

SIX SIGMA PHILOSOPHY AND RESOURCE-BASED THEORY OF COMPETITIVENESS: AN INTEGRATIVE APPROACH

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Abstract. *This paper deals with the resource-based theory of competitiveness and especially with its dynamic aspect. This theory points out the significance of resources and capabilities management, but does not stress enough a very important segment of enterprise value, which concerns processes, informal networks, communication. Bearing in mind the above mentioned, the aim of this paper is to provide a framework for effective and efficient management of resources and capabilities, by introducing some ideas and postulates that Six Sigma concept stands for. The idea for this paper came up from a belief that Six Sigma concept can bring extra speed and quality into resource-based theory.*

Key Words: *competition, resources, capabilities, structure capital, the Six Sigma concept*

INTRODUCTION

Global economy imposes very rigor conditions. If an enterprise wants to achieve and sustain competitive advantage, it has to fulfill those conditions. One of the conditions concerns the care for customers and their introducing into the enterprise, not just through respecting and taking care of their complaints, but through listening to the voice of customers and building their demands into product and process specifications [1, p.7]. This demand of global economy is complex, as its fulfillment means that enterprise has to take care of quality, costs and delivery at the same time. Though it is not very easy, it is not impossible to provide satisfying results in all mentioned dimensions of customer satisfaction. However, this implies continual analyses and improvement of business processes. Business process realization depends on available resources and capabilities for efficient usage of these resources. The significance of effective management of resources and capabilities confirms development of theory that is primarily oriented on resources and capabilities. This theory is called resource-based theory of a firm.

A resource-based view of strategic management deals with resources and capabilities of enterprises which enable them to generate profits and a sustainable competitive advantage [11, p. 697-713]. Gaining competitive advantage implies dealing with constraints of limited information, cognitive biases and causal ambiguity. So, it can be said that identification, usage and managing of resources that are valuable, rare, difficult to copy, and hard to substitute lead to competitive advantage and above normal profit. One of the things that, presented in this way, resource-based theory does not stress enough is the process view of the enterprises. The lack of process view can make it very difficult for someone to explain how competitive advantage can be sustainable over time. Even if the resources have previously mentioned characteristics, the enterprise's competitive advantage will disappear if it does not develop and change resources structure (basis) as a consequence of changing customer needs. Also, the resource-based theory does not stress explicitly one part of intellectual capital, which is very important for doing business in today's environment and it is structure capital. Introducing process view can be done through Six Sigma philosophy, especially by highlighting the significance of structure capital, as a part of intellectual capital.

RESOURCE-BASED THEORY: SOME ACKNOWLEDGEMENTS

The essence of enterprise strategy is in finding the appropriate relationship between internal and external environment. Precisely, strategy can be defined as "the match an enterprise makes between its internal resources and skills, on one side, and the opportunities and risks created by its external environment, on the other side" [7, p.114-133]. During the 1980s the basis for strategy formulation represented external factors, opportunities and threats. However, in the new economy it is suggested that strategy is formulated by respecting internal factors, first, and then external ones. It means that managers have to analyze available resources and capabilities and then decide which customer demands they are going to try to fulfill by using those resources and capabilities. Therefore, resources and capabilities are the central considerations in formulating its strategy: upon them managers can establish enterprise identity and frame its strategy and they are the primary sources of its profitability. The essence of strategy formulation is to design a strategy that makes the most effective use of the available resources and capabilities. According to Penrose, "it is never resources themselves that are the 'inputs' in the production process, but only the services that the resources can render. The services yielded by resources are a function of the way in which they are used—exactly the same resource when used for different purposes or in different ways and in combination with different types or amounts of other resources provides a different service or set of services" [13, p. 24-25].

The resource-based theory is one of a few theories, which consider sources and effects of competitive advantage. Besides the resource-based theory, competitiveness is the focus of the following theories or approaches: competitive industry's structure, competitiveness based on distinctive capabilities and knowledge-based competitiveness. Though mentioned theories are presented as separate, they are very similar and the differences between them arise from a different view and definition of resources and capabilities, and from different significance of some resources and capabilities [14] for some authors and for the specific period and industry. The essence is the same: returns to an enterprise's

resources and capabilities depend upon sustainability of competitive advantage, and upon ability of the enterprise to appropriate the rents earned from its resources and capabilities [10, p. 348]. Concerning the theme of this paper, the following pages will point out the resource-based theory contribution for achieving sustainable competitive advantage, but also its integration with the Six Sigma concept.

The main elements of the resource-based theory may be summarized as follows: [6, p. 33-34] enterprises are collections of resources and capabilities; the effectiveness of an enterprise depends on the balance between resources and capabilities, on one side, and customer demands, on the other; the growth of an enterprise is limited by its resources and capabilities; competitive advantage is based on capabilities which are irreproducible or reproducible only with substantial difficulty. The preconditions, needed for a resource or capability to become a distinctive one and therefore source for competitive advantage, are sustainability and appropriability. There are only few types of distinctive capabilities which meet these conditions, and they are innovation, architecture and reputation. Innovation is an obvious source of distinctive capability, but it is connected with the problem of relatively easy imitation. Architecture of an enterprise is a system of relationships within the enterprise and between the enterprise and its stakeholders (especially customers and suppliers), and it is characteristic of Japanese enterprises. Reputation represents a type of architecture, but it is so widespread and so important that some authors [8, p. 46] think that it is best to treat it as a distinct source of competitive advantage. Actually, all mentioned sources of competitive advantage have to be connected if an enterprise wants to provide sustainable competitive advantage. Usually, initial distinctive capability is based on innovation or architecture and is extended due to reputation.

The resource-based theory points out four characteristics of resources and capabilities which are, at the same time, determinants of the sustainable competitive advantage. Those characteristics are [7]:

- Durability – though it varies considerably among resources, the fact is that increasing pace of technological change is shortening the useful life-spans of most resources; some authors stress that capabilities depreciate relatively slowly (comparing to resources) like in the case of reputation; but reputation or other capabilities can disappear very fast, as well as resources, if they are not subject to continual analysis and improvement,
- Transparency – enterprise's ability to sustain competitive advantage depends a great deal on the speed with which other enterprises can imitate its strategy; the capability which requires a complex pattern of coordination between resources is more difficult to comprehend than the capability which rests on the exploitation of a single dominant resource,
- Transferability – if an enterprise can acquire the resources or capabilities required for imitating the competitive advantage of a successful competitor, than the competitor's competitive advantage will disappear; sometimes transferability can be obtained only in case of merging or acquiring another enterprise (like reputation),
- Replicability – another way for obtain resources and capabilities is by internal investment, because some resources and capabilities can be easily imitated through replication; in this case very important role has inverse engineering.

In this way, the described resource-based theory observes the resource base as predetermined, with the primary task of strategy to maximize rents over time. However, the resource based theory is concerned with the development of the enterprise's resource base as well and not only with the deployment of existing resources and capabilities. Precisely, observing resource base as something that should be developed and not only used, occupies the central position in Porter's analysis of the competitive advantage of nations. In his opinion, an enterprise's success depends on its ability to continually innovate and change the resource basis from basic to advanced. An important feature of advanced resource basis is that they offer more sustainable competitive advantage "because they are more specialized (therefore less mobile through market transfer) and less easy to replicate" [7, p.131-132]. However, it is not necessary for the resource base to be hard to replicate if the enterprise has innovative practice and continually changes the resource base. While competitors are concerned with replicability, the enterprise is concerned with the development of its resource base and therefore leaves competitors behind continually. This implies continual analysis of the internal business processes, because within them resources and capabilities are combined, deployed and developed, and this also shows what the role of introducing Six Sigma philosophy postulates into resource-based theory of competitiveness is.

RESOURCE CAPITAL AND STRUCTURE CAPITAL

Although the word "capital" is used in this subtitle, the aim was not only to point to tangible resources or capabilities, but to denote their durability. Resource capital can be defined as the value-enhancing resources (assets) and competencies of the enterprise. It is the part of the capital that the resource-based theory is based on. But the other, very important part of the enterprise's capital must not be forgotten. It is structure capital as part of intellectual capital, which is an equivalent for an enterprise's capability to support value-enhancing assets and competencies. Intellectual capital consists of human capital (which refers to employees' skills, abilities, motivation, communication), market-based capital (which refers to relationship with customers as well as suppliers), and structure capital (which refers to internal networks, processes, concepts, procedures).

If the resource-based theory points out the significance of physical capital (assets) and human capital and presents them as resources and capabilities, respectively, or with one word as resource capital (Figure 1), than it has a missing piece which can be made up by introducing structure capital. Structure capital is the key ingredient in the relationship between assets and capabilities. It includes the ability of an enterprise to achieve cooperation and coordination within teams and employees. The enterprise's style, values, tradition and leadership are vital encouragements to the cooperation and commitment of its employees [7].

Presented in this way, structure capital represents the context surrounding resources and a resource strategy that enhances or inhibits the optimal use of resource capital. Resource capital demands protection and procurement of rare inimitable assets and competencies. On the other side, structure capital, as the key success factor, emphasizes the effective management of enterprise's resource decision context [11].

Structure capital includes systems, concepts and procedures which represent support for human capital. It means that without structure capital, human capital, and capabilities that proceed from human capital, can not be completely and adequately used and developed. Furthermore, enterprise's ability to generate earnings from resources and capabilities depends a great deal on its effectiveness in managing the social context of these resources and capabilities.

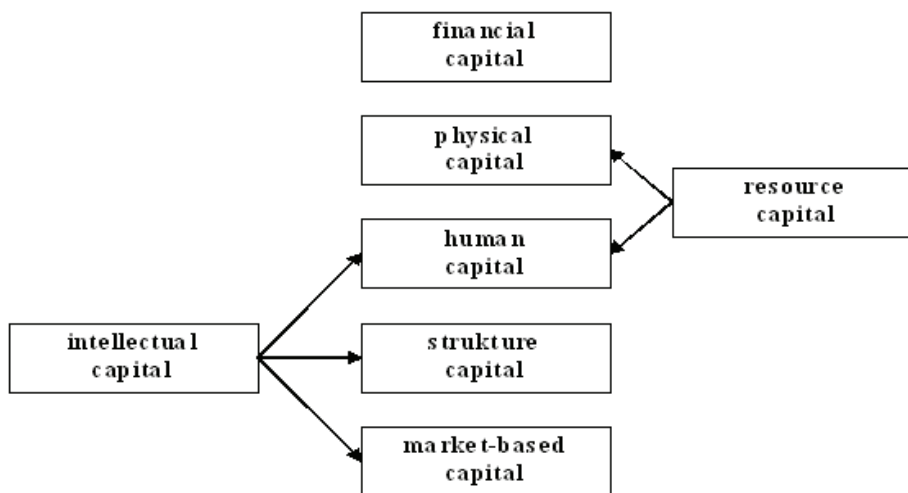


Fig. 1. Enterprise's capital structure

According to Van Buren [15, p. 71-78] structure capital consists of process capital and innovative capital. The first category includes techniques, systems, instruments, and procedures for connecting and balancing everyday employees' activities. The second category is based on the enterprise's capability to create new products and processes or to radically improve the existing ones. In case of new products it is a new design or redesign that is necessary. On the other side, in case of improved products only incremental, cosmetic changes are made. The improvement of existing products and processes could be considered as a part of process, and not innovative capital. The first solution (when product and process improvement is considered as part of innovative capital) has intention to point out the significance of continual change of products and processes, as a consequence of changes in customers' demands and competitors' activities. Doing business in the new economy demands that process improvement become the most important part of process management. In that way it can be concluded that the heart of process capital represents process improvement and the heart of innovative capital process structuring/restructuring. If structure capital is combination of process and innovative capital and it requires process management and structuring/restructuring management, enterprise's managing can be facilitated by introducing Six Sigma concept. The key idea is that process effectiveness and efficiency are at the heart of performance. If business process is flawed, performance will be degraded and no amount of hard work will compensate [2, p.7].

SIX SIGMA PHILOSOPHY AND POSTULATES

Improving competitive posture involves raising the quality of the products and services provided to customers, designing and producing these goods and services more quickly, and doing so in a manner that minimizes costs and increases revenue. To accomplish these tasks an enterprise has to look internally to optimize its internal processes. It means that focus should be changed from functions to processes, and this requires a new concept of the business. This concept represents the composition of the business and reflects the competitive issues of timeliness, cost and quality. Optimizing processes that an enterprise performs drives true business improvement. A business process represents the way work gets done in the organization. Rather than looking at the organization vertically (using a hierarchy), the correct view of the business is taken horizontally, by analyzing the business processes that flow across organizational boundaries. Modern enterprise management needs to change the way of performing business and competing in the new economy. This means that the way an enterprise is managed has to be changed. Consequently, this implies enough capital, appropriate knowledge and business culture that approves the necessity of changes [14, p.7]. One of the concepts that can support enterprise's efforts focused on improving competitive position is Six Sigma concept. Although it is usually connected with a lot of capital, the adoption of the Six Sigma philosophy does not cost a thing.

Six Sigma is a 21st century concept. It represents a process-focused, resource-based and customer-driven concept. Enterprises implement the Six Sigma business concept to achieve processes and activities perfection. The essence of Six Sigma concept is that customers' satisfaction can be provided by increasing the quality of products. The quality of products can be increased by increasing the quality of processes. Finally, the quality of processes depends on resources and capabilities and on their combination. Concerning the previous, it can be said that customer dissatisfaction and undermined reputation would be prevented if an enterprise provided adequate resources and capabilities, combined them in a way needed for efficient process realization, detected and eliminated defects from processes, prevented defecting products and their delivery to customers.

Six Sigma is more than just a business concept. It is a management philosophy that signifies how expensive defects are. Six Sigma can be implemented through Six Sigma projects, which involve five phases: define, measure, analyze, improve, and control [1, p.7]. The essence of these phases is very similar to the famous PDCA cycle. However, the mentioned phases of improvement in Six Sigma way include very detailed, concrete measures, instruments and techniques. This makes it possible to call them methodology. Six Sigma methodology (DMAIC) helps managers find sources of competitiveness inside the processes or exactly at the point where resources and capabilities are combined and used. It suggests that it is usually possible to improve processes' efficiency, not by changing the combination of resources and capabilities, but by eliminating variation and defects, which appear as a consequence of variation. Defects waste enterprises' time and money, and, which is the most important, they have bad influence on its reputation and customers' satisfaction. For that reason alone, processes have to be managed in a way that Six Sigma concept suggests, through the five-phase methodology. This way of process management provides managers precise and relevant information and deciding based on facts and not on guess and intuition.

Apart from the existing processes, proper management of new processes (products) introduction is very important in modern conditions. Incremental changes of existing processes (products) can be significant, but sometimes not enough. When incremental changes can not make a difference, which customers can see and value, it is necessary to make a radical change, which usually implies changing process (product) structure or introducing a new one. The analysis of Van Buren's definition of structure capital and the brief introduction to Six Sigma essence and methodology leads to the conclusion that Six Sigma concept affects both parts of structure capital: process capital and innovative capital. The Six Sigma concept is complement with the resource-based theory, because it supports efficient usage of existing resources and development of the resource base concerning external factor. This is confirmed by some authors, who claim that the continual change in the resources and knowledge within an enterprise along with the continual change in external circumstances present the enterprise with a continually changing productive opportunity [13, p.150]. Through DMAIC methodology Six Sigma explicitly points out the significance of the process-based view of an enterprise for more efficient usage of the existing and effective development of new resources and capabilities [9, p. 41].

THE SIX SIGMA CONCEPT AS STRUCTURE CAPITAL SUPPORT

The Six Sigma can be observed as an accelerator for enhancing both structure capital (directly) and resource capital (through structure capital). Structure capital implies [11]:

- Training programs that accelerate the adoption of new capabilities within enterprise's processes and activities,
- Information technology systems that accelerate the diffusion and use of resource capital,
- Management development programs which continually promote resource improvement,
- Decision support systems which encourage resource innovations,
- Alliances across different industries which facilitate learning and knowledge sharing.

The Six Sigma concept implies training programs, information sharing, continual improvement of processes, decision support methodology, and team and organizational learning. Concerning the above mentioned, it is obvious that the implementation of this concept can be very helpful for enhancing structure capital, because the factors which influence resource and structure capital enhancement, can be found inside Six Sigma concept.

Resource capital and structure capital represent complementary sources of competitive advantage. They have to be managed in a way which implies that structure capital is the basis for enhancing resource capital. Resource capital and structure capital can be procured in several ways. Some of them are:

- Evaluations of resource capital on an ongoing basis to ensure currency and optimal value,
- Benchmarking within the industry or global benchmarking of resource practices in order to avoid tendencies to imitate within industry capabilities that are already accessible and therefore of lower sustainable value,

- The cultivation of exclusive linkages with other enterprises in concrete industry, but in different industries, too, to maximize the potential for accessing information concerning resources,
- Incentive systems tied to competency sharing and resource innovations,
- Ongoing monitoring of internal cultural support for existing resource capital,
- The development and use of hiring criteria, but also compensation system that emphasize resource innovation, leading-edge resource expertise, and continual process improvement,
- Practice of decentralized cross-functional team-based structures to facilitate continual process and resource improvement and reduce conformity to taken-for-granted resource routines.

Resource and structure capital value can be enhanced if there is continual monitoring of customers' demands and competitors' actions, customer-driven resource and structure investments, an effort for personnel turnover reduction, especially for ones that are around core competencies, management emphasis on loyalty and dependability, high level of management-employee trust, global benchmarking of core resource practices, and innovative culture. Customers' wishes and demands have to be an ingredient of every decision that is made in the enterprise. If the enterprise wants customers to become its part, it has to act as their partner. It means that customers' demands have to be built into product specifications and then into processes, products and services. In order to perform this task correctly, the enterprise has to hire employees that have competencies needed for the use of available resources. It also means that the enterprise has to provide proper care and working conditions for employees, adequate compensation system, empowerment, and their involvement in business deciding if it intends to reduce employees' turnover (especially ones that are around core competencies). Managers have to emphasize loyalty, and not only employees' loyalty, but their loyalty to the enterprise and to their subordinated employees, too. Loyalty and mutual trust are very important for a good working atmosphere and necessary for information and knowledge sharing and team work. Having in mind that globalization makes borders fluid and that competitors can appear not only from the same industry, which the enterprise belongs to, but also from other industries, it is necessary for the enterprise to compare itself to its direct competitors, but also to watch carefully the actions of its indirect competitors, belonging to other industries. Business culture represents a very important factor of enterprises behavior and results. It shows how employees behave while working or communicating with each other. It is based on beliefs and customs that are not written, but which are sometimes even more important than written, documented rules.

All previously mentioned possibilities for enhancing resource and structure capital are included in Six Sigma philosophy and its principles. According to the Six Sigma concept, knowledge and information sharing, continual investment in employees' development, good relationships between employees at the same hierarchical level and between hierarchical levels represent the basis for any further improvement in an enterprise performance. By emphasizing the connection between Six Sigma concept and structure capital and therefore between Six Sigma concept and intellectual capital, this concept can be promoted into an enterprise's advocate for continual development of capabilities and con-

tinual improvement of resource structure and usage. The Six Sigma concept is considered a business concept for the future, because it points out two very important aspects of the resource deployment process, which are crucial for sustainable competitive advantage: speed and frequency. The speed refers to the time needed for new resources' and capabilities' integration into the enterprise's knowledge base. The frequency shows how often resources and capabilities, once integrated into knowledge base, are re-evaluated and re-aligned. One of the things that especially distinguishes Six Sigma concept from other initiatives for performance improvement is innovative business culture. Business culture characteristics make it a very important factor of every improvement project. Business culture represents beliefs, values, attitudes and customs and makes an important part of internal structure, which is a significant part of structure capital. Therefore, business culture is another medium through which Six Sigma concept can influence process and innovation capital, or structure capital, as a whole.

CONCLUSION

Changes that happen almost every day in the business environment pressure the management to change the way the business is run. It is not enough only to lean on the physical capital to provide a place on the market. It is not enough only to lean on the physical and human capital to provide the leading place on the market or a competitive advantage. Managers must learn how to manage the other parts of capital (especially intellectual capital), because they provide conditions for strategy implementation only if they are complement, and strategy implementation is very often more important and more complex than strategy formulation.

The theory of competitiveness based on resources explicitly points out the significance of resources and appropriate capabilities for providing sustainable competitive advantage. However, an advantage can not be sustainable for a long period of time if the combination of resources and capabilities remains the same, while changes happen almost every day outside the enterprise. For this reason, it is necessary to introduce change into the resource-based theory and one of the possible ways is to adopt Six Sigma philosophy. This philosophy affects business management through promoting process-based management, fact-based decision making and continual improvement or (re)structuring of business processes and products. In that way, this philosophy and appropriate concept suggest that it is necessary, for the enterprise that wants to be competitive, to continually change the way that resources and capabilities are combined, according to customers' demands and competitors' actions. Only if changes are accepted as a way of its life and survival, the enterprise will have a chance to fit in and to join the club of the successful ones. In this way this paper has shown that the resource-based theory and the Six Sigma concept are complementary and the suggestion is that they should be used together. The connection between the resource-based theory of competitiveness and the Six Sigma concept should be considered also from a market-based capital (as a part of intellectual capital) perspective, so the intension is that this theme becomes the subject of further research.

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SIX SIGMA FILOZOFIJA I TEORIJA KONKURENTNOSTI ZASNOVANA NA RESURSIMA: INTEGRALNI PRISTUP

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Ovaj rad se odnosi na unapredjenje teorije konkurentnosti zasnovane na resursima. Ova teorija ističe značaj upravljanja resursima i sposobnostima, ali zanemaruje veoma značajan segment vrednosti preduzeća, koji se odnosi na procese, neformalne mreže, komunikaciju. Uvažavajući navedeno, cilj rada je da obezbedi okvir za efektivno i efikasno upravljanje resursima i sposobnostima, uvodjenjem ideja i postulata na kojima počiva koncept Six Sigma. Ideja za ovaj rad proističe iz verovanja da koncept Six Sigma može "uvesti" dodatno ubrzanje i kvalitet u okvir teorije konkurentnosti zasnovane na resursima..

Ključne reči: konkurentnost, resursi, sposobnosti, strukturni capital, concept Six Sigma.