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TRIZ FOR BUSINESS AND MANAGEMENT: STATE OF THE ART

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Abstract

In the early 1990s, the first attempts were made to explore if a systematic approach based on TRIZ can be used beyond engineering: in particular, to assist coping with innovative problems and challenges within the areas of business and management. The experience gained since helps with drawing conclusions regarding the applicability of the approach as well as which parts of TRIZ can be directly used in the areas of business and management; which parts cannot be used or must be adapted; and what new knowledge is needed. The paper attempts to define and structure business innovation categories, as well as proposes a roadmap of applying TRIZ tools to different types of innovative projects in business and management.

Keywords: TRIZ, business innovation, systematic innovation

Аннотация

В начале 1990х были предприняты первые попытки исследовать возможности применения системного подхода к решению инновационных проблем на основе ТРИЗ вне привычных технических областей, в частности, в области бизнеса и управления. Накопленный за прошедшее время опыт позволяет сделать выводы, какие части ТРИЗ могут применяться непосредственно и без изменений, а какие – либо не могут или же требуют значительной адаптации, а также какие дополнительные знания необходимо приобрести для того, чтобы организовать эффективную системную поддержку инноваций в бизнесе и управлении. Данная статья делает попытку определить и структурировать категории бизнес инноваций, а также предлагает дорожную карту применения инструментов ТРИЗ для поддержки разных типов инновационных проектов в сферах бизнеса и управления.

Ключевые слова: ТРИЗ, бизнес инновации, технологии системных инноваций.

1. Introduction

For a long time, engineering innovation has been among the most important factors driving the progress of human civilization. Today it is clear that business innovation is not less important to successfully compete and becomes the necessity. Modern business environment is extremely dynamic and fast, information technology and global networking eliminate borders, which used to keep businesses in their comfort zones, the market continuously demands better services, competition even between small companies moves to a global scale. At the same time there was no solid and proven method that would help with business innovation. In search for a solution, more and more businesspeople turn their attention to TRIZ.

While TRIZ nowadays is primarily known and used in technology and engineering, applications of TRIZ in business and management areas have been practically unknown. It should not be surprising: TRIZ was created by engineers for engineers. The vast majority of TRIZ professionals work in the areas of engineering rather than business due to historic reasons. In addition, many TRIZ experts working in the technology areas are vaguely familiar with specifics of business environments, therefore direct applications of “technical” TRIZ to deal with business challenges often failed. It became obvious that a separate version TRIZ for Business and Management was needed.

Relatively recently, TRIZ developers started to expand application of TRIZ to business and management areas [1, 2, 3, 4, 5, 6]. The results appeared to be rather encouraging: a number of seemingly unsolvable business and management problems were solved quite effectively and efficiently. Such situation triggered further development of TRIZ for Business and Management, which has been actively evolving during recent years. A major step in further promotion of “Business TRIZ” was made by introduction of Darrell Mann’s book “*Hands-On Systematic Innovation for Business and Management*” [7] in 2004. It triggered performing further experiments with TRIZ by business professionals in academia and industry.

2. Similarity with Technical TRIZ: Common Principles and Philosophy.

Modern TRIZ is a large body of knowledge [8, 9], which is composed by a combination of theories of solving inventive problems and man-made systems evolution, analytical tools and methods for problem solving and analysis, collections of generic patterns of solutions, databases of specific effects and technologies, and techniques for creative imagination development.

If a role of TRIZ should be defined by a single sentence, one can say that TRIZ supports analytical and creative phases of innovation with systematic knowledge-based support. While most of the basic TRIZ principles were drawn from the studies of technical inventions, after many years of studies it becomes obvious that the ways in which we solve problems and generate innovative ideas of solutions appear to be rather similar in virtually every domain which deals with man-made systems.

For instance, TRIZ postulates that one of the major driving forces of evolution of a certain technology is a stepwise resolution of contradictions emerging between the current technology capabilities and our growing demands. A concept of evolution through contradictions resolution was known in philosophical studies long before TRIZ, but the TRIZ researchers developed this concept further and made it applicable for supporting technical innovation. The same idea of evolution through contradictions resolution appears to be true for many other domains: business, social, political, economic – although the latter ones still require more research to prove this statement.

By now, most of the studies were done with respect to business innovation, and as an example, it is clear that an old and seemingly solid business model that generated solid business during many years will not survive when its business environment changes. It happens because the current business model starts facing contradictions; and in many cases, the business models must go through one or several disruptive improvements to maintain competitive advantage since compromising and optimizing will only help to incrementally impact business results without achieving goals desired.

There are several key reasons which make it possible to apply philosophy and principles of TRIZ to non-technical systems, in particular, business and management systems:

- Inventive problems emerge due to conflicts of demands and none of solutions known in an industry where the problem emerged can help.

- Inventive problems emerge within systems and processes and relate to organization of and interactions between components of such systems.
- Challenges and problems are solved through transforming systems where they emerged.
- At a high level of abstraction, patterns of inventive solutions indicating how systems should be transformed appear to be common for most diverse types of men-made systems.
- General trends of innovative development (evolution) appear to be common for different types types of men-made systems which might belong to very diverse domains.

3. Definition and Categories of Business Innovation

3.1. Definition of Business Innovation

There are hundreds of different definitions of what innovation is which are presented in literature. In case of technical innovation, the distinguishing feature is patentability of a technical solution proposed; thus, the novelty of the solution can be confirmed by a patent issued to protect the solution. In business and management areas, such practice does not exist. Nevertheless, to clarify further reading, let us introduce the following definition of business innovation:

“Business innovation is a new (or known but within a new context) solution within the areas of business or management which: a) creates value for a specific target group, b) ensures that this value that can be successfully captured, b) has a proof of successful implementation, c) is economically accessible by the target group”.

Based on this definition, we will introduce different categories of business and management innovation below.

3.2. Categories of Business and Management Innovation

In the business and management environments, an innovative solution can impact different areas. For example, first, it can change the way a business is organized and performed. Second, how the same business is managed. Third, it can introduce a new service or a product. Although there are known attempts to classify business innovation tasks, for example in [10,11] we believe that such classifications are not exact enough and overlap because they are not based on a system approach.

An approach to business innovation structuring and roadmapping presented below is based on over 60 practical cases performed by the author since 2003 and studies of over 1000 cases of business innovation in diverse fields. These studies resulted in a better understanding how TRIZ can be used for business innovation [12]. One can distinguish between the following six large areas of business and management innovation (Fig. 1):

1. ***Innovation of value proposition.*** This type of innovation is similar to what we understand as innovation within technology and engineering since we deal with a value proposition which always includes at least one main ingredient: a tangible (physical) or an intangible product (e.g. service), or a combination of tangible and intangible products. For example, the value proposition of an automotive company can be based on the combination of delivery of a car, its service and insurance. A value proposition of a training company can be based on the combination of delivering a training course and its follow-up support.
2. ***Innovation of a business process.*** A typical business process consists of a sequence of specific actions and activities. In a modern business organization, their structure is usually rather well defined through business process modeling. A business process can be compared to a production processes in the engineering domain.

3. **Innovation of a business system.** A business system consists of components which support business processes and create value which is then brought and maintained at either B2B or B2C markets. The components of a business system include tangible and intangible assets, which belong to the system and directly contribute to the shareholder value of the system.
4. **Innovation of a value network.** Due to broad expansion of businesses to supersystem, value networks have become increasingly popular. While in the past almost any business could be represented by a supply value chain (both within the organization as well as on a broader scale), where each step adds value from a supplier towards a customer with-in the chain-like structure, today value creation can be represented through network structures and might involve non-business components: customers, social and government bodies, etc.
5. **Innovation of a business model.** Business model innovation becomes very popular to-day and affects all other types of business innovation [13]. However, it is important to recognize the differences between a business system, value network, and a business model. Recently, a number of different approaches have emerged to identify a business model: some only focus on the ways specifying how revenue is generated and distributed but other approaches might include all the components of a business system, value proposition, and supplier/partner/customer relationships as well. In other words, when we look at business system/network innovation, we focus on the components change while when we focus on business model innovation, we primarily change the relationships between the components of a business system and its super-system. Thus, there can be two situations: a) a business model is encapsulated within a particular business system (organization) and matches the business system architecture, and b) a business model expands beyond the business system.
6. **Innovation of capturing value proposition.** This particularly new category of business innovation covers those innovative solutions which help a customer or a consumer to obtain most benefits fully realize potential and value hidden within the products or services they either purchase or license.

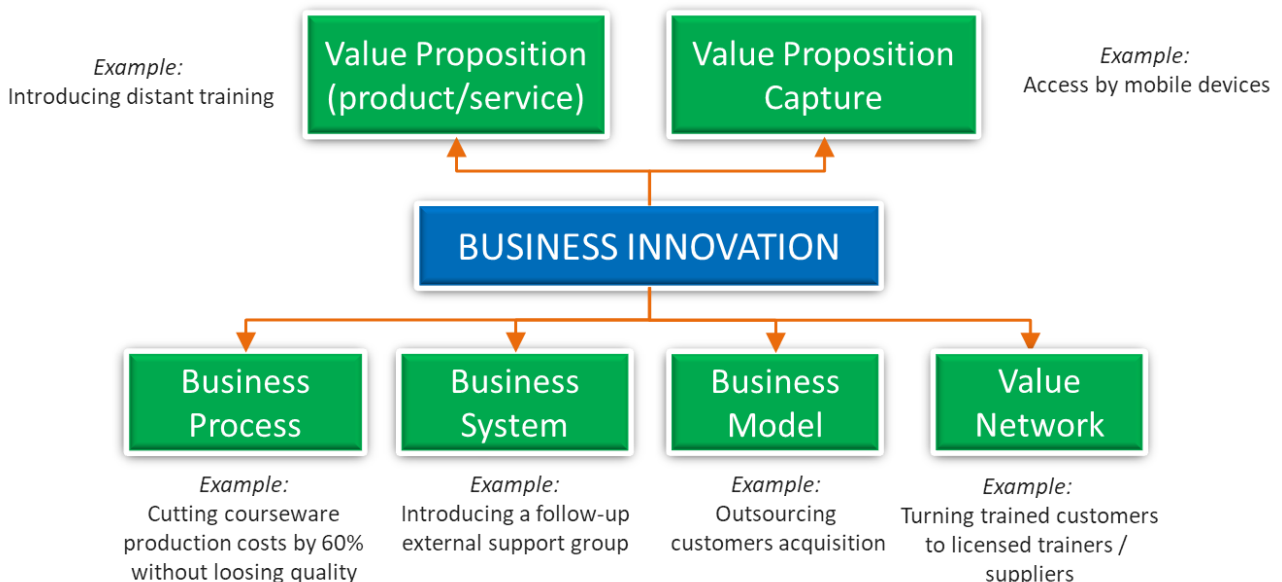


Fig. 1. Categories of business of innovation with examples of innovations at a training company.

In contrast to engineering innovation which occurs either in a technical product or in a manufacturing or a production processes, innovative solutions in business and management have a broader scope and can occur at different places of a specific business ecosystem (Fig. 2). Red spots in the figure demonstrate where such situations can usually take place. Note that sometimes, to achieve improvement of collaborative efforts within the value network, innovation of a business system of a supplier can be demanded.

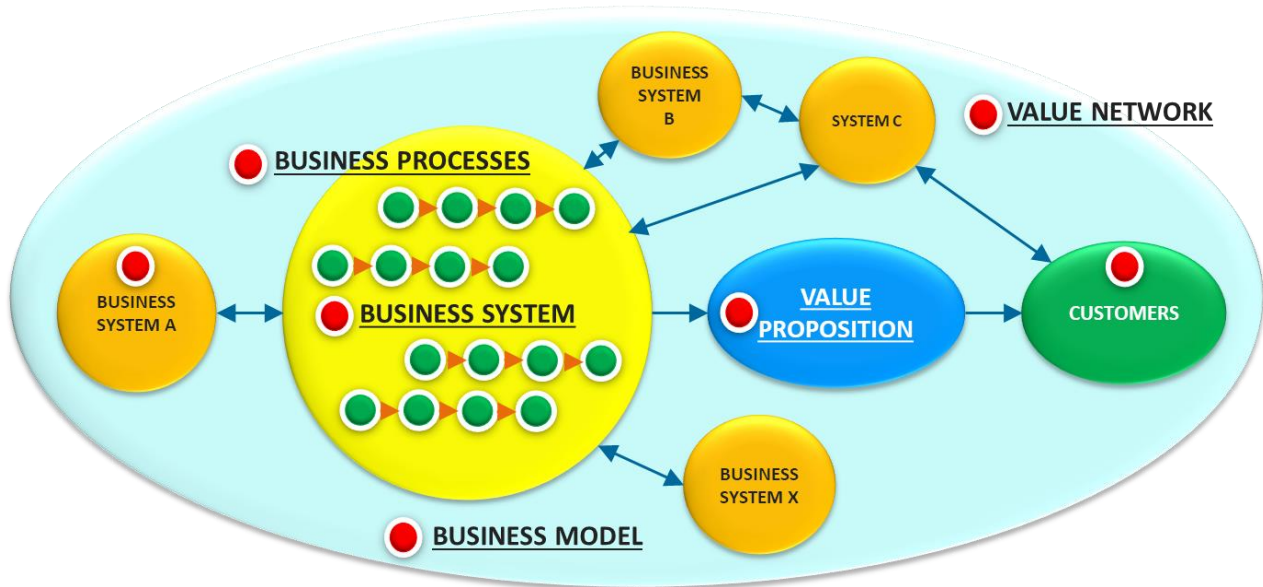


Fig. 2. Red spots mark places where business and management innovation can take place.

4. Business Innovation with TRIZ: Roadmap

4.1. Stage-Gate TRIZ Process to Support Business Innovation

As follows from an overview of typical categories of business innovation shown above, there are three large conceptual groups of innovative tasks in each category:

- a) tasks dealing with solving specific innovative problems,
- b) tasks related to the overall system / value network innovative improvement, and
- c) tasks related to extracting new market opportunities for innovation.

TRIZ proposes a systematic approach to deal with each group of tasks. A typical stage-gate front-end innovation process is shown in Fig. 3. This process does not depend on what conceptual group is involved.

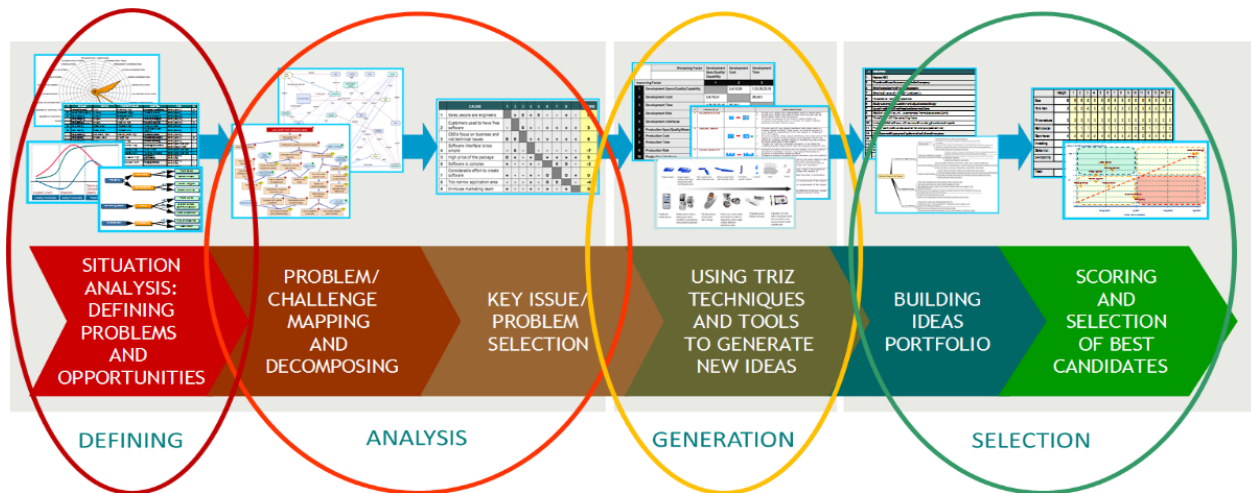


Fig. 3. A typical stage-gate process with TRIZ

A process of dealing with every type of innovation task includes four main steps where each step is supported with specific TRIZ tools adapted for business innovation [14]:

1. **Preparation and Situation Analysis**, where goals are identified and fixed, revision of demands and constraints is performed, project planning is established.
2. **Problem/Issue Analysis**, where analytical tools are used to structure a situation, build its model, decompose a challenge identified and extract key problems/ specific challenges which must be solved to meet the project goals.
3. **Solution Ideas Generation** (including problem solving), where a list (portfolio) of new solution ideas is generated.
4. **Evaluation and Selection**, where the most promising solution candidates are ranked and selected, as well as follow-up implementation problems are investigated.

An example of such a process with the use of modern TRIZ tools to help with systematic business model innovation based on the Business Model Canvas approach [15] can be found in [16].

4.2. Roadmap: Projects, Phases, and Tools

The size of this paper is too limited to present a unique process for each task mentioned, therefore we will focus on mentioning those tools of TRIZ which have been used to systematically support most important types of innovation projects during recent years. Table 1 shows a summary of the TRIZ tools which are most relevant for different groups of tasks defined for typical projects. This classification is based on the experience of the author and his network being engaged to assisting business innovation at customer organizations performed by the author since 2003. In addition, during preparations and analytical phases, other non-TRIZ tools are often were used to deal with specifics of customers' problems and challenges.

It must be noted that some TRIZ tools mentioned in the table have the same titles but might differ from their original versions used for dealing with engineering problems and challenges. In general, we can outline four categories of such tools:

1. **Tools which can be directly applied without change.** Among them *System Operator* (including its expanded version titled *Multi-Screen Analysis*), *Flow Analysis*, *MPV Analysis*; tools for evaluating and selecting solution ideas.
2. **Tools which are used in the modified and adapted form:** *Inventive Principles*, *System of*

Standard Inventive Solutions, Lines of Business Systems Evolution; an extended version of *TRIZ-based Function Analysis* which was adapted to deal with intangible components such as, for example, business decisions or knowledge and information, as well as such tools as *Simplified ARIZ, Resources*.

3. **New tools which were developed specifically for business and management innovation**, such as *S-curve Analysis for business systems* or *TRIZ-Navigator for Business Models* [17].
4. **Tools which may not be used for business and management**, such as *Guides to Scientific Effects* – as clear, there is no place for these tools in the table presented below.

Table 1. Typical phases of most common types of innovative projects and TRIZ tools supporting these phases.

PROJECT GOAL	PREPARATIONS	ANALYTICAL TOOLS	PROBLEM SOLVING SUPPORT TOOLS	TOOLS TO EVALUATE SOLUTION IDEAS
Solving a specific narrow problem: eliminating negative effects; improving performance or control	<ul style="list-style-type: none"> • Problem Perception Mapping. • Innovation Situation Questionnaire. 	<ul style="list-style-type: none"> • Root-Conflict Analysis (RCA+). • TRIZ-based Function Analysis of a problem. • Resource Analysis. • Simplified ARIZ. 	<ul style="list-style-type: none"> • Ideal Final Result. • The use of Resources. • Principles of Contradictions Elimination. • Standard Inventive Solutions for Business. • TRIZ-Navigator for Business Models 	<ul style="list-style-type: none"> • Multi-criteria Decision Matrix. • Ideas Landscape. • Ideality criteria.
Drastic cost reduction: system or process	<ul style="list-style-type: none"> • System Border Analysis. • Innovation Situation Questionnaire. 	<ul style="list-style-type: none"> • TRIZ-based Function Analysis: system or process. • Function/Cost Diagram. 	<ul style="list-style-type: none"> • Function-Ideal Modeling (Trimming). • The use of Resources. • Standard Inventive Solutions for Business. • Principles of Contradictions Elimination. • TRIZ-Navigator for Business Models 	<ul style="list-style-type: none"> • Pair Ranking
Strategic Roadmapping of innovative business development	<ul style="list-style-type: none"> • Trends and competitors Analysis. • Discovery of driving forces. • Analysis of value networks. 	<ul style="list-style-type: none"> • Multi-Screen Analysis (MSA). • Value Conflict Mapping (VCM). • MPV and S-curve Analysis. • Laws of Business Systems Evolution. 	<ul style="list-style-type: none"> • Lines of Evolution of Business Systems and Business Processes. • Principles of Contradictions Elimination. • TRIZ-Navigator for Business Models 	<ul style="list-style-type: none"> • Pair Ranking. • Ideas Landscape. • Ideas Roadmap.
Extraction, formulation and	<ul style="list-style-type: none"> • System Border Analysis. 	<ul style="list-style-type: none"> • TRIZ-based Function Analysis: system or process. 		<ul style="list-style-type: none"> • Multi-criteria Decision Matrix.

ranking existing problems/issues		<ul style="list-style-type: none"> • Cost/Function Diagram. • Flow Analysis. 		<ul style="list-style-type: none"> • Pair Ranking
Search for new applications of business products or business models		<ul style="list-style-type: none"> • Inverse Function-Oriented Search (Inverse FOS). 		<ul style="list-style-type: none"> • Pair Ranking. • Ideas Landscape.
Anticipatory Failures Forecast.	<ul style="list-style-type: none"> • System Border Analysis. 	<ul style="list-style-type: none"> • Multi-Screen Analysis (MSA). • TRIZ-based Function Analysis. • Resource Analysis. 	<ul style="list-style-type: none"> • Anticipatory Failures Forecast. 	<ul style="list-style-type: none"> • Pair Ranking
Inventing a new business product or a new business model	<ul style="list-style-type: none"> • Trends and competitors Analysis. • Problems scorecard. 	<ul style="list-style-type: none"> • Multi-Screen Analysis (MSA). • MPV and S-curve Analysis. • Trends and Lines of Business Systems Evolution. 	<ul style="list-style-type: none"> • Lines of Evolution of Business Systems and Business Processes. • Principles of Contradictions Elimination. • TRIZ-Navigator for Business Models 	<ul style="list-style-type: none"> • Multi-criteria • Decision Matrix. • Pair Ranking

5. Conclusions

At this moment, introduction of TRIZ to support business and management innovation is rather slow. Partly it is due to competition with other ‘quick and dirty’ methods such as brainstorm that do not require investments to learning, but partly due to the fact that TRIZ and Systematic Innovation have been developed within an engineering community and their applications outside technical domains are not well known yet. On the other hand, direct application of TRIZ tools developed for technology innovation is not always well received by the business audience due to a different language and cognitive gaps.

Nevertheless, there is already some positive experience with adapting TRIZ tools to business needs (such as reformulation of inventive principles, inventive standards, ARIZ), structuring innovative business categories and tasks, and using the tools of TRIZ to support the process of business innovation. There are many reports from different countries about successful experience with the use of TRIZ to deal with business and management innovative challenges which came from Australia, Chile, European countries, Malaysia, People Republic of China, South Korea, Taiwan, Turkey, USA.

Still, a broader research and development activities are needed to bridge the gaps between various innovative tasks mentioned above and supporting systematic tools that can support them.

Summarizing, the following conclusions can be drawn:

- Key TRIZ principles, concepts and innovation paradigm can be effectively applied to business and management.
- A scope of business innovation is broader than technology innovation.
- Evolution of business systems seems to be quite similar to the evolution trends of technical

(engineering) systems.

- Business innovation can be structured by dividing to categories and tasks and selecting relevant TRIZ tools to support each task.
- Regarding business innovation some TRIZ tools can be directly used to support tasks required; some must be adapted; and new tools have to be created.

References

1. Zlotin B. & Zussman A., "Evolution of Organizations". *Materials of TRIZ Course, Kishinev, Moldova*, 1991. (in Russian)
2. Mann D. & Domb E. "40 Inventive (business) principles with examples", *The TRIZ Journal*, September 1999. <https://triz-journal.com/40-inventive-business-principles-examples/>
3. Souchkov V., "M-TRIZ: Application of TRIZ to Solve Business Problem", Insytec white paper, June 1999.
4. Ishida Atsuko. "Using TRIZ to Create Innovative Business Models and Products". In *Proceedings of International Conference TRIZ Future 2003*, November 12-14, 2003, Aachen, Germany.
5. Averboukh E. "I-TRIZ for Six Sigma Business Process Management", *The Online TRIZ Journal*, December 2003. Last seen: May 2019: <http://www.triz-journal.com/archives/2003/12/i/09.pdf> Last seen: May 30, 2019
6. Smith H., "P-TRIZ Formulation", #2 in a series, *BPTrends.com*, March 2006.
7. Mann D. "*Hands on Systematic Innovation: For Business and Management*". Edward Gaskell Publishers, 2004
8. Fey V., Litvin S., Petrov V. & Rubin M. "TRIZ Body of Knowledge". International TRIZ Association (MATRIZ), 2007.
9. Souchkov V. "Map of Modern TRIZ". <https://www.linkedin.com/pulse/map-modern-triz-valeri-souchkov/> Last seen: May 30, 2019
10. Moore G. "Dealing with Darwin: How Great Companies Innovate at Every Phase of Their Evolution." Portfolio, 2008.
11. Keeley L., Quinn B., Pikkell R. & Walters H. "The Science of Innovation". *Bloomberg Business*, May 7, 2013. <http://www.bloomberg.com/bw/articles/2013-05-07/the-science-of-innovation> Last seen: May 30, 2019
12. Souchkov V. "Breakthrough Thinking with TRIZ for Business and Management", ICG Training & Consulting, 2007 (2014 2nd ed.). <http://www.xtriz.com/TRIZforBusinessAndManagement.pdf> Last seen: May 30, 2019
13. Johnson M., Christensen C., Kagermann H. "Reinventing Your Business Model". *Harvard Business Review*. December 2008.
14. Souchkov V. "Training Manual for Systematic Business Innovation". ICG Training & Consulting, Enschede, 2007-2019.
15. Osterwalder A. & Pigneur Y. "*Business Model Generation*". John Wiley and Sons, 2010
16. Souchkov V. "TRIZ and Systematic Business Model Innovation", in *Proceedings of Int. Conference TRIZ Future 2010*, Bergamo, Italy. p.189-198.
17. Kuryan A. & Rubin M. "TRIZ-Navigator for Business Models". In *Proceedings of the MATRIZ TRIZfest 2017 International Conference*. September 14-16, 2017, Krakow, Poland

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