

ERP SYSTEM IMPLEMENTATION IN FMCG SECTOR

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Professional paper

Today's businesses have become extremely complex. Enterprise Resource Planning (ERP) systems can help enterprises to reduce operating costs, generate more accurate forecasts of demand, accelerate production cycles and enhance customer service. This paper reports challenges, opportunities and outcome of ERP implementation in a top Fast Moving Consumer Goods (FMCG) house in South-East Asia with diversified interests in varied businesses. This study will facilitate the understanding of the transition, constraints and implementation of ERP in this sector and also provide guidelines from lessons learned in this regard to researchers and practising managers.

Keywords: ERP, FMCG, Logistics, Implementation, SAP, Supply Chain

Uvođenje ERP sustava u sektoru brzog kretanja potrošačkih roba

Strukovni članak

Današnja su poduzeća postala vrlo složena. Sustavi planiranja resursa poduzeća (ERP - Enterprise Resource Planning sustavi) mogu pomoći poduzećima da smanje operativne troškove, točnije prognoziraju potražnju, ubrzaju proizvodne cikluse i poboljšaju usluge korisnicima. U radu su izloženi izazovi, mogućnosti i ishod primjene ERP sustava u jednoj od najvažnijih tvrtki koja se bavi brzim kretanjem potrošačkih roba (FMCG - Fast Moving Consumer Goods) u jugoistočnoj Aziji uz raznoliki interes u raznovrsnom poslu. Ova studija će olakšati razumijevanje tranzicije, ograničenje i uvođenje ERP sustava u ovom sektoru, a također će pružiti smjernice iz naučenih lekcija istraživačima i menadžerima vježbenicima.

Ključne riječi: ERP, FMCG, logistika, opskrbni lanac, SAP, uvođenje

1

Introduction

Uvod

Enterprise Resource Planning (ERP) is an integrated set of subsystems that integrates all facets of the business, including planning, manufacturing and logistics, sales and marketing. ERP systems are originated to serve the information needs of manufacturing companies. Over time though, they have grown to serve other industries, including financial services, customer good sector, supplier chain management and human resource sector. With this growth, ERP systems, which first ran on mainframes before migrating to client or server systems, are now migrating to the Web and include numerous applications. ERP is a product that helps automate a company's business processes by employing an integrated user interface, an integrated data set, and an integrated code set. ERP provides two major benefits that do not exist in non-integrated departmental systems: (1) a unified enterprise view of the business that encompasses all functions and departments; and (2) an enterprise database where all business transactions are entered, recorded, processed, monitored and reported [1]. This unified view increases the requirement for, and the extent of, interdepartmental cooperation and coordination. ERP systems are complex and implementing one can be a challenging, time-consuming and expensive project for any company [2]. ERP provides numerous promising functions – such as integration and automation of business processes, promoting common practices, sharing data across the organization, and providing real-time access to the information [3, 4]. Integration of ERP systems with legacy systems is more complex than the integration of ERP modules and integration of e-business applications. It routinely requires the installation of third-party interface software for communication between ERP software systems and legacy systems [5]. Implementation of ERP is a complex exercise, and many adopters have encountered

problems in different phases [6, 7]. Many cases of the failure to implement ERP because of either cancellations or cost/time overruns have been reported [8, 9]. An ERP implementation can take many years to complete and costs tens of millions of dollars for a moderate size firm and more than \$100 million for large organizations [10]. Implementing an ERP system is a major undertaking. Although the benefits of a properly implemented ERP system are significant, the price of a poorly implemented system is also great [11]. About 90 % of ERP system implementations are late or over budget [12] and the success rate of ERP systems implementation is only about 33 % [13, 14, 15]. Mabert et al. [15] suggested that case studies and interviews facilitate to obtain reliable and detailed information on the current status of ERP practices and ERP implementations. They further argued that most implementation projects are unique in many ways in spite of many common underlying issues, activities and strategies. To meet deadlines and also the budget targets, ERP projects have to be planned very carefully and managed very efficiently [15]. The high failure rate in the implementation of ERP calls for a better understanding of the process [16]. Limited research has been conducted about ERP implementation issues in FMCG sector and mainly in the form of individual organizations case studies only. Implementation failures, challenges and problems are still not documented in the literature [5].

In the context of ERP project implementation, challenges represent major pitfalls, which, if not addressed, would definitely cause the failure of a project. Therefore, it is important to understand the real life implementations, problems and related scenarios in detail. This paper is organized as follows: First ERP implementation related literature is reviewed. The next section includes the case study of a real life ERP (SAP) implementation which, through effective integration followed by lessons learned, has improved supply chain management. Section 5 summarizes conclusions.

2

Literature review

Pregled literature

ERP systems, similar to other management information systems, are often perceived as very complex and difficult to be implemented [17, 7]. System implementation success depends on many factors. ERP system evaluation, vendor selection, the ERP consultant, implementation plan and execution are all critical to the success of implementing an ERP system [18]. The inability of some firms to successfully implement and utilize enterprise systems to increase organizational outcomes has been a source of concern for both practitioners and academia [19]. The evidence of enterprise implementation failures go back to the late 1990s [20, 21, 2]. For many organizations, ERP systems are the largest systems they have worked with in terms of financial resources invested, the number of people involved and the scale of implementation [18]. Several recent cases of ERP system implementation have experienced considerable difficulties [22, 23, 24, 25, 7]. The failure rate of ERP implementation is very high [25]. Among other obstacles, technical problems and people obstacles have been cited as the major barriers [26, 23]. The types of problems and issues that arise from the implementation of ERP systems range from specific issues and problems that can come up during the installation of an ERP to behavioural, procedural, political and organisational changes, etc. that manifest themselves once the system is installed. In case of ERP successful implementation is urgent, since the costs and risks of these technology investments rival their potential pay-offs [27]. Failure of ERP, system implementation projects may lead to bankruptcy [2, 28, 29, 30]. A study of 100 projects by Sirkin and Dikel [31] show that their sponsors considered them successful in only one-third of the cases and that tangible financial impact was achieved in only 37 % of cases. Markus et al. [29] suggest that ERP systems are inherently flexible which means that stakeholders have many opportunities to influence the form of technology during the initial decision-making, development, implementation and also the use of the system. They further argued that many problems related to ERP-implementation are related to a misfit of the system with the characteristics of the organization. This is supported by Davenport [2] that "ERP tends to impose its own logic on a company's strategy, culture, and organization" which may or may not fit with existing organizational arrangements". Although ERP systems are functionally wealthy, standardizing organizational processes with these systems is often difficult [32]. It is found out that many firms that have experienced success with ERP, have comprehensively reengineered their organizational processes and structures as a method for enterprise-wide transformation [33]. In case of implementing an ERP system we should put more effort in customizing ERP modules to compile with the existing workflow, report formats and data needs [18]. Second generation ERP systems use a relational database management system (RDBMS) to store enterprise data. Data conversion from legacy systems to RDBMS is often a time-consuming and tedious process. Integration of the business processes also faced additional challenges related to new rules built into ERP software and their incompatibility with the established ways of thinking and the norms of behaviour embedded in the existing work routines [5]. Involving users as early as possible in system

implementation is generally a good strategy [34]. As an enterprise system, the success of ERP implementation requires a close cross-functional cooperation [35]. Effective integration is the key because if one of these links fail, the organization's performance may suffer and may not meet the expectations of its customers or the service level of its competitors. The primary benefit of integration is that all business units and supply chain partners share the same data, and synchronize actions and minimize distortions in demand management [36]. Further evidence from literature shows that, although many organizations are using some modules of an ERP system, they do not see themselves to be equipped with ERP [37, 38, 39].

The ERP system is an increasingly popular management tool to reshape a business or organization. Generally, the case study method is a preferred strategy when "how" and "why" questions are being posed, and the researcher has little control over events [40]. The case study method, a qualitative and descriptive research method, looks intensely at an individual or a small group of participants, drawing conclusions only about the participants or the group and only within in the specific context [40]. The case study method is an ideal methodology when a holistic, in-depth investigation is required [41]. The case study method has been proven to be a useful tool in investigating the problems of ERP implementation [42, 43, 44, 45].

3

Case study

Predmet proučavanja

3.1

Background of the company

Pozadina tvrtke

Company ABC is one of the top FMCG houses in South East Asia with diversified interests in varied businesses. Its areas of operation are FMCG, hotels and agro business. The strength of company ABC lies in the distribution network spread over the geography, covering more than a million retailers, and to service this, the manpower involved is multifold. To succeed today, and to pave the way for a better future, organizations need to create strong linkages with their business partners using the concept of supply chain management. Today more and more organizations are realizing the importance of developing and implementing a comprehensive supply chain strategy – and then linking this strategy to the overall business goals. Among four major dimensions of supply chain – namely supply chain strategy, supply chain integration, inventory management and IT, this paper focuses on supply chain integration through SAP implementation. The criticality of demand management and inventory management makes it necessary to look into the aspect of supply chain integration and inventory management respectively [46] which is of crucial importance in various industries [47]. The primary result of system integration for users in an enterprise should be an easier utilization of the system [48]. Integration and optimization of various business processes lead to improved planning and decision quality, smoother coordination between business units resulting in higher efficiency, and quicker response time to customer demands and inquiries [49]. By the time the implementation of an ERP system is completed, the strategic context of the firm may have changed [50].

By 1998, the company decided to automate its functions in-phase of reducing wastages and improve its bottom-line by increasing effectiveness and efficiency in its supply chain management system. The company had kept pace with technology over its evolution and has put in various best practices across function and divisions but global optimization was not being delivered. Duplication of data was happening at various chain ends, leading to inefficiency, and after having understood the advantages of integrated enterprise solution, the vision of the organization was very clear to provide the best IT solution for best performance. The supply chain strategy must holistically align with the business strategy. Due to weak alignment of supply chain strategy with business strategy, actions do not result in bottom-line gains. This is primarily due to the rigidity of the structure of the organizations along functional lines with department-specific performance measures [46]. This company follows the normal product supply chain of reaching products to the final consumer in the most cost optimal procedure possible.

3.2 IT Setup Postavka IT

Company ABC in keeping with technological advancements had developed various systems in parts to efficiently run its different departments. Manufacturing was supported by ManMan (Computer Integrated Manufacturing Software) and some standalone Ingress based systems. Marketing was supported by IBCC. Each system had its utility in the context of development and deployment, but one of the major hurdles faced by the organization was making each system communicate to each other requiring interpretation and translation out side system interface as each subsystem in different departments operated on a separate technological platform making communication between them impossible. This is one of the prime reason organization decided to move towards a full ERP solution.

Learning's from each system, benefits and negatives went into inputs for the development of the next system, improvements in technology, and expansion of the business were kept in mind in each development stage.

3.3 Weaknesses of IT applications Slabosti IT aplikacija

One of the main hindrances was data flow from various quarters in various forms and the issue of consolidating the same to get the overall scenario, and forming strategies on the basis of the data. There were also technological differences to cope with; therefore, various elements of supply chain coordination became a major hurdle. Duplication of job and extension of time lines were other issues, due to above mentioned reasons.

3.4 ERP implementation ERP provedba

At the initial phase, the company developed a steering committee with top and middle level managers. They evaluated various packages in the world by means of site

visits of other organizations which had already implemented SAP. Finally, the organization decided to go with SAP.

The steering committee also provided functional support for SAP implementation. IBM & SAP jointly were selected for ERP implementation. External consulting was provided by PwC (Pricewaterhouse Coopers). It was decided that initial user training would be provided by PwC. Finally, kick off has been started. The number of core members started with 9, and went up to 16 and the number of consultants started with 15 and finally reached 30, who were experts on functional, ABAP (Advanced Business Applications Programming) and BASIS (Languages in SAP to customize solutions). The strategy followed by the company for implementation is the big-bang method. SAP solution for the company's requirements is given in the Figure 1. There are some standalone systems (ex: wholesale distribution information system running at wholesale distributors location) that could not be changed and needed to be integrated with SAP.

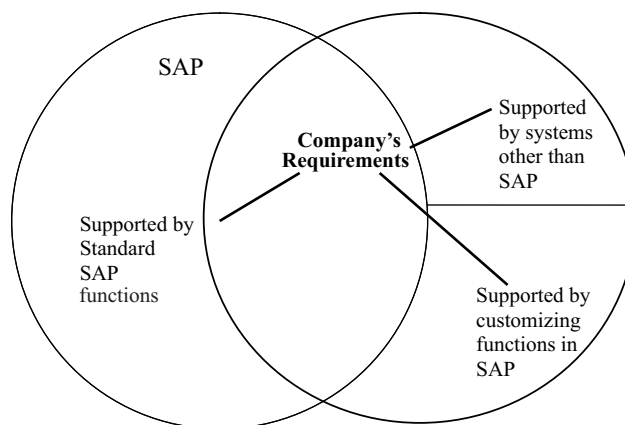


Figure 1 SAP solution
Slika 1. SAP rješenje

The SAP organization structure is the "backbone" of the SAP system and is "linked" to every transaction and master data element in the SAP system.

SAP organization structure should:

- Map closely the physical organization structure.
- Ensure that business transactions can be carried out smoothly.
- Ensure that information requirements for internal and external reporting are met.
- Clearly assign responsibility for organizational elements.
- Ensure authorizations and control mechanisms.
- Ease master data maintenance.

Following activities are performed during implementation:

- 3.4.1 AS-IS process study: Users from every level are involved in the business process study. Information is gathered from end-user level and then collated and moderated at all levels up to the highest position of the company.
- 3.4.2 TO-BE process finalization: Decisions are jointly taken by consultants and all levels of users. Consultants' contribution is the SAP functionality and users' contribution is related to the business processes that are to be incorporated.
- 3.4.3 Configuration: This process initially configures the product as per user requirements.

- 3.4.1 Gap analysis and resolution: This activity identifies the gap between To-Be process and SAP. These gaps are resolved by work-around and developments.
- 3.4.2 Business scenario development and testing: Business scenarios are prepared by end-users and these cases are treated as Test cases. Then the product that is getting configured is tested by end-users from various locations.
- 3.4.3 Addressing of TPRs (Total problem resolution)
- 3.4.4 Master Data collection and cleaning for uploading to Production Client: Master Data in SAP is the backbone of the system. It builds up the Inter-module and Intra-module interface in the system and transactions take place depending on master data. The efficiency and effectiveness of the system mainly depends on master data. Master data needs to be converted and should only be transported into SAP once the data is extensively cleaned up in the existing system. It includes vendors, customers, assets, Board of Management (BOM), machine masters, work centers, material master, etc. In addition to the master data, historical transaction data (e.g. accounting documents, Purchase Orders (P.O.), sales orders, General Ledgers (G.L.) records, Production orders, maintenance orders etc.) and control & customizing data (e.g. Currency rates, Unit Of Measure (UOM), plant, business areas, company codes, etc.) need to be converted and transported into SAP.
- 3.4.5 Training at all locations: Each department on a site had identified Site Champions & Super-users. Training hierarchy is established as follows:
- 1st Level: Super User
 - 2nd Level: Site Champion
 - 3rd Level: End User
- Training materials are prepared as per module and hierarchy. Then training took place at all locations of ITD as per hierarchy.
- 3.4.6 Data Transition
- 3.4.7 Security control by authorization profiles
- 3.4.8 Go Live: Activities for deployment day and resource positioning are:
- Positioning of all core team members and consultants across of all key locations.
- The decisions that:
- Central Helpdesk would start operating and provided 24X7 coverage for first two weeks after going live.
 - Central Helpdesk would be connected through phone/fax/SAP mail/Lotus Notes.
 - Ongoing support would be provided by competency center at Head Office.
 - Competency center would be manned for 24 hours by Senior Consultants and Core Team members.
 - Legacy system would be "Switched off" (Except stand alone systems).
 - Detailed communication would be sent all across.
 - Accountability would be defined for all users
- 3.4.9 Integration of WDIS (Wholesale Distribution Information System) to SAP: WDIS is a stand-alone, customized software developed by the company for capturing data at dealers distribution centres running on Visual Basic as application front-end with Oracle as back-end database. Oracle is used for security and scalability. It runs at WD (wholesale distributor) location. WDIS is used in WD (wholesale distributor) to provide daily/weekly sales information to the

company that can be used to correctly figure out the stock position in WD location. It is also used by WDs to know the status of delivery order, trading balance and WD pipeline. WD enters sales information on regular (daily or weekly) basis in WDIS.

Information Flow:

WD → ABC

- SPR (Special Requisition-due in detail update)

ABC → WD

- Delivery Order
- Updated Training Account Balance
- WD relevant master Data (e.g. WD Master, Product Master, Product Category Master)

It is integrated with SAP by using the following steps:

- This information is synced with SAP by connecting through the Internet into a staging Server.
- Information flows in an encrypted XML format over the network between WDIS and staging Server and then from staging server to SAP for further Production Planning & Procurement.
- SAP sends WD related data and master data to the staging server.
- This data gets transferred over to WDIS, once the WD syncs over the Internet.

3.5

Challenges during implementation

Izazovi tijekom provedbe

In order to bring efficiency to their processes, the company had implemented ERP to keep online information about their manufacturing plants, distribution points, distributors and retailers. After identifying the need for integration, other key issues during implementation were:

- SAP and non-SAP data interface
- Implementation for pilot site with parallel run
- Activities in data conversion
- Standardizing the master data across locations as master data in SAP is the backbone of the system. It builds up the Inter-module and Intra-module interface in the system.

ERP deployment had lead to an increase in operational efficiency; however to follow continuous evolution (change management) is part of the ERP implementation towards its success to all stakeholders.

Change management is a systematic approach to deal with change, both from the perspective of an organization and that of an individual level. Successful adaptation to change is as crucial within an organization as it is in the natural world. The more effectively we deal with change, the more likely we will thrive. Two main issues that were faced by the company were uncertainty and insecurity. To overcome uncertainty, and insecurity, the following procedure was followed:

- Involvement and communication all through the project.
- User Involvement for preparing business scenario and testing.

- Training and confidence building (Motivation)
- Leading role played by super users during the training.

4

Post implementation scenario

Scenarij nakon provedbe

FMCG enterprise requires consolidating their information base that's been accumulated from different sources. As the company has operations spread across a wide area, the major problem is data integration. The company had deployed ERP systems to optimise the distribution network and improve delivery mechanisms. Implementing ERP solutions has led to an improvement in the service levels of the organization vis-à-vis their dealers, through the redressal of potential stock-out situations. This has also been made possible due to better visibility of sales, inventory and production in progress data.

Some key changes that took place are:

- Integration between marketing and factories.
- Better visibility and sharper focus.
- Invoices generated at branches.
- Delivery Order printed at godowns/Warehouses.
- Raw materials, spares procurement through MRP (Material Requirements Planning).
- Raw material issues are being back flushed, with actual stock declaration at day end.
- OCM (Organizational Change Management) to feed direct data through SAP.
- Enhancement, Support and new requirements are addressed by central competency center.
- Master data is controlled centrally.

The Post-Implementation activities are as follows:

- New requirement and enhancement
- Training
- System audit review
- Inter-functional interface
- Master Data
 - o Creating new master data for new product, location, etc.
 - o Changing of existing Master Data
- Providing training to end-users, as and when required
- Controlling of SAP access and authorization.

The company had great expectations for SAP and was aiming to collect immediate benefits after the implementation. The overall project achieved both of the primary goals - timeline and cost. However, post-implementation progress did not occur as the company expected it to. Many areas remained 'out of SAP', data residing in SAP was questionable for its accuracy, certain controls were still missing in SAP, and when compared to the previous applications or manual process, transactions were taking more time to complete in SAP. When these issues were realized at the top-management level, a SAP Review Committee was formed to conduct an assessment of the current situation and to develop an action plan. The team started working on the task and after assessing the situation and meeting with the key staff; the following was presented to management as feedback.

The overall project lacked appropriate change management during its implementation. The SAP was definitely a transformational project for the company where its scope involved the company-wide processes and almost

all the head Office based employees were expected to use the system. Another significant factor was the reduced training time for the end users. The project team wanted to complete the implementation phase and make an unfairly optimistic assumption about the 'train the trainers' approach.

5

Conclusion

Zaključak

This company's ERP implementation was one of the best and successful implementation systems undertaken by the organization in big-bang method. The implementation of the system tested out the limits of all participants, but the fruit was in the "On Time Go Live" of the system which very few organizations can claim credit to. The outcome of the project was the integration of all parts of the supply chain on a one single platform avoiding duplication of data, achieving commonality in language of system and tremendous saving of time in data compilation and interpretation. Resource productivity is improved and implementation of decisions and analysis of data on a collated level is better and this aids all related activity right from purchasing to supply of finished goods, bringing efficiency in the well laid out supply chain of the company. From this implementation experience, it can be seen that it is not a particular technology platform or software application that can transform a company. Instead, it is the way the company implements the technology that makes it successful.

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References

Literatura

- [1] Umble, E. J.; Haft, R. R.; Umble, M. M. Enterprise resource planning: Implementation procedures and critical success factors, *European Journal of Operational Research*, 146(2003), 241-257.
- [2] Davenport, T. H. Putting the Enterprise into the Enterprise System. *Harvard Business Review*, 76(1998)4, 121-32.
- [3] Shang, S.; Seddon, P. B. Managing Process Deficiencies with Enterprise Systems. *Business Process Management Journal*. 13(2007)3, 405-416.
- [4] Fox, P. The Art of ERP Done Right. *Computerworld*, 37(2003)20, 3-22.
- [5] Otieno, J. O. Enterprise resource planning (ERP) systems challenges: A Kenyan case study. W. Abramowicz and D. Fasel (Eds.): *BIS 2008, LNBIP 7(2008)*, 399-409.
- [6] Markus, M. L.; Axline, S.; Petrie, D.; Tanis, C. Learning from Adopters' experiences with ERP: problems encountered and success achieved. *Journal of Information Technology*, 15(2000)4, 245-265.
- [7] Xue, Y.; Liang, H.; Boulton, W. R.; Snyder, C. A. ERP implementation failures in China: Case studies with implications for ERP vendors. *International Journal of Production Economics*, 97(2005)3, 279-295.
- [8] Kumar, V.; Maheshwari, B.; Kumar, U. Enterprise resource planning systems adopting process: a survey of Canadian

- organizations, *International Journal of Production Research*, 40(2002)3, 509-523.
- [9] Scott, J.; Vessey, I. Implementing enterprise resource planning systems: the role of learning from failure, *Information System Frontier*, (2000), 537-544.
- [10] Mabart, V. A.; Soni, A.; Venkataramanan (2000) Enterprise resource planning survey of US manufacturing firms. *Production and Inventory Management Journal*, 41(2000)20, 52-58.
- [11] Sun, A. Y. T.; Yazdani, A.; Overend, J. D. Achievement assessment for enterprise resource planning (ERP) system implementations based on critical success factors (CSFs), *International Journal of Production Economics*, 98(2005), 189-203.
- [12] Martin, M. H. An ERP Strategy, *Fortune*, 2 February: (1998) 95-97.
- [13] Zhang, M. K. O.; Lee, L. Critical Success Factors of Enterprise Resource Planning Systems Implementation Success in China. In: *Proceedings of the 36th Annual Hawaii International Conference on System Sciences* (2003).
- [14] Arif, M.; Kulonda, D.; Jones, J.; Proctor, M. Enterprise Information Systems: Technology First or Process First? *Business Process Management Journal*, 11(2005)1, 5-21.
- [15] Mabart, V. A.; Soni, A.; Venkataramanan (2003) Enterprise resource planning: Managing the implementation process. *European Journal of Operational Research*, 146(2003), 302-314.
- [16] Somers, T.; Nelson, K. Enterprise resource planning for next millennium: development of an integrative framework and implications for research, in: *Proceedings of the Americas Conference on Information Systems*, Long Beach, CA, (2000) 998-1004.
- [17] Liang, H.; Saraf, N.; Hu, Q.; Xue, Y. Assimilation of Enterprise Systems: The effect of Institutional Pressures and the Mediating Role of Top Management. *MIS Quarterly*, 31(2007)1, 59-87.
- [18] Chang, M. K.; Cheung, W.; Cheung, C-H.; Yeung, J. H. Y. Understanding ERP System Adoption from the User's Perspective, 113(2008), 928-942.
- [19] Kumar, V.; Movahedi, B.; Kumar, U.; Lavassani, M. A Comparative Study of Enterprise System Implementations in Large North American Corporations. W. Abramowicz and D. Fasel (Eds.): *BIS 2008, LNBP 7*(2008), 390-398.
- [20] Hayes, S. Providing Enterprise Systems. *Practical Accountant*, 40(2007)2, SR11-SR11.
- [21] Hendricks, K. B.; Singhal, V.R.; Stratman, J. K. The Impact of Enterprise Systems on Corporate Performance: A Study of ERP, SCM, and CRM System Implementations. *Journal of Operations Management*, 25(2007)1, 65-82.
- [22] Goldberg, A. The ERP trap. *Upside*, 12(2000)11, 32.
- [23] Krasner, H. ERP Experiences and Evolution. *Communications of the ACM*, 43(2000)4, 22-26.
- [24] Wah, L. Give ERP a change. *Management Review*, 89(2000)3, 20-24.
- [25] Yeh, T. M.; Yang, C. C.; Lin, W. T. Service Quality and ERP Implementation: A conceptual and empirical study of semiconductor-related industries in Taiwan. *Computers in Industry*, 58(2007)8-9, 844-854.
- [26] Botta-Genoulaz, V.; Millet, P. A Survey on the Recent Research Literature on ERP Systems. *Computers in Industry*, 95(2006)2, 510-522.
- [27] Boonstra, A. Interpreting an ERP-implementation project from a stakeholder perspective. *International Journal of Project Management*, 24(2006), 38-52.
- [28] Fowler, A.; Gilfillan, M. A framework for stakeholder integration in higher education information system projects. *Technol Anal Strategic Manage*, 15(2003)4, 467-89.
- [29] Markus, M. L.; Tanis, C. Multisite ERP implementations. *Communications of ACM*, 43(2000)(4), 26-42.
- [30] McAfee, A. When too much IT knowledge is a dangerous thing. *Sloan Management Review*, 44(2003)2, 83-9.
- [31] Sirkin, H.; Diekel, K. Getting value from enterprise initiatives, Boston: Boston Consulting Group. (2001).
- [32] Genoulaz, V. B.; Millet, P. A. An Investigation into the use of ERP systems in the service sector. *International Journal of Production Economics*, 99(2006), 202-221.
- [33] Mische, R.; Bennis, W. Reinventing through reengineering. *Information Systems Management*, 13(1996), 58-65.
- [34] Tchokogue, A.; Bareil, C.; Duguay, C. R. Key lessons from the Implementation of an ERP at Pratt & Whitney Canada. *International Journal of Production Economics*, 95(2005)2, 151-163.
- [35] Motwani, J.; Subramanian, R.; Gopalakrishna, P. Critical Factors for successful ERP implementation: Exploratory findings from four case studies. *Computers in Industry*, 56(2005)6, 524-544.
- [36] Kalambi, N. Preparing for supply chain management: time is money, *Dataquest, special supplement*, (2000), 5-9.
- [37] Keil, M.; Tiwana, A. Relative Importance of Evaluation Criteria for Enterprise Systems: A Conjoint Study. *Information Systems Journal*, 16(2006)3, 237-262.
- [38] Rikhardsson, P.; Kraemmergaard, P. Identifying the Impacts of Enterprise System Implementation and Use: Examples from Denmark. *International Journal of Accounting Information Systems* 7(2006)1, 36-49.
- [39] Choi, J.; Ashokkumar, S.; Sircar, S. An Approach to Estimating Work Effort for Enterprise Systems Software Projects. *Enterprise Information Systems*, 1(2007)1, 69-87.
- [40] Yin, R. K. Case Study Research: Design and Methods, 3rd Edition, Sage Publications, Thousands Oaks, CA. (2003).
- [41] Feagin, J.; Orum, A.; Sjoberg, G. (Eds.) A Case for Case Study, University of North Carolina Press, Chapel Hill, NC. (1991).
- [42] Sheu, C.; Chae, B.; Yang, C. L. National differences and ERP implementation: issues and challenges, *Omega*, 32(2004)5, 361-371.
- [43] Sarker, S.; Lee, A. S. Using a case study to test the role of three key social enablers in ERP implementation, *Information & Management*, 40(2003)8, 813-829.
- [44] Voordijk, H.; Leuven, A. V.; Laan, A. Enterprise resource planning in large construction firm: implementation analysis, *Construction Management & Economics*, 21(2003)5, 511-521.
- [45] Motwani, J.; Mirchandani, D.; Madan, M.; Gunasekaran, A. Successful implementation of ERP projects: evidence from two case studies, *International Journal of Production Economics*, 75(2002)1-2, 83-96.
- [46] Sahay, B. S.; Mohan, R. Supply chain management practices in Indian industry, *International Journal of Physical Distribution & Logistics Management*, 33(2003)7, 582-606.
- [47] Maticević, G.; Lovric, T.; Cicak, M. Using ERP system to improve internal supply chain coordination, *Tehnički vjesnik*, 14(2007)3-4, 11-21.
- [48] Galeta, T.; Kljajin, M.; Karakasic, M. Supporting product development process through ERP system, *Tehnički vjesnik*, 15(2008)2, 25-34.
- [49] Mishra, A.; Mishra, D. Enterprise System Implementation: An Oil and Gas Exploration Sector Perspective, F. Bomarius et al. (Eds.): *PROFES 2009, LNBP 32*(2009), 416-428.
- [50] Mishra, A. Enterprise Resource Planning Systems: Effects and Strategic Perspectives in Organizations. In: Gupta, J.N.D., Sharma, S.K., Rashid, M.A. (eds.) *Handbook of Research on Enterprise Systems*, IGI Global, USA, ch. V, (2008), pp. 57-66, ISBN:978-1-59904-859-8.

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