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Designing performance analysis and IDEF0 for enterprise modelling in BPR

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Abstract

This paper presents overviews of both a manufacturing enterprise modelling and quality performance analysis used to perform a number of successful business process re-engineering (BPR) effects. The framework presented in this paper can support the analysis of activities and information flows within the scope of manufacturing application in BPR. In addition, the paper discusses the selection of techniques and IDEF0 tools used to implement the modelling and performance capabilities. To demonstrate and validate the modelling method and process graph, an example has been carried out in designing the product of a television manufacturing company. © 2002 Elsevier Science B.V. All rights reserved.

Keywords: BPR; Functional modelling (IDEF0); Process graph; Incidence matrix

1. Introduction

Many manufacturing enterprises are undertaking a critical analysis and redesign of their business processes to achieve breakthrough improvements in performance. Business process reengineering (BPR) is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in measures of performance such as cost, time, quality, speed, and services [1]. The general idea of business process reengineering (BPR) is to provide means for optimizing and enhancing business processes both in the product

area and in administration. BPR utilises components of several other tools and concepts such as Systems Engineering, IDEF (Integration DEFINITION), activity-based costing (ABC), brainstorming workshops (BW), functional economic analysis (FEA), process benchmarking (PB), customer satisfaction measurement and cross functional team building in addition to total quality management (TQM) of the quality movement. BPR seeks performance breakthroughs through radical redesign of strategic, value-added business processes and the systems, including the resources, and organizational structures that support them.

We also need to develop further an understanding of how to apply BPR in improving the competitiveness of enterprises. We need more information about the impact of reengineering on the overall performance of a given organization.

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For this purpose, the modelling and analysis of BPR will play an important role in reengineering business processes by providing the necessary information on decision-making, showing various alternatives within BPR, and their impact on the performance of a whole organization. Also, the modelling and analysis of BPR will help to gain more insights into the concept, enabling the overall application of BPR. This requires the modelling of business processes and reengineering, using various tools such as simulation, IDEF, network models, queuing theory, etc. Also, the applications of management science (MS) and operations research (OR) models play a greater role in the understanding and implementation of BPR [2,3].

The aim of this paper is to coordinate information flow for activities, enhance requirement reconfigurability, and to minimize errors and the unplanned evolution of activities in BPR project executions.

Section 2 will define BPR process modelling and IDEF0 techniques. The proposed model framework is developed in Section 3. Section 3.1 overviews the proposed framework, and Section 3.2 describes the IDEF0 model and process graph. In Section 4, we describe a set of methods for matrix forms and an example of an analysis model in supporting the BPR process. The conclusions are outlined in Section 5.

2. BPR model methodology

2.1. The nature of BPR model

This section provides a brief description of the BPR process technique and IDEF0 modelling review. BPR pursues simultaneously multiple improvement goals such as quality, cost, lead time, flexibility, outcome, innovation and accuracy. BPR may be defined as a critical analysis and radical redesign of work flows and business processes in order to achieve dramatic improvements in important measures of performance, such as cost, quality, service, and speed [4]. Major BPR efforts are shown in redesigning internal organizational processes, changing fundamental product delivery and customer services procedures, and reexamining and repositioning corporate strategy [5,6].

A conceptual model explaining major component factors of BPR, with possible organizational changes in the information technology is shown in Fig. 1 [7,8]. As discussed earlier, an effective supply process system can be achieved by BPR. BPR requires organizational change with the help of simplification and standardization, and with other information technologies such as commerce at light speed (CALS)/electronic commerce (EC), supply chain management (SCM), enterprise resource planning (ERP), computer integrated manufacturing

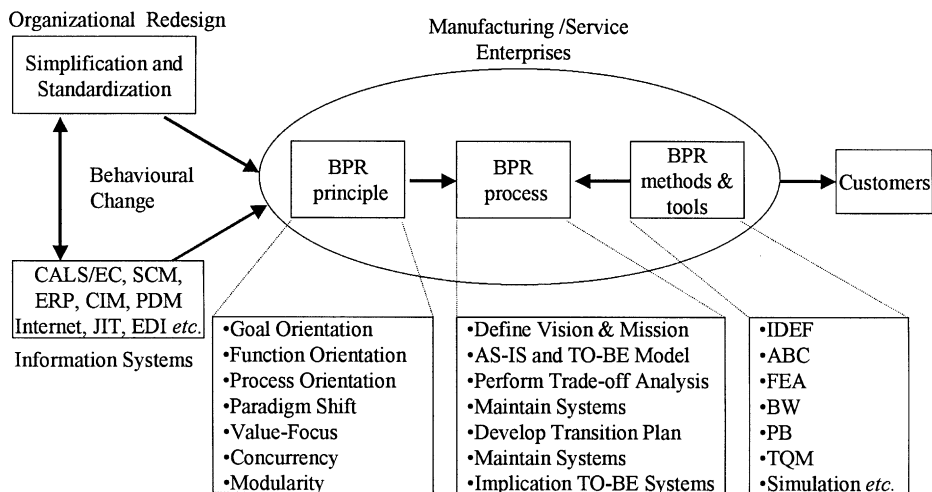


Fig. 1. Major component factors of BPR.

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