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Critical Analysis on Innovation and Technology Strategy in Companies

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Abstract

The significant degree of uncertainty associated with technical endeavours necessitates the development of technological plans that contribute to the overall business strategy of the organization. This research set out to define the technological standing of aviation technology-based SMEs in the Vale do Paraba and to determine if and how they formulate and distribute their technological strategies. Descriptive and exploratory research was used for this study, which was conducted through in-depth one-on-one interviews with the business owners of small and medium-sized online businesses in the Brazilian cities of Caçapava, So José dos Campos, and Taubaté. As a result, the authors came to the conclusion that businesses, especially those in the small and medium size range, need to implement a technology innovation plan that is cohesive with the broader goals of the organisation. This will aid them in remaining competitive in their respective niches, both domestically and abroad.

Keywords: Technological innovation, Small and medium technology-based companies Strategy, Technological strategy,.

1.Introduction

The economy and social contexts have become increasingly complicated and competitive due to the rapid flow of information and growing technological improvements during the past century.[1] Technological competitiveness on a worldwide scale is a significant managerial problem for businesses or organisations, especially those in sectors that rely heavily on technology. How can companies, in today's dynamic and uncertain commercial and technical climate, effectively manage their product offerings, value chain systems, product strategies and technology, competencies, and capabilities? [2] In order to improve productivity, creativity, and business model creation in today's complex and dynamic corporate operating environment, technology plays a crucial role in its management. [3] It can be difficult for businesses to optimise their investments and respond to shifting market demands in light of emerging technologies. To remain competitive and generate value over the long term, businesses must be able to formulate and implement plans at both the

business and technological levels simultaneously. [4] Businesses that formerly focused on optimising a single department increasingly manage a variety of departments together. It is imperative for businesses to have strategic management skills in order to maximise their returns on investments and improve their overall performance. Strategic technology management is looked to for answers to the challenges of dealing with the technologically driven complexities, uncertainties, and changes plaguing today's enterprises. [5] The use of the word "strategic" to describe the management of technological resources draws attention to the connection between strategic management and technological resources. Strategic management is a broad category, and this article's focus on strategic technology management is one shade under that umbrella, providing food for thought for readers in many fields.

Strategic Management

"Definition of basic, long-term goals and objectives of a business and the adoption of courses of action and the allocation of resources necessary to achieve those goals" is how we describe strategy at Strategic Management Company. [6] A company's strategic management plan is focused on the company's environment and its goals and how those two factors influence the development, improvement, and maintenance of the company's capabilities. General managers, on behalf of their owners, implement strategic initiatives that utilise resources to improve the performance of their enterprises in their external settings. [7]

a) Value Proposition and Organizational Structure

Enterprises strive to improve the lives of their clients, shareholders, employees, and the community as a whole by adding value at every stage of the value chain.
When looking at the economy as a whole, the significance that technology and innovation play in the system of value generation cannot be overstated. But that's not all: corporations have been influenced by the constant stream of technological and innovative advancements to shift their value creation processes, which in turn has spawned the development of entirely new economic sectors. [8] Strategy development, formulation, and implementation must all be undertaken with an eye toward satisfying the needs of customers and other stakeholders. In the long run, a company's market standing and value chain position are determined by the strategy it develops and how well it is implemented. An organization's standing stems from the business model it employs to achieve its goals. Business models are difficult to see in practise despite the fact that they consist of value chain systems, products, offerings, and a revenue model.

b) Strategic Planning and Action

Strategic planning and implementation are essential to a company's survival, value generation, and long-term success. However, in today's ever-changing business climate, it's difficult to predict what kind of company strategy would be effective. Strategic emphasis, origin, and justification are all hallmarks of a well-formed plan. distinct schools of thought for strategy in terms of prescriptive and descriptive senses and asserted that meta-schools of strategy are coherent, evolving, and systemic in nature. He identifies seven distinct schools of thought on the topic of strategy: the entrepreneurial; cognitive; learning; power; cultural; environmental; and configuration; and the three prescriptive:

design; planning; and positioning. [9] However, there is no empirical evidence to suggest which method of strategy formulation is most effective in terms of outcome or how a corporation may truly improve its strategy. argued that strategic planning must take technological considerations into account since they affect every step of a company's value generation process.

c) Technology Strategy

Strategic technology management relies heavily on a well-developed technology plan. The firm as a whole must work to define and assess the technology's capabilities and characteristics. Technology should be linked and aligned with business strategy due to its significance and relevance to the organization's overarching competitive strategy. In addition, businesses need to develop their product, service, and process strategies in light of how technology will impact each stage of the value chain. [10] Researchers have in the modern era, technology strategy is essential for the development of business strategy and the maintenance of a competitive advantage. This is because it provides insight into crucial questions like: which competencies are to be adopted for competitive advantage; what should be the investment level in technology development; how to organise technology development and its management; etc.

Technology Management and Innovator

The management of technology focuses on the interaction between an organisation and its external technical context. Licensing, purchasing, the current state of technology, research and development, and technical policy are all examples of technological things. New product development, new process development, and innovation policy are all sub-fields of innovation management.

In charge of technology

Technology is defined as "theoretical and practical knowledge, skills, and artefacts that can be used to produce products and services, as well as the systems that produce and deliver them," among other things.People, substances, mental and bodily operations, physical infrastructure, and tools all constitute embodiments of technology. [11]

Methods for Managing Innovation

The term "innovation management" refers to a "integrative problem solving framework," as well as "an awareness of the linkages among innovation streams, organisational teams, and organisation evolution." The focus should be on how to put plans into action, including how to deal with political obstacles, control issues, and personal resistance to change.

2. Materials and Method

The study used in-depth interviews with business owners of small and medium-sized technology firms in the Brazilian cities of So José dos Campos, Taubaté, and Caçapava to construct an exploratory descriptive research type. The qualitative analysis of the interview data provided a rich description of the entrepreneurs' familiarity with technical innovation and technological strategy in

the aeronautics sector's small and medium technology-based enterprises in the Paraba Paulista Valley.

Samples

According to data from the National Bank of Economic and Social Development (BNDES), So José dos Campos, Taubaté, and Caçapava are home to an estimated 176 small and medium-sized technology-based businesses, defined as those with annual gross operating revenue of R$ 1.2 million or more but less than R$ 60 million. The population or universe is defined as the group of people in the area where the search will take place. This paper's sample was probabilistic and limited; specifically, it consisted of 35 small and medium-sized technology-based businesses with an estimated 5% error margin, 95% confidence interval, and one-way variance. To derive this value, we used the following formula:

$$Sample(n) = \frac{s^2 \cdot Z^2 \cdot N}{s^2 \cdot Z^2 + e^2 \cdot (N-1)}$$

where s^2 is the standard deviation, N is the total number of people being studied, Z is the confidence level, and is the margin of error.

3.Results

Table 1. Strategic positioning

Strategic/technological positioning	Respondents
Buyer	0
Reactive follower	6
Pro-active follower	7
No opinion	24
Imitator	63

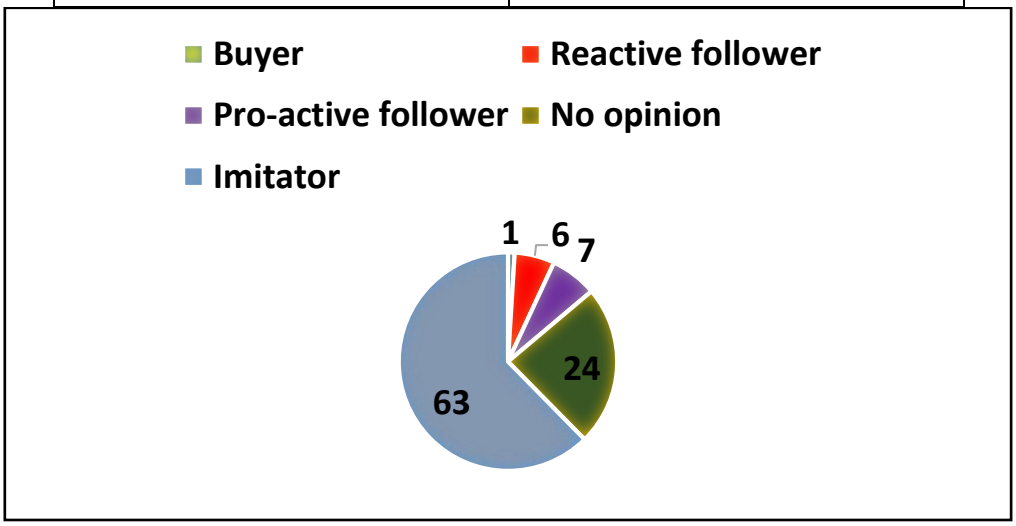

Fig 1. Strategic positioning

Percentages of the companies' strategic and technological positioning are shown in Figure 1 below. Small and medium-sized aviation technology firms in So José dos Campos, Taubaté, and Caçapava were found to be 63% proactive followers or to take a defensive stance.

Table 2. Strategy for Businesses

Business strategy	Respondents
Formal	33
In process	1
Informal	3
No opinion	16
An idea	47

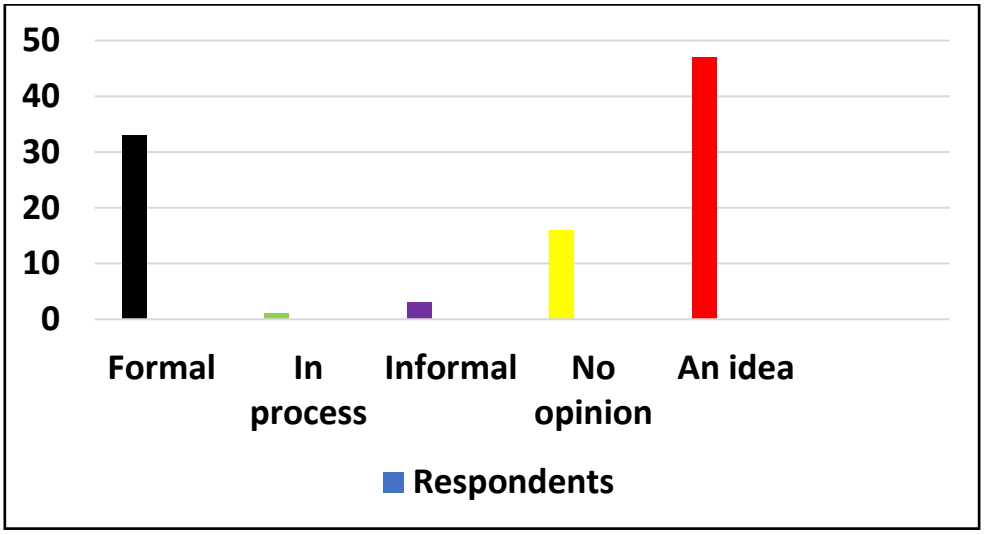

Fig 2. Strategy for Businesses

Figure 2 displays the percentages of the organisations studied that have formally documented and disseminated their business plan. The statistics showed that 47% of organisations have what is called an "informal business plan," which means they have a formal business strategy but only certain layers of management are aware of it.

Table 3. Strategic Plan for Technology Adoption

Technological strategy	Respondents
Formal	1
In process	6
Informal	3
No opinion	39
An idea	51

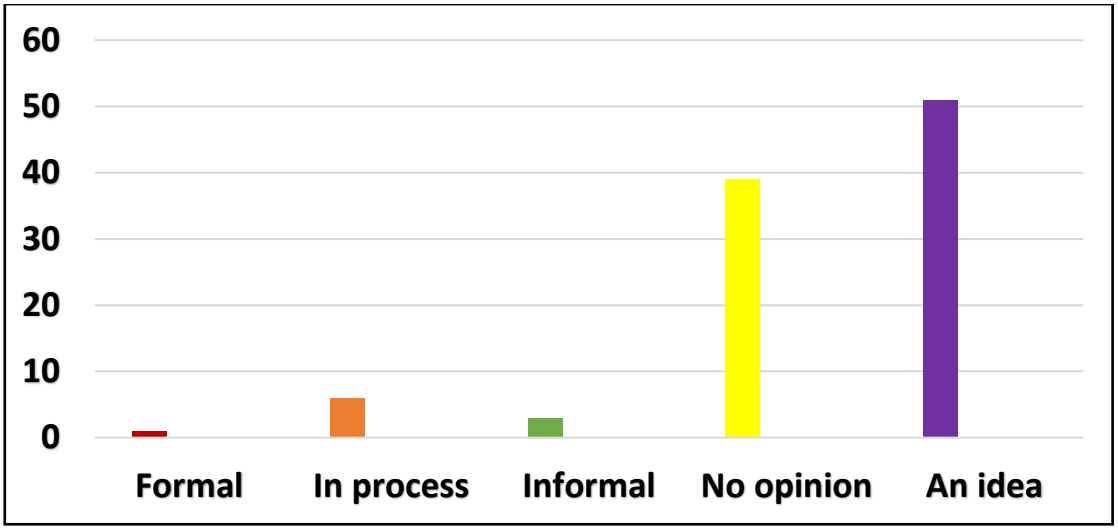

Fig 3. Strategic Plan for Technology Adoption

Figure 3 shows that 51 percent of the organisations surveyed said their technical strategy consists of a single, undocumented idea that is only discussed among a small group of decision-makers within the company.

4.Discussions

Brazil's home market is conservative, making it challenging to launch innovative products there. Companies are less motivated to develop since they can now only respond reactively to threats of market decline. [12] Therefore, it is proposed in this section that small and medium technology-based companies in the aeronautical sector in So José dos Campos, Taubaté, and Caçapava can adopt certain business and technological strategies and postures in order to remain competitive within their specificities and not only on the domestic market but also the international market. Among these businesses, 24 percent employ a dependent approach in which they only push for product or process changes in response to specific requests from customers or databases. [13] It was also verified that these businesses place a premium on both technological advancement and cost-cutting in production. The mindset of the imitator is one that looks for openings and then replicates successful market ideas. [14] It was found that only 7% of businesses actually invest money in R&D. 33% of the organisations reported having a clear, explicit, and communicated company strategy, which suggests that these companies strategically plan, organise, direct, and coordinate the full process. Some 3% of businesses were found to have what is known as an "informal technology strategy," wherein a formal strategy exists but is only known by a select few in upper management. [15]

5.Conclusions

Pursuing its stated goal of "technological strategy," this study proposed an evaluation of the technological and strategic posture of small and medium technology-based enterprises operating in the aeronautical industry in So José dos, Campos Taubaté, and Caçapava. To achieve this goal, we used a technologically focused questionnaire to uncover the needs essential to fostering the growth of competitive small and medium-sized businesses. The authors concluded that these businesses are too small to justify massive R&D expenditures on an enterprise scale. Most of them take the role of passive and active followers, focusing instead on application research and development while doing

extensive work in incremental and process R&D. The findings show that aviation enterprises in So José dos Campos, Taubaté, and Caçapava, although small and medium in size, have never had a formalised and communicated technological plan.

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