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STRATEGIC MANAGEMENT IN THE IMPLEMENTATION PROCESS OF NEW TECHNOLOGIES

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Abstract:
The formulation of the technological innovation strategy of an entity (civilian or military) represents the evaluation of the current position and the definition of its future strategic course. Through this article, I aim to highlight the essential tools that can be used in strategic analysis to evaluate the entity's position following the principles and cultural intelligence of the Romanian people. The tools to be defined provide answers to questions such as: What threats and opportunities are the most pressing in the entity's environment? What are the entity's strengths and weaknesses? Does the entity have sources to maintain a sustainable competitive advantage? In this article, we have carried out quantitative research in the form of a questionnaire, and among the objectives can be listed: analyzing the opinions of some Romanian specialists on how strategic management evolves in the implementation of new technologies, highlighting the best tools that are used in this process and which are the perspectives regarding the implementation of new technologies.

Keywords: strategic management, technologies, development, strategic tools

1. Introduction

Strategic management brings together both actions that describe the strategy definition process and the specific strategy implementation processes. However, it can be challenging to differentiate between strategic and traditional management control. Of course, some organizations may implement a strategic management control system consistent with the idealized version presented in the textbooks. However, most organizations apply strategic and more traditional management tools in their control systems.

Management control has been linked to strategy for more than half a century. Although, initially, this process was described by Anthony (1965) in his well-known management control framework, presented among others by Otley (1994) and Nilsson et al. (2011), the link between strategy and control was mainly related to the budgeting process. The strategic objectives were thus translated into financial figures in the budget and monitoring reports.

By current standards and as discussed in the literature (see, for example, Otley 1994, 1999; Simons, 1995; Nilsson & Rapp, 2005; Nilsson et al., 2011), the framework has several disadvantages, such as:

• Emphasis on strategy implementation rather than strategy formulation
• Weak relationship between budget tracking and strategy execution.
• Emphasis on financial information that is too highly aggregated to support decision-making at lower organizational levels.

Technological innovation is the most critical driver of competitive success in many industries. Firms in various industries rely on products developed in the last five years for nearly a third (or more) of their sales and profits. For example, at Johnson & Johnson, products developed in the last five years account for more than 30 per cent of sales, and sales from products developed in

the last five years at 3M have reached up to 45 per cent in recent years. The increasing importance of innovation is due in part to the globalization of markets. Foreign competition has pressured firms to innovate to produce differentiated products and services continuously. Introducing new products helps firms protect their margins while investing in process innovation helps firms reduce costs. Advances in information technology have also played a role in accelerating the pace of innovation. For example, computer-aided design and manufacturing have made it easier and faster for firms to design and produce new products. In contrast, flexible manufacturing technologies have made shorter production runs economical and reduced the importance of production economies of scale (Kastrenakes, (2016).

If the drive for innovation has raised the competitive bar for industries, perhaps making success more complicated for organizations, its net effect on society is more positive. Innovation enables a broader range of goods and services to be delivered to people around the world. It has made food and other necessities more efficient, produced medical treatments that improve health conditions, and allowed people to travel and communicate with almost every part of the world. Imagine how different life would be without these innovations! The aggregate impact of technological innovation can be seen by looking at the gross domestic product (GDP). An economy's gross domestic product is its total annual output, measured by the final purchase price—average GDP per capita (i.e. GDP divided by population) for the world from 1980 to 2016. Figures have been converted to US dollars and adjusted for inflation. The average world GDP per capita has grown steadily since 1980. In a series of economic growth studies conducted at the National Bureau of Economic Research, economists have shown that the historical GDP growth rate cannot be accounted for. For entirely through increased labour and capital inputs. Economist Robert Merton Solow argued that this unaccounted residual growth represented technological change: technological innovation increased the output achievable from a given amount of labour and capital. This explanation was not immediately accepted; many researchers have tried to explain the residual elimination of measurement error, inaccurate price deflation, or labour improvement.

Strategic Management of Technological Innovation Improving a firm's innovation success rate requires a well-crafted strategy. First, a firm's innovation projects should align with its resources and goals, leveraging its core competencies and helping it achieve its strategic intent. A firm's organizational structure and control systems should encourage the generation of innovative ideas while ensuring effective implementation. Finally, a firm's new product development process should maximize the likelihood that projects will succeed technically and commercially. To achieve these things, a firm needs (a) a thorough understanding of the dynamics of innovation, (b) a well-designed innovation strategy, and (c) well-designed processes for implementing the innovation strategy (Markham, 2013).

Innovation can come from many different sources. It can come from individuals, as in the familiar image of the lone inventor or users designing solutions for their own needs. Innovation can also come from the research efforts of universities, government laboratories and incubators, or private nonprofit organizations—a primary driver of innovation firms. Firms are well suited to innovation activities because they typically have more significant resources than individuals and a management system to marshal those resources toward a collective goal. Firms also face strong incentives to develop new, differentiated products and services that can give them an advantage over nonprofit or government-funded entities. However, an even more critical source of innovation comes not from any of these sources but rather from the connections between them. Networks of innovators harness knowledge and other resources from multiple sources and are one of the most potent agents of technological progress.

An individual's creative capacity is a function of his intellectual abilities, knowledge, personality, motivation, and environment. The most important intellectual skills for creative thinking include intelligence, memory, the ability to look at problems in unconventional ways, the ability to

analyze which ideas are worth pursuing and which are not, and the ability to articulate those ideas to others and to convince others that the ideas are worthwhile. An essential intellectual skill for creativity is a person's ability to let their mind engage in a visual mental activity called primary process thinking.5 Because of its unstructured nature, primary process thinking can lead to combining ideas that are not usually linked, leading to what has been called distant associations or divergent thinking. Sigmund Freud noted that the initial thought process was most likely to occur just before sleep or while dozing or daydreaming; others have noted that it may also be habitual when distracted by exercise, music, or other activities. Creative people can make their minds more open to distant associations and then mentally sort through these associations, selecting the best ones for further analysis. Having an excellent working memory is also helpful here - individuals with excellent working memory may be more likely or able to search for longer paths through the network of associations in their minds, allowing them to arrive at a connection between two ideas or facts that seem unexpected or strange to others.6 A connection that appears to be random may not be random at all—it is just difficult for other people to see the association because they are not following such a long chain of associations.

Technology clusters can span a region as narrow as a city or as broad as a group of neighbouring countries.50 Clusters often comprise several industries linked by relationships between suppliers, buyers, and producers of complements. The main reason for the emergence of regional clusters is the benefit of proximity in knowledge sharing. Although advances in information technology have made it easier, faster, and cheaper to transmit information over long distances, several studies indicate that knowledge does not always transfer quickly through such mechanisms. Proximity and interaction can influence firms' ability and willingness to share knowledge. First, the knowledge that is complex or tacit may require frequent and close interaction to be meaningfully changed. Firms may need to interact frequently to develop standard ways of understanding and articulating knowledge before they can transfer it. Second, proximity and frequency. of interaction can influence a firm's willingness to exchange knowledge. When firms interact frequently, they can develop norms of trust and reciprocity. Firms interacting over time develop a better knowledge of each other, and their repeated interactions provide information about the likelihood that their partner will behave opportunistically. A shared understanding of the rules of engagement emerges, where each partner understands their obligations regarding the amount of knowledge exchanged, how that knowledge can be used, and how the firms are expected to reciprocate. Close firms thus have an advantage in exchanging information, leading to higher innovation productivity. This can, in turn, lead to other self-reinforcing geographic advantages. A group of firms with high innovation productivity can establish several new firms nearby and attract other firms to the area.

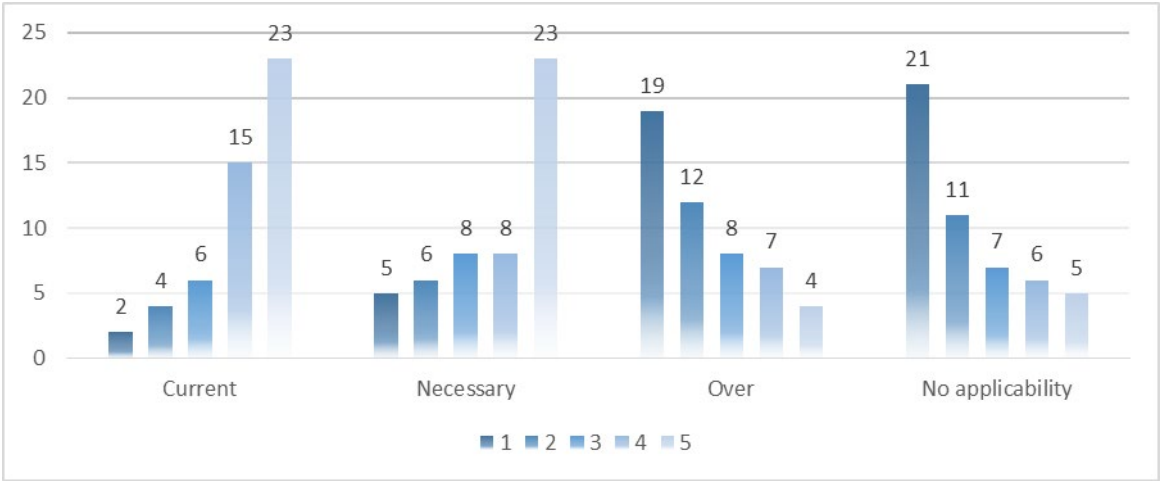
There are also some disadvantages to geographic grouping. First, the proximity of many competitors serving a local market can lead to competition that reduces their pricing power in their relationships with buyers and suppliers. Second, the proximity of firms can increase the likelihood that a firm's competitors gain access to the firm's proprietary knowledge (this is one of the mechanisms of technology spillover, discussed in the next section). Third, clustering can lead to traffic congestion, excessively high housing costs and higher pollution concentrations. Finally, a large part of the reason technologies is often localized regionally is that humans primarily hold technological knowledge and are often reluctantly mobile. In a well-known study, Annalee Saxenian found that engineers in Silicon Valley were more loyal to their craft than to any company. They were also very likely to stay in the region even if they changed jobs. This was partly due. To the labour market for their skills in the region and partly to the disruption to an individual's personal life if they were to move out of the region. Thus, if, for some reason, an innovative activity starts in one geographic area, the knowledge and expertise that accumulates may not spread quickly to other geographic locations, leading to a localized pool of technological expertise.

The path a technology follows over time is called its technology trajectory. Technology trajectories are often used to represent the rate of improvement in technology performance or its rate of market adoption. Although many factors can influence these technological trajectories (as discussed in both this and subsequent chapters), some patterns have been consistently identified in technological trajectories in many industrial contexts and over many periods. Understanding these patterns of technological innovation provides a valuable foundation on which to build in later chapters on technology strategy formulation. The chapter begins by reviewing the dimensions used to distinguish types of innovation. It then describes the S-curve patterns so often observed in the rate of technology improvement and the rate of technology diffusion into the market. In the final section, the chapter describes research that suggests that technological innovation follows a cyclical pattern composed of distinct and reliably occurring phases.

2. Questionnaire

Through this questionnaire, I proposed to identify the opinion of Romanian specialists (people engaged through various positions held in public or civil entities) regarding implementing the new processes specific to strategic management. We also aimed to highlight the impact that the action of implementing new technologies has, as well as how important it is to maintain a relationship of codependency between strategic management and the use of new technologies.
The research was based on a sample of 50 people and had as a research tool a questionnaire consisting of 21 questions, five of which were classified and identified. In Romania, this was done between June and September 2022 by sending the questionnaire to specialists from public and private companies. This questionnaire was applied through Google Forms.

1. Is the use of strategic management critical in Romania?



1. Current : 1x4 + 2x4 + 3x6 + 4x15 + 5x23 = 4.06
2. Required: 1x5 + 2x6 + 3x8 + 4x8 + 5x23 = 3.76
3. Over: 1x19 + 2x12 + 3x8 + 4x7 + 4x5 = 2.3
4. No applicability: 1x21 + 2x11 + 3x7 + 4x6 + 5x5 = 2.26

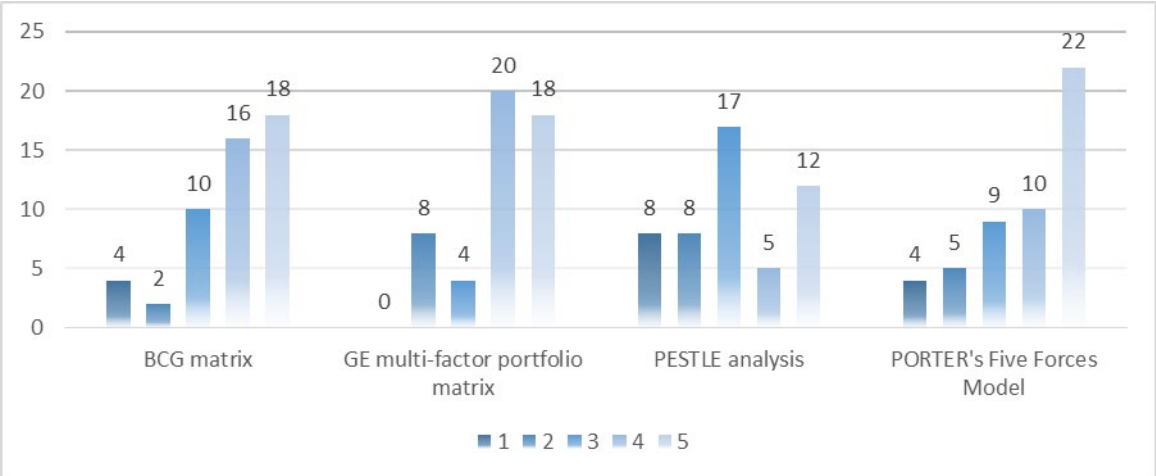
In the opinion of specialists in our country, it is essential to use strategic management; they consider it current. This answer obtained a score of 4.06; also, in their opinion, this process is necessary - a score of 3.76. The lowest score is associated with the idea of applicability of the process, where a score of 2.26 was obtained.

2. How important is the process of implementing new technologies in the current activities of a company in Romania in terms of strategic management?

1. Extremely important : 1x2 + 2x3 + 3x9 + 4x14 + 5x22 = 4.02
2. Revolutionary: 1x5 + 2x8 + 3x9 + 4x10 + 5x18 = 3.56
3. Current: 1x4 + 2x6 + 3x7 + 4x9 + 4x24 = 3.86
4. No result: 1x21 + 2x16 + 3x7 + 4x4 + 5x2 =2

In the opinion of Romanian specialists, the actions related to implementing new technologies under strategic management represent a significant action whose impact is very beneficial for the entity. This opinion was also highlighted by this questionnaire, with the score obtained by the "significant" variable being 4.02. At the same time, the "revolutionary" variable obtained a perfect score - of 3.56, and the "current" variable 3.86. The arguments offered looked at production costs, productivity, lead times and, last but not least, energy values associated with production.

3. What are the most approached tools when undertaking strategic management actions?



1. BCG matrix : 1x4 + 2x2 + 3x10 + 4x16 + 5x18 = 3.84
2. GE multi-factor portfolio matrix: 1x0 + 2x8 + 3x4 + 4x20 + 5x18 = 3.96
3. PESTLE analysis: 1x8 + 2x8 + 3x17 + 4x5 + 5x12 = 3.1
4. PORTER's Five Forces Model: 1x4 + 2x5 + 3x9 + 4x10 + 5x22 = 3.82

As seen in the previous graph, the position of specialists is comprehensive and diverse when analyzing the tools that contribute to the improvement of strategic management, especially in

technological development. The diversity obtained as an answer to the previous question is natural and justified because we must consider that organizations are different here. At each of them, we encounter a different organizational culture. It is also important to note that organizations evolve differently and benefit from different budgets and development concepts. In the present situation, the essential tool used is the GE multi-factor portfolio matrix, which obtained the best score-3.96.

3. Conclusions

The process of implementation and development in organizations in Romania and worldwide of strategic management is critical. The valences under which it is developed at the organizational level differ wherever it is implemented. In recent years, the implementation processes of strategic management have been interspersed with all kinds of technological elements, which in the general sense, contribute decisively to the improvement of all processes at the organizational level.

It is essential that at the level of each entity, its analysis and control tools related to strategic management are developed to observe the direction towards which the company is heading. Also, through the new technical solutions available in Romania and worldwide, processes have been extensively developed, creating new opportunities and perspectives for organizational evolution.

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