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INNOVATION ANALYSIS BASED ON SCORES AT THE FIRM LEVEL

Viewpoint and
replies on
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Abstract

Innovation analysis based on scores (Innovation Scoring) is a simple way to get a quick diagnosis on the potential of innovation of a firm in its intention to achieve the innovation capability. It aims to identify and remedy the deficient aspects related to innovation management being used as a measuring tool for the innovation initiatives over time.

The paper aims to present the advantages and disadvantages of using the method, and the three approaches developed over time. Therefore, the model proposed by the consulting firm Arthur D. Little in collaboration with the European Business School, Eckelmann's model and AGGB's local model are summarized and compared. At the end of the paper, several possible solutions are proposed to improve the way of analysis based on scores.

1. The Need for Innovation

It is obvious that innovation has become a goal of our days really highlighted in the strategy named Europe 2020.

Europe's global economic ranking is changing rapidly. By 2050, Europe's share of world GDP is likely to be half of today's 29%.

So far, Europe has been able to keep its share of world exports (20%), and in that respect our performance is better than that of other advanced economies. But China, India and Brazil have started to catch up with the EU by improving their economic performance faster than the EU has, year-on-year, over the last five years (European Commission, 2013).

It is intended that EU to become a smart, sustainable economy, with an inclusive growth. In the strategy Europe 2020 arose the initiative, "The Innovation Union", which is a strategy focused on stimulating investment in research, innovation and entrepreneurship in each EU Member State and region so as to fully exploit Europe's potential (European Commission, 2013).

The Innovation Union has benefits for entrepreneurs and industry/business, which means:

- Improved access to finance
- Innovation-friendly rules and regulations
- Accelerated standard-setting
- Cheaper patenting
- Innovation supported by the public sector
- Innovation Partnerships to give EU businesses a competitive edge
- Facilitated access to EU research and innovation programs.

To access priority funds provided by the European bodies which are aimed at research, technological development and innovation, companies must prove that are competitive, and pay attention to the aspects of innovation, that aiming the creation of international partnerships, to make efforts to obtain the capability of innovation, seen as the capacity of a firm

to innovate successfully on a sustainable basis.

2. The Innovation Capability

The capability means generally the feature to be able to, to have the ability to perform something, to fit for something (the definition of the Romanian Explanatory Dictionary).

A series of definitions about the organization's innovation capability are met in the literature:

- The significant set of the features of an organization that facilitates and supports the innovation strategies (Burgelman, Kosnik & Van den Poel, 1988).
- Innovation capability is the ability to absorb, adapt and transform a given technology into specific operational, managerial and transactional routines that can lead a firm to profit (Zawislak et al., 2012).
- Innovation capability as an interaction of different elements as strategy, resources, processes, methods, tools, organization and culture which in interaction enable the success of innovation and the success of the whole company (Meier, Fadel et al. 2004) (as cited in Buergin, 2006).

as well as shorter or longer accepted definitions:

- Ability of an organization to adapt and implement successfully new ideas, processes and products; Ability to mobilize knowledge through the employees, to combine them in order to create new knowledge resulted in the innovation of a product and/or of a process. It has a dynamic character in which it reveals the interaction between the internal knowledge of a firm and the demands from the external market.

For a firm to innovate, to have the innovation capability must meet several requirements:

1. *to be forced to innovate* innovation rely on the existence of declared needs;
2. *to want to innovate* the existence of a vision, a strategy aimed at innovation;
3. *to enable innovation* the existence of a culture that supports innovation, process innovation;
4. *to achieve innovation* to exploit the available resources to complete projects started;
5. *to learn from innovation* to acquire internal and external knowledge necessary for future innovations;
6. *to persevere in innovation* the existence of a firm depends on its ability to continuously innovate.

Firm's innovation capability is reduced considerably if one of the six requirements is missing or is not highly significant.

3. Innovation analysis based on scores (Innovation Scoring)

Any firm has a potential of creativity and innovation. A question is rising: how innovative is the firm and where is it situated, as performances, against the competition? Therefore, the analysis of the innovation capability represents the starting point in the achievement of excellence in innovation.

At this stage of the analysis, a number of tools and methods find their utility, such as: questionnaires and checklists, analysis based on scores and benchmarking.

Innovation Scoring is a simple mechanism for detecting and correcting the deficient aspects related to innovation management within a company, aiming to improve the overall performance of a company. The benefits obtained by small and medium enterprises at the assessment of the innovation capability based on scores vary:

1. Innovation capability is shown as aggregated numeric scores.
2. Predefined set of the most important success factors and indicators that have major impact on the innovation capability.
3. Comparability of the innovation capability by a specified calculation scheme and a predefined set of indicators – the calculated score for one enterprise can be compared to the scores obtained by other enterprises.
4. Transparency on strengths and weaknesses of the innovation capability based on a hierarchical model of indicators, success factors and the seven Fields of Design – the changes of several scores over a period of time give information about the overall development of the innovation capabilities, both for the entire company and its particular divisions.
5. Improving internal communication and the possibility to use the results when communicating with third parties like: customers, partners, investors or media.
6. Benchmarking against internal reference points or against reference points from other companies (in case of data availability) (Scarlat et al., 2010).

4. Models of the analysis of the innovation based on scores

Among the first models in the field of innovation was the score-based model developed in its first phase (1998) by Arthur D. Little in co-operation with European Business School. Afterwards, the Eckelmann's model (2002) (see Table 1 - Appendix).

The most important similarity between the two models Arthur (2001) and Eckelmann (2002) is that the analysis of innovation is on the same five directions:

1. innovation strategy,
2. innovation process,
3. innovation culture,
4. resources deployment,

5. innovation organization.

In 2007, George Bala and Alexandru Gheorghiu propose a different model of innovation analysis based on scores, the same analysis on five directions, but totally different as components unlike the previous models.

1. *The potential of driving the innovation* - to quantify the structural conditions required for the assurance of the innovation potential, taking into consideration the human resource involved in the process of innovation from the research and development activity to the promotion and sale of the innovative solutions.
2. *The potential for creating knowledge* - to measure investment and financing attracted in the research and development activity;
3. *The capacity of innovation and integration in a relational system* to measure innovation efforts for strengthening the capacity of innovation at level of the economic operator;
4. *The performance of the innovation activities* - for expressing innovation in terms of value added;
5. *The Intellectual Property* - to measure the results achieved through the exploitation of knowledge and intangible assets.

As shown in Table 1 (see Appendix) Arthur D. Little's and Eckelmann's models seem more comprehensive through their sizes chosen for the analysis. These models propose an analysis based on 40 criteria in relation to the 25 criteria suggested by AGGB model (Bala & Gheorghiu, 2007).

The AGGB model records the first three dimensions analyzed, more inputs in the innovation process referring to human, relational and financial resources, and the last two dimensions refer to the results and performance of the innovation process. The AGGB model does not analyze the internal aspects of the company starting

from achieving work climate that supports innovation, continuing with planning and organization of the innovation process. Also, issues related to the idea management and the central part of the innovation process, the transformation one being neglected.

The scales used for granting the scores based on the number of positions ranging from three (Arthur D. Little's model), through five (Eckelmann's model) and reaching ten (AGGB's model). It differs from Eckelmann's model that has explicit instructions to mark scores on criteria (each combination between the criteria and the positions on the scale is explained).

Arthur D. Little's and Eckelmann's models make possible a more accurate comparison of the results of innovation between firms in different industries in that each dimension and criterion analyzed have a weight of importance that differ depending on the branch.

In the case of AGGB's model, only firms from the same industry and of the same size can be compared.

The problem of identifying the weights of dimensions according to industry is an extremely difficult problem.

The Eckelmann's model assumes as a basis the experience in the field of innovation gathered at the country level (Germany), which allows comparison of the results of innovation even for different industries. Only in Germany, there are over 20 firms and institutes joined in the field of innovation audit (Herstatt et al., 2007).

In Romania, there are not firms or institutes that provide reliable information that allow comparison among the performances in the field of innovation for the same industry.

The concept of the innovation audit is very little known in Romania as opposed to spreading the concept in the world.

Just to have an idea, the Internet search by exact phrase "innovation audit" (March, 2014) in Romanian language leads to 14

items, while over 14,500 results have been identified in English and German.

Regarding the individuals involved in granting scores in the case of AGGB appears the explicit recommendation as at the assessment two independent evaluators participate (an expert in the field of sciences and an expert in the field of economics), and the final score is actually the average of the two scores.

5. Directions for improvement of methodology

A possible extension of the analysis of innovation on seven directions allowing a more accurate analysis of the innovation process and a substantial increase in the number of criteria analyzed because of the complexity of the innovation process and of the multitude of issues that must be considered:

1. Conceptual factor,
2. Cultural factor,
3. Organizational factor,
4. Personnel factor,
5. Technological and process factor,
6. Learning factor,
7. Economic factor.

In the evaluation process, an assessment of the internal perspective is necessary and implies both employees from different departments, and managers. Innovation scoring is an average of the responses given by the participants, eventually being able to compare the scores given by departments and the scores given by the managers.

The manner of granting scores for each criterion is based on the methodology used by the EFQM (European Foundation for Quality Management) which would allow reducing the subjectivism that occurs in the case of Arthur D. Little's and AGGB's models.

6. Conclusion

Wanting to track whether the concepts related to innovation management are well implemented in the company, many managers are looking for tools that allow

the quantification of the effort undertaken in obtaining the excellence in innovation. This desire is fuelled by the fact that using tools as *Innovation Scoring*, it can be seen the time evolution of the company as a variation of the score, which allows an analysis of the innovation on dimensions, and how these dimensions contribute to the innovation score and to identifying those areas with potential improvement.

Unfortunately, at this moment it is difficult to believe that such a tool could be used also as a tool for Benchmarking because of the way in which many companies in Romania maintain an absolute secret on how to act.

However, when these companies will want to draw important investors and EU funds for the development of projects in the field of research and development to substantially improve the company's competitiveness and achieve innovation capability based on sustainability, a complex analysis of innovation becomes necessary.

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Appendix

Table 1
Models of the analysis of the innovation based on scores

Analyzed aspect	Arthur D. Little's model	Eckelmann's model	AGGB's model
Analyzed dimensions	<ul style="list-style-type: none"> ➤ Innovation strategy, ➤ Innovation process, ➤ Innovation culture, ➤ Resources deployment, ➤ Innovation organization 		<ul style="list-style-type: none"> ➤ The potential of driving the innovation, ➤ The potential for creating knowledge, ➤ The relational system, ➤ The structure of the activities, ➤ The Intellectual Property
Criteria of analysis for dimensions	<p>There are eight different sets of criteria of analysis for each perspective (dimension). The criteria are different for the two models. In total 40 criteria are analyzed.</p>		<p>For each dimension there is a set of five criteria of analysis.</p> <p>In total 25 criteria are analyzed.</p>
Type of scale	Scale with three positions	Scale with five positions	Scale with ten positions
Scale explanation	There are instructions at the minimal level to mark scores on criteria.	There are explicit instructions to mark scores on criteria (each combination between criteria and position on the scale is explained)	There are instructions at the minimal level to mark scores on criteria.
Deciding on the weight of dimensions	<p>Each dimension has a coefficient of importance, which varies depending on the branch.</p> <p>The amount of the weights of the five dimensions is one.</p>		<p>Each dimension has a coefficient of importance, but is not different according to the branch.</p> <p>The amount of the weights of the five dimensions is one.</p>
Establishing the weight of criteria	<p>In order to analyze innovation performances achieved by various firms from different branches, each analyzed criterion gets a weight of importance.</p> <p>The amount of the weights of the eight criteria for each analyzed dimension is one.</p>		<p>Each analyzed criterion has a weight of importance regardless of branch.</p> <p>The amount of the weights of the five criteria for each dimension is different.</p>
Determining the score of innovation	<p>The score of innovation is established by summing up the scores balanced for each dimension.</p>		<p>The score of innovation is established by summing up the scores balanced for each dimension.</p>