

Creating a model of process innovation for reengineering of business and manufacturing

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Abstract

The purpose of this paper is to develop a basic model of process innovation to support reengineering of business and manufacturing. The proposed model introduces basic relations between source, object and performance characteristics of process innovation at conceptual level. The model aims at improving “assessment of process innovation initiatives”. It points out the effectiveness chain from an original initiative through process changes to potential increase in “performance of processes” and “competitiveness of the whole enterprise”. Discussion of the proposed model suggests the basic relations of effectiveness to be operationalised as assessment tools for a decision support system of process innovation © 1999 Elsevier Science B.V. All rights reserved.

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1. Introduction

There are many challenges that industrial enterprises face to maintain their competitiveness. Running industrial operations effectively is not enough in the long run. Capabilities of innovation and utilising innovativeness in new ways are required in future competition. First we discuss shortly some key concepts of the topic stressing the point of view of manufacturing enterprises.

1.1. On industrial innovation terminology

What is a process? A process is a specific ordering of work activities across time and place, with a beginning and an end, and clearly identified inputs and outputs: a structure of action [1]. In this study we consider typical industrial processes of manufacturing, engineering and materials management combined with customer related processes of product and sales management. Linking these processes to chains we specify business process as follows.

Business process is a structured set of activities designed to produce specific outputs for internal or external customers or markets. It implies a strong emphasis on *how* work is done within

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an organisation, in contrast to product focus's emphasis on *what*. Further more business processes have cross organisational boundaries and they are generally independent of formal organisational structure [2]. *Activity* is a combination of people, technology, raw materials, methods and environment that produces a given product or service. By pointing out *process view of business and manufacturing* this study emphasises the need for understanding and tracing chain effects on processes and on the whole enterprise.

Process Innovation means performing a work activity in a radically new way. Process innovation is generally a discrete initiative and it also implies the use of specific change tools and technology for enterprise engineering and transformation of business processes [1]. Innovation is usually concerned with creation and development of new ideas and solutions. However innovation is not completed until its economic impact becomes apparent. Noori has compared process innovation with product innovation and studied relations between them [3]. So in the way of product innovation also process innovation must be "commercialised" before it is completed.

Reengineering of business processes (BPR) has in recent years been a very popular item in management literature. It is often connected with adopting new technology in processes. In this study reengineering works as an object element of process innovation.

1.2. The field and aim of this study

To emphasise the importance of innovative customer approach to business and manufacturing processes we first outline the *industrial innovation field*, see Fig. 1. The four important innovation elements in the field have linkages and interdependencies between each other.

Linkages at this general level work in both directions, either as internal customers or suppliers to each other. In manufacturing companies the main stream runs in five relations: technology for processes, technology for products, processes for products, processes for customers and products for customers. In this study we focus on the elements

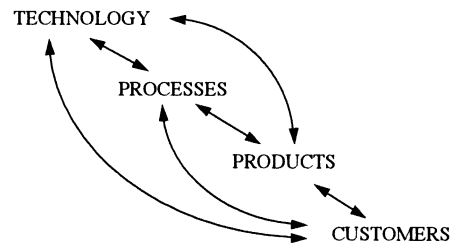


Fig. 1. Industrial innovation field.

relation of *technology for processes* in industrial innovation field.

The aims of this study are:

1. to propose a basic model of process innovation to support assessment of process innovation initiatives and projects;
2. to discuss opportunities and competence of the basic model as a decision support aid for reengineering of business and manufacturing.

1.3. Previous study on process innovation approaches

The need for systematic approach to innovation management is widely recognised in industrial innovation field, see Ref. [4]. This implies the need for supporting tools, methods and models at different management levels and even an innovation system for the whole company. A number of methods and models have been presented aiming at modelling the entire procedure of innovation or supporting different phases of innovation procedure. Some process approaches are presented as follows:

(i) The model of gradually detailing process concept by Jensen and Westcott [5]. The contribution of this study was the development of process concept model and a structured approach for translating a manufacturing strategy into a set of tactical manufacturing innovation projects.

(ii) The process application of fusion model by Ishii and Ichimura [6]. The main finding of this proposed method is that it is possible to develop production design as a product characteristics deployment process, from the technical

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