

## Development of an instrument for measuring sustainability in the reverse logistics of a bakery company in Villahermosa, Tabasco

### Diseño y elaboración de un instrumento para la medición de la sustentabilidad de la logística inversa de una empresa panificadora en Villahermosa, Tabasco

RAMOS-PARDO, Osiris Cecilia†\*, LÓPEZ-VALDIVIESO, Leticia, ELISEO-DANTÉS, Hortensia and DE LEÓN-DE LOS SANTOS, Brissa Roxana

*Tecnológico Nacional de México Campus Villahermosa, México.*

ID 1<sup>st</sup> Author: *Osiris Cecilia Ramos-Pardo* / ORC ID: 0000-0001-8944-5126, Researcher ID Thomson: AFB-6778-2022, CVU CONACYT ID: 1155371

ID 1<sup>st</sup> Co-author: *Leticia López-Valdivieso* / ORC ID: 0000-0001-6288-3636, Researcher ID Thomson: G-5753-2018, CVU CONACYT ID: 67839

ID 2<sup>nd</sup> Co-author: *Hortensia Eliseo-Dantés* / ORC ID: 0000-0003-4006-4669, Researcher ID Thomson: F-6749-2018, CVU CONACYT ID: 411079

ID 3<sup>rd</sup> Co-author: *Brissa Roxana, de León de-Los Santos* / ORC ID: 0000-0002-4775-6185, CVU CONACYT ID: 778437

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#### Abstract

The aim of this research is to explore in the applicable theoretical perspectives, which innovation factors can be empirically studied in work teams. For that purpose, an integrative review of the literature was carried out using the methodology of search and evaluation for inclusion. A coherent classification, based on theory, was obtained for the innovation factors in work teams that could guide subsequent studies in real life to contribute to the lack of this type of studies reported in the literature.

**Innovation factors, Work teams, Empirical studies**

#### Resumen

Esta investigación tiene como objetivo rastrear en las teorías más relevantes sobre el tema de los factores de innovación al nivel de equipos de trabajo que pueden ser estudiados empíricamente, para ello se llevó a cabo una revisión integrativa de literatura usando la metodología de búsqueda y evaluación para inclusión. Como resultado, se construyó una clasificación coherente, fundada en la teoría, de los factores de Innovación que operan al nivel de equipos de trabajo para facilitar estudios en la vida real, que contribuyan a la falta de datos este tipo que ha sido reportada en la literatura.

**Factores de innovación, Equipos de trabajo, Estudios empíricos**

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\* Author's correspondence (E-mail: osiris.ramospardo@gmail.com)

† Researcher contributing first author.

## Introduction

Over the past few decades organizations around Nowadays, organisations with a sustainability orientation or sustainable approach have a competitive advantage in the globalised market, which is a characteristic paradigm in the 21st century.

Today, thanks to technology, new management methods and innovative management approaches, sufficient tools are available to take on the challenge of administering and managing sustainable organisations, and these can easily impact society, the economy, politics and even the culture of a nation, incorporating models that integrate and promote ethical and responsible behaviour, with sustainable strategies.

Business competitiveness is driving companies to face new challenges in order to survive due to growing material needs, scarcity of natural resources, and social and cultural inequalities. As a consequence, sustainability takes on a key role as a global strategy, based on economic prosperity, ecological balance and the common good. Likewise, sustainability is the way to find economic, ecological and social balance, resulting in progress and capitalisation of new resources. Organisations must advance towards the achievement of their objectives, but they must be aware that society demands that they do so within the framework of their social responsibility.

In view of the above, this study proposes the design and development of an instrument for measuring sustainability in the reverse logistics of a bakery company in Villahermosa, Tabasco, given that the aim is to determine the conditions of this variable in the business environment.

## Theoretical foundation

For the economic development of a country, the food industry plays an important role, in view of this, there are several studies on the subject of sustainability.

Kent (2016) mentions that sustainability is a paradigm that is based on socially fair, economically viable and ecologically acceptable development, based on principles of intergenerational equity that, with the recognition of society, favours access to a social, economic and natural heritage equivalent to that of their predecessors.

In turn, Drucker (2007) argued that: "the old forms of business management have not paid attention to people and values, on the contrary, they have underestimated and annulled them, thus weakening the possibilities of development and undermining their own economic objectives".

On the other hand, an organisation will be socially responsible when it manages to internalise a set of shared values that foster a culture capable of generating the conditions required to assume its commitment to sustainability.

While business research has been good in the area of finance, in the field of sustainability it presents an opportunity to create measurement instruments (Bonns, Baumann and Hall, 2012).

With regard to business evaluation, the following questions arise: is it possible to measure creation and destruction in global production value chains; does the measurement of sustainability require economic, environmental, political, technological, cultural and social metrics; and does the measurement of sustainability require economic, environmental, political, technological, cultural and social metrics?

## Problem statement

The bakery company located in the city of Villahermosa, Tabasco, which is the object of study, has been characterised for many years as a world leader in the food area. On the other hand, in the area of reverse logistics, little interest has been given to sustainability under strategies for improving competitiveness.

Society demands a quality service where expectations are improved in all areas (economic, social, and environmental) added to the high competition and the signals that mark an image through social networks, the interest of this analysis lies in knowing how the variables of the context affect sustainability, in the environments: social, economic, political, environmental, technological and cultural, where a socially responsible attitude is taken with the awareness and self-sufficiency to leave the following generations better opportunities for development.

Strategies to use, safeguard and maintain human and material resources in an optimal way, with the aim of creating a responsible, friendly and beneficial balance, sustainable in the long term, through recovery and recycling, are part of this sustainable balance for a better world. In environmental matters, the efficient and rational management of natural resources will contribute to improve the welfare of the population by enhancing the sustainability of the company.

### Justification

The bakery company to be studied stands out for having a sustainable approach, not only as a form of social contribution, but also as a "way of acting" in favour of society. Therefore, it is of great importance to develop sustainability in this organisation and to establish itself in the social, economic, political, environmental, technological and cultural context, and thus, to implement timely strategies that allow to improve and maintain the organisational sustainable approach.

Being a sustainable company means investing in training, establishing good working conditions and benefits for employees. Stopping seeing actions as an expense, because everything that is given to workers is recovered in the form of efficiency, good service, quality, loyalty and innovation.

It is important to have an integral development model that allows them to respond to the current contexts they face, so that they can remain competitive and keep up with the competition, guaranteeing their growth, permanence and profitability.

### Methodology

For the selection of the experts, certain specific characteristics were determined based on their experience, skills or knowledge of the topic under study.

The Delphi method was used, which falls into the family of subjective methods. It is particularly useful when it is not possible to satisfy the requirements of information accumulation demanded by the methods included in the other families of techniques, but nevertheless there is a pool of experts who can offer reasonably solid prospective visions on the analysis of the sustainability of the reverse logistics of the bakery company.

Within the methodological design, we also show the strategies and procedures that allowed the collection of data and information, and its processing, analysis and interpretation in order to respond to the problems that were raised in the research objectives.

- This study proposes a comprehensive productivity measurement instrument, based on ten priority elements in any organisation, either from an intangible or tangible point of view, as both aspects need to be considered when measuring productivity.

#### *Pilot phase*

To validate the sustainability measurement instrument, a pilot test will be carried out, selecting through a non-probabilistic sample by convenience, experts from the organisation with knowledge in logistics.

The instrument shown in tables 1-10 consists of 10 fundamental elements for sustainability, which are described below:

- Element 1: Process management. This refers to the way in which processes and procedures are administered and managed in the different areas of the organisation, as well as those responsible for each one.
- Element 2: Infrastructure and resources. This refers to the physical assets available to the organisation, and the degree of importance they have for each process.

- Element 3: Collaboration and relationship with partners. This element considers the relational factor with agents outside the company, in this case with strategic partners.
- Element 4: Measurement and continuous improvement. Here it is considered whether the necessary indicators are in place to measure productivity and whether the necessary resources are available to execute it in the best possible way.
- Element 5: Policy. It is important to assess the involvement of top management in the comprehensive development of both tangible and intangible elements of the organisation, as well as the involvement of government policies.
- Element 6: Economics. This element aims to measure which external and internal economic aspects impact the company, as well as the relationship it has with production.
- Element 7: Society. It is crucial that the people in the organisation are aware of the social variables they face.
- Element 8: Culture. This is another determining element in today's world, as values, customs and traditions have a significant impact on the attitude and aptitude of human capital.
- Element 9: Technology. This is a determining aspect for the development of the organisation in the globalised context in which we live, as knowledge and the application of technologies provide competitive advantages.
- Element 10: Environment. This element measures the environmental impact of the organisation, in a bidirectional sense.

| ELEMENT 1: Process management |   | Progress in % |    |    |    |     |
|-------------------------------|---|---------------|----|----|----|-----|
| SUB-ELEMENTS                  |   | 20            | 40 | 60 | 80 | 100 |
| 1                             | There is a clear and well-defined workflow for reverse logistics processes.                                 |               |    |    |    |     |
| 2                             | It has been documented and communicated to all employees involved in reverse logistics.                     |               |    |    |    |     |
| 3                             | The key entry and exit points of products and materials in the reverse logistics flow have been identified. |               |    |    |    |     |
| 4                             | Performance indicators have been established to measure the efficiency and effectiveness of the processes.  |               |    |    |    |     |
| 5                             | Regular assessments of reverse logistics processes are conducted to identify opportunities for improvement. |               |    |    |    |     |

**Table 1** Integral instrument for measuring sustainability (Element 1)

Source: Own elaboration

| ELEMENT 2: Infrastructure and Resources |  | Progress in % |    |    |    |     |
|---|--|---------------|----|----|----|-----|
| SUB-ELEMENTS                            |  | 20            | 40 | 60 | 80 | 100 |
| 1                                       | The storage and handling infrastructure for returned goods is adequate and efficient.                                    |               |    |    |    |     |
| 2                                       | The necessary resources and equipment are in place to carry out reverse logistics activities efficiently.                |               |    |    |    |     |
| 3                                       | Information systems and technologies are in place to monitor and manage product and material flows in reverse logistics. |               |    |    |    |     |
| 4                                       | A tracking and tracing system is in place for returned products and recyclable materials.                                |               |    |    |    |     |
| 5                                       | A quality and safety management system is in place for reverse logistics.  |               |    |    |    |     |

**Table 2** Integral instrument for measuring sustainability (Element 2)

Source: Own elaboration

| ELEMENT 3: Collaboration and relationship with partners |   | Progress in % |    |    |    |     |
|---|---|---------------|----|----|----|-----|
| SUB-ELEMENTS  |   | 20            | 40 | 60 | 80 | 100 |
| 1   | Strong and collaborative relationships are maintained with suppliers, retailers and other partners involved in reverse logistics.             |               |    |    |    |     |
| 2   | Relevant information is shared with partners to optimise product and material flows.  |               |    |    |    |     |
| 3   | Clear and established arrangements are in place for the return of products and materials and their reintegration into supply chain processes. |               |    |    |    |     |
| 4   | Effective and smooth communication with customers is carried out to facilitate the return of products and materials.                          |               |    |    |    |     |
| 5   | Regular evaluations of partner performance are carried out and joint improvement actions are established.                                     |               |    |    |    |     |

**Table 3** Integral instrument for measuring sustainability (Element 3)

Source: Own elaboration

| ELEMENT 4: Measurement and continuous improvement |  | Progress in % |    |    |    |     |
|---|--|---------------|----|----|----|-----|
| SUB-ELEMENTS                                      |  | 20            | 40 | 60 | 80 | 100 |
| 1   | Periodic measurements of productivity and performance indicators in reverse logistics are carried out.                                 |               |    |    |    |     |
| 2   | Specific goals and objectives are set to improve the efficiency and effectiveness of reverse logistics processes.                      |               |    |    |    |     |
| 3   | Data collected is regularly analysed to identify trends and patterns in reverse logistics performance.                                 |               |    |    |    |     |
| 4   | A culture of continuous improvement is fostered and employee participation in identifying opportunities for improvement is encouraged. |               |    |    |    |     |
| 5   | Corrective and preventive actions are put in place to address identified areas for improvement in reverse logistics.                   |               |    |    |    |     |

**Table 4** Integral instrument for measuring sustainability (Element 4)

Source: Own elaboration

| ELEMENT 5: Policy |  | Progress in % |    |    |    |     |
|-------------------|--|---------------|----|----|----|-----|
| SUBELEMENTS       |  | 20            | 40 | 60 | 80 | 100 |
| 1                 | They are aware of government policies and regulations related to reverse logistics and how they impact productivity. |               |    |    |    |     |
| 2                 | Are there specific laws or standards regarding waste management, recycling and extended producer responsibility?     |               |    |    |    |     |
| 3                 | Do political changes influence policies and regulations affecting reverse logistics?                                 |               |    |    |    |     |
| 4                 | Are there international agreements that may influence reverse logistics and reverse logistics productivity?          |               |    |    |    |     |
| 5                 | What government incentives or subsidies are available to promote sustainable practices in reverse logistics?         |               |    |    |    |     |

**Table 5** Integral instrument for measuring sustainability (Element 5)

Source: Own elaboration

| ELEMENT 6: Economy |   | Progress in % |    |    |    |     |
|--------------------|---|---------------|----|----|----|-----|
| SUBELEMENTS        |   | 20            | 40 | 60 | 80 | 100 |
| 1                  | Learn about the costs associated with reverse logistics, such as transport, storage and handling of returned goods.   |               |    |    |    |     |
| 2                  | How changes in prices of raw materials and resources influence the profitability of reverse logistics                 |               |    |    |    |     |
| 3                  | Understanding exchange rates and how they affect international transactions of returned goods in reverse logistics    |               |    |    |    |     |
| 4                  | Economic policies that can influence investment in reverse logistics infrastructure and technology                    |               |    |    |    |     |
| 5                  | How current economic trends impact the demand for returned goods and the need to efficiently manage reverse logistics |               |    |    |    |     |

**Table 6** Integral instrument for measuring sustainability (Element 6)

Source: Own elaboration

| ELEMENT 7: Society |   | Progress in % |    |    |    |     |
|--------------------|---|---------------|----|----|----|-----|
| SUBELEMENTS        |   | 20            | 40 | 60 | 80 | 100 |
| 1                  | Do consumers perceive the importance of reverse logistics and its impact on sustainability?                             |               |    |    |    |     |
| 2                  | Do you know the social expectations and demands in relation to the management of returned goods and reverse logistics?  |               |    |    |    |     |
| 3                  | Cultural differences exist that may influence the way in which returned goods and reverse logistics is handled          |               |    |    |    |     |
| 4                  | Social considerations can be incorporated into the planning and execution of reverse logistics to improve productivity. |               |    |    |    |     |
| 5                  | Social barriers may exist to effective implementation of sustainable practices in reverse logistics.                    |               |    |    |    |     |

**Table 7** Integral instrument for measuring sustainability (Element 7)

Source: Own elaboration

| ELEMENT 8: Culture |   | Progress in % |    |    |    |     |
|--------------------|---|---------------|----|----|----|-----|
| SUB-ELEMENTS       |   | 20            | 40 | 60 | 80 | 100 |
| 1                  | Cultural values related to sustainability and social responsibility in reverse logistics are known.                 |               |    |    |    |     |
| 2                  | Reverse logistics practices can be adapted to the cultural needs and expectations of different markets.             |               |    |    |    |     |
| 3                  | Cultural differences exist that can influence perception and participation in reverse logistics programmes.         |               |    |    |    |     |
| 4                  | Cultural changes that encourage greater acceptance and participation in sustainable reverse logistics are promoted. |               |    |    |    |     |
| 5                  | It is known which cultural factors can impact the implementation of sustainable reverse logistics practices.        |               |    |    |    |     |

**Table 8** Integral instrument for measuring sustainability (Element 8)

Source: Own elaboration

| ELEMENT 9: Technology |  | Progress in % |    |    |    |     |
|-----------------------|--|---------------|----|----|----|-----|
| SUBELEMENTS           |  | 20            | 40 | 60 | 80 | 100 |
| 1                     | It is fully understood what technologies currently exist to improve the efficiency and effectiveness of reverse logistics.                       |               |    |    |    |     |
| 2                     | The technological tools available for tracking and monitoring returned products and recyclable materials are available.                          |               |    |    |    |     |
| 3                     | You know what technological advances can help optimise reverse logistics processes, such as the use of data analysis or artificial intelligence. |               |    |    |    |     |
| 4                     | Technological solutions can be implemented to improve the visibility and traceability of products in reverse logistics.                          |               |    |    |    |     |
| 5                     | Technological barriers exist that hinder the adoption of sustainable practices in reverse logistics.   |               |    |    |    |     |

**Table 9** Integral instrument for measuring sustainability (Element 9)

Source: Own elaboration

| ELEMENT 10: Environment |  | Avance en % |    |    |    |     |
|-------------------------|--|-------------|----|----|----|-----|
| SUBELEMENTS             |  | 20          | 40 | 60 | 80 | 100 |
| 1                       | The environmental impact of reverse logistics processes, such as greenhouse gas emissions and consumption of natural resources, is well known. |             |    |    |    |     |
| 2                       | Environmental regulations and sustainability standards are in place that affect reverse logistics and productivity.                            |             |    |    |    |     |
| 3                       | Initiatives are being implemented to reduce the environmental impact of reverse logistics, such as recycling and reuse of returned products.   |             |    |    |    |     |
| 4                       | Reverse logistics practices can be improved to reduce waste generation and promote the circular economy.                                       |             |    |    |    |     |
| 5                       | Opportunities exist to collaborate with partners and suppliers on environmental initiatives in reverse logistics.                              |             |    |    |    |     |

**Table 10** Integral instrument for measuring sustainability (Element 10)

Source: Own elaboration.

The pilot test will be used to determine whether the elements considered are adequate to comprehensively measure sustainability in the organisation to be assessed, or whether the elements and sub-elements need to be refined.

For the test, it will be necessary to arrange interviews with experts and managers of the organisation for its application.

**Results**

The study has partial results, so that two of the objectives have been fulfilled:

- To establish the elements for the measurement of sustainability, based on the theoretical foundation.
- To design an integral instrument capable of measuring sustainability in the reverse logistics of a bakery company in Villahermosa, Tabasco.
- These objectives have been fulfilled and dictate a partial conclusion of the research.

**Conclusions**

Reverse logistics is presented as an important tool, which is generated from the consumer to the producer, having as its objective the correct return of products that are defective, that have been returned or, in its case, that have been discarded.

This procedure, recently applied to industry, will address problems of customer and/or user dissatisfaction at the end of the supply chain. It is a system that consists of analysing and evaluating the origin of the problems that are transmitted to customers when the products and/or services demanded do not comply with the conditions established by the marketing operations between both parties and managing the return of the same.

It will be closely related to the concept of sustainable development because there must be a balance between industrial development and the environment, therefore, rules must be implemented that allow an adequate exploitation of resources without compromising future generations, this is how reverse logistics through the reintroduction of materials that have completed their life cycle and have been set aside, will be able to generate a decrease not only in production costs but also in the amount of waste that is discarded on a daily basis, thus being an important tool to help in business sustainability, as it will be able to extend the life cycle of products and therefore cause an immediate decrease in pollutants.

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