Indicators of Innovation in the Strategic Management of the Textile Sector

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Abstract: The internal structure of Ecuadorian textile companies includes an important aspect: their level of innovation. To remain competitive, it is crucial for these companies to continuously update and create cutting-edge processes that differentiate them from textile companies in other countries. This study examines the impact of innovation on the strategic management of the Ecuadorian textile industry. Data was collected through a survey based on a structured questionnaire, which was administered to textile company managers in the Sierra region. The questionnaire underwent validation by eight industry experts, and its high reliability was confirmed using Cronbach’s Alpha method. The results indicate a positive relationship between innovation and strategic management. Furthermore, the study identifies two key areas that offer significant opportunities for improvement in the short term: the selection and training of talented personnel and the integration of information and communication technologies (ICT) in management processes.

Keywords: Innovation, IT Resources, Strategic Management.

1. INTRODUCTION

In an increasingly competitive and dynamic business environment, the capacity for innovation has become crucial for the success and survival of organizations. The ability to generate new ideas, adapt to changes, and transform them into sustainable competitive advantages is essential for staying ahead in the market. In this context, strategic management plays a fundamental role in driving the organization’s efforts toward innovation, thereby ensuring long-term value creation. It is important to note that strategic management involves systematic and proactive decision-making and resource allocation to achieve organizational objectives. For the strategy to be effective, it is crucial to have the capability to measure and evaluate the performance of innovation within the organization. It is where innovation indicators come into play, as they are tools that enable the quantification and monitoring of progress and result in innovation [1].

This paper examines innovation indicators in strategic management, exploring their significance, different categories, and practical applications in the business domain. Through a review of specialized literature and the presentation of case studies, different ways of measuring innovation will be analyzed, and best practices for implementation will be discussed [2]. The main objective of this work is to provide professionals, managers, and students with a comprehensive understanding of innovation indicators, equipping them with the necessary tools to evaluate and improve innovative performance in their organizations. Additionally, it seeks to foster an understanding
of the relationship between innovation and strategic management as fundamental elements for business success in a highly competitive environment.

In this regard, one can assert that innovation involves introducing changes and improvements in techniques, products, production processes, and distribution. According to some authors [3], a company's innovative efforts, which are crucial for achieving competitiveness, directly relate to technology. Thus, innovation enables the transition from technology to competitiveness. Tinto [4] argues that developing and utilizing innovation plays a crucial role in increasing productivity, particularly in the face of increasingly complex pressures in the industry. As a result, the connection between innovation, changes in productivity, and business competitiveness is established.

In the case of Ecuador, data on innovation activities in the textile industry are sometimes unavailable in any official database. Additionally, the available quantitative indicators often inadequately explain all relevant aspects of innovation processes. These limitations led a group of researchers to conduct a comprehensive study on innovation in the strategic management of a specific productive sector: the textile industry located in the Sierra region. These studies addressed a global issue while considering local peculiarities, aiming to provide a comprehensive response to these deficiencies. In other words, they aimed to address the lack of quantitative and qualitative information on innovation processes and their influence on competitiveness [5].

The textile industry faces challenges in three key areas: markets, technologies, and products [1]. Therefore, a study is necessary to improve knowledge about innovation processes and their impact on the competitiveness of the textile industry. Firstly, markets are changing due to increased competitiveness and the opening of international markets. Secondly, the textile industry has relied on technology development in other sectors, such as construction machinery and platforms, to implement information and communication technologies (ICT) [6].

The current era presents a new perspective on innovation processes that can be applied in different areas of the company. Considering innovation in talent management and computer resources implementation as a strategic part of organizations represents a significant increase in their economic value [7], [8]. Recent studies have shown that the profitability of small industries is based on strategic talent management and the process that enables an organization to establish itself in the market through the efficient work of its staff and the use of ICT in managerial processes.

Countries like Colombia, Argentina, Brazil, Chile, and Peru have implemented strategic talent management practices in the textile sector. These internships include staff support, innovating with compensation indicators and retention policies, and fostering motivation to achieve goals through strategic organizational components, attributes, and contemporary approaches. In Ecuador, regular adjustments are being made based on the specificities of each textile company [3]. Some companies are achieving expectations by incorporating a strategic approach into their talent management processes and digitizing procedures. Those responsible for strategic management are actively involved in this process [10].

In the small and medium textile industries of the Sierra Region, made up of both natural and legal persons, difficulties have been observed in management processes, leading to weaknesses that impact strategic management and undermine the operational effectiveness of human resources. The strategic talent of management is an administrative and operational tool that increases the likelihood of success. Variables related to human resources and using information and communication technologies (ICT) as a form of innovation in management procedures positively impact organizations through innovation. The selection, recruitment, integration, orientation, productivity, self-development, rewards, evaluation, and audit of personnel form links within the socio-competitive and strategic company value chain [9]. It influences the strategic management of companies, which, supported by a systematic methodology aimed at achieving high employee performance, results in high productivity levels [10].

This paper diagnoses the capabilities and levels of technological innovation in the Ecuadorian textile industry. These elements interact with each other so that any change in one of them affects the others, generating new
motivations and producing changes and expansions in the entire innovation system. In this case, the principal variable is human talent. Table 1 details the aspects of provision, organization, maintenance, development, and audit of the strategic management of human talent (Table 3). These aspects are closely related and interdependent, so any change in one of them influences the others, requiring adjustments and adaptations in the whole system from a systemic perspective that considers the subsystems within it.

Table 1. Human talent process in strategic management.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provisioning subsystem.</td>
<td>Recruitment and Selection of personnel.</td>
</tr>
<tr>
<td>Organizational subsystem.</td>
<td>Placement of positions by experience. Performance evaluation</td>
</tr>
<tr>
<td>Maintenance subsystem.</td>
<td>Remuneration, commensurate with training and experience. Social benefits</td>
</tr>
<tr>
<td>Development subsystem.</td>
<td>Personnel training.</td>
</tr>
<tr>
<td>Management and audit</td>
<td>Human resources information systems. Ethics and responsibility</td>
</tr>
<tr>
<td>computerization subsystem.</td>
<td></td>
</tr>
</tbody>
</table>

While innovation in the implementation of ICT in strategic management processes, according to surveys and expert validation, is at the level of interaction through computer resources for activities of purchase and sale of textile products, process automation, attendance control, use of software for warehouse control, and for control and systematization of activities of preventive and corrective maintenance of machinery in the textile industry.

2. HUMAN TALENT IN STRATEGIC MANAGEMENT

Other studies define strategic management as the process in which managers establish the structure necessary to achieve the objectives set by the company. The selection of personnel with training and expertise is seen as an innovation in recruitment and job design to carry out long-term strategic workforce planning processes. Only in this way is it possible to identify the competencies, positions, and skills required to occupy a specific role within the scope of human talent in strategic management [11].

Gavino [7] introduces personnel recruitment as a comprehensive process encompassing the search, selection, integration, and training of both existing employees and prospective candidates joining the organization. This meticulous approach equips them with the tools to carry out their designated responsibilities proficiently.

The organizational subsystem of companies includes defined processes: job description and analysis, job design, and performance evaluation. These activities support effective personnel management by addressing the organization’s continuous improvement needs and planning functional training with collaborators from relevant areas as required. After personnel integration, according to Ramirez [12], they are organized and provided with information about their position, tasks, responsibilities, and interdependence with other departments, and ultimately undergo a performance evaluation to measure their contribution and commitment to achieving objectives.

The development subsystem in organizations encompasses personnel training and development, creating sustainable learning spaces to prepare employees for management positions, and maintaining continuous management with personnel. It should include career and organizational succession plans that provide opportunities for professional improvement. The development of human talent is considered an investment that leverages the potential of employees and contributes to achieving the organization's objectives. It involves career plans designed based on seniority, acquired experience, and trajectory in the company, evaluating the conditions to promote staff promotions [13].

Münch [24] states that an integrated management system includes recruitment and selection, salary and
compensation administration, training and development, labor relations, industrial hygiene and safety, services and benefits, and planning and evaluation. This process starts with personnel recruitment and aims to apply their functions to optimize and consolidate the company's achievement indicators. On the other hand, Kim et al.[8] propose conditions that allow impeccable occupational development for workers. According to Chiavenato [14], the processes in people management are: integrating, organizing, retaining, developing, and evaluating human talent.

3. ICT IN THE STRATEGIC MANAGEMENT

According to Saldarriaga [15], human resources information systems are tools made available to those responsible for human talent to make processes more flexible and expand coverage in personnel selection. These systems are methods or techniques for acquiring, regulating, securing, manipulating, and disseminating information representing data organized in meaningful ways and conveying valuable knowledge to those who receive it [16]. According to Alfaro [17], in companies, technology has been a means of organizational communication that brings the necessary collaborators closer to the candidates who offer their services.

This article analyzes the main actors in the textile industry that use the innovation approach in the recruitment and training of human talent and the use of information and communication technologies (ICT) in strategic management processes. The article is organized as follows: the first section reviews the literature on innovation. The second section briefly describes the methodology and the development of the research. Next, the main results are presented, followed by a discussion of the companies that are part of the textile innovation system in the Altiplano zone.

4. MATERIALS AND METHODS

Global textile markets present diverse and ever-changing demands, which require adaptability and satisfying the needs generated by new and demanding, flexible markets. Emphasis also places on the quality of garment production due to the continuous efforts of the sector's entrepreneurs to remain technologically up-to-date and become more competitive. It implies the need for a skilled workforce and, as far as possible, innovation in management systems through ICT use. The different links in the value chain within sectors are considered low-tech it is clear that the various activities form a set of processes with distinct patterns of behavior and sources of innovation [18], [19].

In the case of the Ecuadorian textile company, to improve productivity and competitiveness, the influence of human talent and the use of ICTs as forms of innovation in competitiveness are studied. This work is framed within non-experimental exploratory research since information will be collected from secondary sources such as databases and national and international organizations. Additionally, it has an evaluative approach, since surveys and selective interviews will be conducted with owners or managers of companies in the textile sector as primary sources of information. On the other hand, documentary research will be carried out through the search, interpretation, and presentation of data from existing sources, together with field research involving direct contact with facts or phenomena related to the study.

AITE [20] provides the database used in the study, shown in Table 2, presenting the total number of textile companies by province in Ecuador. From this database, the researchers intend to diagnose the current state of the Ecuadorian textile industry and propose future challenges in terms of technological innovation, human talent, and the use of ICTs in strategic management and competitiveness [21].

Table 2. Companies belonging to the association of textile industries of Ecuador in the Sierra Region.

<table>
<thead>
<tr>
<th>Company</th>
<th>City</th>
<th>Region</th>
<th>Installed capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delltex</td>
<td>Cumbayá</td>
<td>Sierra</td>
<td>80%</td>
</tr>
</tbody>
</table>
The survey technique was used for data collection using a questionnaire consisting of 16 items with an ordinal scale. Several response options were used, to which Cronbach’s alpha was applied as a reliability formula. This process gave a result: 0.90, being highly reliable. In response to the specifications of the research objective, the following interpretation scale was generated to measure the mean, establishing the behavior of each of the dimensions studied (Table 3).

Table 3. The scale of interpretation of the average.

<table>
<thead>
<tr>
<th>Range</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 1≥</td>
<td>No satisfactory.</td>
</tr>
<tr>
<td>1 - 2≥</td>
<td>Moderately unsatisfactory.</td>
</tr>
<tr>
<td>≤2 - 3≥</td>
<td>Neither Satisfactory - Neither Unsatisfactory.</td>
</tr>
<tr>
<td>≤3-4≥</td>
<td>Moderately satisfactory.</td>
</tr>
<tr>
<td>≤4-5</td>
<td>Satisfactory.</td>
</tr>
</tbody>
</table>

5. DISCUSSIONS

The results obtained in this limited sample do not allow for precise generalization; however, they reveal trends related to aspects of process innovation. The low level of knowledge about innovation allowed the operationalization of a manageable number of variables. The similarities between several cases allow the identification of influential variables, categories, and relationships. It is important to establish some generalization potential in the results, i.e., that the observed facts related to innovation in human talent and the use of ICTs can be generalized beyond the specific situation of the companies studied.

Only seven companies have individual innovation plans, which represent an opportunity due to their growth potential. As noted, innovation in human talent and ICT use in strategic management positively affect competitiveness, according to surveys and expert validation.

Large distributors and specialized store chains (mainly under the franchise regime) control the main markets in Ecuador. These establishments typically source low to medium-quality products from companies located in low-cost countries rather than local markets. Many Ecuadorian companies have struggled to adapt to this new landscape. Therefore, the challenge lies in retaining current customers and exploring new markets beyond innovation processes for effective strategic management. It highlights the increased significance of analyzing variables such as
human talent and ICT as forms of technological innovation.

Regarding the human talent process that influences the strategic management of the Ecuadorian textile industry, it was found that the arithmetic mean is 2.78, mode: 2, variance: 1.32, standard deviation: 1.09, and coefficient of variation: 46%. It is placed in the medium-level category, allowing to maintain an organizational structure that provides optimal working conditions and satisfactory occupational development for workers.

Innovation processes within an integrated management system begin with incorporating new workers to optimize and consolidate the textile company's achievement indicators. According to Herrera [22], the conditions for carrying out these activities must be adequate, and the competencies generated are measured through motivation, recognition, and ethical performance. It encompasses personnel selection, induction, reinduction, social welfare, training and development, performance evaluation, and occupational health and safety.

The process is sometimes contingent and situational, resulting from its flexibility and relationship with the subsystems. It varies according to the corporate principles of each textile company and depends on environmental, organizational, human, technological, and economic factors. Regarding personnel selection, 66% of the 16 respondents disagreed, while 15% were undecided. As for the personnel selection indicator, 34% disagreed, and 27% of managers indicated a moderate level of disagreement.

The training and acquisition of human talent provide the necessary tools for each textile worker to perform their duties efficiently and effectively. On the job design indicator, 41% expressed disagreement, while 21% indicated moderate disagreement. For job description and analysis, 35% disagreed, and regarding performance evaluation, the figure was 48%.

Qualified personnel and computerized processes allow the textile company to integrate employees into its corporate culture, reinforcing their identity with the organization. Implementation of the maintenance subsystem prevents risks for both employees and company assets. In many cases, incidents occur due to a lack of orientation and training in using processes, equipment, and tools. In addition, organizational health involves physical, mental, and social worker's well-being [23].

Regarding the innovation in implementing ICT in strategic management processes, there is evidence of interaction through computer resources in activities such as textile product buying and selling, process automation, attendance control, use of software for warehouse management, and preventive and corrective maintenance of textile machinery.

On the other hand, the importance of the indicators of personnel training (60%) and personnel development (51%) is evident since many respondents disagreed that these indicators impact the strategic management of the Ecuadorian textile industry. The results coincide with those indicated by Munch and Montes [24], who emphasizes that the development subsystem must be considered an innovation that contributes to achieving organizational objectives. It involves career and succession plans and the evaluation of the conditions for promoting promotions or personnel transfers. Regarding the computerization of management processes and information systems, 44% of respondents disagreed, while 16% showed a moderate level of disagreement.

Based on this study, it is determined that the textile industry should focus on the following aspects:

- Leveraging and continuous training of human talent to increase production capacity and adopt innovative business practices in terms of technology.
- Training of human talent for research, development, and innovation activities.
- Innovation in the use of ICTs as part of strategic management.
Training of human resources is necessary to implement technological innovation and add value through design, machine programming, preparation, and spinning of fibers. Educational institutions must increase the academic offer in the coming years. The proposed innovation also implies the presence of new jobs, specialists in new services, and a growing demand for technicians at different levels, not only in the textile field but with solid training. One of the challenges facing the Ecuadorian textile industry is the establishment of textile research centers equipped with design and documentation units, such as specialized libraries housing journals in the field. This initiative aims to enhance the industry’s innovation capacity and knowledge exchange.

The textile company must approach strategic planning from an organizational perspective, considering aspects of localization, competitiveness, and efficiency based on technological investment, which will allow it to improve processes and invest in training and knowledge to have specialized labor, which in the medium term translates into innovation, quality, and competitiveness.

**CONCLUSION**

The Ecuadorian textile industry, as in other regions, is undergoing significant changes in its economic structure due to the globalization process. In this scenario, policymakers, entrepreneurs, and society, in general, must rethink how to regain competitiveness through innovation.

To achieve this challenge, an exhaustive analysis of the primary forces and actors that are part of this specific sector in a given region is necessary. Also, this paper aims to highlight the most relevant results of previous research in this area of investigation.

The research emphasizes developing the human talent required to implement technological innovation in the Ecuadorian textile industry. The reference framework provides a checklist to assess a company’s situation concerning innovation processes, including external analysis with situational factors and the competitive environment. The influence of innovation on competitiveness is acknowledged, and different strategies enable companies to manage risks and seize opportunities.

When analyzing the human talent process stage that impacts the strategic management of Ecuadorian textile companies, we observe that it falls into an intermediate category. This observation allows us to maintain an organizational structure and favorable working conditions that facilitate satisfactory occupational development for workers.

The indicators that present the most opportunities for improvement in innovation processes in Ecuadorian textile companies are personnel selection and the use of ICTs in strategic management. It is important to emphasize that business reality does not necessarily cover all aspects of innovation processes. Therefore, empirical evidence, deduction, analogy, and creativity also have a place in this context.

Companies must prioritize innovation in talent acquisition and development to impact social, psychological, economic, and organizational aspects of workers’ activities and harmonize their quality of life.

From a strategic management perspective, textile companies must align their principles and objectives to establish a clear vision. This alignment fosters worker identification with processes and consolidates each activity defined in organizational planning, reducing costs and time. The proper implementation of human talent processes and the use of ICT positively influence the strategic management of companies, generating sustainable competitive advantages and adapting to new trends and challenges of business networks in terms of innovation.

In interviews with managers, another notable factor emphasized is promoting a business organization that aligns with the strategic vision and implements best practices in human talent. This approach positively impacts worker performance.
Undoubtedly, Ecuador’s medium and large textile companies will face technological challenges. Although those that can adapt to new trends with their resources, such as ICT and human talent, will be the ones to survive and compete in the global market.

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