Competitive advantages and operations strategy: scientific production analysis in the period from 2008 to 2013

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ABSTRACT

Nowadays there is a growing market demand by increasing consumers’ purchase power as a result of incentive programs of government and international agencies for companies and self-employed professionals that generate improvement in quality of life and purchase power of those consumers. Competitiveness condition arises as a concern in the companies, particularly with respect to gains of competitive advantages (CA) in order to keep on operating and raising their economic position. This paper aims to put the topic into context by reviewing the literature on which attributes generate CA, seeking the contribution from the main authors on that issue and using the operations strategy (OS) technique to manage this competitive advantage. As a result we expect to contribute to confirming whether AC generation is a condition required for the success of the business activities and whether using the OS to manage it is the best technique.

Keywords: bibliometric analysis; competitive benefits; business competitiveness.

1. INTRODUCTION

The global context experimented from the half of the past century on has allowed the number of businesses to grow, thereby increasing the competition for best results. Identifying conditions to stand out among competitors has been one of the ongoing concerns of entrepreneurs and researchers since then.

Entrepreneurs and researchers are constantly engaged in seeking for differentiations that can be translated into competitive advantages (CA), which according to Porter (1985) are values the company adds to its customers as opposed to the inherent cost to create it.

For the elaboration of a construct on CA, theories argued by four authors highlighted in Table 1 were used in this paper.
Table 1 – Summary of factors generating competitive advantages and their researchers

<table>
<thead>
<tr>
<th>Key Factors for CA generation</th>
<th>Porter</th>
<th>Schumpeter</th>
<th>Collis; Montgomery</th>
<th>Slack; Lewis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differentiation</td>
<td>1986</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus</td>
<td>1986</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation</td>
<td>1988</td>
<td></td>
<td>1995</td>
<td></td>
</tr>
<tr>
<td>Inimitability</td>
<td></td>
<td></td>
<td></td>
<td>2009</td>
</tr>
<tr>
<td>Durability</td>
<td></td>
<td></td>
<td></td>
<td>2009</td>
</tr>
<tr>
<td>Speed</td>
<td></td>
<td></td>
<td></td>
<td>2009</td>
</tr>
<tr>
<td>Quality</td>
<td></td>
<td></td>
<td></td>
<td>2009</td>
</tr>
<tr>
<td>Flexibility</td>
<td>1986</td>
<td></td>
<td></td>
<td>2009</td>
</tr>
<tr>
<td>Cost</td>
<td></td>
<td></td>
<td></td>
<td>2009</td>
</tr>
<tr>
<td>Reliability</td>
<td></td>
<td></td>
<td></td>
<td>2009</td>
</tr>
</tbody>
</table>

Compiling the theories argued by those four authors on how those factors provide their users with AC, below is Porter’s definition (1986, p. 49-53, bold added) of:

- Total Cost Leadership: a firm seeks to be the lowest cost producer of products and services, to make its offer attractive.
- Differentiation: creating products or services differently from other competitors, again making the offer attractive, and further, if possible, creating a technological gap among other competitors.
- Focus: the preceding strategies basically compel the firm to find a niche on the market where those strategies can be implemented, generating competitive advantage that will secure the firm a competitive position (PORTER, 1986, p. 49-53).

For Porter (1986), positioning on primary or processing cost is important, however, it does not secure a competitive position if the firm lacks other factors inherent to such condition. Therefore, according to the author, it is necessary to have a position on the external environment through sectors such as research and development, marketing, production.

In this regard, Schumpeter (1988) argues that innovation should occur through changes by combining existing resources that would break the existing balance condition. For Schumpeter, such innovation must not only be carried out in products and services themselves, but on how they are designed and particularly on how the corporate activities are created to that effect. Therefore, he states that innovation consists of five types: the introduction of a new product; the introduction of new methods of production; the opening up of a new market; the conquest of new sources of raw materials and new forms of market organization.

Corroborating the views of the authors above, Collis and Montgomery (1995) argued that CA would be achieved when the company could generate attributes to its products, endowing them with inimitability and non-replacement of their resources and capacities, and which could produce durability, appropriateness and superiority.

Slack and Lewis (2002) corroborate with those views and point out that every company should have competitive benefits that are order qualifiers, which should migrate to a second state called order winners that will demonstrate differentiations in relation to competitors, based on performance objectives such as quality, speed, reliability, flexibility and cost. In a third stage, in order to obtain leadership in the sector, the company should seek a competitive benefit called surprise. This benefit, in addition to being an order qualifier and winner, denotes a performance much higher than the customers’ expectations and that no competitor has yet introduced to the market.
Thus, the search and the need to manage the CA generated the emergence of new management techniques and models, among them operations strategy. (OE).

Operation strategy is less related to individual processes and more to total transformation process, i.e. to the business as a whole. It is related to the way the competitive environment is changing and what the operation has to do to meet current and future challenges. It is also related to long-term development and its processes and resources of operations so that they can provide the basis for a sustainable advantage. If a business fails to fully assess the strategic impact that an effective management of processes and operations may have, it is wasting an opportunity. Perhaps more significantly, many businesses that seem to be competitively successful and are maintaining their success for longer have a clear operations strategy (and, usually an innovative one) (SLACK; LEWIS, 2002, p. 27).

Management of CA through OS has been confirmed by some recent researches released overseas such as that of Jayaswal et al (2011) who demonstrated that operations strategy produces significant effects on the condition of choice among products where demand requires that capacity take place by means of dedicated production, reducing prices and delivery times and that of Shavarini et al (2013) with 160 Iranian companies showing that OS defines the business focus based on the size of the industries and on the market they intend to operate.

In Brazil, Correa, Paiva and Mendes Primo (2010) were the publishers of a forum on operation management, which resulted in a research on the number of Brazilian and international publications encompassing seven topics that addressed CA, among those topics was the OS with eight papers published within the period. At the end of that forum, the authors recommended that an ongoing effort be made to expand and improve the quality of researches on operations management in Brazil.

Given those findings, it is of paramount importance for researchers and entrepreneurs to quantify and qualify which factors generate the CA. Thus, the aim of this paper is to identify by means of the Brazilian publications the relation between the key factors stated in table 1 and the CA generation, and also within this analysis the relation between CA and OS.

2. MATERIALS AND METHODS
To accomplish the objective of this research, a bibliometric research involving Brazilian journals in the area of Production Engineering from 2008 to 2013 was created, whose search was carried out by means of the key factors described in Table 1. This collection resulted in a corpus that can be seen in Table 2.

Table 2 – Stratification of the corpus in February 2014

<table>
<thead>
<tr>
<th>TITLE</th>
<th>ISSN</th>
<th>STRATUM</th>
<th>CORPUS (N° of papers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERA</td>
<td>1676-5648</td>
<td>B1</td>
<td>06</td>
</tr>
<tr>
<td>RBGN</td>
<td>1806-4892</td>
<td>B1</td>
<td>05</td>
</tr>
<tr>
<td>Production</td>
<td>0103-6513</td>
<td>B2</td>
<td>32</td>
</tr>
<tr>
<td>Management &amp; Production</td>
<td>0104-530X</td>
<td>B2</td>
<td>35</td>
</tr>
<tr>
<td>Applied Economics</td>
<td>1413-8050</td>
<td>B2</td>
<td>04</td>
</tr>
<tr>
<td>Operational Research</td>
<td>0101-7438</td>
<td>B2</td>
<td>02</td>
</tr>
<tr>
<td>ABCosts</td>
<td>1980-4814</td>
<td>B4</td>
<td>26</td>
</tr>
<tr>
<td>Online Production</td>
<td>1676-1901</td>
<td>B4</td>
<td>43</td>
</tr>
<tr>
<td>Product &amp; Production</td>
<td>1983-8026</td>
<td>B4</td>
<td>12</td>
</tr>
<tr>
<td>Product &amp; Engineering</td>
<td>1983-9952</td>
<td>B4</td>
<td>13</td>
</tr>
<tr>
<td>Gepros</td>
<td>1984-2430</td>
<td>B5</td>
<td>14</td>
</tr>
<tr>
<td>Research &amp; Development</td>
<td>1679-5830</td>
<td>B5</td>
<td>04</td>
</tr>
<tr>
<td>Exacta</td>
<td>1983-9308</td>
<td>B5</td>
<td>03</td>
</tr>
</tbody>
</table>

Note: Stratum refers to the CAPES Brazilian Research Agency classification
For the data collection technique that according to Beuren (2006) is a type of research based on “materials”, which have not yet received an analytical treatment or that can be reworked according to the research objectives”, the Sphinx software was used in order to promote lexical and content analysis.

According to Bardin (1991, p. 42) the content analysis consists of a set of techniques for communication analysis in order to obtain by systematic and objective procedures of message content description, indicators (whether quantitative or not), that allow interference of knowledge related to the conditions of production/reception (inferred variables) of those messages.

It is important to point out that this survey does not reflect the universe of publications existing in that period, as the selection criteria gave preference to publications released in digital format available on CAPES Journals portal due to the convenience of collecting and treating the data.

3. RESULTS AND VIEWS ON CA GENERATION
With the aid the aforementioned software, text treatment was used first, where factors generating CA argued in the Table 1 were changed into independent variables. CA was considered as a dependent variable and subsequent lexical and content analysis by means of balance by categories, the quantitative results reached are presented in Figure 1.

Seeking to understand the nature, a regression and correlation analysis was conducted for each one (simple analysis) of the factors already changed into variables, as shown in Figure 2.

According to Bruni (2011) regression and correlation allow to numerically demonstrate whether the logic postulation on the existence of a relationship between the populations of two or more variables is adequate. The correlation is positive if x and y increasing and decreasing values are linked. That is, when y increases, so does x. When y decreases so does x and vice-versa (BRUNI, 2011 p. 275).

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![Figure 1. Values added from factors in the CA generation](image-url)
Qualitatively explaining the statistical results presented in this section, Gebauer et al. (2011) concluded in a study involving 332 European industries that the search for differentiating services has led to innovation seeking alternatives to reduce costs. Wrubel et al (2011), in their turn, pointed out in a balance by categories aimed at forming a competitive strategy that differentiation is a strong ally of strategy management of cost in generating advantages. According to Cho and Pucik (2005), quality and innovation alone are not seen as capable of improving performance and profitability. On the contrary, they state that quality impacts on the growth and innovation on the profitability. These factors generate CA only when involved by a well-defined competition strategy towards the scenarios. Battaglia and Bergamo (2010) investigated and argued that cooperation inside the networks of companies needs to be better structured and measured as a means of achieving innovation, cost reduction among other CA's. For them the basis for that is the approach by analysis by means of value engineering.

Arguing qualitatively the view on durability, Munck et al. (2012) conducted a case study in an industry of the electronics sector and they concluded that durability is intrinsically part of the discussions on organizational sustainability that has CA and eco-efficiency as one of its cornerstones that according to Bleischwitz (2003) can be translated as the efforts to minimize the adverse impacts generated by business activities and a more responsible use of the productive resources.

In the study conducted by Tan et al (2008) it was found that speed in response to market demands, especially with regard to generating new products generates CA. Corroborating qualitatively with the analysis carried out, Oprime et al. (2011) found in a research conducted in 46 Brazilian industrial companies that speed is constantly present in processes that search for ongoing improvement and consequently they provide CA-generating factors.

Carolis (2003), Kindström (2010) state that imitability is a weak point that reduces CA generation, while inimitability is a factor that favors CA generation, therefore a strong point. The difference between imitability and inimitability lies in the capacity of the companies to generate value-added and innovative products and services with technologies difficult to imitate. Ensslin et al. (2010) concluded on a research conducted in the telecommunication sector that ongoing assessment and continuous selection of contractors compose a process of CA generation based on inimitability.

According to Silva et al. (2012) in a research conducted in the furniture sector in Brazil, it was found that flexibility is achieved by strengthening the product brand, design, finish and introduction of new products to the marketplace. The characteristics leading to that finding is the size of those companies and ongoing monitoring and improvement of those factors to the point of composing a differentiated positioning and winner on the market.

Moori et al. (2009) state that reliability is a relevant element in managing the supply chain, and to that effect in 2006 in the metropolitan area of São Paulo they investigated a sample from the food supply chain involving grocery stores, wholesalers and manufacturers of the
food sector and they evidenced that failures in the information system cause the so-called bullwhip effect, adversely impacting reliability that is a CA-generating factor.

After identifying the key factors for the CA generation and justifying those conditions, we still need to analyze the relationship between CA and OS.

4. RESULTS AND VIEWS ON THE ANALYSIS BETWEEN CA AND OS.

According to Slack and Lewis (2002) for an operation strategy to be valid, it has to play an active and driving role for the performance of operations, capacity strategy, supply chain strategy, process technology strategy, improvement strategy and development and organization of products and services.

Those drivers such as the construct that was performed originating the analysis contained in charts 1 and 2, also allowed an analysis that can be identified in Figure 3.

![Figure 3. Analysis between CA and OS](image)

A well-conducted operations strategy must pass the scrutiny of the following analysis presented in Table 3.

Qualitatively justifying the statistical results demonstrated in this section, Varum et al. (2009) evidenced in a study related to 30 years of scenario in Portugal, that the significant changes in productivity resulting from increasing focused production due to technological development, resulting from increasing focused production for the sake of technological development, fruits of the research and development, altogether, corroborated with all components for the generation of OS.

<table>
<thead>
<tr>
<th>OS Components</th>
<th>Key Questions for the Creation of OS Components.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance of operations</td>
<td>Do the function and key performance objectives of operations change over time?</td>
</tr>
<tr>
<td></td>
<td>Can tradeoffs between performance objectives of operation be surpassed?</td>
</tr>
<tr>
<td></td>
<td>Which are the advantages and disadvantages of having focused operations?</td>
</tr>
<tr>
<td>Capacity Strategy</td>
<td>What capacity should an operation have?</td>
</tr>
<tr>
<td></td>
<td>How many separated places should an operation have?</td>
</tr>
<tr>
<td></td>
<td>Which are the important issues when the capacity levels change?</td>
</tr>
<tr>
<td></td>
<td>Where should capacity be located?</td>
</tr>
<tr>
<td>Supply chain strategy</td>
<td>Which are the arguments for and against outsourcing?</td>
</tr>
<tr>
<td></td>
<td>How do partnership relationships attempt to obtain the best from both worlds?</td>
</tr>
<tr>
<td></td>
<td>Do supply chains exhibit any dynamic natural behavior?</td>
</tr>
<tr>
<td></td>
<td>How will the nature of the supply chain in which it is inserted be changed?</td>
</tr>
</tbody>
</table>
Process technology strategy

What are the proper dimensions for the process technology characterization?
How do volume and variety of market affect the process technology?
How can the process technology be strategically evaluated?

Improvement Strategy

Which are the differences between managing major innovations and managing ongoing improvements?
How do market requirements drive the development of processes of operations?
How can management and control be used to develop both skills?
What can operations do to unfold their skills on the market?

Development and organization of products and services

What are the processes used to develop products and services?
How should efficacy of product and services development process be judged in terms of meeting the market requirements?
Which decisions based on resource of operations define the development strategy of products and services?

Source: Adapted from SLACK and LEWIS (2002)

Costa and Maçada (2009) proved in sampling that companies of the Brazilian automobile industry do not hold an inter-organizational communication focused on generating competitive advantages, and maintain it only on the operational level contrary to the three last points related to the supply chain strategy of Table 3.

The issue of developing new products and services necessarily requires a long-term view, and in this regard Rodrigues et al. (2013) confirmed in the preparation and development of a model of scenario and setting up of a strategic plan for the civil construction industries that all key questions for the formation of that component of OS should to be included.

In a study of competitiveness of the main Brazilian compact motor vehicles, Sanchez et al. (2012) found that in order for that industry to be more competitive, it needs to enhance the focus on measures that increase the intensity of relevant weapons and reduce dispersion, promoting the opposite, i.e., reducing the intensity of irrelevant weapons of competition. Obviously this will involve new investments, but will increase the efficiency and consequently, according to the researchers reduce costs.

After creating the views on CA and OS, it is possible to draw considerations on the constructs presented.

5. FINAL CONSIDERATIONS

The research fulfills the primary objective, since the topic 3 evidences a relationship between the factors highlighted in table 1, characterized by the stratum and corpus described in table 2, analyzed as per the representation by charts 1 and 2.

It is evidenced by the reasons described in topic 3 that the key factors for the CA generation are present in the investigation carried out, therefore, the theory presence was identified in the researches published in 2009 and 2013.

Since the degree of perfect positive correlation is evidenced by the content analysis method on a sampling comprised of 199 papers, it is understood how those CA's are to be managed, which is the secondary objective of this paper that correlated the factors of table 1 with the issues raised in table 3.

It is again evidenced that there is a positive correlation between OS and CA by the key factors for the CA generation and the key questions to create the OS components.

Thus, it is clear that the CA generation is a conquer required for success of the business activities, however, having mechanism to manage it is also important, as highlighted in this research by topic 4.
Considering likely developments of this topic, supplementations to this research may occur in the following areas:
- enlarging the corpus for other areas of the Brazilian research;
- enlarging the corpus by including the results from international research;
- intrinsic study of each key variable and its relation with CA and OS.

Given the relevance of the topic, especially for the rational and conscious use of the OS by the companies, it is understood as salutary having the result of this work as a support in making decisions, since it did not intend to exhaust the subject.

REFERENCES


