TECHNICAL UNIVERSITY OF CLUJ-NAPOCA

ACTA TECHNICA NAPOCENSIS

Series: Applied Mathematics, Mechanics, and Engineering
Vol. 63, Issue Special, October, 2020

TRIZ FOR THE CREATION OF BLUE OCEANS

Stefan SCHAPER

Abstract: *The Blue Ocean Strategy is a strategic approach that supports companies in the creation of a business space without competition by using specific levers of utility for the customer.*
However, the creation of those levers is usually challenging. The use of contradictions and inventive principles can create new ways to overcome those challenges.
Key words: *Creation, Blue Ocean.*

1. INTRODUCTION

The Blue Ocean strategy approach is based on the idea to design a new unoccupied market with-out any direct competition ("Red Ocean"). A Blue Ocean is created in the region where a company's actions favorably affect both its cost structure and its value proposition to buyers. Cost savings are made from eliminating and reducing the factors an industry competes on. Buyer value is lifted by raising and creating elements the industry has never offered (Čirjevskis 2010). Over time, costs are reduced further as scale economies kick in, due to the high sales volumes that superior value generates (W. C. Kim 2000).

The Buyer Utility Map (see fig. 1) helps managers to focus on the customer perspective and it an important instrument for defining a Blue Ocean. The application of the Buyer Utility Map shall help to identify new market spaces within the business and allow a new positioning of the products in the future. It outlines all the levers companies can pull to deliver a useful product or ser-vice to customers as well as the different experiences customers can have of a product or service. It enables the identification of the full range of utility propositions that a product or service can offer. It describes the process how the customer perceives the company (a product or service is purchased, delivered, used, maintained or disposed or supplements are bought). Cutting across the stages of the buyer's experience in a matrix, there are the so-called levers of utility: the ways in which companies can unlock utility for their customers. Most of the levers are obvious. Simplicity of use, image, and environmental friendliness require little explanation, as well as that a product could reduce a customer's financial, legal or physical risks. A commonly used lever is customer productivity. An innovation can increase customers' productivity by helping them do their thing faster or better. The Buyer Utility Map is an essential element to link the positioning of the offering to the customer to the strategy. (W. C. Kim 2004) It is, however, important to note that it does not evaluate if the current competing elements are superior or inferior to those of the competition. Earlier authors have noticed similarities between TRIZ and the Blue Ocean strategy. While TRIZ is using a patent and product based approach to provide technologically strong innovations, the Blue Ocean Strategy is emphasising the value for the customer to drive market success. However, there are possibilities to link them (Marc Trela 2015) (King 2009).

	Purchase	Deliver	Use	Supplements	Maintain	Dispose
Productivity						
Risk						
Simplicity						
Convenience						
Image						
Ecofriendliness						

Fig. 1. Structure of the Buyer Utility Map. The intention is to create utility for the customer in specific layers, along the process from purchase to disposal.

TRIZ provides useful methods to develop solutions for unoccupied fields for customer value:

1. Use of contradictions.
2. Cause-Effect-Chain-Analysis (CECA).
3. Use of the 40 Inventive Principles.
4. Function Analysis (for Processes) and Trimming: There are several trimming rules in case existing components or process steps must be eliminated.
5. Trend of Engineering System Evolution. See (Ikovenko 2016).

The focus of this paper is on the use of contradictions and their resolution.

2. TRIZ RELATION

TRIZ is usually seen as a method for technical development. This approach can support to link it to corporate strategy and link TRIZ and innovation to the strategic approach of the company.

3. METHODS

The Buyer Utility Map uses the so-called levers of utility for the customer. These are:

- Productivity
- Risk (reduction)
- Simplicity
- Convenience
- Image
- Eco-friendliness (W. C. Kim 2000)

Every step of the customer experience can be enhanced by one or several levers, especially if this is not done by the competitors. It is not the target to use many or even all the levers. It might even be a good idea to select just one, if it is decisive. For example, Tesla Motors first vehicle, the Roadster, was a sportscar. Instead of competing with other sportscar manufacturers with maximum speed, prestige, etc., Tesla chose the way to offer a more environmentally friendly car. So here, the lever “eco-friendliness” during the “use”-step made the difference. This was achieved using electric engines and advanced batteries, which linked the strategic direction with the inventive advances.

This example shows that these levers of utility offer a great source for contradictions. If we stay with the previous example, the main factor of use of a sports car is engine power and its related ability to accelerate and to reach a certain maximum speed. This contributes to

image and prestige of the brand and is relevant for the purchase decision.

If, from a strategic point of view, the lever "eco-friendliness" is to be used, the former parameter "engine power" is in a technical contradiction to "eco-friendliness:

IF we increase engine power THEN acceleration improves BUT fuel consumption is higher.

	Purchase		Deliver	Use	Supplements	Maintain	Dispose
Productivity							
Risk							
Simplicity							
Convenience & Fun				X (conventional sports cars)			
Image							
Ecofriendliness				X (Tesla)			

Fig. 2. Buyer Utility Map for sports cars.

Using the CECA, the reason for the high fuel consumption lies in the prevalent combustion technology of the engine.

In the present example, the use of electric engines with a higher conversion efficiency than fuel engines helped to resolve the contradiction. The Trends of Technology Evolution indicate some hints. The S-curve model shows that the conventional combustion engines are in the stagnant phase of their development. Electric engines in vehicles could be (see at the start of tesla) as the new s-curve in mobility. Also, other approaches are possible: use of light weight materials, use of hydrogen or use of biofuels to mention some examples, but the use of the electric drive pro-vides currently the best results, although considerable improvements need to be done on the battery technology.

Another example comes from the pharmaceutical industry: Fresenius is a supplier of several medical and pharmaceutical products for hospitals e.g. infusion solutions. There are several producers of such products and heavy competition took place.

Here the levers "productivity" and "risk" during the "delivery"-step were chosen. "Productivity" has already been present before (in purchasing), as the competition took primarily place over price, but still a considerable capital use was necessary on the customer side to hold enough safety stock for the hospital for such important products. Risk is defined is this case as follows: wrong management of stock can lead to lack of critical products putting patients at risk; proper management of expiration dates of medications risks capital and availability for patients and large capital binding risk to have "just in case" enough safety stock.

So, there are several contradictions:

IF we reduce price THEN customer reduces costs BUT capital cost is still high

IF we reduce price THEN customer reduces costs BUT risk is still high

When applying CECA, the reason for the capital costs and risk is the previously high

safety stock of the hospitals. When eliminating this, the capital can be used elsewhere and there is a competitive advantage for the producer without further reducing the price of the product.

This can be broken down to the parameters “efficiency” (lower price) and “productivity” (high capital costs), according to the Matrix 2003. The relevant inventive principles are Segmentation, Local Quality, Asymmetry and Dynamics.

	Purchase	Deliver	Use	Supplements	Maintain	Dispose
Productivity	X (conventional competitors)					
Risk		X (Fresenius)				
Simplicity						
Convenience & Fun						
Image						
Ecofriendliness						

Fig. 3. Buyer Utility Map for hospital suppliers (infusion solutions).

Here, the company has invested into the creation of a logistic solution that was able to serve hospitals in less than 24 hours. This reduced their need to maintain own stocks, increasing the hospitals productivity and reduction of its capital risk by the elimination of stocks and even safety stocks, which can be considered a combination of Asymmetry and Dynamics.

Also, trimming would have led to this result in a more obvious way: After creating a function model involving the components of medical supplies, stock, capital, hospital and supplier (supersystem), the function of managing stock could have been trimmed from the hospital and it could have been taken over by the supplier.

In the previous examples the focus was on solving contradiction to enable Blue Oceans. There are several other options to create customer value along the levers of utility. TRIZ tools like the System Operator can be used in an easy way in a business context. Brainstorming based on this method enables the design of future generations of products or business models involving the system, supersystem and subsystem. Contrary to conventional brainstorming, this gives amore holistic picture. Some authors also use the original concept of Multi Screen Thinking for similar purposes (Hung-yul 2015).

Example:

A manufacturer of medical devices for blood sugar tests applied the System Operator for brain-storming on a new generation of devices. The System Operator showed the environment (Super-system), the system itself (the test device) and the subsystem (here: the chip) in its 3 dimensions in time. However, the meeting also showed a big lack in the design of the operational system. This led to a new concept of cloud-enabling operational system which will solve several customer problems (related to costs and maintenance).

Also, the use of Ideality may contribute to create space for Blue Oceans. The reduction of harms and the increase of useful functions can

e.g. be used in improving. This would create competitive advantage and save costs.

Example:

A pharma company has a high burden of regulatory processes. For instance, employees need to prove that they were trained for each task. For this purpose, training certificates are issued. After a certain period of time, those trainings need to be repeated, regardless of the current workload or if the employee is currently working on such tasks.

The application of Ideality has led to a model where trainings were only triggered when needed. This system enables more flexibility and convenience and reduces workload for employees.

4. EVALUATION AND OUTLOOK

TRIZ provides many analytical and problem-solving methods. However, they are primarily used in development and engineering activities. The use in business has been proposed by several authors but is hardly practised (Souchkov 2015) (Litvin 2011).

Classical management and strategy consulting are rarely "out-of-the-box" and come often with the same approaches that often provide little or no value. When analysing the most practiced tools by consultants, we can observe mainly (pers. observation):

1. Reorganizations
2. Mergers & acquisition
3. Cost reduction programs (often in combination with 1. and reducing headcount or 2. to achieve scale effects)
4. Process optimizations and IT tool implementations
5. Measures to protect existing business (James E. Ashton 2003)

The use of the Blue Ocean Strategy in conjunction with TRIZ could provide new horizons and create value for the business of corporations such as

- Serve unserved markets
- Create competitive advantage beyond cost leadership
- Generation of entirely new creative approaches for top management

This kind of approach also supports the customer centricity of the strategy (Monti 2000) and helps to discover unmet needs (Mijeong Song 2019). The use of the utility levers in combination with TRIZ methods like contradictions, trimming or trends can lead to new service, product, process or business model innovations.

Also, there are ways to provide an even more complete approach to the corporate customers: The levers of "simplicity" and "convenience" are not primarily a domain for TRIZ-based creativity. Here a combination with tools that are able to gather the usability can be more helpful. Methods like Design thinking or Sprint could be involved in such a consulting model.

5. REFERENCES

[1] Čirjevskis, A., Homenko, G., Lačinova, V. "*New approaches in measuring and assesing viability of blue ocean strategy in b2b sector*, Journal of Business Management 3, pp. 162–179." Journal of Business Management, 2010: 162–179.

[2] Ikovenko, S., *Triz Level 3 Certification Training, Material*, C&R, Jantschgi; Jantschgi., TRIZ Consulting GROUP., 2016.

[3] James E. A., Frank X. C., Jr. Paul S. "*Uncovering Hidden Value in a Midsize Manufacturing Company."* 06 2003.

[4] Kim, W. C., Mauborgne, R. *"Knowing a Winning Business Idea When You See One*", Harvard Business Review, 2000.

[5] Kim, W. C., Mauborgne, R., "*Blue Ocean Strategy*", Harvard Business Review, 2004.

[6] Litvin, S., "*Main Parameters of Value: TRIZ-based Tool Connecting Business Challenges to Technical Problems in Product/Process Innovation*", 7th Japan TRIZ Symposium, Yokohama, Japan, 2011.

[7] Mijeong, S., Dongsup, J., Siho, J., Chang-Ryong, H., Dong-Il, S., Chi-Hyun, C., Bokyung, K., Jiho, S., "*Evolution map based on advance invention, process, and case studies*", TRIZ Review: Journal of the

International TRIZ Association , 02 2019: 61-73.
[8] Monti, J. A., Yip, G. S., "*Taking the High Road When Going International*", Harvard Business Review, 2000.
[9] Souchkov, V., "*Systematic business innovation: a roadmap*." Proceedings of TRIZfest 2015. Seoul, 2015. 215-224.

TRIZ pentru crearea strategiei Blue Ocean

Rezumat: Strategia Blue Ocean este o abordare strategică care susține companiile în crearea unui spațiu de afaceri fără concurență prin utilizarea unor pârghii de utilitate specifice pentru client.
Cu toate acestea, crearea acestor pârghii este de obicei o provocare. Utilizarea contradicțiilor și a principiilor inventive poate crea noi modalități de a depăși aceste provocări.

Stefan SCHAPER, PhD, Schaper-Tech, Germany, Stefan.Schaper@schaper-tech.com