 1999).

According to the discussion presented above, the primary objective of this paper was to examine the relationship between IT, ERP and business process change. The role of ERP systems implementation in reengineering business is provided in Section 2. A case study of ERP system solutions and BPR project implemented in the pharmaceutical company PLIVA is described in Section 3. The results of the research are discussed in Section 4. Finally, the conclusions outlining the main findings of this paper are presented in Section 5.

## 2. The role of ERP in reengineering business practices

In the past, companies used to customize software solutions to support and automate their business processes. This was changed with ERP systems that required the business processes to be modified to fit the system (Davenport, 1998). Recent ERP solutions are modular and flexible, and thus can be customized to a certain degree. There are, however, constraints since major modifications are complex and extremely costly. The implementation delays and ERP product modifications could result in exponential growth in both direct and indirect costs.

From the above analysis, it would always be better to complete the BPR project prior to information system modelling and ERP system development. Since the implementation of large information systems is not possible without business processes change, reengineering is essential to extract maximum benefit out of the ERP products.

However, analysis of business practices shows a different approach. Initiating BPR projects prior to ERP implementation means that the companies must provide resources for two successive projects. Many companies chose to conduct ERP system development trying to solve

the organizational problems without reengineering the processes.

ERP implementation significantly impacts company culture, organizational structure, business processes, procedures and rules. Furthermore, ERP applications integrate many best business practices and much knowledge that could be worthwhile if included as a part of BPR projects. By taking the best practices inherent in ERP applications, companies can change their processes simultaneously with technological change. As a result, many companies changed their business processes to fit the ERP system requirements, and the possibilities of ERP systems have been used to underpin BPR (Kooch, 2001, Chen, 2001). As ERP systems have traditionally taken too long to implement, a dynamic and incremental implementation of ERP components is recommended as opposed to massive reengineering.

It must be stressed that failing to match business processes with a company's ERP system can derail even the best-run firms. Managers and employees must be able to assess the technological and business process issues involved with specific ERP applications. It is well known that overcoming employee resistance can be a critical factor for the successful completion of a project and top management must provide leadership for all changes, efforts, objections and disagreements that arise in the process of reengineering and ERP implementation.

The synergy created and manifested by ERP and BPR, along with new employee energy can provide organizations with unprecedented capabilities they never envisioned prior to ERP implementations (Chenn, 2001). Ahmed (1999) also points out that evidence of practical experiences of success of business process change related programs require ongoing effort for at least three to five years, even reaching time frames of around 10-20 years for the realization of full potential. Consequently, the focus of ERP implementations has shifted from matching business processes with the ERP system to developing "knowledge-workers" that can quickly understand and work with redesigned processes and realize the ERP-enabled benefits.

It must be stressed that certain benefits can be directly evaluated and predicted, while others are

more difficult to measure or evaluate (intangible benefits). According to Murphy and Simon (2002) ERP benefits framework was divided in several dimensions: operational, managerial, strategic, IT infrastructure and organizational. The operational benefits (like cost reduction, cycle time reduction and productivity improvement) are tangible, measurable and quantifiable, while the majority of the strategic and organizational benefits could be considered intangible. Some intangible benefits might be the improved image of a company as a whole, an increased market share, better relationships with business partners, increased customer satisfaction, better data quality for business decision making and better working relationships with suppliers.

### **3. Case study of a pharmaceutical company PLIVA**

PLIVA is the largest pharmaceutical company by turnover in Central and Eastern Europe that consists of 44 legal entities, has 5 major business divisions (research, fine chemicals, pharmaceutical, OTC, DDI) and 9 strategic/corporate divisions (development, regulatory affairs, finance, human resources, IT, quality assurance, legal affairs, corporate communications and engineering). PLIVA employs almost 7500 people in 33 countries (including 120 IT professionals not including out-of-house consultants), has 5 main production locations (Croatia, Czech Republic, Poland, Germany and USA) and 43 subsidiaries in 23 countries.

PLIVA continues to expand its operations with recent acquisitions of pharmaceutical and R&D companies in the Czech Republic, France, Germany, United Kingdom and USA. With increasing efforts concentrating on the global pharmaceuticals market, PLIVA has divested its cosmetics, food and agrochemicals production units as stand alone companies.

#### **3.1. SAP software solutions in PLIVA**

The development of a modern ERP system to support these business operations, began in 1995/6 with projects intended to advance individual modules or sectors of IS. Pressured by a lack of time for independent development of a

new integrated system, the management decided on the purchase of the SAP software solution (alternatives were IBM, BAAN and Oracle).

During the implementation of the IS, the consulting company PriceWaterhouseCoopers conducted a reengineering project, or the reorganization of business operations aimed at determining the key sectors of future operations: the 'core business'. Though these were two fully independent projects, they were harmonized at the level of the steering committee.

SAP modules were implemented through 4 phases:

**1) 1996-1997.**

- SAP 3.0 modules: FI-Financials, CO-Controlling, BC-Basis components,
- UPGRADE SAP 3.0-3.1 H

**2) 1998-2000.**

- modules: MM- Materials Management, PP:- Production Planning, QM-Quality Management, SD-Sales & Distribution, WM- Warehouse Management, HR-Human Resources,
- UPGRADE SAP 3.1H-4.0B-2000 (JAN)
- UPGRADE SAP 4.0B-4.6 C 2000 (JULY)

**3) 2001.**

- modules: SAP PP-PI-Production Planning- Process industries-extension of PP module
- QM module-advanced functionality of Quality control
- PM-Plant Maintenance

**4) 2002.**

- International roll-out

A thorough review of the information system according to SAP specifications and standards was also conducted, and the implementation of the following modules was planned in 2003:

- SCM- Supply Chain Management,
- BIW- Business Information Warehouse,
- Project Systems, and
- Treasury

### **3.2. The analysis of SAP software implementation in PLIVA**

According to the respondents (IT managers) who participated in the survey conducted in January, 2003, the process of preparations and

employees training and education lasted 4 months in 2 shifts, which included 700 employees (average training period of 7 days per employee). The transfer of operations to the new system (in the second phase of implementation) lasted 12 days, as the problem of shifting from the old coded system (taking over 'old' data) needed to be resolved. During the transfer to the new system, operations were halted for 10 days, while inventory and a detailed financial harmonization were conducted.

In addition to resistance to change (particularly emphasized with warehouse employees), the most significant problems in the system implementation were in the weak experience and quality of consultants who bid in the public tender, the lack of time and the specificity of the pharmaceutical industry (strictly regulated quality of raw materials, the obligation of non-stop production).

During the implementation of the new information system, and in running information systems in general, project organization with the usual participants stands out: the project sponsor, steering committee, project teams, team leader (most often a person outside the information specialization), functional teams and team members.

An interesting organizational solution used in PLIVA are the validation teams, which are separated from the project teams, having the task of control the teams' work, measuring harmonization with business plans and goals and coordinating the cross-functionality of teams. The validation team is led by a person from Quality Assurance (QA)), responsible for validating the information system. The members of the validation team are also team leaders for the remaining teams in the project.

It must be also pointed out that the IT Department in PLIVA has a strategic position in the company. It is directly responsible to the top-management and is organized as a profit center, meaning that daughter companies are billed for the transfer, implementation and use of the existing IS in the daughter companies (roll-out in 2003 in Czech Republic and 2004 in Germany). Considering that PLIVA has over 1500 SAP licenses, a help desk, ABAB programmers, highly educated employees (18 employees are SAP consultants) and an organizational

management for user support, all the conditions have been set for PLIVA to become a SAP Customer Competence Center (certification in progress), which would then reduce the costs of license maintenance on 20%.

In 2001, the PLIVA IT Department achieved USD 1 million in revenues. Information strategy stems from the strategic business plans, in which 2% of revenues are earmarked for IT, and the IT Committee gives global initiatives and a strategic development direction. In addition to the plans to implement new ERP modules (SCM, CRM), PLIVA also plans in the near future to create a unique methodology for project management.

#### **4. Discussion and evaluation of the research results**

The results of this survey could be compared with the research about ERP systems in Croatia conducted by Fertalj et al. (2002) and the research about BPR projects in Croatian companies conducted by IT researchers from the Department of Information Science and Business Computing of the Faculty of Economics and Business in Zagreb (Croatia) in 2002 (Spremic, 2002), which is going to be described briefly.

The key objective of this research was to examine a number of issues regarding BPR practices on a sample of the '400 Largest' Croatian companies, ranked according to 2001 annual revenues. A similar survey was conducted in 2000 (Bosilj-Vuksic et al., 2001) on the same sample ('400 Largest' Croatian companies according to the annual revenues) and with exactly the same questionnaire, which formed a solid basis for discussion and analysis of trends. Both surveys showed very similar results about the implementation of BPR projects in Croatian companies. Major barriers to the successful implementation of BPR projects in surveyed Croatian companies were: difficulties in recognizing 'key' business processes, poor preparations for massive organizational changes, unwillingness for any change, lack of business function interactivity and horizontal interoperability, lack of vision, lack of strategic planning, lack of motivation and employee support, poor education planning and an overall resistance to organizational change. According to the results, it could be concluded that management in the surveyed Croatian companies

had a reactive attitude toward process innovation projects and to BPR projects.

The following conclusions, similarities and differences between the results of PLIVA case study and the surveys referenced above, are obtained:

- The results of research on BPR projects conducted in the '400 Largest' Croatian companies (Spremic, 2002) showed that the management of Croatian companies primarily had a reactive approach to process of business innovations – this hypothesis did not prove to be true in the case of the pharmaceutical company PLIVA, where a BPR project was conducted side-by-side with the implementation of the ERP system. The case study of PLIVA proves the assumption that the successful implementation of the ERP system has to be accompanied by an appropriate BPR project. It could be concluded that the final results are positive even when these are completely separate and independent projects, but strongly harmonized at the level of the project steering committee. In this respect, the PLIVA case is interesting as this is an international company which has dedicated much attention to employee training (and which has had standing cooperation with the Management Center Europe for many years) with the goal of achieving maximal flexibility and readiness for constant organizational changes (organizational change and change management training. This long-standing cooperation has resulted in an internal training program which PLIVA employees carry out according to the methodologies of the Management Center Europe.
- The project of implementing 4 phases of the SAP software solutions implementation lasted 3-4 years, which agrees with the research on ERP system application in Croatia (Fertalj *et al.*, 2002). The length of implementation time of such a system can be critical as valuable business resources are engaged over the long term, frequently with an uncertain ending, as it was in a case of SAP system implementation in Nestlé USA (CIO, 2002). On the other hand, the phase-by-phase approach used in the case of PLIVA could be assumed as the critical factor of successful implementation.

- According to PLIVA experts, it was very difficult to find experienced and good quality SAP consultants. As such, PLIVA was forced to repeat its public tender for consulting services several times as they were not satisfied with the services offered. The same problem was pointed out in the research conducted by Fertalj et al. (2002).
- High costs of consulting services were stressed in the research done by Fertalj et al (2002). However, the case study of PLIVA showed that the high initial consulting costs could be reduced if the employees themselves become consultants (18 employees are SAP consultants). Besides, PLIVA has achieved all the criteria necessary to become a SAP Customer Competence Center, which would thus reduce license fees from 22% to 18%.
- According to the both surveys, the organizational changes and business process standardization were required. In the case of PLIVA, the project of ERP system implementation and the BPR project were independent, but coordinated at the level of the project steering committee, which permitted the proper execution of wide-reaching organization changes and contributed to the overall success of the ERP system implementation.
- better visibility of the 'workflow systems' and their coordination,
- secured forecasts of money flows and planning of available financial resources for a more rapid execution of all business processes,
- centralized supply (6-7 employees for the entire company) as a result of the BPR project.
- better (monthly) production planning (based on market needs and standing inventory)
- better flexibility of the system with regard to business decisions,
- automated warehouse (implementation of real warehouse with optimized selection and delivery of products)
- well-informed decision making, new quality in planning and forecasting.

## 5. Conclusions

Information system presents the connective tissue of business, as it connects various sectors of the business system, various business organizations, various business functions and process, thus permitting efficient coordination and control of overall business operations. The implementation of a new ERP system will not bring the expected benefits if it is not accompanied by a change in human behavior and in organizational regulations. There is no point in implementing a new ERP system if a business will then simply continue with its old, inefficient ways. Therefore, the implementation of ERP systems must be accompanied by a thorough change of business processes, procedures and rules.

In this research, the advantages and the benefits (tangible and intangible), as well as the problems, of the BPR and the ERP implementation projects were analyzed, discussed and compared to the similar research. The results have supported the assumptions on the need for parallel projects of the organizational change and the implementation of new programming solutions. The most critical issues of IT and business process change adoption have been recognized, but there are still other factors that have to be identified and analysed. The authors will continue this research, comparing similar projects in other companies in Croatia and abroad, in order to secure credible results and comparisons on a large sample size.

The results achieved by ERP and BPR projects in PLIVA improved the process performance in terms of time and costs and can be summarized as follows:

- reduction of overall inventory by at least 30%, thus increasing the coefficient of turnover,
- reduction of product delivery time to the buyer from 4 days to 24 hours,
- reduction of the number of employees by 20-30% in functions where the new system was implemented (redistribution of work meant savings),
- reduction in the number of complaints due to mistakes in delivery (complaints reduced to a minimum)
- reduction of time of payment by 30% with the implementation of the buyer's credit limit.

The basic intangible benefits from the implementation of the new ERP system in PLIVA are:

## Acknowledgements

The authors are grateful to the IT managers of surveyed Croatian companies who took the time to respond to the questionnaire and to those who participated in the conducted survey. We also gratefully acknowledge the contributions of Marijo Volarevic, Head of IT End-User Support in PLIVA and Mirko Slovljak, Head of Corporate IT Business Support in PLIVA, who participated in interviews and provided in-depth knowledge for the PLIVA case study research.

## REFERENCES:

1. Ahmed, P.K. (1999), "Magic bullets of process change? TQM and BPR", *Business Process Management Journal*, Vol. 5, No. 4, pp 294-296.
2. Al-Mashari, M., and Zairi, M. (1999), "BPR implementation process: an analysis of key success and failure factors", *Business Process Management Journal*, Vol. 5, No. 1, pp 87 – 112.
3. Arora, S. and Kumar, S. (2000), "Reengineering: A Focus on Enterprise Integration", *Interfaces*, Vol. 30, No. 5, September-October 2000, pp. 54-71.
4. Bosilj-Vuksic, V., Spremic, M., Kovacic, A., (2001): *Managing Change Toward e-Business Era: Slovenian and Croatian Perspectives – invited paper*, *Proceedings of Days of Slovenian Informatics - DSI 2001*, Portorož, Slovenia, pp. 12-28.
5. Chang, S. L. (2000), *Information technology in business processes*, *Business Process Management*, Vol. 6, No. 3, pp 224 – 237.
6. Chenn, I.J. (2001), "Planning for ERP systems: analysis and future trend", *Business Process Management Journal*, Vol.7, No. 5, pp. 374-386.
7. CIO (2002), "Nestle ERP Odyssey – December2002", <http://www.cio.com/archive/051502/nestle.html>
8. Davenport, T.H. (1998), "Putting the enterprise into the enterprise system", *Harvard Business Review*, Vol. 76, No. 4, pp. 121-31.
9. Davenport, T.H. and Short, J.E. (1990), "The New Industrial Engineering: Information Technology and Business Process Redesign", *Sloan Management Review*, pp 11-27.
10. Fertalj, K., Mornar, V., Kovac, D., Hadina, N., Pale, P. and Zitnik, B. (2002), "Komparativna analiza programske potpore informacijskim sustavima u Hrvatskoj", *Projekt primjene IT proveden uz potporu Ministarstva znanosti i tehnologije*.
11. Grant D. (2002), "A Wider View of Business Process Reengineering", *Communications of the ACM*, February 2002, Vol. 45, No. 2, pp 85-90.
12. Koch, C., (2001), "BPR and ERP: realising a vision of process with IT", *Business Process Management Journal*, Vol.7, No. 3, pp. 258-265.
13. Murphy, K.E. and Simon, S.J. (2002), "Intangible benefits valuation in ERP projects", *Information Systems Journal*, Volume 12, Issue 4, October 2002 - Special Issue: Information Systems Evaluation, pp 301-320.
14. Siriginidi S.R. (2000), "Enterprise Resource Planning in Reengineering Business", *Business Process Management Journal*, Vol. 6, No. 5, pp. 376-391.
15. Spremic, M., (2002): *Perspektive unaprijedjenja poslovanja hrvatskih kompanija primjenom poslovnog reinzenjeringa*, *Suvremeno poduzetnistvo*, br. 5, svibanj, 2002, pp. 161-169.