



## **Breakthrough Effect of Combining Resource Management Models**

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### **ABSTRACT**

Nowadays Russia is trying to overcome the difficult times, which are characterized by a complicated international situation, high level of turbulence in social and economic sphere and general uncertainty. In the conditions of extremely fierce competition, companies prefer to use a combination of business models with the aim to take the best from several concepts of management. The goal of this research is to analyze one of the model of modern resource management - “velocity” and to relate it to the current state of the Russian economy. Theoretical and practical aspects of the model are presented. Implementation of the “velocity” in the United Engine Corporation - Gas Turbines, Joint-stock Company is highlighted. This is one of the few examples of using above-mentioned concept in Russia. Summarizing, “velocity” can become a promising strategy in the context of the Russian economic situation and in general in the contemporary conditions of the world economic development.

**Keywords:** Velocity, Lean Production, Theory of Constraints, Six Sigma, Resource Management

**JEL Classifications:** D22, L23, M11

### **1. INTRODUCTION**

The current crisis of the Russian economy is a logical continuation of a difficult geopolitical situation in the world, formed at the end of 2014. Therefore, companies clearly have to generate competitive development strategies. The concept of “competitiveness” is a complex and determines the position of the state in the world rankings according to many indicators.

The ranking of countries based on the level of global competitiveness, which is compiled by the International Institute for Management Development every year, is one of the most authoritative. The dynamics of the places that were occupied by Russia in 2009-2016 is presented on the chart (Figure 1).

Guided by the graph, Russia’s positions are fairly modest. In 2015, the drop in the global competitiveness index of Russia amounted to 7 points (from 38 to 45). It had happened due to the aggravated geopolitical environment. General macroeconomic stability is noted, but the low level of diversification of the economy is also highlighted.

Russian government has embarked on a policy of import substitution and structural economic changes. It involves the actualization of the issues, that are connected with competitiveness of Russian industry. Therefore, it is worth to note that there is a need of implementation the effective models of management of industrial enterprises and organization of internal processes. In conditions of extremely high competition, companies that are able to respond quickly to changes in the external environment, will survive. More and more companies make their choice in favor of combining different business models, trying to take the best from several concepts of management. Chosen management model remains effective, but it ceases to give maximum results.

Problems of formation and implementation the competitive management models in conditions of limited resources of industrial enterprise are explored in the works of foreign and local authors. Among foreign researchers are Ohno (1988), Imai (1997), Womack and Jones (2003), Prahalad and Hamel (1990), Collis and Montgomery (1995), Pande et al. (2000), Deming (1982), Goldratt and Cox (1984), Goldratt (1997), Cox et al. (2010) and

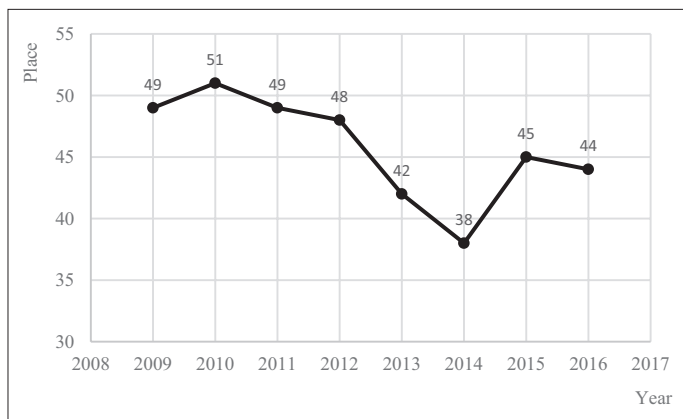
others. Among the national scientists, we should mention Kleiner (2011), Adler and Shper (2000), Katkalo (2002), Glukhov et al. (2012) and others.

## 2. KEY RESEARCH FINDINGS

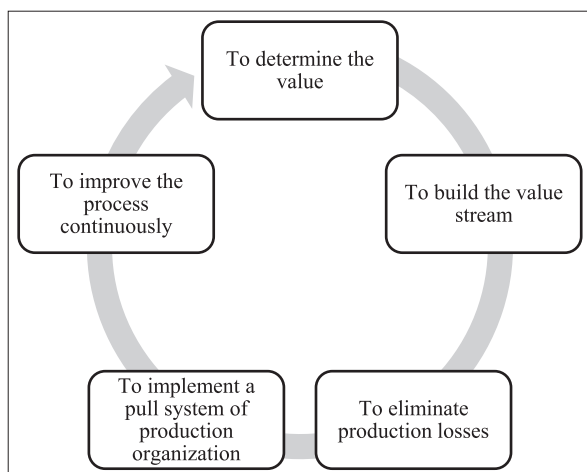
### 2.1. Velocity

Velocity is a management philosophy, combining individually effective models of modern resource management: Lean production, theory of constraints, six sigma. It has been tested in the U.S. army with the aim of establishing logistics processes (Dumond, 2001). This concept is an example of productive cooperation of the different organizational technologies. It is an undisputed fact that each model has proved itself from the best side in international practice, however their symbiosis is considered a relatively new phenomenon in modern management theory. Missions of these models are the most distinct features that link them. Each model is a programme of improvements. The Deming cycle (PDCA) (Deming, 1982) is the basis of the algorithm logics of improvement the processes of the above-mentioned concepts. The sequences of actions of their implementations are presented next (Figures 2-4).

**Figure 1:** The dynamics of the places that were occupied by Russia on the basis of the level of global competitiveness according to the Institute for Management Development in 2009-2016



**Figure 2:** Stages of implementation of lean production, developed by the authors

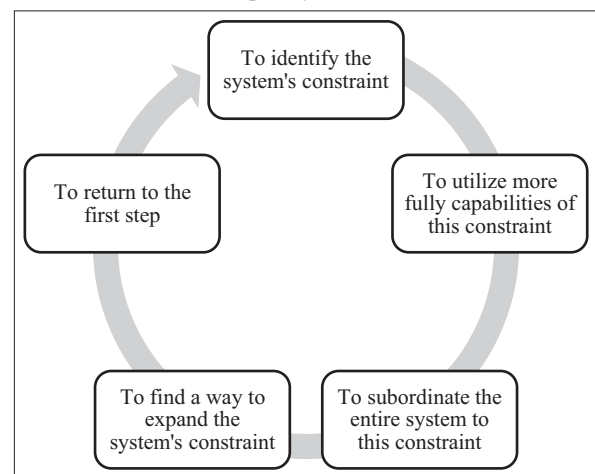


According to the cycles, the fundamental differences of three concepts become clearly visible. They lie in the attention focus and the main idea (Table 1).

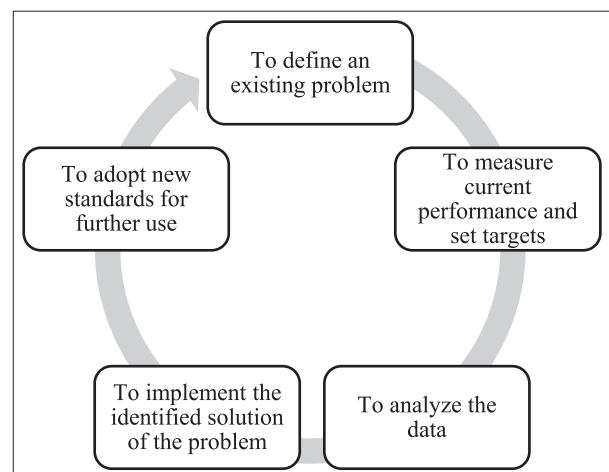
Team of the scientists (Cox et al., 2010) proposed the variant of models' integration in the framework of the concept "velocity." Lean production and six sigma work better within the theory of constraints than without it. Because with the assistance of the theory of constraints it is really to create fastly a stable system and then improve it using lean production and six sigma. But it is important to keep the main constraint that sets the speed of the process. The authors shifted the management paradigm from using of single theory to combination of several theories. In their business novel "Velocity" they showed that the combination of lean production, theory of constraints and six sigma can achieve breakthrough performance.

The proposed variant of implementation of the concept "velocity" was previously confirmed by the practice of a large American electronics manufacturer. This company conducted an experiment with the aim to compare the effectiveness of lean production, six sigma and "velocity" (Pirasteh and Farah,

**Figure 3:** Stages of implementation of the theory of constraints, developed by the authors



**Figure 4:** Stages of implementation of six sigma, developed by the authors



2006). For more than 2 years of research 101 projects were executed on 21 company's plants. According to the initially assigned distribution: 11 plants have applied six sigma, 4 - lean production and 6 - integrated model. All other conditions were equal, for example, the level of training of employees. As a result, the methodology of the improvement process of the concept "velocity" has significantly reduced the company's costs. The percentage share of contribution to the savings by organizational technologies is presented below (Figure 5). It is an extraordinary result in the context of the development of modern management.

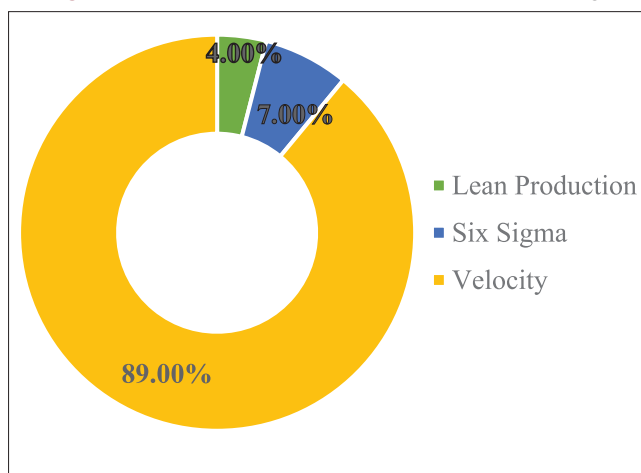
Thus, "velocity" has the following sequence of stages:

1. To apply the principles of the theory of constraints:
  - To identify the system's constraint;
  - To utilize more fully capabilities of this constraint;
  - To subordinate the entire system to this constraint;
  - To find a way to expand the system's constraint.
2. To apply the principles of lean production considering the identified bottleneck:
  - To determine the value;
  - To build the value stream;
  - To eliminate production losses;
  - To implement a pull system of production organization, based on the customer preferences.
3. To apply the principles of six sigma with the aim to pursue perfection:
  - To define an existing problem;
  - To measure current performance and set targets;
  - To analyze the data;
  - To implement the identified solution of the problem.

**Table 1: Comparison of the concepts: Lean production, theory of constraints, six sigma, developed by the authors**

Characteristic	Lean production	Theory constraints	Six sigma
Focus of attention	Value stream	System constraints	Existing problems
Main idea	Reduction of losses	Decreasing of constraints	Reduction of variation

**Figure 5: The ratio of the shares of contribution to savings**



4. In parallel to use the tools of lean production and six sigma to maintain the continuous improvement process and reduce the variations.
5. To examine performance over time.

It is important, before the introduction the "velocity," all employees of different levels must be well-trained and aware of the principles of the integrated model and of each model separately. The final objective is to design the mechanism of functioning of the enterprise, which is agile.

Because of the growing popularity of the concept "velocity" in the foreign practice there are a lot of absolutely the latest research in this field of modern management. Researchers examine the theory from the different sides, trying to form a universal winning management model. So, Pirasteh and Fox (2010) defined it as a comprehensive system, which would help ensure organizations' quality, productivity, profitability, and continuous improvement of processes with sustained results. Scholars (Sproull and Nelson, 2012) pay great attention to the development of the theoretical aspects of this field of knowledge. Sproull (2012) explores the issue of maximizing the company's profit using the ultimate improvement cycle, which is based on the idea of the concept "velocity." Evans and Lindsay (2014) have an interesting point of view. They indicate the primary role of the six sigma in the models' combination. Some scientists consider the concept in mix with other fields of knowledge and spheres of activity. For example, "velocity" in the healthcare (D'Andreanatteo et al., 2015) and in the context of a utilities monopoly (Shannon, 2013).

## 2.2. Velocity in Russia

In contrast to the developed countries "velocity" has not yet received sufficient development in Russia. From a theoretical point of view, now Russian authors (Kleiner, Katkalo, Glukhov, Balashova and others), studying foreign methodology and experience, try to develop adaptive models to the Russian realities (Balashova, 2014).

From a practical point of view, "velocity" in the activity of domestic industrial enterprises is being expressed episodically and implicitly. Russian industrial enterprises are trying to keep up with current global trends and make attempts to combine management approaches, tools, methods and techniques. It is obvious that the symbiosis is carried out in relation to the set of conditions of the micro and microenvironment, as well as of the general philosophy of the company. In this context, models of modern resource management attract special attention. As these models are able to effectively influence the target performance of the company in the current economic conditions.

United Engine Corporation (UEC) - Gas Turbines, Joint-stock Company (UEC-GT, JSC) is a remarkable example of the implementation of the concept "velocity" in Russia. It is the UEC leading company for manufacturing of the power generating and gas compressor sets as well as for the power plants turnkey construction. Full production cycle allows for the shortest possible lead time and high quality of products and services.

The company's organization of production embodies a model of lean production, theory of constraints and six sigma. The main

principles and focus areas are:

- Customer orientation;
- Loss reduction;
- Corporate culture;
- Involvement of each employee in improvements;
- Continual enhancement of personnel professional capabilities;
- International partnership;
- Quality policy implementation;
- Sustainable development.

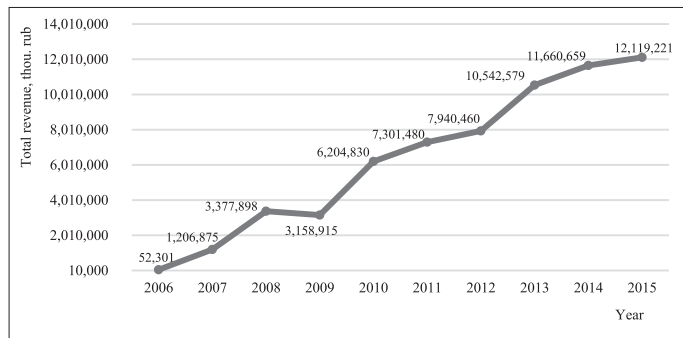
In 2009 the company embarked on the path of global transformation that resulted in the creation of the production system based on continuous improvement principles and quality improvement processes. At the beginning, special department for the conversion of the company's activities was created. In May 2009, this department conducted the first steps of transformation - deployment of 5S and Kaizen (continuous improvement process) and working groups in the workshops were formed. The emphasis of the effort was directed primarily at the main production units. Employees in the framework of the "continuous learning" at least once in a quarter receive training on lean production, theory of constraints and six sigma in Moscow, St.-Petersburg, Ekaterinburg, Nizhny Novgorod. The results of the 1<sup>st</sup> year of implementation of this management strategy are: 37% of employees were involved in the continuous improvement process, and the economic effect amounted to about 400 million rubles. In addition, master-classes in areas of production workshops with participation of specialists of the NPO "Saturn" and "Snecma" were carried out; the proposal submission system has been introduced; assessment of workplaces was performed; key performance indicators of working groups were identified and counted. Also in 2009 employees have made more than 170 suggestions for improvements. For the first 5 years, 86 projects were opened. In 56 of them, production took an active part. Such projects as "Unification of pipe flanges," "Cooperation-1," "220," "Linked plans," "Growth of quality," "Rainbow" and "Business of product" had a special meaning. The key of such successful changes was the combining of three management models. Dynamics of the company's total revenue is significant evidence of the concept's economic efficiency (Figure 6).

The graph clearly shows the breakthrough made by the company after the implementation the competitive management strategy - "velocity."

The UEC-GT's strategy implies further development and establishing a company in full compliance with global quality standards, carrying out design and making supplies, including aftersales, of gas compressor sets and power generating plants to oil and gas sector and distributed power generation, achieving RF and CIS gas turbine equipment market share of at least 20% in 2020. And due to the "velocity," the company's development strategy seems to be quite realistic. The current position of the UEC-GT in industry is illustrated below (Figure 7).

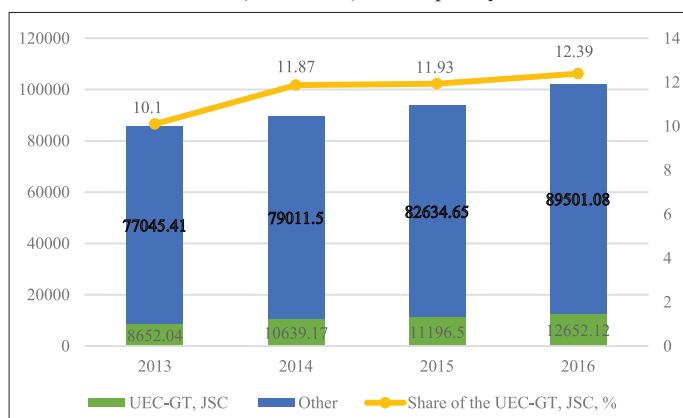
The chart reflects that UEC-GT's market share in Russia tends to increase. According to the annual reports of the UEC-GT since 2009, top management explains company's success by well-functioning management model: "Lean-transformation is carried out intensively in the company."

**Figure 6:** Dynamics of the United Engine Corporation's gas turbine total revenue (2006-2015)



Source: Official website of the United Engine Corporation's - Gas Turbines, Joint-stock Company

**Figure 7:** United Engine Corporation's gas turbine equipment market share in Russia (2013-2016), developed by the authors



### 3. DISCUSSION AND CONCLUSION

"Velocity" is very dynamically developing business model that allows to get many answers to the important questions of modern management. There are some outcomes of the article:

1. The economically difficult situation in Russia provokes enterprises to generate management models, which are capable to maintain a high level of competitiveness without significant investments, mostly due to internal resources;
2. The integration of the organizational technologies of modern resource management is a promising step;
3. The main advantage of "velocity" is agility, which is the result of combining the best practices of the resource management models: Lean production, theory of constraints, six sigma and particularly actual in the current unstable realities;
4. It is important to be aware of not only the principles of "velocity", but the principles and tools of the lean production, theory of constraints, six sigma too;
5. The successful example of introducing the concept in the UEC-GT confirms the multiplicity of its application and motivates to use it in Russian industry.

The above-described concept is fairly new to modern management theory and that's why there are a lot of obstacles and unknown features for mass implementation. But "velocity" can become



the breakthrough strategy, which will increase the performance indicators of a lot of companies in the world.

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