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A study on process evaluation and selection model for business process management

Chiwoon Cho *, Seungsin Lee

School of Industrial Engineering, University of Ulsan, Ulsan 680-749, Republic of Korea

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ABSTRACT

Currently, BPM is considered as the suitable framework for today's process-centric trends and BPM may result in considerable rewards for companies adopting it. For successful BPM initiative, the selection of suitable processes for BPM is very important. However, it is difficult to evaluate systematically and reasonably business processes for enterprises that plan to introduce BPM. This paper describes a web-based business process evaluation model based on BSC and fuzzy AHP for BPM. A web-based business process evaluation system was implemented and it provides impartial and reasonable results to enterprises or concerned persons that have insufficient experience and knowledge about BPM. Thus, this paper demonstrates the applicability of fuzzy AHP and BSC concepts in business process evaluation and selection for BPM, and provides a systemic guidance in the decision-making process.

1. Introduction

Many surveys indicated that the gap between IT and business is growing and that might signal a change in how enterprise technology is run. There are also increasing reports of IT not meeting business needs. Therefore, there is a need for better communication and understanding between IT and Business. To overcome this gap, many companies emphasis on the importance of business processes and the role of IT.

BPM (business process management) has emerged as a new breed of process-centric approaches for companies that consider processes to be fundamental business assets (Davenport, 1992; Hammer & Champy, 1993; Lee & Dale, 1998). However, to be fully effective, BPM must not be approached as simply another IT toolset but rather as an environment where a business-process-oriented view is the means of communicating business requirements throughout the organization. BPM solutions hold the promise of bringing a process-centric approach to IT solutions (Sinur, 2003; Smith & Finger, 2003).

BPM uses a technology designed specifically to manage business processes. These BPM systems are an enabler of business innovation because of the dramatic potential for improving the performance and agility of companies (Verner, 2004).

In BPM initiative, the selection of suitable processes for BPM is one of the most important issues. However, because of the wide variety of business processes existing, the selection of business process for BPM is extremely difficult and time-consuming task. The other important factors contributing to the complexity of process selection are evaluation criteria imposed by the business characteristics of the individual organization and the existence of some level of uncertainty due to vagueness or fuzziness of the evaluation criteria. Owing to the unstructured nature of the problem, there are not many research works related to process selection problem (Weck, Klocke, Schell, & Ruenauver, 1997). Most are incomplete prototypes that consider only a limited number of evaluation criteria, and are not very successful to deal with the qualitative factors associated with the problem. In addition, very little attention has been paid for selecting business process for BPM from a set of alternatives under fuzzy environment. Furthermore, there are no reports of the deployment of such process evaluation tools for BPM or platforms on the web to make it widely accessible to potential users.

This paper presents a web-based model called Biz_Tower for business process evaluation and selection for BPM initiative. The model employs BSC (balanced scorecard) and Fuzzy AHP (analytic hierarchy process), and decision algorithms to identify an appropriate solution. An example is given to demonstrate the application of Biz_Tower.

2. Related works

2.1. BPM process selection and BSC

Many guides and considerations related to the process selection for BPM were presented from companies and research institutes (Kim, Cho, & Kim, 1994; Park, 1995; Weck et al., 1997). However, the standards or the standardized methods for BPM process selection do not exist and the same selection criteria also have a

* Corresponding author. Tel.: +82 52 259 2287; fax: +82 52 259 2180.
E-mail address: chiwoon6@mail.ulsan.ac.kr (C. Cho).

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difference according to the characteristic of business and business environment of the target company. Table 1 summarizes the process selection criteria of the related works.

However, there are limitations related to the BPM process selection in the set of work reported above. Most are incomplete prototypes that consider only a limited number of factors and the factors are so conceptual. Hence, more robust guides and standardized methodologies, which can evaluate both tangible and intangible factors and overcome the drawbacks, are required. BSC can be considered as an excellent tool for evaluating the BPM processes. BSC makes it possible to evaluate managerial processes and activities with unbiased viewpoints by providing both tangible financial aspect and intangible, non-financial aspects: customer, internal business process, and learning and growth.

BSC, as illustrated in Fig. 1, is widely recognized and used (Kaplan & Norton, 1992, 1993, 1996). This framework views an organization's performance from four key perspectives, with regard to which organizations should articulate their core vision, strategy, and goals before translating them into specific initiatives, targets, and measures (Butler, Letza, & Neale, 1997; Letza, 1996; Martinsons, Davison, & Dennis, 1999; Smith, 2007).

Table 1
Process selection criteria.

References	Process selection criteria
Davenport (1992)	• Strategic importance • Needs to improve • Difficulty of improvement • Process scope
Hammer and Champy (1993)	• Many conflicts/high frequency/excessive non-structured communication • Competition outperforming • Continuous incremental improvements
Lee and Dale (1998)	• Most fundamental • Most interactive
Park (1995)	• Characteristic of process itself BPR performance ability
Choi, Lee, and Choi (2005)	• Business impact • BPM adequateness • Implementation feasibility

In this research, BSC is utilized for the BPM process selection to pursue overall optimization through a balanced view of various perspectives and add values by providing relevant and balanced information for decision makers.

2.2. Fuzzy AHP

The fuzzy theory, which originated with Zadeh (1975), allows for the existence of some level of uncertainty in decision-making due to vagueness or fuzziness rather than due to randomness alone (Chen, 1996; Cheng, 1999; Cheng & Mon, 1994; Mon, Cheng, & Lin, 1994). The theory of fuzzy has evolved in various directions, for examples; treating fuzzy sets as precisely defined mathematical objects, and the linguistic approach. Based on those directions, fuzzy theory has been applied in a variety of fields in the last four decades (Bozdah, Kahraman, & Ruah, 2003; Weck et al., 1997).

The AHP has become one of the most widely used multiple-criteria decision-making (MCDM) methods, and has been used to solve unstructured problems in a variety of areas (Chang, 1996; Lee & Kim, 2005).

In this paper, the fuzzy theory is combined with the AHP to determine the criteria-values of each proposed process for BPM as well as the evaluation results of the proposed processes.

3. BSC-based process evaluation criteria for BPM

BSC was applied to define the process evaluation criteria for BPM in this research because BSC has been the most suggestions for developing a framework for performance measurement and management. In addition, a good balanced scorecard contains several strategic or future-focused metrics, that tell the organization how it is doing, on its path towards its vision (Kaplan & Norton, 1992, 1993, 1996).

We first base on the four perspectives of the BSC to prepare a list of evaluation criteria, and then have a several interviews with BPM experts. A questionnaire is designed using conventional AHP questionnaire format (Butler et al., 1997; Letza, 1996; Martinsons et al., 1999) and the four perspectives of BSC and the selected evaluation criteria are included as shown in Table 2. Each of the

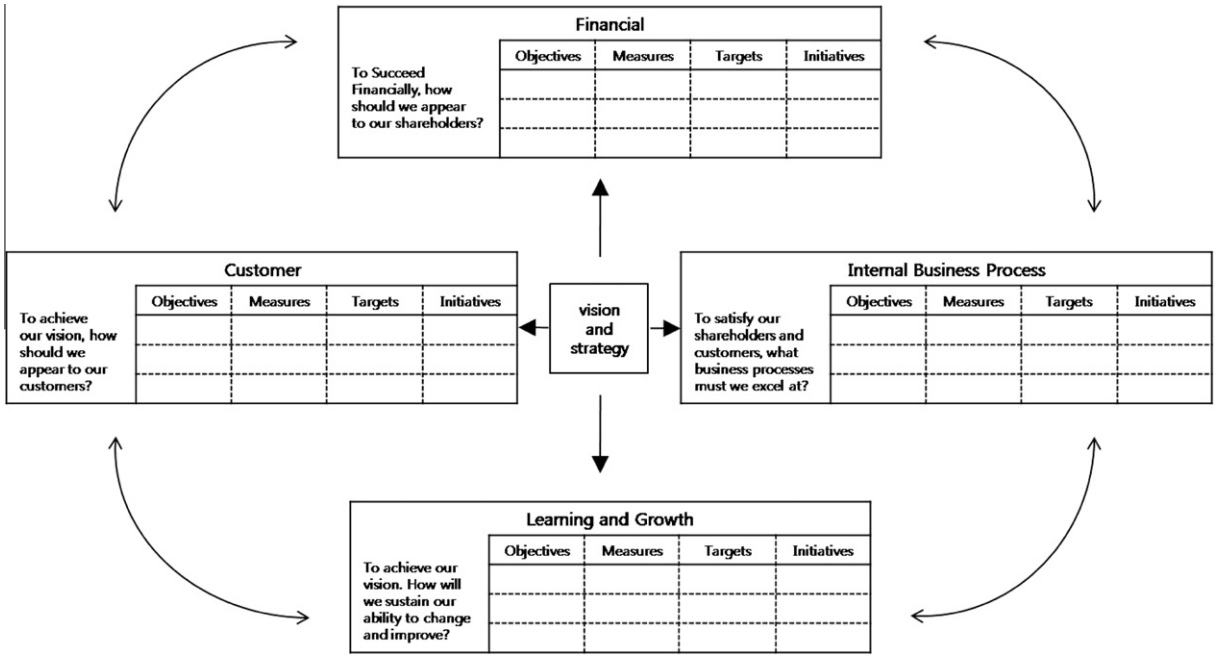

Fig. 1. BSC approach (Kaplan & Norton, 1996).