

KNOWLEDGE MANAGEMENT AND ITS IMPACT ON A MANUFACTURING COMPANY

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Carrillo Leal Eduardo¹, Lechuga-Nevárez Mayela del Rayo², Rivas Barraza Anapaula³, González Lazalde Iván⁴

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¹Tecnológico Nacional de México/Instituto Tecnológico de Durango, 17040238@itdurango.edu.mx, <https://orcid.org/0009-0001-5279-9673>,

²Tecnológico Nacional de México/Instituto Tecnológico de Durango, mlechuga@itdurango.edu.mx, <https://orcid.org/0000-0003-3221-0742>,

³Tecnológico Nacional de México/Instituto Tecnológico de Durango, arivas@itdurango.edu.mx, <https://orcid.org/0000-0003-3950-7469>,

⁴Tecnológico Nacional de México/Instituto Tecnológico de Durango, igonzalez@itdurango.edu.mx, <https://orcid.org/0000-0002-6728-4381>

Abstract -- Nowadays, knowledge management is fundamental for manufacturing companies, since it involves the organization and efficient distribution of information and experiences within the company. The objective of this study is to analyze the level of knowledge management and its impact in a manufacturing company. The research has a quantitative approach, a descriptive, exploratory and explanatory design. The census technique was used to collect the information. The questionnaire was used as an instrument, which was validated and reliability analysis was performed. The results show that there is a good knowledge management without being an established strategy.

Keywords: Intellectual capital, competitiveness, knowledge management, talent management, innovation, continuous improvement, knowledge transfer.

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INTRODUCTION

Effective knowledge management has emerged as a central element for the success and sustainability of companies in the contemporary era. In particular, in the

In the context of local manufacturing companies, where competition is intense and globalized, the ability to acquire, organize and apply knowledge effectively has become a determining factor for business survival and growth.

This case study emphasizes the level of knowledge management of the company in question, in order to identify the impact that this management generates in the organization, with the objective of providing a proposal that adapts to the capabilities and scope of the company. Through an exhaustive analysis, the models to which there is greater adaptability in terms of knowledge management generated and accumulated within the company were examined.

By understanding this dynamic, it is possible to identify areas of opportunity and thus propose practices to improve the efficiency, effectiveness and competitiveness of the company in the market it is in. The general objective is to analyze the level of knowledge management and its impact on the company located in Durango, Dgo.

DEVELOPMENT

Theoretical

framework

Knowledge

[1] states that knowledge is an inherent ability of human beings, which resides in the mind of each person.

According to him, knowledge workers represent a vital resource for any company. In addition, he points out that motivation is a key factor driving the successful flow of knowledge. Both knowledge and motivation are considered intangible resources, and precisely because of their abstract nature, they are difficult to value within organizations [2]. While information can be acquired, knowledge, on the other hand, is not something that can be bought [3].

Management

According to the principles of the scientific organization of work proposed by [4] and his innovative vision in the field of management, he defines management as the ability to identify what actions should be carried out and to execute them in the most effective way possible to achieve the expected improvements.

On the other hand, [5] a leading exponent of classical administration points out that management is composed of five essential components: planning, organization, direction, coordination and control. These elements must be organized and applied following fundamental administrative principles, such as division of labor, authority, discipline, unity of command, centralization, hierarchy, equity and personnel stability, among others, to ensure the efficient operation of the company.

Knowledge management

[6] describes knowledge management as the ability of an organization to leverage its internal resources through the use of an adequate infrastructure and information technologies, in order to make decisions, innovate, optimize processes and generate new knowledge. He points out that this process is crucial for the creation of wealth within the organization. For his part, [7] argues that the greatest challenge in organizations is the tension that arises in knowledge management. He points out that much of the organizational knowledge is transmitted from generation to generation [8]. [7], the real challenge lies in how to generate knowledge without putting the organization at risk. He suggests that one solution is to resort to external companies, such as consultancies, to mitigate this problem [8].

According to [1], knowledge management involves a process that facilitates the collection and organization of individual and collective experiences related human talent, which are considered valuable as knowledge. This process also contributes to the dissemination of such knowledge to create competitive advantages in the contexts in which organizations operate.

[8] agree that knowledge management acts as a bridge that connects the development of human talent with organizational learning, thus driving the creation and evolution of intellectual capital.

Based on these definitions, knowledge management can be understood as an integral process of creation, exchange, use and administration of knowledge and information within an organization, with the objective of improving its efficiency and competitiveness.

Knowledge management models

Knowledge management models are developed as tools to simplify and represent the complexity inherent to this concept [9]. Over the years, different approaches to manage knowledge have been proposed, and the most prominent in recent times are presented below:

- Intangible assets, strategic management by competencies, EFQM, E. Bueno's Model, Andersen's Model, Knowledge Creation, Wiig's Model, Riesco's Model, Balanced Scorecard, Knowledge, among others.

Based on the review of the models, the following models were chosen:

- Balanced Scorecard
- Knowledge

Since the analysis and evaluation are adapted to the particular characteristics of each organization, their implementation is easier. In addition, it is important to highlight the abundance of documented cases in which these models have been applied, which facilitates their understanding and direct application in companies.

Balanced Scorecard Model: This approach is one of the most comprehensive, as it combines different measurement systems for business management. It provides a conceptual framework for assessing whether the right resources, processes, and people are being used to achieve the company's maximum performance [9]. This model is structured in four key areas:

1. *Financial perspective:* According to [10], this perspective is aimed at meeting shareholders' expectations through value creation. It is based on performance indicators that reflect the company's operating performance, growth and sustainability.
2. *Customer perspective:* This dimension analyzes the company from the point of view of the customers who purchase its products or services. It is considered essential for financial and commercial success, since the customer base is fundamental for sales and growth [11].
3. *Internal processes perspective:* Here the strategic objectives linked to the organization's key processes are identified. The indicators of this perspective are established after defining those of the financial and customer perspectives, seeking to align the activities of the collaborators with the company's main processes to meet the strategic objectives [10].
4. *Learning perspective:* This perspective answers the question "How can the organization learn and continuously improve?". It is crucial to achieve long-term sustainable results, so it requires special attention from the organization [10].

Knowledge Model: This simpler model is used as an evaluation and diagnostic tool. It focuses on four key aspects:

1. *Leadership:* [12], defines leadership as the interpersonal influence exerted in an organization.

specific situation, through human communication, to achieve one or more specific objectives.

2. *Culture*: According to [12], organizational culture is a set of beliefs, expectations and values, as well as a particular way of interacting and relating within the organization. This system must be constantly observed, analyzed and interpreted.
3. *Technology*: [13] describes technology as body of knowledge based on science, which allows describing, explaining and applying technical solutions to practical problems in a systematic and rational way.
4. *Measurement*: This aspect allows identifying weaknesses within the organization and taking measures to improve and develop intellectual capital, with the objective of generating value.

These four components facilitate the process of knowledge management in organizations [9].

Systematic process for knowledge management Pávez argued that knowledge management can be understood as a systematic process, composed of a series of logical and structured steps, in which it is necessary to complete one task before moving on to the next [14].

- *Detect; Select; Organize; Generate; Encode; Transfer; Filter; Present; Use.*

Problems in the implementation of knowledge management

[15] identifies several of the main obstacles that organizations may face when implementing knowledge management:

- Level of commitment of associates; Organization always alert; Calculating results and designing new indicators; Ensuring that knowledge is correctly used; Knowing what to capture; Cultural changes.

Objective of knowledge management

[16] highlight several key objectives that seek to strengthen the spaces within an organization to improve the results of all its members. These objectives include: implementing the necessary resources to obtain information and knowledge; effectively managing knowledge and organizational learning; developing more efficient integrated frameworks; and establishing a technological base appropriate to the context and environment in which it will be applied.

Key factors in knowledge management implementation

As noted above, by implementing effective knowledge management, organizations can

may face a number of challenges. In this context, [16] suggest that it is essential to take into account certain aspects within the organization, given that management encompasses people, culture and technologies. A knowledge-oriented culture, knowledge technology infrastructure, direct relationship between knowledge management and development strategies, language harmonization, reward and incentive systems, knowledge structure, various knowledge communication channels and visualization system benefits [17].

Knowledge management cycle

Once the type of structure of the organization, its characteristics and how they carry out their activities have been studied, the application of knowledge management should be defined, where according to [16] six stages in a permanent cycle that allows incorporating knowledge management as a habitual practice. These stages are:

1. *Diagnosis. Definition of objectives.*
3. *Production of organizational knowledge.*
4. *Storage and updating. Circulation and use of knowledge: [18] users.*
- Performance measurement.*

Knowledge management as organizational innovation

The rise and increasing importance of knowledge as an essential component in business production has made the development of technologies, approaches, and strategies for assessing, generating, and sharing such knowledge a central concern for today's organizations. Moreover, knowledge has become crucial for economic and social advancement [19].

This implies that companies must make significant adjustments, both in terms of adapting and simplifying their infrastructure and in the intensive use of information and communication technologies (ICTs) and decentralized decision-making. It also requires a team with diverse skills, familiar with technologies, capable of making effective decisions and facing challenges. It is essential for the company's management to recognize the importance of implementing personnel training and updating programs, and to value interpersonal relationships as a tool for the exchange of knowledge.

As for organizational innovation, [20] describes it as the introduction of new organizational methods in practices, in the organization of the workplace or in the organization's relations with its environment. In the business context, this implies the adoption of novel methods for organizing routine tasks and management processes, with the aim of improving learning and knowledge sharing in the organization. Decentralization of control refers to

to the formation of new teams, both formal and informal, to increase employee flexibility.

METHODOLOGY

The study site is a local company, located in the city of Victoria de Durango, belonging to the secondary sector that corresponds to the manufacturing industry. The research is exploratory, descriptive, explanatory and quantitative.

[21] point out that an exploratory study investigates little-known topics in order to increase familiarity with them. This type of study aims to define the level of knowledge management in manufacturing companies through an exploratory analysis. Descriptive research, on the other hand, focuses on identifying the properties of individuals or groups, evaluating different aspects of the phenomenon to describe the current situation of knowledge management and transfer in the company, considering factors such as jobs, collaborators and the work environment.

The explanatory approach, also described by [21], aims to understand the causes of physical or social events, explaining why certain phenomena occur and the relationship between variables. In this context, the research focuses on clarifying the level of knowledge management within the company. Finally, [21] point out that quantitative research is a structured and systematic approach based on the collection and analysis of numerical data to identify patterns, test theories and make predictions. For this purpose, surveys, interviews, observations and questionnaires will be used as key tools for data collection and subsequent analysis.

Figure 1 "Diagram of the research design" is shown below.

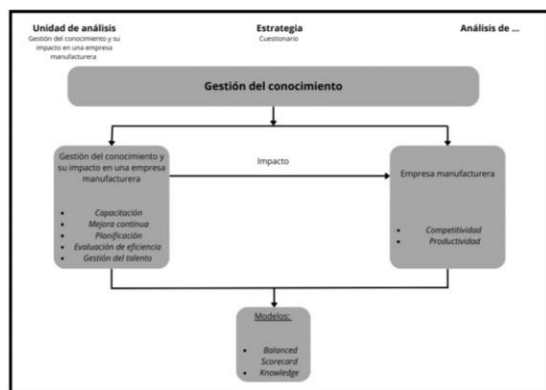


Figure 1. Research design of the subject of the study.
Source. Own elaboration (2024).

Subject of study

All areas of the organization were selected as subjects of , paying special attention to those where knowledge is directly generated and produced,

such as the engineering, mechanical design and CNC machining departments, among others. However, the other areas were also included, since also produce knowledge, albeit indirectly.

Sample size

The scope of the study was limited to the organization and, due to its small size, it was decided to out a census, thus including all the members of the organization.

Models used for the study

Once the literature related to the topic of was analyzed, two models of knowledge were selected based on the characteristics of both the company and the study, resulting in:

- Balanced Scorecard
- Knowledge

Based on these two models, the factors or indicators that were most relevant to the research were selected and are shown in Figure 2,

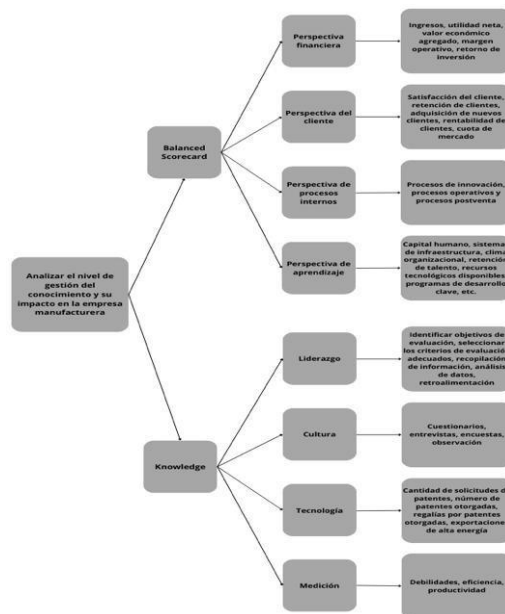


Figure 2. Research design. Source. Own elaboration (2024)

Techniques and instruments for data collection

After analyzing the literature and operationalizing the variables of the subject of the study, two models of knowledge management were chosen as a starting point to elaborate a model of our own, taking into account the approaches described below:

- Balanced Scorecard:
 - o Financial perspective

- Customer perspective.
- Internal process perspective.
- Learning perspective.
- Knowledge
 - Leadership.
 - Culture.
 - Technology.
 - Measurement.

The questionnaire consists of 63 questions with answers under the Likert scale, which are distributed as follows, structured in several sections. The first part focuses on sociodemographic information and is composed of eight items. The financial perspective includes five items, while the customer perspective and the internal processes consist of nine items each. On the other hand, the learning perspective is addressed through ten items. In addition, different approaches are explored: the "leadership" approach and the "culture" approach contain five items each, the "technology" approach consists of six items, as does the "measurement" approach, which also has six items.

As mentioned above, the hierarchy of the organization's management was considered for a better handling of the information and greater ease application, so the questionnaire was adapted to be answered by:

- Management.
- Middle management.
- Operators.

For the validation of the instrument, the expert judgment was carried out, in which the instrument was given to four businessmen, three doctors and two operators on behalf of the organization, where, after its analysis, the pertinent changes and corrections were made.

According to [22], the validation technique by expert judgment is based on the relationship between the items of the instrument and the research, where it seeks to obtain a considerable degree of acceptance by the expert. This technique makes it possible to evaluate whether the items selected by the researcher in each section coincide with the criteria of the experts involved. However, it does not guarantee the reliability of the instrument, so it is used as a draft subject to adjustments and modifications to improve its accuracy. When combined with other techniques, such as pilot testing, it helps to determine whether the instrument effectively measures what it is intended to measure [22].

Collection of information

Permission was requested from the company to apply the questionnaire in the period from February to May 2024, the dates established by the company in person to guarantee and ensure that the questionnaire is answered correctly.

Methods and techniques for information processing

The software *Microsoft Excel* 2021 (16.78.3) and *Google forms* were used, since both are statistical tools that provide analysis and processing of information from a small amount of data.

DISCUSSION AND ANALYSIS OF RESULTS

The results reveal that the work team is mainly composed of young employees, between 22 and 36 years of age, indicating energy and openness to new ideas. They are predominantly men, single and childless, suggesting availability and flexibility to take on additional responsibilities. The data show that 71.4% of the members are single, 81% are men and 14.3% are women.

In terms of education, all team members have at least completed high school, and some have university degrees, providing specialized knowledge. With an average work history of 10 years, the team, although young, has significant experience. This can enhance their ability to meet challenges and contribute to the success of the organization.

In general, how many years of experience do you have?

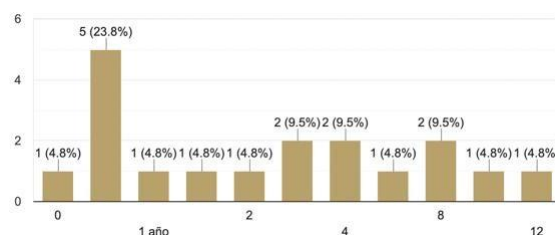


Figure 3. Years of experience

Source. *Google forms* based on the questionnaire prepared for the research (2024).

Knowledge management in the company focuses continuous learning and professional development to maintain competitiveness. The company shows effective management of training programs, reflecting its commitment to innovation and skills development. This good management ensures that knowledge is accessible and useful, promoting a culture of continuous improvement. More than 50% of employees approve of training, and the company monitors the skills of the team. The company adequately manages training and education programs to improve workers' skills.

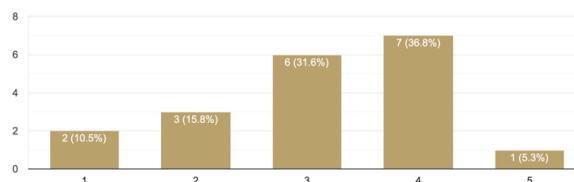


Figure 4. Training programs

Source. *Google forms* based on the questionnaire prepared for the research (2024).

These results indicate that the company not only adequately manages its knowledge resources, but also demonstrates a strong commitment to the needs and development of its employees.

This commitment is evident in the approach the company takes to the professional and personal development of its team. The organization ensures that knowledge is always available and useful when required, enabling employees to have access to the information and skills necessary to perform their roles optimally. This proactive approach to knowledge management not only facilitates problem solving and informed decision making, but also drives innovation within the company.

Finally, the results of the questionnaires applied to employees indicate a high degree of satisfaction with the practices implemented in the company, thus supporting a positive view of employees. Employees value the organization's efforts to train and support them in their professional development, considering them effective and valuable. This level of job satisfaction is not only a key indicator of a healthy and positive work environment, but is also linked to higher talent retention, productivity and long-term success of the company.

The previous results of the questionnaire converge with various positions of the literature reviewed on knowledge management in industrial companies. [23] emphasizes that training and updating are essential for proper knowledge management, which is reflected in the company analyzed, where more than 50% of the employees approve the training programs. [24] highlights the relationship between knowledge management, job satisfaction and productivity, something that coincides with the findings of the questionnaire, in which employees show a high valuation of the practices implemented. [25], points out that investing in knowledge has a positive impact on the profitability and competitiveness of organizations, which is evident in the company studied, where a culture of continuous improvement and access to information is fostered. [26] highlights the importance of knowledge transfer as a means to improve organizational efficiency, which is observed in the way the company manages learning and development of competencies. Finally, [27] affirm that a correct orientation in knowledge management not only strengthens the generation and dissemination of knowledge within MSMEs, but also improves productivity and business performance, which is in line with the positive perception of employees about training and its impact on the company.

CONCLUSIONS

It can be concluded that the information gathered on the level of knowledge management in the company highlights the following

its clear orientation towards continuous growth and the efficient management of accumulated knowledge.

The company promotes a continuous learning environment, where the acquisition of new skills and knowledge is valued and encouraged. This educational environment not only benefits employees in their professional growth, but also contributes to the company's adaptability and competitiveness in a constantly evolving market. The ability to adapt quickly to market changes and new technologies is crucial to maintaining a competitive advantage, and the company appears to be well positioned to meet these challenges.

In addition, the company shows a strong commitment to the well-being and growth of its employees, which reflected in the training and professional development programs it implements. These programs are designed not only to improve employees' technical and professional skills, but also address aspects of personal development, fostering a culture of work-life balance. This integrated approach contributes to greater job satisfaction, which in turn translates into higher talent retention and productivity.

Indeed, the company not only manages knowledge well, but is also committed to the well-being and growth of its employees. This integrated approach enables the company to evolve and adapt to the market, positioning it as a leader in its industry. Efficient knowledge management, a continuous learning environment and a commitment to employee well-being are the basis for its sustained success and future growth.

It is also important to mention the future lines of research that may originate from this project, such as:

The impact of knowledge management on innovation, which would analyze how knowledge management influence the generation of new ideas, products and processes within companies. Another possible line would be the Another possible line would be cross-sectoral comparisons, which would examine differences and similarities in the implementation of of knowledge management strategies at different industrial sectors.

Human capital and development of competencies through knowledge management, the industrial 4.0 era, organizational resilience, among others, are lines of research that could be addressed.

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Contribution role table

Role	Author(s)
Conceptualization	Eduardo Carrillo Leal
Data Curation	Eduardo Carrillo Leal, Iván González Lazalde, Mayela del Rayo Lechuga-Nevárez
Methodology	Eduardo Carrillo Leal, Mayela del Rayo Lechuga-Nevárez, Iván González Lazalde
Project management	Eduardo Carrillo Leal, Mayela del Rayo Lechuga-Nevárez
Resources	Eduardo Carrillo Leal, Mayela del Rayo Lechuga-Nevárez, Anapaula Rivas Barraza, Iván González Lazalde
Software	Eduardo Carrillo Leal, Mayela del Rayo Lechuga-Nevárez, Iván González Lazalde
Supervision	Eduardo Carrillo Leal, Mayela del Rayo Lechuga-Nevárez, Iván González Lazalde, Anapaula Rivas Barraza
Validation	Eduardo Carrillo Leal, Mayela del Rayo Lechuga-Nevárez, Iván González Lazalde, Anapaula Barraza Rivas
Visualization	Eduardo Carrillo Leal, Mayela del Rayo Lechuga-Nevárez
Drafting - original draft	Eduardo Carrillo Leal
Writing - proofreading and editing	Eduardo Carrillo Leal, Mayela del Rayo Lechuga-Nevárez



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