

## **MODERN GLOBAL TRENDS IN ENTERPRISE REENGINEERING MANAGEMENT**

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**Abstract.** The paper deals with the question of enterprise reengineering management in the modern global changeable environmental conditions for competitive growth of Russian business. It is referred to identification of the competitive potential of Russian enterprises in the conditions of tough competition, globalization and uncertainty. Reengineering is considered as a requirement for an enterprise innovative development. The authors define the principal directions for measurement of changes and cushioning of risks; reason the choice of growth rate of enterprise development; consider the model of enterprise reengineering management. Engineering companies are initiators of activity for numerous participants of technological projects realization, getting involved into their work if necessary to achieve maximum efficiency of their realization. Not material product is realized on this market, but an individual service which has no compatibles at the date of making of contract and realizing of which is related to high technical risk. That is why a client accrues the right to use the scientific and technological potential of the developer (engineering company) and its subcontractors only from the pay for eventual outcome. As tools we used the methods of economic analysis of business performance, strategic management approach, innovation management, financial management, administrative diagnostics, business reengineering, and such general scientific approaches as analysis and synthesis, system approach to business external and internal environment, social and economic conditions and processes, forming generalized criteria and operating rates.

**Keywords:** global business processes reengineering, development control, competitiveness, innovative enterprise, management of change.

**JEL Classification:** M1, L2, C6.

### **1. Introduction**

In modern global conditions any enterprise faces the challenge of carrying out periodic task-oriented reengineering, work restructuring for the purpose of survival, saving its market power or further development in the changeable competitive conditions. An enterprise's goal is to survive, to develop today and in the long term, to bring operation of business to infinity. Considering that in whatever way we define the development process, it always has its limit. While nearing to the limit the income and volume of sales decrease, costs escalate, competition's influence increases. When one competitor nears to the limit of development, the

others study alternative processes with higher limits on the base of background experience and new knowledge integration.

Unconditional and urgent necessity of reengineering of modern enterprises, as it was exactly determined by the experts in reengineering Michael Hammer and James Champy, is conditioned by separate and joint effect of so-called three "C's" forces (Clients, Competition, Change) which form new external environment and it is evident that businesses, created to function in one environment, can not perform well in other, dramatically changed environment.

## 2. Method

As tools we used the methods of economic analysis of business performance, strategic management approach, innovation management, financial management, administrative diagnostics, business reengineering, and such general scientific approaches as analysis and synthesis, system approach to business external and internal environment, social and economic conditions and processes, forming generalized criteria and operating rates.

## 3. Theory

Engineering is an English word which means machinery, projecting, design. Business engineering is the system of methods and techniques used to create business which can achieve the enterprise's goals. This term includes business projection procedures, knowledge allowing to measure the efficiency of the invested capital, invention and so on. Reengineering expresses reconstruction or reorganization. The term was introduced for scientific use by an American scholar Michael Hammer in early 90s, XX century. Russian scholars define this term as follows: "Business reengineering is fundamental change of the existing management and production structure of a company, based on interaction of distinguished processes (as is in engineering). That is why reengineering is a derived concept of engineering and expresses projecting or change of the existing structure of management and production of an enterprise and its overall business (Bagautdinova N.G. & Safiullin L.N., 2014), (Shigabieva A.M. et al., 2014), (A.I. Podgornaya et al., 2015).

Some authors considered engineering as "a definite form of export of services (transfer of knowledge, technology and experience) from a country of production to an ordering country". Engineering includes integrated research on feasibility study, package of project documents and working-out recommendations on production and control engineering, equipment operation and end product sale (Leshchuk, V., et al., 2015), (Kabaale, E. & Kituyi, G.M., 2015), (Nadarajah, D. et al., 2015).

To select the following features of engineering:

1. in format - it is a service to material production business on the commercial basis;
2. in matter - service package including designing, turnkey construction, completing, putting in operation, adjustment and test operation of construction project;
3. in goals - finishing high-technology scientific research results to production stage;
4. in field orientation - industry, construction, agriculture etc.

So, engineering is providing package of services to different companies (clients) in design, construction, completing, putting in operation, adjustment and test operation of construction

project on the commercial basis for the purpose of realization of technologically highly risk investment projects. Engineering companies activity is an important factor of introduction most recent scientific achievements to the national economy. Complex character of engineering services means that the process of any technological project's realization is long in time and heterogeneous in the structure of carried out operations. In general we can specify four rough stages of the complete cycle of engineering services in the sphere of real investing:

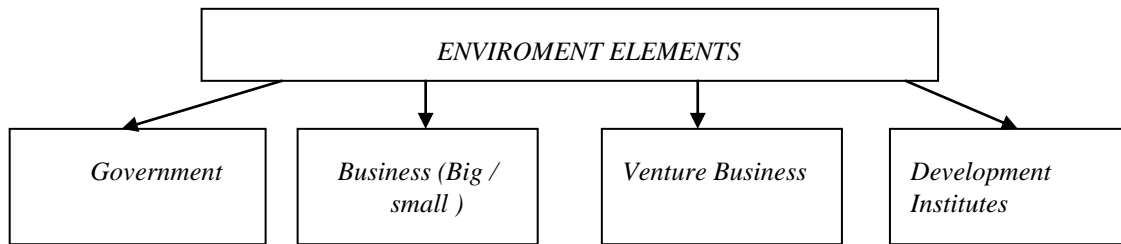
1. project stage - pilot studies of marketing feasibility of the project, technical capabilities of its realization, feasibility study preparation;
2. designing - project documents, master plot plans, schemes, drawing design drafting etc;
3. post-project stage - preparing orders for equipment, construction-engineering works, control on production of equipment and course of installation and construction works;
4. advisory services on project operation after the start-up and end product sale.

Engineering companies are initiators of activity for numerous participants of technological projects realization, getting involved into their work if necessary to achieve maximum efficiency of their realization. Besides, the engineering companies' activity is a factor of pioneer products and technologies introduction into real sector of economy. It is important to note that consultative component of engineering is not its characteristic feature as this type of business service is primarily a way of large industrial projects realization and a method of introduction of research and technology achievements into an enterprise practical activities (Cherukupalli, P. & Raghu Reddy, 2015).

Thus, developing of a special business of particular research and technology services aimed at developing scientific achievements to production stage was the result of transformation of brain capital into essential production factor. All over the world these engineering services are provided by specialized companies which create conditions for introduction of scientific-and-technical progress achievements in production. The same tendency is observed in Russia (A. Podgornaya & S. Grudina, 2015). The conditions of modern industrial production make it more effective for the most of companies to engage engineering firms for adjustment, testing and maintenance of new technology and equipment rather than to find additional resource for training the existing personnel.

Hereby, innovative activity in primary industries is now inconceivable without work of specialized engineering companies. Moreover, when realizing complex many-component projects, an engineering company is not only a "conduit" of scientific research achievement to enterprise's practical activities but also a control center which coordinates the work of all investment process parties and provides quantitative and qualitative performance of a project. Figure 1 presents the environment elements.

Figure 1: Figure description (TNR 10pt., centered, italics)



In the modern global trends in enterprise reengineering management environmental signals can be divided into three groups . In the first group of signals threats and possibilities of the external and internal environment are equal, strong and weak points are equal. In the second group threats and possibilities are not equal and in the internal environment there are more strong points than weak. In the third group there are more threats than possibilities, there are more weak points than strong ones.

Table 1: The model for the analysis of crisis signals at the modern global trends in enterprise reengineering management

<i>Threats= Possibilities</i>	<i>Threats&lt; Possibilities</i>	<i>Threats&gt; Possibilities</i>
<i>The initial stage of life cycle</i>	<i>The life cycle growth stage</i>	<i>The life cycle drop stage</i>
<i>Readiness to implement projects of any complexity</i>	<i>Gaining experience in realization of innovative projects</i>	<i>Choosing the easiest projects for realization</i>
<i>Strong motivation to make an innovative product</i>	<i>Ability to generate an innovative product</i>	<i>From generating to intellectual property protection</i>
<i>High potential of knowledge refreshment</i>	<i>The competition is around new knowledge</i>	<i>Exchange of knowledge specific features</i>
<i>Example: a young consulting company, enterprise (flash-memory inventing by Toshiba)</i>	<i>Example: the way to manage the Amazon company</i>	<i>Example: the experience of «3M» company].</i>

Let's consider the signals of the first group. Here we will refer the negative macroeconomic trends which strengthen uncertainty of successful realization of an innovative product, the unstable market conditions leading to forming of nonobjective understanding the potential demand, unpredictable activities of competitors, difficulties in choosing reference points at entering the market, attracting investments is complicated, growth of information asymmetry. The positive signals are: the activated capital share slowly increases, the potential share is maximum, strong and weaknesses are equal when analyzed. The base which forms the crisis is to be searched in weaknesses of the internal environment of the enterprise (Radosevic, M et al., 2015). For example, inaccuracy in marketing researches, unjustified overestimation of the costs, partially estimated risk level, downsides of power distribution and others. As an example, the strategies which lead to anti-recessionary immunity forming in case of the given signals can be: licensing and patent protection, accumulating of working capital at the expense of self-financing, use of state orders, joining the major manufacturer and different projects in effect. In case of availability of irresistible competitive advantage it can also be intensive development of a product.

The signals of the second group we will call aggression of the environment, bureaucratic barriers in development of business, attempts of copying of a product, the dumping, zero

demand, a segmentary competition, sharp growth of the amounts of works, increasing financial flows, quantity indicators exceed qualitative ones at decision-making. Positive signals: an excessive demand, increase in quantity of regular customers, a competition as equals and so on. Environment threats gradually become more and more numerous, there is direct growth of the possibilities, the available reserves are promptly spent. Professional burning out, disbalance in the purposes and values, corruption in authority functions, the threats of creation of competitive companies, who copy innovations, moral or technological depreciation of capacities, system errors can be the crisis sources. As an example, the strategy leading to forming of anti-recessionary immunity in this case can be: production of a unique product, with the raising price, non-standard, simple decisions, capitalization of human potential, trust forming for an exchange of experience and knowledge between employees, effective concentration and distribution of resources, use of tools of aggressive marketing, lobbyism of interests in product promotion (An, J.-W. & Zhang, Z.-Q., 2013).

The signals of the third group are difficulties in access to external resources, a capital withdrawal and decrease in competitive advantages. Threats exceed the possibilities, absence of the potential capital, a strong deterioration of actives (Rrezaie, K. et al., 2013).

*Table 2: Presents examples of synergies relating to the value drivers (elements of reengineering).*

<i>Value driver (signal)</i>	<i>Examples of some possible synergies (elements of reengineering)</i>
<i>Increase sales growth</i>	<i>Use Target distribution network for Bidder product, or vice versa. Complementary products can increase volumes for both.</i>
<i>Increase operating profit margin</i>	<i>Cost efficiencies.</i>
<i>Reduce cash tax rate</i>	<i>More tax- efficiencies</i>
<i>Reduce incremental investment in capital expenditure</i>	<i>Combine operations and sell off surplus assets</i>
<i>Reduce investment in working capital</i>	<i>Combine operations and reduce inventories</i>
<i>Increase time period of competitive advantage</i>	<i>Strengthened branding</i>

Let's consider an innovative approach to aggregated model system construction for decision making on reengineering administration. It is based on core open model of a company life support model and a model of status of intermediate developing enterprise with the mechanism of correction of realized changes providing an enterprise reengineering by means of adaptation to the most probable changeable external environment in the course of planned reform realization. The basic model with minority of variables or restrictions is reorganized.

The generalized change management model in the course of an enterprise reengineering reflects the requirements of the theory of systems and financial analysis to this process, outlines the working range on providing the tools that allows to consider the changes in the course of reengineering within the consolidated process with due consideration of the enterprise global external environment conditions and with emphasis on relation, interdependence and interaction of different aspects of its functioning in this environment (Kirshin I.A., 2013), (Hess, T. & Schuller, D., 2012), (Ryashchenko, V.P., 2012, A), (Ryashchenko, V.P., 2012, B).

According to our research from a perspective of systems theory, the process of global enterprise reengineering can be presented as transformation of some business process  $\mathbf{B}_1$  (having a certain effect  $\mathbf{E}_1 = \{\mathbf{r}_{1j}\}$ , providing feasibility of some results  $\mathbf{r}_{11}, \mathbf{r}_{12}, \dots, \mathbf{r}_{1j}$  ( $\mathbf{R}_1 =$

$\{\mathbf{r}_{1j}\}$ ), meeting some requirements  $\mathbf{n}_{11}, \mathbf{n}_{12}, \dots, \mathbf{n}_{1j}$  ( $\mathbf{N}_1 = \{\mathbf{n}_{1j}\}$ ) with a definite quality  $\mathbf{q}_{11}, \mathbf{q}_{12}, \dots, \mathbf{q}_{1j}$  in every realization  $\mathbf{r}_{1j}$ ) into business process  $\mathbf{B}_2$  with a relevant characteristic on effect  $\mathbf{E}_2$  (characterized by its set of results, requirements and properties). At that aggregative quality rating  $\mathbf{Q}_{E1} = \{\mathbf{q}_{1j}\}$  and  $\mathbf{Q}_{E2} = \{\mathbf{q}_{2i}\}$  at realization of requirements  $\mathbf{N}_1 = \{\mathbf{n}_{1j}\}$  и  $\mathbf{N}_2 = \{\mathbf{n}_{2i}\}$  acts as effect (quality) rating of business processes  $\mathbf{B}_1$  and  $\mathbf{B}_2$ .

When  $\mathbf{R}_1$  and  $\mathbf{R}_2$  align with potential quality of business processes  $\mathbf{B}_1$  and  $\mathbf{B}_2$ , the enterprise reengineering management can be presented in the following way:

$$\mathbf{B}_1 : \mathbf{Q}_1 \equiv \mathbf{Q}_{E1}, \mathbf{E}_1 \equiv \mathbf{R}_1 \rightarrow \mathbf{B}_2 : \mathbf{Q}_2 \equiv \mathbf{Q}_{E2}, \mathbf{E}_2 \equiv \mathbf{R}_2 .$$

It should be noted that at the enterprise restructuring a new need  $\mathbf{N}_2 = \{\mathbf{n}_{2i}\}$  is the extension of totality of needs  $\mathbf{N}_1 = \{\mathbf{n}_{1j}\}$ , wherefrom it follows that  $\mathbf{N}_1$  and  $\mathbf{N}_2$  are subaggregate of some universal set  $\mathbf{N}$ , which determines the belonging of the given needs type.

## 2. Conclusion

This circumstance makes it possible to draw the following conclusions for developing the range of aggregated models of reengineering of business processes at enterprises:

1. As a builder of business process  $\mathbf{B}_2$  (a new enterprise in the course of its reengineering) to realize the need  $\mathbf{N}_2$  an existing business process  $\mathbf{B}_1$ , its elements, bonds and structure must be used.
2. In the course of a new business process ( $\mathbf{B}_2$ ) it is required to reconsider the structure and to reform each element and business process  $\mathbf{B}_1$  in the course of evaluation of their value in the new business process ( $\mathbf{B}_2$ ) with due consideration of involving new components into business process  $\mathbf{B}_2$  (which are not elements of  $\mathbf{B}_1$ ) and bringing them into relevant relations with other elements and processes of business process  $\mathbf{B}_2$ .
3. As a result of alteration of business process  $\mathbf{B}_1$  some intermediate developing business process  $\mathbf{B}_{12}$  is formed, continuous monitoring of which (at a level of experimental evaluation of functional quality  $\mathbf{Q}_{12}$  on particular realizations  $\mathbf{R}_2$  and evaluation of complete quality  $\mathbf{Q}_2$ ) makes an opportunity to evaluate the sufficiency of carried out reorganization of the enterprise in terms of its transfer to the new level of functioning.

The stated factors condition appearing of engineering services as a specific commercial product and predetermine their further development.

The global engineering market is a specific innovations market segment. Not material product is realized on this market, but an individual service which has no compatibles at the date of making of contract and realizing of which is related to high technical risk. That is why a client accrues the right to use the scientific and technological potential of the developer (engineering company) and its subcontractors only from the pay for eventual outcome. The global business engineering, considered interrelated system of models, procedures and works can be characterized as business optimization and reengineering.

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