

Evolving role of business process reengineering: a perspective of employers

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Abstract

Purpose – The purpose of this paper is to analyze and illustrate the needs and expectations of the industry from a newly hired engineering candidate for an entry-level position involving business process reengineering (BPR). The paper aims to highlight the changing role and the new emerging face of business process design, analysis, and management, its relevant contents and methodologies, its new role, and emergence of a value of BPR, which has been redefined.

Design/methodology/approach – The growing interest and the importance of the role of business processes in organizations have promoted the development and implementation of an undergraduate level course on BPR at Stevens Institute in 2006. This research involved a survey of some potential employers during a recent redesigning of this course. The survey collected information from the employers on how important and relevant are the topics on BPR that are covered in the course for an entry-level BPR related position.

Findings – The findings indicate a strong support from the employers for BPR curriculum. Of the 19 BPR topics on which information was collected from the employers, 63 percent were rated as “extremely important” and “very important”. The two highest rated areas of BPR were ability to research and collect process related data (3.8), and ability to use graphical methods to map the current or reengineered processes (3.5).

Research limitations/implications – One of the limitations of this research is the size and representation of the data collected. A more broader sample would extend this work into a framework for BPR skill set and knowledge at various levels of experience.

Practical implications – The implications of this research are to both the academic community and potential employers. This paper provides useful knowledge on what skill sets are relevant for an entry level BPR professional in an economy, which is predominantly going to be dependent on efficiencies from business processes.

Originality/value – The paper provides value to those seeking entry-level positions in terms of the knowledge and skill sets required to fulfill such a role effectively. The paper also provides guidance to faculty on areas needed to focus on in a BPR curriculum content and pedagogy and prepare students for practical situations. With the increasing role of service orientation in managing information systems – the importance of business process definitions and their reengineering cannot be undermined.

Keywords Business process re-engineering, Education, Training

Paper type Research paper

Introduction

Today business process reengineering (BPR) is a mature concept, which has evolved over a period of time. Currently there is extensive literature that has documented support of this evolution. This literature is a result of various academicians' and practitioners' valuable work and views on the subject (Champy, 1995; Champy and Weger, 2005; Davenport, 2003; Hammer, 1990). The role of information technology is a key enabler of BPR re-emergence today (Ahadi, 2004; Mary, 2008).

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The authors of this paper have been interested and committed to developing a course on BPR which addresses the employers' relevant needs from the current perspective of BPR. In order to address this objective the authors piloted a course on the topic in the Fall of 2006 (Jain *et al.*, 2007) and further refined it based on the employers' and students' survey for Fall 2007 (Jain and Chandrasekaran, 2008).

The employers' survey included an assessment of the current relevance of business process design and reengineering for their operations. The researchers of this paper investigated the understanding of the scope of BPR in its current form for these employers. The employers were surveyed to identify their need for BPR related skills and knowledge in the new recruits they intend to hire.

BPR was an important activity during the 1990s and there is a dramatic re-emergence of organizations' interest in the topic once again since the early 2000 (Paper and Chang, 2005; Rigby and Bilodeau, 2005). A survey conducted by a reputable consulting firm of 960 companies published in 2005 confirmed this trend. The use of BPR as a management tool was reported to have gone down from 69 percent in 1995 to 38 percent in 2000, and revived again to 61 percent in 2004 (Rigby and Bilodeau, 2005). The paper focuses on the new emerging face of business process design, analysis, and management (Hammer, 2005) its relevant contents and methodologies, its new role, and emergence of a value of BPR, which has been redefined. BPR and similar other processes seem to be directed at optimization and continuous improvements and the radical initiatives hardly connect to external opportunities (Dekkers, 2008). The paper starts by tracing the historical perspective of BPR followed by providing an overview of the BPR course developed and then discussing the research methodology and the employers' survey and summarizing the research findings.

Business process reengineering course

The content for this new BPR course was carefully selected based on an extensive literature review in the BPR field. The course was designed to provide knowledge and skills on BPR and its main concepts; the technologies and the strategies for implementing business transformation; and best BPR practices by emphasizing the role of BPR in managing technology and the engineering functions. This course is taught in senior year and one of its main objectives is to prepare the students for their professional careers. The course was first taught in 2006 as EM 435 for engineering management students. The student learning and some lessons learned are documented in (Jain *et al.*, 2007). The course covers the strategic, operational and technological aspects of BPR by relating it to quality improvement and Information Technology. It also takes into account the seven factors critical to BPR implementation success namely, teamwork and quality culture, quality management system and satisfactory rewards, effective change management, less bureaucratic and participative, information technology/information system, effective project management and adequate financial resources (Ahmand *et al.*, 2007) along with BPR readiness assessment (Neda *et al.*, 2008).

The major learning objectives of the course are to understand the importance of processes and BPR, and appreciate how BPR bridges the business operations and engineering of systems; to understand how business processes can be radically improved, dramatically reducing process cycle time and cost, and improving the quality of the process products or outcomes; to identify business processes those are candidates for improvement; to model current business processes and to diagnose problems; to model and develop improved

business processes those require IT and organizational redesign; and to develop measures and benchmarks for business processes.

The authors of this paper approached redesigning of the course from two perspectives, one to improve student learning based on the experience of teaching the course and student feedback, and the other to emphasize the topics and their scope based on the industry needs. The former approach is documented in (Jain and Chandrasekaran, 2008). This paper focuses on the latter approach to redesign. The authors believe that an engineering course such as BPR should be taught in the context of current practices and application. The course should aim at both providing student learning and at the same time prepare the students for a career in the corporate world. In order to understand the hiring needs of the corporate world, a survey on industry expectations from an entry-level applicant for BPR related roles was designed and implemented. The results and findings of this survey provided guidelines on which topical areas and topics within the course should be more focused during lecturing, discussions, and hands-on projects and assignments.

Research methodology

Survey research was used to understand the importance of the BPR topics covered in the course to the industry. A formal industry survey was designed to assess the level of importance of the topics covered in the BPR course to the industry when hiring an entry-level applicant. The survey contains two parts. First part of the survey contains demographic information about the respondent and his/her company or organization. Second part of the survey focuses on the BPR topics and its importance. The respondents were asked to provide their responses in terms of the importance of the topic for their organization when they were considering a potential employee for an entry-level position requiring BPR skills and knowledge.

The survey had a total of 33 questions, 11 of them belonged to part 1 where we collected information on the respondent and, 22 of them belonged to part 2. In part 2, the questions were related to the importance of the topic or skill to the potential employers while hiring an entry-level applicant. The respondents were asked to rate the topic or skill using a five-point scale: 1 – Not important; 2 – Somewhat important; 3 – Important; 4 – Very important; 5 – Extremely important.

The topics that were covered in the survey and the topical area classification are listed in Table I. Table I also shows the order in which the topics appear in the survey. The analysis of the response is discussed in the following sections.

Demographics of survey participants

In order to determine the potential employers' need for BPR related skills and knowledge, the survey was sent to companies representing several industries, which are currently hiring engineering management graduates. The industries are obtained based on the report published by Stevens Institute of Technology Office of Career Development. According to this report, 28 percent of graduates are hired by financial industry, followed by 17 percent engineering services, 17 percent pharmaceutical and manufacturing, 12 percent technology/telecom, 6 percent business consulting, and the rest is divided between government, non-profit, education, aerospace, energy and transportation industries (www.stevens.edu/undergrad/outcomes). We received responses from 12 companies representing industries including manufacturing (electronics and automotive), consulting (technology, management, taxation and training), finance (banking and insurance), IT and software, and pharmaceutical. Figure 1 shows the percentage breakdown of the industries represented. Out of these 12 companies, 67 percent were from the services sector and 33 percent of them were from the manufacturing sector. The company size in terms of employee and value are shown in Figures 2 and 3.

Table I BPR related knowledge and skills

<i>Topical area</i>	<i>Per cent respondents ranked the topic "very" and "extremely important"</i>	<i>BPR topics (number relates to the order as it appears on the survey)</i>
Analysis and mapping of processes	75	18. Ability to use a "process mapping" software (i.e. Visio)
	92	10. Ability to analyze process related data
	92	8. Ability to use graphical methods to map the current or reengineered processes. Process boundary, inputs and outputs; main activities; business rules and decision points; activity/process owners; applications and technology infrastructure require
Identification of potential process improvements	100	9. Ability to research and collect process related data (Researching and reviewing available data; collecting data by conducting one-on-one or group interviews, etc.)
	75	6. Ability to diagnose problems, select processes to be reengineered and justify the selection
	73	7. Ability to define and document current and reengineered processes by identifying the following: Process boundary, inputs and outputs; main activities; business rules and decision points; activity/process owners; applications and technology infrastructure
Planning for BPR	92	11. Ability to prioritize potential improvements by identifying: Redundant and unnecessary activities; inefficient process layouts; rework process steps; recurring delays; and major checkpoints which create major delays
	17	5. Ability to create a BPR project plan
	16	16. Ability to create an implementation plan for the reengineered process discussing the implementation issues such as cost, time, improvement potential, likelihood of success
Process optimization and measurement	42	12. Ability to develop measures and benchmarks for business processes
	33	19. Ability to use a "modeling and simulation" software (i.e. Extend, Arena, etc.)
	42	15. Ability to model current and reengineered business processes to diagnose problems using modeling and simulation techniques
	50	14. Ability to define metrics to measure the current and reengineered process and evaluate the improvement potential as a result of reengineering of the process
	75	13. Ability to redesign/reengineer the current process by: Eliminating non-value added activities; reducing cycle time; improving service and product quality; minimizing inefficiencies; balancing flow and capacity, etc.
Understanding of BPR	67	3. Understanding of what BPR can do for organizations
	58	17. Understanding of the factors that lead to the success and failure of BPR initiatives
	58	2. Understanding of the difference between various process improvement and management techniques (such as TQM, BPR, Six Sigma, and etc.)
	75	4. Understanding of how business processes can be radically improved, dramatically reducing process cycle time and cost, and improving the quality of the process products or outcomes
	75	1. Understanding of the importance of processes, process management and improvement tools and techniques

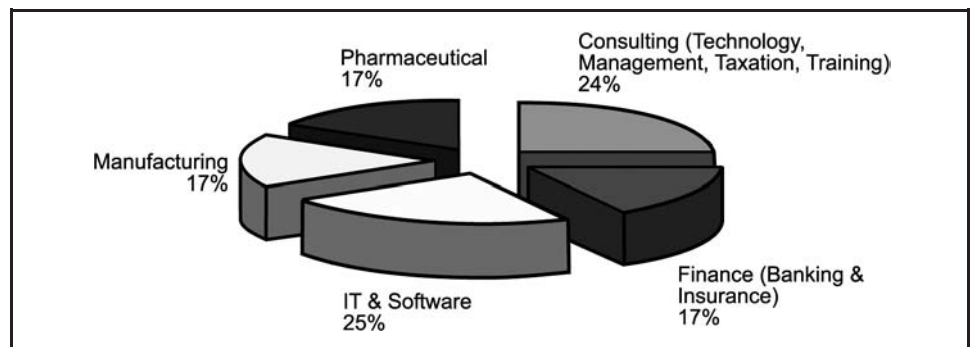
Figure 1 Industries represented in the BPR needs survey

Figure 2 Number of employees

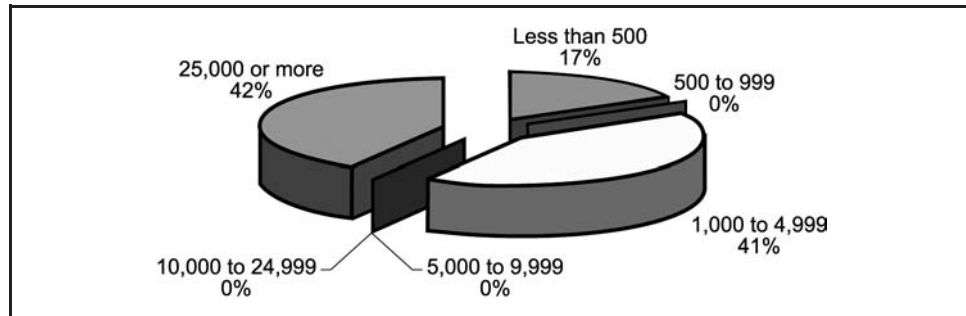
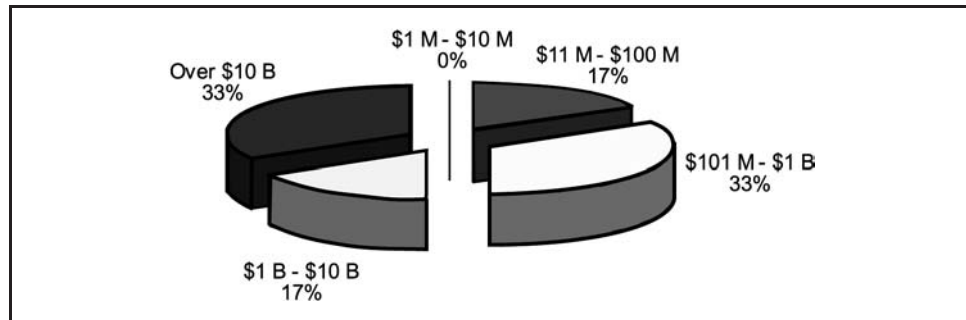


Figure 3 Company size



BPR topics by importance: the survey findings

The survey responses were analyzed to address the following three research questions. These are discussed in the sections below:

- 5.1 Overall, how important were the BPR topics covered in the course for the industry at an entry-level (role)?
- 5.2 Based on the classification of these BPR topics into topical areas, how did the importance vary with each topical area?
- 5.3 Are there any visible trends on analyzing these topics by levels of importance (>90 percent, >70 percent > 50 percent)? How different was this trend from the importance ratings by topical areas?

Industry ratings of the importance of BPR topics covered in the course for an entry-level role

A survey had 19 BPR topics and respondents were asked to rate them by importance on a five-point scale. Considering each topic to be an item and then counting the responses for each item the percentage of responses across the five-point scale was calculated. Figure 4 shows the percentages across the five-point scale. This analysis shows that overall most of the topics were rated as at least very important (63 percent). Also, there are no topics covered in the course that are not important for the industry. This is an indicator of how relevant are the topics covered in the course to the industries' expectations. Based on this result, it is safe to assume that the BPR course provides the learning and knowledge that an industry requires from a new college recruit.

The average and standard deviation of responses on all BPR topics is shown in Figure 5. The overall average score on all the responses across all respondents was 2.78 on a weighted scale of 0 to 4 translating to very important with a relatively low standard deviation of 0.79. This indicates that on an average all the BPR topics listed in the survey are very important to the industry. An entry-level applicant for a BPR related job should

Figure 4 Survey responses

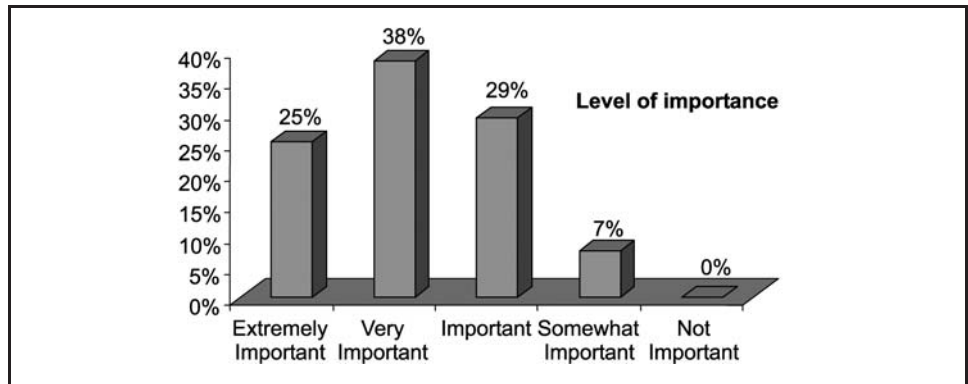
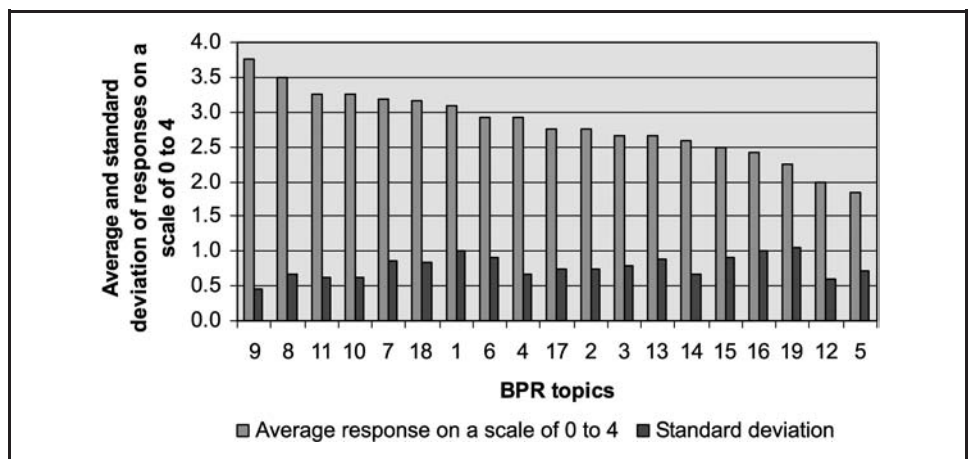


Figure 5 Average and standard deviation of responses on all BPR topics



possess adequate knowledge on these topics. A lower overall standard deviation also supports this statement. The lowest level of importance is given to the topic, Ability to create a BPR project plan. The average of importance on this topic is 1.8 which translates to important on a five-point scale. This result further validates that all BPR topics are important to be learnt at an undergraduate senior level. The reason for lower importance level for BPR project planning ability may be because project planning is not just related to BPR effort in an organization and also it is an activity performed at a managerial-level rather than at an entry-level.

The BPR topics that are most important are ability to research and collect process related data (3.8), and ability to use graphical methods to map the current or reengineered processes (3.5). This is a reflection of the roles and responsibilities of an entry-level position. At this level the BPR effort requires the person to perform research on the processes and develop a process map.

The survey respondents varied by at least one standard deviation (>0.99) in three BPR topics namely, ability to use a “modeling and simulation” software (i.e. Extend, Arena, etc.), Ability to create an implementation plan for the reengineered process discussing the implementation issues such as cost, time, improvement potential, likelihood of success, and understanding of the importance of processes, process management and improvement tools and techniques. Respondents varied in these three topics mainly because only a few companies use modeling and simulation software and a role of an entry-level applicant does not include planning and management in most of the companies.

Industry ratings of importance by broad topical areas: how different are they by each topical area?

The survey required respondents to rate the level of importance of 19 BPR topics that are covered in the offered BPR course. The importance rating was to assess how useful the preparedness of a potential employee at an entry-level position that requires BPR skills. We categorized these 19 BPR topics into five areas. The average responses across these five areas and their standard deviation are shown in Figure 6. The disagreement of the respondents on their responses (standard deviation) increases with decreasing level of importance (averages). This highlights the fact that the respondents have highly agreed on selecting the must-have topics of BPR thereby helping the authors in identifying the focus areas for teaching. Analysis and mapping of processes is rated the highest among the five areas. Analysis and mapping of processes is an extremely important topic/knowledge an entry-level applicant should possess. Planning for BPR has been rated as the least important. This area is rated as an important knowledge for an entry-level applicant to possess but not as important as the other five areas.

Trends on analyzing these topics by levels of importance (> 90 percent, > 70 percent, > 50 percent): how different was this trend from the importance ratings by topical areas?

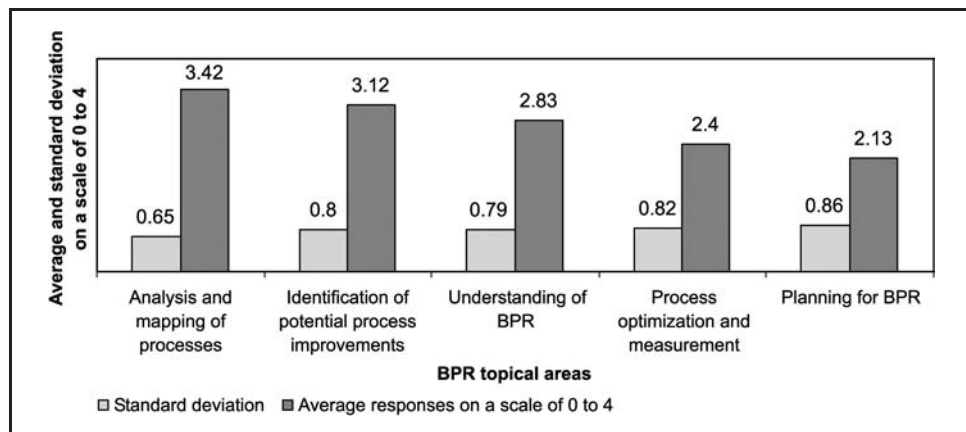
In order to understand what trend the industry follows in ranking the level of importance of a BPR topic that an entry-level applicant must possess we grouped the responses in four categories. The categories are:

1. More than 90 percent of the respondents ranked this topic to be very and extremely important.
2. More than 70 percent of the respondents ranked this topic to be very and extremely important.
3. More than 50 percent of the respondents ranked this topic to be very and extremely important.
4. Less than or equal to 50 percent of the respondents ranked this topic to be very and extremely important.

The percentage of respondents that rated very and extremely important for each topic is shown in Table I. Based on the categorization and analysis we can then state that:

1. Researching, understanding (mapping), analyzing, and prioritizing processes for redesigning as the most important (> 90 percent extremely and very important).
2. The knowledge and ability required to do so as the next to most important (> 70 percent extremely and very important).

Figure 6 Importance of BPR topical areas



3. The fundamental knowledge of BPR as the next level of importance (>50 percent extremely and very important).
4. Developing metrics, benchmarks, plans, models and simulations were the less important factors (< or = 50 percent extremely and very important). In other words measurement and modeling is the least important.

The trend observed from this analysis is that companies rank a BPR topic to be important if that topic helps identify value-adding processes as candidates for BPR. The level of importance varies to the extent a BPR topic address this aspect. In other words, the industries expect the entry-level applicants to analyze the current processes and identify candidates for improvement. But does not expect them to implement and measure the BPR effort. This trend is also supported by the topical area analysis. Planning and process optimization and measurement are rated the lowest among the five areas.

Conclusions

Our research clearly indicates an evolved role of BPR. Corporations and employers view BPR as more of an operational initiative than a strategic one. This is reflected in their importance of tools and techniques, and hands-on skills of BPR in assessing the suitability of their new hires. The authors incorporated changes in the BPR course based on the findings of their research (Jain and Chandrasekaran, 2008) to better prepare the students and ease transition into industry work. This research could be used by entry-level applicants to prepare them with skills and knowledge for the industry. This research could be used as a baseline for training and course development to address the required fundamentals of BPR. The research is limited in its sample size and scope. Future work including a bigger sample of industries could provide the basis for developing a framework. Such a framework could highlight and illustrate the skill sets and knowledge mapping for various levels of industry experience requiring BPR. This will help both the employers and the potential employees (potential new hires) to identify their initial level of BPR knowledge and skill sets and plan on further improvements depending upon their career track. In the longer term, specific certifications for BPR for various levels may be developed based on such a framework.

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