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Developing an ERP Triggered Business Process Improvement Cycle from a Case Company

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Abstract

ERP (enterprise resource planning) systems offer tremendous opportunities to more consistently provide information to organizations in a standardized, centralized, and cost efficient manner. One of the primary objectives for installing ERP is the ability to integrate business processes. After a period of ERP use, key users try to bring improvements in their areas. These improvements are also related with business processes. So, to collect the improvements also to check the systems functions are needed. To prevent ERP system from the containing disconnects in the processes, an audit cycle integrated with on-going reengineering of the business processes is necessary. In this article, we have examined the user request types and the structure of a case company. And developed a model that analysis and ERP request and integrates into a BPR (Business process reengineering) project and check the system's sustainability depending on an audit cycle.

Keywords: ERP, BPR, Post implementation, Improvement

1. Introduction

Enterprise Resource Planning (ERP) systems have been considered as essential for gaining and maintaining competitive advantage in the globalized market under ever increasing competition. ERP systems integrate and support all the major processes of a company such as accounting, finance, manufacturing and human resource management, by providing a unified platform of database and business applications (Chang 2006, Shang and Seddon, 2007, Ha and Ahn, 2013). Because of those situations ERP is most popular choices to gain competitive advantage in complex production systems. With this popularity the literature abound of many studies on ERP systems from various approaches. However, despite the practical and academic interests in ERP, many companies still suffer from not being able to gain the expected benefits from it, even initial success of ERP system implementation.

It has been discussed in literature that the initial implementation success, alone does not guarantee the successful use of ERP after go-live (Deloitte 1998, Zhu et al. 2010). As a result, many companies struggle to achieve success in the post-implementation stage. In order to address the research gap, this study focuses specifically on the post-implementation stage of ERP and tries to structure a business improvement cycle model.

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It is very difficult to precisely capture the business requirements at the early stage of information systems development (Thomas 2005, Bocij and Greasley 2006). Due to an inherent uncertainty, many of the additional requirements for the system may be found only at later stages, often requiring debugging, modification or addition of system functions for some business processes (Thomas 2005, Bocij and Greasley 2006). ERP systems need to be able to accommodate these inevitable late changes in business processes to overcome uncertainty and function at full capacity (Ha and Ahn, 2013).

In this context, this study aims to structure a business improvement cycle model.

2. ERP Systems

ERP systems are customizable software applications which contain solutions for the key business processes, such as manufacturing, purchasing and sales, logistics, accounting, finance and human resources (Rosemann and Wiese, 1999). Those systems offer the standardized platform which takes care of all desired parameters in a structured manner required for the best performance of all departments in a company. ERPs are innovative IT systems whose basic features are modularity, supplementing other systems in the firm and with the ability to provide management information (Lorca and Andrés 2011). ERP systems are seen as optimization and integration tools of business processes across the supply chain, implemented through modern information management systems (Stefanou, 1999). This integration provides visibility and consistency across business functions like manufacturing, finance, distribution, and project management.

ERP systems offer various benefits to the firms. It provides fast and accurate communication in electronic format. It captures all of important data with date and time. It ensures accurate scientific and logical inventory management. It allows perfect integration and transparency among all related departments in the organization. It assures automatic generation of preventive maintenance schedules. It secures centralized data base management. It ensures availability of various cost reports. It eliminates loop holes in the existing system. It gives opportunity to analyze the past in the present for the better future (Technofunc, 2013).

3. BPR and ERP Systems

Business Process Reengineering (BPR) and ERP are not necessarily complementary but can be designed to support each other. A BPR programme is in reality a change management programme (Zairi and Sinclair, 1995; Taylor, 1998); it is more so with ERP leading the way. As opposed to radical top-down BPR, or participative BPR, ERP-driven BPR implementations do not have to deal with the process of negotiation and coalition building with the employees. ERP-driven BPR requires a company to align itself with the demands of the software, a step-by-step implementation plan through cross-functional coordination, and deal with variety of issues relating to employee culture (Huq et al., 2006).

The contribution of ERP systems towards BPR implementation can be significant in terms of scope, configurability and integrativeness. Through the choice of industry standard modules and sub-modules, process activities can be embedded in the software implementations. This results in data integrity, transaction reduction.

The top four reasons companies embark on BPR are to improve customer service, to reduce cycle time by reducing transactions, to reduce production/service costs and to improve quality (Carr and Johansson, 1995; Huq et al., 2006).

The project team in charge of implementation will be challenged to meet the functionalities of the ERP application by aligning the current processes with the software that may look like a company-wide BPR project. It will face organizational resistance to changing the status quo, and the team must also make sure the ERP applications run well on the company's existing technology (Huq et al., 2006).

Both business situation and degree of improvement desired by an organization are the determining factors for deciding when BPR should take place in ERP implementation (Bancroft et al., 1998). However, it is repeatedly advised that BPR is best implemented following the ERP model (Slooten and Yap, 1999).

4. ERP Stages

Ross and Vitale (2001) argue that the stages of an ERP implementation can be regarded as an experience with five stages (Ross and Vitale, 2001):

1. Design (the company has to decide on two important design questions: process change and process standardization)

2. Implementation (the go-live, after which most companies experience a decline in their performance)

3. Stabilization (in this phase the company attempts to clean up its processes and data and adjust to the new system and organizational changes)

4. Continuous improvement (adding new functionality and new modules or bolt-ons to the ERP system from third-part vendors)

5. Transformation (the company may transform itself).

In this study we will concentrate on continuous improvement stage, after go-live.

5. Continuous improvement in the after live (post-implementation) stage

Once it is agreed that initial implementation success is not the final goal, it becomes clear that ERP systems should still change and evolve after go-live. (Ha and Ahn, 2013)

There are a couple of reasons why continuous improvement is necessary in the after live (post-implementation) stage. Firstly, the need for maintenance and support arises naturally after go-live (Welch and Kordysh 2007). Due to the enormous size of ERP systems, its maintenance can often involve dealing with serious defects during implementation that leads to modification or addition of some functions. For example, Tsai et al.'s study (2011) shows that the performance of business can be influenced by system and data maintenance activities in the post-implementation stage, where the maintenance can include adjusting the ERP system architecture or adding new functions. Shang and Seddon's study (2007) also suggests that ERP implementation can incur many deficiencies due to the complex nature of the system, which need to be actively addressed after go-live for the successful use of ERP. Secondly, simple modification or extension of some of the functions is often insufficient.

So, on-going reengineering of the business processes is necessary. Without these efforts, ERP systems may inevitably contain many disconnects in the business processes (Allen, 2011), which may inhibit enterprise-wide process integration (Ha and Ahn, 2013).

6. Case Study and Developed Model

This section describes the research method and the case company. Then the developed framework will be presented.

6.1. Research Method

The pilot study based on the interviews with case company's ERP team. The company was analyzed through interviews and data collection.

This paper does not attempt to test any hypothesis to explain the impact of organizational interventions, nor does it attempt to explain the financial loss/gain observed after BPR implementation. There are numerous evidences that successful BPR implementation were not followed by improved financial performance (Grint, 1994) because financial performance is coupled with competitors, environment, technology and financial markets (Huq et al., 2006).

The study employs a qualitative case study methodology. Authors interviewed key BPR/ERP personnel, one member who actually worked in a managerial position within the company studied.

6.2. Case Company Profile

Case company Inka is a Turkish manufacturing company who was established in 1986. In 1990, Inka began to manufacture fixing systems to world market both his own brand and as a supplier to well-known large corporations. Her product ranges are: pipe clamps, industrial type clamping systems, support channels, steel anchors, chemical anchors (Inka Fixing Systems, 2012). For year 2011, the case company's annual revenue EUR 30 million, and of %80 is export (Inka Fixing Systems, 2011) with 200 employees.

In 2004 the company decided to introduce a new corporate information system and the new ERP was chosen. The implementation and deployment of ERP are considered a huge success and a major advance for the company in the area of information management. Today, with the experience of more than 7 years in ERP use, it is possible for us to outline some of the important contributions the integration of ERP make to the case company in a general way.

6.3. Developed Framework in a SME

In this section a continuous improvement model based on ERP cycle developed in a SME will be explained. This developed cycle is using to trigger the improvement projects also improve the current ERP system's functions regarding to business changes.

Company agreed the following prerequisites (Ng et al., 1999):

- Expertise in ERP
- Understand the business operations
- Project management skills

ERP triggered business process improvement cycle's figure can be seen in the Figure 1 below.

Explanations of some key points:

(A1)BPR trigger: BPR request, BPR & analyze. Triggers from:

-Changing business rules: Internal: management, organization. External: market, customer, supplier, governments changing laws like customs, account, HR regulations.

-Changing technology (ERP itself, new support technologies like bar-coding, new manufacturing or warehouse systems innovations, SCM integrations via EDI and internet technologies)

-Innovations (like from MRP to Kanban planning system)

(A2) Create an improvement project (TO-BE) on ERP or on business process: Many companies conduct process innovation together with initial ERP implementation (Willcocks and Sykes 2000, Law and Ngai 2007). However, there is an increasing consensus that process innovation needs to be continuous for the successful use of ERP (Kettinger and Grover 1995, McGinnis and Huang 2007). Companies can later find it necessary to widen the scope of process integration to gain more benefits from ERP. This can be with customers or suppliers due to the changes in the competitive environment or strategic direction (Davenport et al. 2004). The improvement will often involve systems integration and extension on a continuing basis (Ha and Ahn, 2013).

(A3) Analyze and identify requirements: This process of specifying the requirements can be quite exhaustive, but its importance should not be underestimated, considering the work and expense that will be incurred following the requirement definition (Ng et al., 1999). The ERP management ranks them in priority status from low to high, into align them with ERP (Huq et al., 2006).

(A4) Analyze and review the current system: The expert should research as much as possible into already existing systems, in order to avoid spending time developing something that is already in the current system and to learn about design ideas he or she has not previously thought of (Ng et al., 1999). Perform an analysis to identify the processes that match ERP standard modules, and the processes that does not (Huq et al., 2006).

(A5)Process change decision: Working along with key members of the staff, map all the business processes and identify the "fit/gap" of the processes with the standard ERP modules. In cases where there is no fit, decide to re-engineer the processes to make them fit with the ERP system (Huq et al., 2006).

(A6) Design TO-BE solution to fill the gaps: Create a suggestion system related with the determined weak points. Find solution, to-be. In this phase begin with the future business functions and the processes defined in the analysis phase (A4) and map them to ERP functionality, resulting in a fit-gap analysis (Huq et al., 2006).

(A7) New design confirmation: New design must be confirmed by related managers and key employees.

(A8) Analyze & test the new system: This phase includes detailed configuration of the final system, finalization of the technical programs, testing (Huq et al., 2006).

(A9) User test; management confirmation

(A10) Go live: This phase is the start of the use new design in daily transactions.

(A11) Update manuals, workflows: Prepare a user manual or update existing (manual must not just include ERP use; also include business flow and business rules)

(A12) Publish documents: Related persons or departments must be informed about the changes. And after that a training (B6) is required.

(B1) Periodic audit system: To catch the unbalances between the daily business operations and predefined ERP or BPR based business rules. This creates a continuous cycle. Audit period, who will be audited, which process will be audited must be clearly defined, and checked on regular basis.

(B2) AS-IS start (Exam/survey/ checklist): Prepare a survey to measure user's perspective about the ERP's competence in related daily business processes and operations (AS-IS). It can also be an exam or checklist. Prepare exam scenarios, based on business operations and prepared manuals. Select the users for the exam. Make the exam

(During the exam, it is a good chance to watch the users style and see their behaviors. Examine the wrong use or complaint about the unimplemented changed business rules).
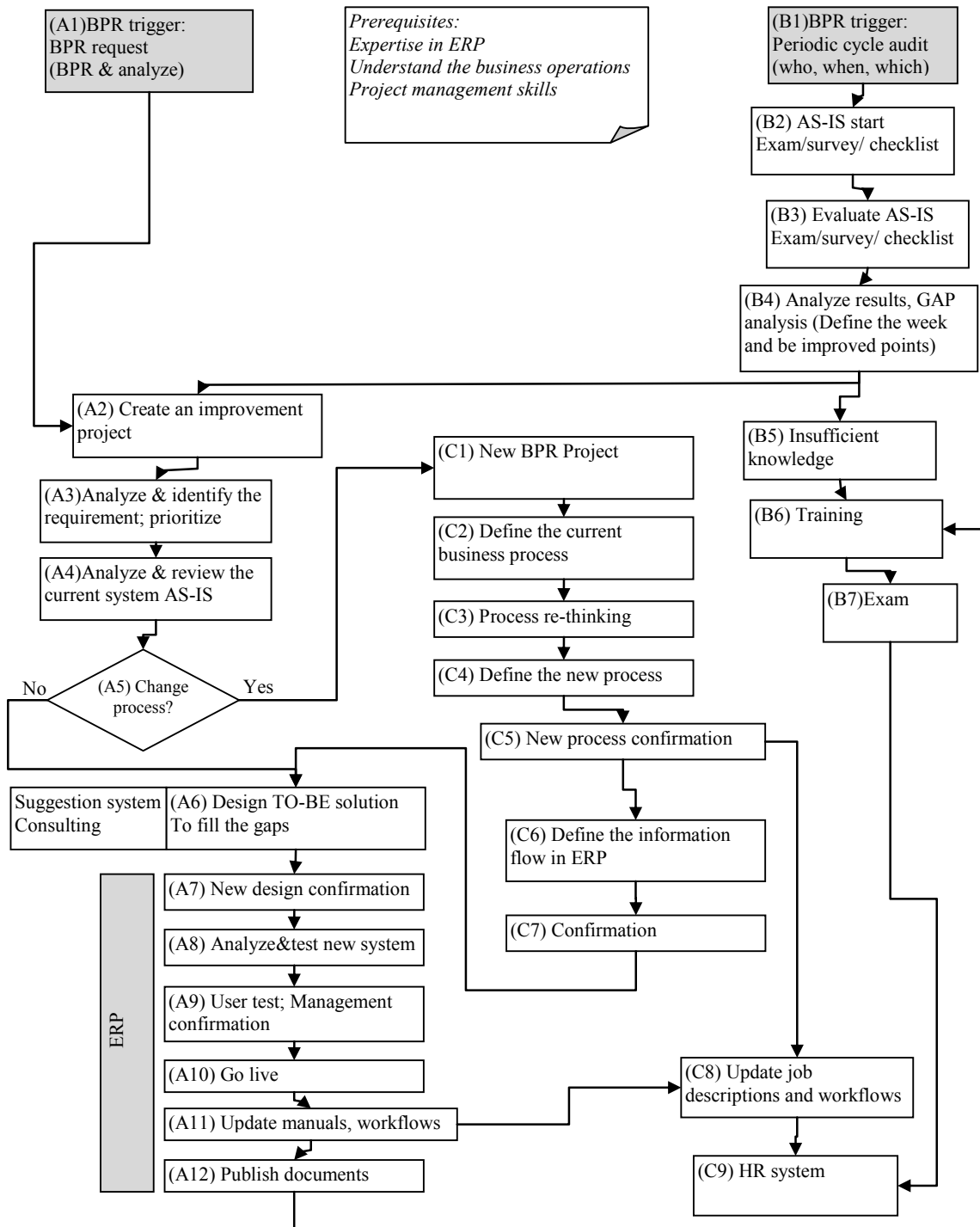

Fig. 1 Developed model

(B3) Evaluate AS-IS (Exam/survey/ checklist results; end of AS-IS): Analyze and determine the user defined weak points from the survey results. (Generally two main reasons were examined: 1. Insufficient or wrong knowledge about the ERP module or related transaction 2. A real improvement issue).

(B4) Analyze results, GAP analysis: Define the weak and be improved points from the results of exam. Prepare an improvement project (A2) or training (B6).

(B5) Insufficient knowledge: Generally they were because of lack of training, or personnel turnover or delegation problems

(B6) Training: Emphasize the points mentioned on survey and exam's incorrect answers.

Because user training improves users' understanding of ERP, it can motivate users to be more active and cooperative in communication and collaboration with other departments in the post-implementation stage. Considering the lack of inter-departmental integration in many organizations (Kahn 2003), it is often difficult to bring about users' participation without on-going training. Training also helps users understand the importance of continuous improvement efforts and motivate them. Users need to understand that changes are inevitable because of the market environment, or the evolving nature of ERP and business processes (Ha and Ahn, 2013).

(B7) Exam: Make the exam to measure the efficiency of training or realize user's behavior.

(C1) New BPR Project (Process re-engineering): This stage calls for study and redesign of the existing state in a given business area of the enterprise. It begins with preliminary analysis and the business operations and problems are studied in greater detail (Ng et al., 1999).

(C2) Define the selected business process (System analysis): The experts must completely familiarize themselves with the current working system by auditing its flexibility, reliability, accuracy, efficiency and connectivity. Any problems that are inherent in the system can be fully understood and clearly defined. Modeling techniques can be employed to map out the logical flow of the processes involved in the system (Ng et al., 1999).

(C3) Process re-thinking : This involves recognizing potential solutions, and then seeking and recognizing obvious or latent problems that may be solved. The experts should query the assumptions that underlie current business operations in order to generate new methods. In this way, a set of new system rules and processes can be achieved for process benchmarking (examples of best practices) (Ng et al., 1999).

(C4) Define the new process: New process must be explained in detail with its benefits.

(C5) New process confirmation: Confirmation of new or revised process from management

(C6) Define the information flow in ERP: Based on selected business process.

(C7) Confirmation

(C8) Update job descriptions and workflows: These process changes and results of exams, trainings must be linked with the HR (human resources) system

(C9) HR system: Link the training and exam results to the HR.

7. Conclusions

Although ERP does not automatically re-engineer a process, it drives an organization to do it itself. ERP forces an organization to decide how it wants to run its business at a detailed level. It is important to recognize that the project was not led by the information systems (IS) department.

Changing market environment can impose new requirements on ERP such as adding new functions or adjusting the settings of ERP (Markus and Tanis 2000, Calvert 2006). As the use of ERP matures, a more advanced and strategic use of ERP can be required involving wider integration of business processes (Shang and Hsu 2007). These require the users' understanding of ERP and their active participation which must be facilitated by on-going activities like training and improvement projects.

Considering the lack of studies focusing on the after-live (post-implementation) stage, this model can be regarded as filling a significant research gap.

Business managers can implement and use this model in their areas. The coordination between process development team and human resources (HR) team is very important, to measure the results and effects of the application. The results may be used to evaluate personnel performance. Implementation of a suggestion system and reward system will motivate staff to create solutions to problems. In addition to this, ERP documentations and job descriptions must correspond to each other, as much as they can, to eliminate duplicate work.

Although there are some limitations and further research issues remaining, the authors believe that the study provides a model that triggers the improvement projects from ERP use and that the study can help many companies successfully improve the performance of business processes and ERP systems.

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