

# Basic Preconditions and Specific Elements of the Virtual Enterprises

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**Abstract** - In the modern world of high-speed changes the industrial enterprises could not be the same. To survive they have to meet the requirements of XXI century. The virtuality offers us one of the opportunities for developing of the enterprises. The information technology progress provides a lot of possibilities before the enterprises in reply to new millennium challenges. This publication is dedicated to changes, the enterprises fulfilled in answer to the challenges.

**Keywords** – Business process Re-engineering, Industrial engineering and management, Virtual enterprises

## I. INTRODUCTION

The new reality in the world economics poses new problems to the enterprises business activity. Industrial engineering and management aims to create an effective scientific basis of the functioning of the enterprises. In connection with the mentioned above, it is necessary to look into the factors that characterize industrial enterprises environment. Generally, there are three main factors:

1. The organizational structures and management concepts of the past are no longer viable in a marketplace of rapid and continuous change.
2. The ability to respond to such change requires a new flexibility, which affects our traditional ideas of organization and management.
3. Technologies, which were formerly separate and distinct are now converging to support the flexibility demanded by organizations.

In consequence of the functioning of these three factors, the industrial enterprise needs to conform with:

- The continuously decreasing cycle of life of the article (this is especially regarding the high technologies).
- The high-speed modifying market conjuncture.
- The consumers aim to receive goods and services consistent with their individual tastes.
- The decrease of terms of production and delivery.

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- Global market and lack of “national umbrella” for poor quality goods.

- The need of fast rearrangement of production programs.

- The reducing of the expenditure for developing and manufacturing of new articles. In fact, regarding the top articles the expenditure for the development exceeds the expenditure for production.

- The new way in the selection, motivation, work and control of the staff of the industrial enterprise.

Answering to the mentioned requirements, the industrial engineering and management has created the Concurrent engineering [1] (for optimization of the process of development of new technologies and machine) and Reengineering of the business process [2,3,4,5,6] (for complete engineering and management of the XXI century enterprise). The opportunities of virtual enterprises are detailed described in [7,8].

The virtual enterprises are based on the Reengineering PR principles.

## II. VIRTUAL ENTERPRISES FEATURES

There is no only one uniform definition for the virtual productions as there is new area of quickly developing scientific knowledge. In spite of this phenomenon, we will point three of the definitions, which we find more correct than the others:

“Virtual organizations...do not need to have all the people, or sometimes any of the people, in one place in order to deliver their service. The organization exists but you cannot see it. It is a network not an office.” [9]

“A temporary network of independent companies linked by information technology to share skills, cost and access to one another’s markets.” [10]

“Virtual organizations will be reliant on the medium of cyberspace; will be enabled via new computing and communications developments; [and] will initially only exist across conventional organizational structures.” [11]

Under the concept “virtual enterprise” we understand (Fig.1):

The virtual enterprise is:

1. The one which is created on the basis of the new method for industrial engineering and management – reengineering of the business process.

2. The communications within the enterprise are made in a principally new way. There is a possibility that the staff of different departments of the enterprise to work together on some creative projects.

3. In order to meet the previous two requirements, the specialists use high information technologies.

We will consider one by one the elements, which characterize virtual enterprise.

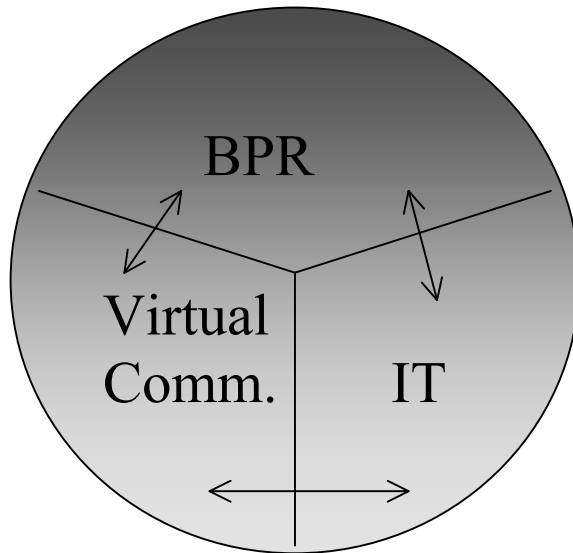


Fig.1

### III. BUSINESS PROCESS REENGINEERING

Business process reengineering (BRP) is a powerful change phenomenon and an approach that has made radical and fundamental changes to the way organizations business [12]. The purpose of these changes is to redesign the existing business processes and implement new ones with the objective of cost reduction and improved efficiency and effectiveness, including profitability, customer satisfaction, return on assets, growth, and market share. [13] Because of the pervasiveness of changes, organizations undertaking BRP must redesign not only their business processes, but also their products, assets, culture, thought patterns, behaviors, and/or technology spanning across functional areas [14]. Many researches even contended that the larger the scope of process change, the greater the potential for radical performance improvement [12].

The effectiveness of the application to BPR in virtual enterprise is mainly due to (fig.2):

- 1.High quality
- 2.Downsizing
- 3.Core competencies
- 4.Outsourcing
- 5.Just in time manufacturing
- 6.Team working
- 7.Empowerment

#### A. For making the quality high the specialists use:

Quality control – putting things right after they have gone wrong

Quality circles – involving staff in putting things right and making them better

Quality systems – a focus on internal procedures to assure a certain level of performance and delivery

Benchmarking – looking outside the organization to monitor the standards, targets and performance of market leaders

Total quality management – an all-embracing philosophy whereby the whole workforce uses a range of techniques and methods to achieve the goal of continuous improvement for the customer.

#### B. Core competencies

The concept of core competencies looks at the organization not as a portfolio of products and services but as a system of activities, some of which are more critical than others.

#### C.Outsourcing

One result of identifying core competencies is the opportunity to use outsourcing to work with carefully selected outside partners, who can add value to the functioning of your organization. Traditional outsourcing targets have been those areas, which make up the support and internal servicing of the organization. More recently, some organizations have expanded the boundaries of outsourcing and contracted out IT services, public relations and even accounting, training and information processing.

#### D. Just in time manufacturing

Just in time manufacturing use IT to link production with logistics to reduce stock-holdings and enable more efficient distribution.

#### E. Team working

A team is a group of people, who share common objectives, who need to work together to achieve them and for which they hold themselves mutually accountable.

#### F. Empowerment

Empowerment involves giving people greater responsibility and devolving decision – making. It should be viewed not as a technique, but more as a form of organizational culture, which relies for its success or failure on the attitudes and behavior of managers and employees. The manager becomes a leader or facilitator rather than a supervisor, developing and maintaining conditions, which will allow others to care about and accept responsibility for obtaining results.

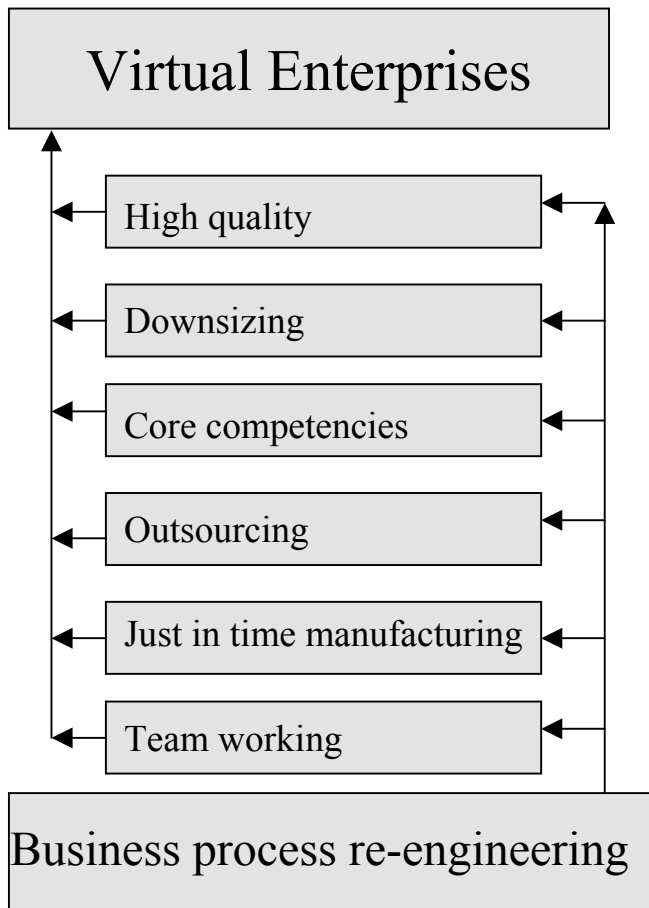


Fig.2

#### IV. VIRTUAL COMMUNICATION

The development, which have improved intra- and inter-organizational communications and focus on the advantages to business. We shall look at:

1. Telecommunication lines
2. Global information nets
3. Video-conferencing
4. Groupware

##### A. Telecommunication lines

Now, however, two communication technologies are developing the capability of greater quality and speed of delivery for the PC user at a lower cost: fibre optics and ISDN. ISDN can now complete the digital link by transforming the line between the home and the exchange so as to exploit the capability of the PC for the transfer of text, image, video, fax or telephone messages either separately or at the same time.

##### B. Global information nets

The Internet is a world-wide network of computer networks connected to each other by telecommunications links, and is made up of an ever-growing number of organizations and individuals, who have decided to make information available in a giant, interconnected, open system.

The marketing potential of the Internet is one of the main attractions for business seeking to explore the potential of a world-wide market through the World Wide Web (WWW), a software program, which cross-references, links and retrieves data from computers around the world in seamless moves, using a hypertext system.

As an advertiser on the WWW, you can't target your customers directly, but they can send requests – and complaints – direct to you through e-mail.

At the time of writing, banks are working with software houses to find foolproof, unbreakable ways of ensuring secure, confidential payments on the Internet. In due course – and sooner rather than later – they will offer secure methods for organizations and individuals to try.

Intranets share the same software, network technology and computer language as Internet. However, while the Internet is a global network open to all, Intranets exist only within organizations, fenced off from external communications by “firewalls”. The organization's employees can communicate safely internally and look outside at the Internet at large, but anyone outside cannot get in.

##### C. Video-conferencing

Video-conference links allow groups of people in remote locations to see as well as hear each other via a live video connection. The connection is created by a telecommunications link (ISDN) and enables people to conduct live “meetings” in cyberspace. In this way it can create a shared work environment for individuals separated by time and distance.

##### D. Groupware

Groupware achieves this by:

Allowing people in appropriate groups special access to bulletin boards on the network, which allows dialogues on-screen

Organizing information for easy collection and distribution

Combining information from different sources into new documents.

Virtual teamworking allows employees to collaborate from a variety of locations, using e-mail, groupware, the Intranet and video-conferencing. These staff may be teleworkers, mobile workers or people working at opposite ends of the building or on different sites. There is no longer any need for members of a team to be physically located together, although the provision of office facilities described above under “hot-desking” is important in allowing face-to-face meetings to take place.

## V. CONCLUSION

The changes in global market push the industrial organizations to a radical change. This change could be taken only as a continuous improvement of the enterprise, which should offer more and more high quality goods and services of lower prices in decreased terms of delivery. This new method for industrial engineering and management – BPR, gives an opportunity to the enterprises to meet the new market requirements. One of the directions of the reengineering development is the virtual enterprise.

Virtual communications within these enterprises have the following purposes:

To make the work of the employees more creative.

To remove the barriers between the distantly working employees.

To decrease the distance between the industrial enterprise and the market.

To create the opportunity for interactive marketing decisions.

To create the possibility for effective and interactive teamwork.

To decrease the number of the staff. The information technology process contributes an entirely decreasing of the unpleasant and non-creative work.

The future development of the information technology gives possibilities for more perspective decisions in this new area of scientific knowledge.

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